

Paper

# **Complex systems, climate change, urban health and the human scale: An evolutionary complex systems perspective on urban health**

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## Panel proposal

### Theme—*Governance: Past, Present, and Future*

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### Panel title:

## **Climate change, complex systems governance and human-scale versus people-centred development**

### The panel's focus and rationale (299 words)

Climate change is one of the most complex challenges we face in the 21st century. Its global dimension has drawn more public attention to international agreements made by inter-governmental bodies as possible solutions (Schröder 2012). While the top-down global agendas of climate change mitigation and adaptation, such as the Paris agreement, are set in place, they need engaged local actors to support and implement actions from the bottom-up. Despite the human propensity for cooperation and community-building is capable of managing common-pool resources sustainably (Ostrom 2005), the boundaries of social and ecological systems are open and dynamic. Increasing global interconnectivity and growth have enabled to reduce poverty but also increased in inequality, which can be seen as an indicator of failing to cope with increasing complexity in governance. The global dimension of climate change fosters the need for collective action at a global scale. How can local collective action be scaled up globally and how can new forms of governance still respond to the broad spectrum of fundamental human needs as opposed to people-centred policies?

The objective of this panel is to discuss climate change, complex systems governance and the human-scale versus people-centred development. Human-scale development builds on Max-Neef's matrix of fundamental human needs, and people-centeredness is a concept applied in the context of Chinese urban development policies. We will exemplify both with two case studies, from China and from Latin-America. We will also tap into the social, cultural and political dimensions of local climate governance efforts in the case studies, which, in the Chinese case, are the actions driven by the development paradigm *ecological civilization* and, in the Latin American case, attempts to achieve polycentric governance for indigenous communities in Peru and Brazil. The third presentation will aim at drawing lessons from complexity science for global climate change governance.

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## WOW6. Individual paper presentation

Franz W. Gatzweiler, Jieling Liu, Manasi Kumar

### **Complex systems, climate change, urban health and the human scale: An evolutionary complex systems perspective on urban health**

Deliberations about how to govern complex problems of climate change, urban health and wellbeing, sustainably and yet in accordance with human needs, have often been implicitly biased by well-intended ideas such as being ‘human-scale’ or ‘people-centred’. With increasing urban populations and increasing urban systems interconnectivity, cities as we knew them transform into city regions or clusters and the externalized costs of such growth are increasingly shared with people who become marginalized and detached. We present ‘human-scale’ and ‘people-oriented’ ideas of urban development from an evolutionary systems perspective, as expressions of two types of socio-political organisation with different degrees of self-organisation. We refer to multi-level selection theory to explain the maladies of current urban developments, their negative impacts on people’s health, the environment and the reasons for denial or not being able or willing to act in response to the available knowledge about urban and planetary health problems. Finally, we make recommendations for governance to address the systemic problems of urban health.

**Keywords:** cities, memes, complex systems, institutions, attractors, ultrasociality, evolution, denial

#### **Introduction**

From an evolutionary complex systems perspective, we associate ‘human-scale’ and ‘people-oriented’ ideas of urban development with two different forms of socio-political organisation with different degrees of self-organisation at different scales in complex systems. Former, primarily promoted by decentralized democracies, latter typically applied by centralized democracies. Both abide by the evolutionary mechanisms of cooperation and competition for space and resources, and the laws of thermodynamics. Multi-level and group selection theory, which we will elaborate in later sections, is at the heart of understanding urban development. Instead of seeking ‘either-or’ solutions to problems of urban health, “the complexity approach (...) has the potential to make the historical framing of politics [‘left’ and ‘right’] obsolete” (Beinhoker 2007: 416) and “the evolutionary complex systems perspective leads to policy recommendations that cut across current political ideologies” (Gowdy and Wilson 2015).

The history of agriculture and urbanisation is a history of changing flows of resources and energy at different levels of complexity in order to secure survival. With the rise of agriculture humans started to capture and redirect more energy from the sun for their own needs, by cultivating and domesticating specific crops and animals for their own use (Christian 2008). In that process, cities and new specialised professions evolved, social complexity increased, and patterns of interconnectivity changed and required new forms of coordination (governance). The speed of resource flows and interactions also increased. To meet the challenges of increasingly complex social organisations, institutions transformed from repetitive actions which proved to be useful, like habits, routines and other spontaneous behavioural order, to sophisticated complex multi-

layered institutions in specialized sectors of society, like the legal system. This organisation of increasing complexity became necessary to meet the needs of a growing number of interconnected human agents and to facilitate the exponentially increasing number of interactions, exchanges and flows of resources and services among them.

One of the remarkable features of systems with increasing complexity is that at some point they seem to develop traits which have been referred to as a “self”. In fact, the neurobiological explanation of consciousness as the “self” coming to mind is a result of changing patterns of interconnectivity in neural networks (Damasio, 2010). And with regards to social organisation, Alexis de Tocqueville (1835) wrote, “the village or township is the only association that is so perfectly natural that... it seems to constitute itself.” As we take an evolutionary perspective, we portrait the “self” as a social construct resulting from the observation and experience that systems behave as if they have an identity of their own. Our understanding of cities as complex systems (Bai et al. 2016) and the “self” is that of a system with higher organisational complexity, measured by its degree of interconnectivity, with feedback links to its components, which are of lower complexity and that functions to pass on information by means of genes or memes. While genes are passed on through the multiplication of organised biological systems, the organisation of social institutions, like religion, traditions or know-how, facilitated an even more efficient passing on of information, by **memes** – cultural units of information (Dawkins, 1989). In fact, it seems that on the basis of memes and institutions, the grammar and syntax for which has been proposed by Crawford and Ostrom (2000), it is possible to build a coherent evolutionary theory for the social sciences.

We will argue, that the health problems we are observing in cities, have emerged from the failure to match organisational capacity (governance) to increasing degrees of interconnectivity in socially and technologically increasingly complex systems (Gatzweiler et al. 2017). This asymmetry of social, technological and ecological complexity leads to adverse health outcomes for people and leads to unsustainable cities. The failure to adjust the asymmetries is in part due to people being overwhelmed by the task of governing complexity but also due to the enabling and inhibiting impacts on behavior from higher organizational levels, leading to denial and apathy.

### **The systemic kind of problem urban health is**

The history of urbanisation starts with the transition from hunter-gatherers to sedentary forms of live, early settlements and eventually cities.

Agriculture enabled people to gain control over resource flows, produce and store surplus and thereby improve chances of survival. A warming climate contributed to making new areas of land cultivatable and inhabitable. That development, however, reached a threshold when humans start fearing the consequences of their dominance over the natural environment. Environmental degradation eroded the ecological support functions required for healthy living. Before facing health problems of global or planetary dimensions, people were always confronted with health problems in cities, famously in medieval cities which suffered diseases in epidemic proportions (Ciecieznski 2013). Interestingly some of those medieval diseases, such as the plague, are now returning. 2015, the World Health Organization recorded 320 cases including 77 deaths (Bichell 2017). Gatzweiler et al. (2017) explain why health problems in cities are emerging from

complexity. Here we aim at an evolutionary complex system explanation for the challenges to govern increasing complexity in cities.

Social systems, like markets, which were originally built on the bases of informal rules of exchange have evolved into a sophisticated system of global capitalism (Gowdy and Wilson 2015) and now seem to dictate and manipulate human behaviour. Neoliberal ideas led to a situation in which the market system “tell(s) people how to live rather than people setting up markets to help them live the way (they) want to live.” (Norgaard, 2017). As we will argue, this perception of a system “dictating” the behaviour of the individuals can be explained by so-called ‘downward causation’ in multi-level selection theory<sup>1</sup> and the evolution of human ultrasociety<sup>2</sup>. Gowdy and Krall (2013a:138) explain that in the transition to ultrasociety “...groups of individuals become economically organized to function as a superorganism. (...) human society began to function like a single organism dedicated to the purpose of producing an economic surplus.”

Crucial to our explanation of how and why humans are struggling with the negative urban health consequences of their own progress, is an understanding of the cooperation and competition of complex systems at different scales of organisation. As it is an evolutionary process, it is by definition, not driven by a purpose or intention. Rather it is a process in which different systems and subsystems cooperate, compete and grow to fill spaces in the systemic state space<sup>3</sup> - a view which is supported by multi-level selection theory (Wilson and Wilson, 2007). Selection takes place at multiple levels of society, between individuals in groups but also among groups. At the group level selection is determined by those group traits which are best adapted to their environment, emerge from the combination of traits of the individuals in the group and, obviously, also from the coordination mechanisms within the group which organise how individuals interact inside the group and with their environment. The group then thereby displays a character of its own (Wilson, Ostrom and Cox, 2013).

Gowdy and Krall (2013a: 139) explain that “...group selection takes on a new force with the transition to agriculture”, and here we argue that with the transition to agriculture we have witnessed one system (agriculture) outperforming another (hunter-gatherer) in the competition for resources and space - a process which could take place among all types of living systems. Living systems are temporary exceptions to the 2<sup>nd</sup> law of thermodynamics and they maintain forms of order with the help of extracting energy from outside their system boundaries in order to fulfil a specific function. From the perspective of genes, living systems are “throw-away survival machines” for passing on genetic information (Dawkins 1989). Accordingly, socio-cultural systems serve to pass on memetic information.

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<sup>1</sup> “Simply put, downward causation (...) is the claim that in complex systems exhibiting emergence, the higher or macro-level (...) exerts some kinds of causal influence downwards on the lower level substrates in the systems from which the emergent emerged.” (Campbell, 1974: 141)

<sup>2</sup> “Ultrasociality refers to the most social of animal organizations, with full time division of labor, specialists who gather no food but are fed by others, effective sharing of information about sources of food and danger, self-sacrificial effort in collective defense. This level has been achieved by ants, termites and humans in several scattered archaic city-states.” (Campbell 1982). Wilson refers to ultrasociality as eusociality (2005).

<sup>3</sup> In discrete dynamical systems theory, a state space is the set of all possible configurations a system can take.

## Governance mismatches and institutional homeostasis

The theory of institutional homeostasis (simplified in Fig. 1) explains how and why institutions create around value in the process of evolutionary organisational change as population densities change, social organisation emerges and natural environments are transformed at different scales and speeds (Gatzweiler, 2014). From a complex system perspective, social values can be seen as created by shared expectations of advantages from cooperation. They are emergent properties of cooperation and they are visible in form of norms and other social institutions.

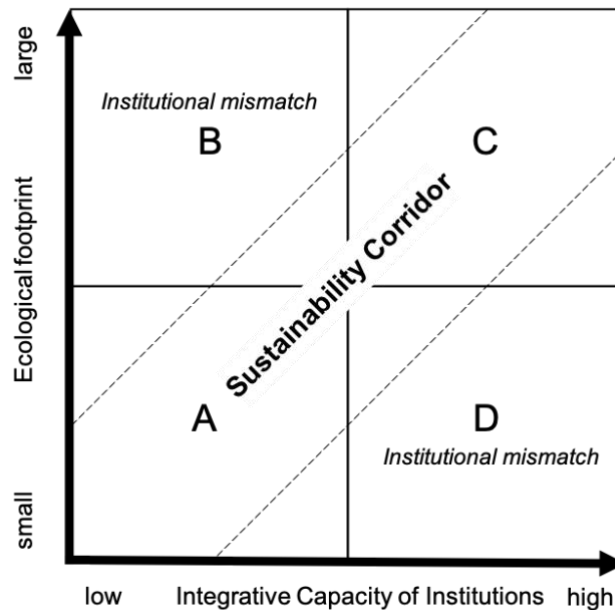


Figure 1: Institutional homeostasis explains why mismatches occur between the 1. capacity of institutions to avoid externalities and 2. population growth and economic development producing larger ecological footprints (modified from Gatzweiler 2014)

Institutions are both, intentionally designed and unintentionally evolved sets of rules, which define the system's components, their interconnectivity and thereby the behavior of a system. From an evolutionary perspective biological value is the reason why humans attach a value to virtually everything around them (Damasio, 2010). Biological value is defined by the state of living tissue within a homeostatic range. Physiological states in a homeostatic range where the viability of living tissue declines have a low biological value, whereas those whose living tissue flourishes have a high biological value. High biological value and optimal homeostatic ranges express themselves in the conscious mind as pleasurable feelings, extreme or dangerous ranges express themselves as unpleasant or painful feelings. This biological primitive of value also applies to cultures, because value is tied to need and need is tied to life. For that reason, it is important to recognise needs in human-scale development (Max-Neef 1991) and the valuations we establish in everyday social and cultural activities are always linked to the processes of survival and life regulation (Damasio 2009: 212).

The evolution of institutions are manifestations of the same homeostatic impulse for living systems: Institutions constitute the systems which pass on memes, coded information of behaviour. They aim at avoiding extreme behaviour which could cause social imbalances and endanger the viability

of individuals or the group, and reversely, at providing incentives for ‘good’ behaviour. Damasio (2010: 293–5) calls this socio-cultural homeostasis.

Values can evolve from rules in use or rules emerge from values. Value in social systems can therefore be seen as emerging from positive feedback mechanisms<sup>4</sup>, which create attractors<sup>5</sup> (Fig. 2): Systems which show a certain degree of order and organisation attract agents from less organised systems to join because pursuing their goals is less costly. Transaction costs are lower in more ordered systems. Positive feedback mechanisms work according to a simple set of rules, like those which define the behavior of individuals in swarms: 1) stay close but do not collide with the neighbour and in order to do so 2) adapt to the speed of the neighbour, 3) move towards the centre, i.e. have more of others around you (to be safe) (Reynolds 1987).

Attractors have basins of attraction, which are the centre of gravity of systems towards which the components of the system aim at moving towards. They aim at occupying a space and securing their state in the available state space and they are in competition for this space in order to improve their chances of survival. Systems will maintain their internal structure and continue to grow until their size causes the interconnections (which maintain their structural state) to weaken and fall apart. Interconnectedness weakens at the edges because costs to connect or cooperate increase with increasing distance from the centre, which could be a city where people have access to public goods, spaces and services. Like two contra-directional, gravitational and centrifugal/entropic forces. At the edges of systems (edge of chaos<sup>6</sup>), the connections to the core attractors are weaker, social entropy is higher and opportunities for joining other systems or the creation of new systems, are also higher with increasing distance to the centre. Not all agents can join a system around the same attractor. Because of the different types of agents, organised differentiation and specialisation occurs inside the system and creates efficiency gains in form of agglomeration benefits. Outside the system different types need to be organised around other attractors and form other collective functions in new organisation.

John Searle (2012) refers to this phenomenon of building systems of rules (institutions) around things that are perceived to have value, by explaining the ability of humans to create facts from declarations of ‘status functions’. The status of a piece of paper being ‘money’ or a person being a ‘professor’ comes with specific functions associated to that status, which can only be performed if it is collectively accepted that something has that status and function. Human institutional civilization”, he says, “is created entirely by a certain class of declarations (making something the case by declaring it as being the case)”. This is a kind of hybrid between realism and constructivism and a “natural consequence of our biological structure and language.” The reason for people to come up with status function declarations is that it creates power, e.g. by a system of obligations, duties and rights, Searle says. It should however also be considered, that power is not only the cause but could also be the consequence of social structures being built around human values.

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<sup>4</sup> Positive feedback works to align members into a synchronised state and create order. The ordered subset of the system is called an attractor, because anybody in its vicinity will be attracted to join because of the efficiencies and reduced interaction costs.

<sup>5</sup> An attractor is a set of states towards which a system will gravitate and remain cycling through unless perturbed.

<sup>6</sup> Edge of chaos is referred to the phase transition zone between order and disorder.



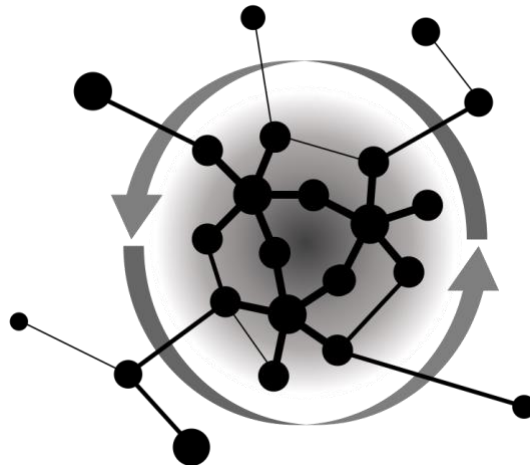


Figure 2: Attractors and positive feedbacks are centres of gravity around which institutions evolve

The same positive feedback mechanisms which attract others to join the system and contribute to its growth and stability, eventually also destabilise the system, when variety is reduced. A reduction of variety can lead to decreasing innovation, creativity and loss of system resilience (Yamagata and Maruyama 2016). Positive feedbacks (“more begets more”) are the cause for exponential growth (Bettencourt et al. 2007). They occur because of the persistence of successful interrelationships and tend to be invasive, exploitative, dominate over corrective negative feedback mechanisms and tend to reduce variety. Because of the lack of negative feedback and adaptation mechanisms the system will inevitably collapse (if it does not innovate), creating the entropy needed for other systems to emerge.

An example can be drawn from the current economic growth model and its contribution to climate change, which has been discussed among experts from Lisbon University and the Chinese Academy of Sciences, during a meeting on climate change and health at the Lisbon Academy of Science in October 2018 (Ref to be added): Economic growth and the globalization of goods and capital flows led to an unsustainable level in the consumption of natural resources, steady increase in pollution and climate change. On the one hand, the market economic system attracts fossil-fueled industries to thrive, converting primary resources into products and services, which contribute to diversify the economic system; on the other, environmental externalities – air pollution, deforestation, ecological degradation, biodiversity loss, and global warming destabilize the economic system by jeopardizing human health and security, which in turn drives further growth to regain human health.

### **Denial, the double reality and institutional negentropy**

*We know that our lives can end at any moment, yet we live as though we do not know this. Lifton calls this condition the “absurdity of the double life.”*

Lifton (1993)

We now look at the inevitability of collapse by turning to explaining the inability or unwillingness of people to change their behaviour in response to life threatening, global level system changes like climate change and biodiversity loss but also that of living short and unhealthy lives in underprivileged urban environments. In doing so we apply the theory of institutional homeostasis.

More generally, we aim at understanding the condition of seemingly accepting or ignoring living conditions which are no longer at a human scale, unhealthy or life endangering. Attempts to explain what at first sight seems like an apathy, reach from a lack of information<sup>7</sup>, lacking emotional connectedness to socially organised denial (Norgaard 2011, Zerubavel 2006).

Emotions seem to be critical in understanding denial. Hochschild writes that “a person totally without emotion has no warning system (...)”. As emotions are the link between personal experiences and broader public issues, Hochschild further notes, that “When we do not feel emotion, or disclaim emotion, we lose touch with how we link inner to outer reality” (1983, 223). In her attempt to weave the pieces together which explain denial Norgaard (2011) views denial as the process by which individuals collectively distance themselves from information and use an existing cultural repertoire of strategies in that process. For example, the emotion of fear is dealt with the emotional norm of ‘being optimistic’ and ‘maintaining control’ and the emotional management strategy of ‘selective attention’, ‘controlling exposure to information’ or ‘not thinking too far ahead’ (Norgaard 2011:174). That means, Norgaard argues that people do emotionally respond to global threats like climate change, but they cultivate or culturize emotions, like fear, in order to deal with them in socially acceptable and familiar forms.

Her explanation may be problematic because emotions are deep inside human’s unconscious mind where they are actually not mindful or aware of them at all. The purpose of emotions is to enable an immediate behavioural response to a threat in order to improve the chances of survival (Damasio 2010). The apathetic behaviour we observe under global threats like climate change, could, however, simply be a non-response, or an inability to act based on emotions because of a missing emotional link to the threat – it is simply too far away and does not cause immediate harm. In fact, according to how emotions are defined by Damasio (ibid) there are not emotions, but feelings triggered by the knowledge of climate change. While we comfortably sit in a café and drink our latte, our body is in a homeostatically “feel good” state. Although we read about a global threat and the information enters our mind, it is not sufficient to change our bodily state and move us out of the healthy homeostatic comfort zone. It seems to be absurd to fear the consequences of actions (climate change) which are driven by the fear of survival and the motivation to secure one’s life. The information about a potential threat, as real as it may be, does not reach our emotions. It is received but too far away to trigger the emotional survival mechanism of an immediate response. So rather than being a socially constructed behavioural response, as Norgaard (ibid) has suggested, in this case, denial may simply be an inability to act in response to a threat because the emotion-response mechanism which has evolved in humans over hundred thousand of years, remains unaffected.

We here attempt to explain denial in the context of ultrasociality, attractors, positive feedbacks and institutions: the individuals of a (ultra)social system do not have any overarching purpose in mind, except that of their immediate social context, like family or kin. By striving towards improving the individual’s own living conditions the social superorganism is created by an ever-denser set of rules defining the roles, positions and behaviours of each member of society. Within

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<sup>7</sup> The information deficit model (Bulkeley 2000) explains that information is the limiting factor in public nonresponse.

that increasingly dense web of institutionalised<sup>8</sup> interactions there is increasingly little space to secure one's livelihood by further specialisation and finding a new socio-ecological niche. Opportunity spaces are getting scarce in the full world scenario (Daly 2005). In such a system, be it democratic or other, *"People don't 'choose' to act as if they are climate change deniers or compulsive shoppers. In the social system that evolved through blind mechanical forces we have to act in ways that support and are constrained by that evolved system."* (Gowdy 2019). From the societal perspective this process looks as if the overarching social organisation, the social superorganism, imposes a particular behaviour onto its members to secure its own functioning. What actually happens is that as interconnectivity increases, people who are part of an ultrasocial system are caught in a web of increasing institutional negentropy which constrains their opportunity spaces. Others, who are not caught in that web become marginalized and become free or sufficiently unsafe and fearful to secure their livelihoods and seek new opportunities elsewhere, which can lead to large scale migration.

### **Human-scale and people-centeredness in the urban context**

Detachment or anomie is another perspective to explain why people have difficulties to (re)act on the knowledge they have (about climate change). It occurs when there is little moral guidance to individuals in a society, or even breakdown of social bonds between the individual and the society. In larger cities people live detached from another and traditional institutions. Emil Durkheim (1897) uses the term anomie to describe the derangement of traditional social-cultural bonds with the rise of industrial society. And as people create their identities not only among themselves but also to their physical and natural environments, degrading environments affects peoples' identities.

Historically, the advantages of living in cities have turned into disadvantages when population growth outpaced the organisational capacity of cities for making use of additional members or including them to enhance the common good. Since the 1940s modern urban environments were built for cars driving at 50-60 km/hr, instead of being built for people walking at 3-5 km/hr. The slow-paced period of thousands of years of co-adaptation between humans and their natural environment changed during the great acceleration of high-speed technology, mobility and infrastructure development, the rise of the city and urban and exponential population growth in the age of the Anthropocene (Ehlers and Kraft 2006). Because of the speed of development, the process of evolutionary co-adaptation changed and became increasingly organisationally challenging, producing what we can observe as so-called externalities: various forms of environmental pollution in ecosystems and poverty in social systems – the consequences of maladaptations in the process of socio-ecological (cultural) evolution. Those are the areas outside of the sustainability corridor in Figure 1, when institutional and environmental change are not aligned or happen at different paces of change.

When such mismatches occur in the pace and scale of social organisation, they appear in form of costs which are shifted to outside of 'the system', so-called externalities. Globalisation created a new space for global networks of exchange to appear in form of large infrastructure and housing projects in cities in which people have specialised functions; are workers and consumers, driving or serving the economy by striving to fulfil their needs and wants and thereby keeping themselves and the system, they are part of alive: a positive feedback. The disconnect between infrastructure

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<sup>8</sup> Institutional entropy is reduced (Georgescu-Roegen 1990, Auster 1983, Bailey 1990). Institutionalised interaction are interaction regulated by rules.

related to global resource and financial flows and local urban territory is particularly visible in global urban financial centres. Global networks of exchange are largely detached from local urban territory. Cities have increasingly been defined as investment vehicles instead of shared living spaces (McDonald and Bailly 2017). Urban public spaces are increasingly changed into private spaces for investments responsive to global flows of finance detached from the local needs of urban residents. “There is no possibility for the active participation of people in gigantic systems which are hierarchically organised and where decisions flow from the top down to the bottom” (Max-Neef, 1991: 198).

In this paper we have used „human-scale” (Gehl 2010) and the “people-oriented” (Chen et al. 2019, see annex) kinds of urban development because they have been used to refer to two different types of **political self-organisation**. We use them as representative for two different kinds of political self-organisation (Colchester 2016). The former referring to a more distributed network, the latter a more centralized and hierarchical network. They are both human-made and both aim at improving the health and wellbeing of people. Both take different approaches to urban development by realising different ideas and degrees of political self-organisation in decision- and rule-making and implementation processes.

Problems occur with the human scale of urban architecture and physical infrastructure when people are disconnected from the resource flows which they embody or when they are distant from and do not share the values which those structures represent. **Different ways in which value is delivered through their networks are at the heart of both, types of urbanisation.** Although human-scale has often been categorised to be ‘small and beautiful’ (Schumacher 1973), according to our understanding, physical size is not a necessary criterion for human-scale. What matters is the delivery of human values through the network. For example, large infrastructure projects, like a bridge connecting two cities on opposite sides of a river, or a tunnel, built by the government, are large, yet human-scale as long as their structure and function is connected to what humans want, desire or value. The human scale can be big but it needs to be connected to what people value by a web of social, institutional, technological and biological infrastructure channeling resources to and creating value from the project. The challenge lies in the situation that what people value at one stage of development (e.g. growth) can be counterproductive at later stage.

Values and their institutional infrastructure ensure that resource flows continue to support the physical or biological infrastructure and thereby prevent its disintegration. Because people value the function of a bridge there will be political and institutional mechanisms in place which connect regular maintenance of public infrastructure to political decision-making to ensure the structure is for the public good, shaping rational economic reasoning to allocate funds for maintenance and thereby avoiding decay. In fact, such a system can be described as being economically viable and sustainable (Beer 1972). The concept Stafford Beer has referred to as the ‘Brain of the Firm’ (1972) lies at the heart of governance at the right scale and may well be transferred to cities (Ebikeme et al. 2019).

Physical infrastructure which decays or is not used is the result of anomie or a disconnect from supporting socio-economic and institutional infrastructure which channels resources to where structure and form is to be sustained. The values needed for justifying the allocation of resources and the respective institutional infrastructure which shapes the decision-making process, have

changed. In a way the physical infrastructure no longer stands on the foundation of a supporting social infrastructure and eventually decays because resource flows bypass the (physical) structures which require continued investments. Societal values, ideas and aspirations and expectations may have changed, attractors which emerge around those values have shifted to other locations to which resources are now allocated.

### **Conclusions: An evolutionary complex systems perspective for urban and human wellbeing**

The evolutionary complex systems perspective on cities provides a new understanding of the kind of urban health and wellbeing problems we are facing in cities worldwide, beyond normative and ideological categories. We used “human-scale” and “people-centred” as two different categories of political self-organisation applied in two different types urban development and planning. They are both human-made and both aim at improving the health and wellbeing of people in cities. In summary some of the following dynamics seem to be at work and help to explain increasing health and wellbeing risks in cities:

- 1) Institutional negentropy of a system which captures people in mutually dependent<sup>9</sup> roles, positions and behaviours in which they are no longer free to choose and act.
- 2) Denial and apathy are observations of a detachment or disconnect between local and global attractors and resource flows.
- 3) Marginalisation, detachment or anomie happens as a result of the grand acceleration and lacking time for co-adaptation.
- 4) Competition for space and resources among different types of living systems.
- 5) The systems which people developed to sustain their livelihoods, became increasingly interconnected, evolved into ultrasocial superorganisms which seem to display a behaviour of their own, and in fact is simply the result of emerging complexity.

From a systems perspective, the observation that the systems develop a ‘self’ and the fact that people deny climate change or population growth receive a new understanding as phenomena of emergence and detachment.

Throughout most of human history, small groups of people were the most natural social units for self-regulation. They can govern themselves and participate in governance at a larger scale (Ostrom 1990; Bowles and Gintis 2002; Ostrom 2010). Large-scale social governance cannot simply be inflated small-scale governance. Instead it needs to be multi-cellular, or polycentric. In such societies individuals’ participation is an important intermediate level.

Every human sphere of activity has an optimal scale centered around values as attractors and a supporting institutional framework that re-enforces these values in positive feedback mechanisms. The challenge is to find the best institutional framework, based on a total account of costs and benefits occurring inside and outside the system, not to adjust the system to ideological categories.

Some recommendations for healthy and sustainable urban governance which can be derived are:

1. Enable and include people – individuals, families, communities, and other non-government groups to participate in urban health and climate governance and co-create the institutions which support access decision-making and inclusion.

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<sup>9</sup> The mutuality is between people and the system in which they act.

2. Denial and apathy are the opposite of action promoters. They prevent constructive, fore-frontal, pro-active and direct actions. To encourage participations of climate actions and health protection among groups in wider society, decisionmakers need to create opportunities in which attention to personal experiences and feelings towards climate impacts and urban health problems can be given to people.
3. Co-adaptation with public participation means “to do things right at the right scale” by avoiding governance mismatches and having learning and feedback mechanisms in place at all levels of society. It is likely to yield greater public support in the long run, which can effectively resolve the problems of marginalisation, detachment and denial.

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## Annex

As a concept, people-centered development has been discussed beginning from the 1980s, e.g., by David Korten and Rudi Klaus (1984). According to James Robertson, a contributing editor of the People-Centered Development Forum which Korten and his colleagues founded, people-centered development is one that facilitates the transition to a new civilization a sharp contrast to more familiar forms of development that have taken their mission to be the Euro-American civilization and modernization, in which wealth is augmented by ever-increasing exploitation of the Earth, governed by an impersonal system and possesses greater legitimate power than people (Robertson 1994). As a wider international response to the discussion, the concept was endorsed by the United Nations Department of Economic and Social Affairs as an approach to sustainable development as early as 1995 at the World Summit for Social Development held in Copenhagen (UNDESA 2004). “People-centeredness” as a concept was pointed out by United Nations General Assembly in 2004 as too abstract, and for the purpose of concretization, was encouraged for the realization of people-centred approaches in public policies and development strategies.

People-centeredness, as discussed and approved by World Health Organization (WHO) member states for health service provision, refers to the types of health care approaches that “consciously adopts the perspectives of individuals, families and communities, and sees them as participants as well as beneficiaries of trusted health systems that respond to their needs and preferences in humane and holistic ways.” (WHO et al. 2015, p10-11). According to WHO, people-centered health services need to reflect a set of core principles such as comprehensiveness in responding to the evolving health needs and aspirations of people and populations, equity, sustainability, prevention, empowerment, systems-thinking, and many more. Figure 3 presents a conceptual framework of people-centered health services defined by WHO.

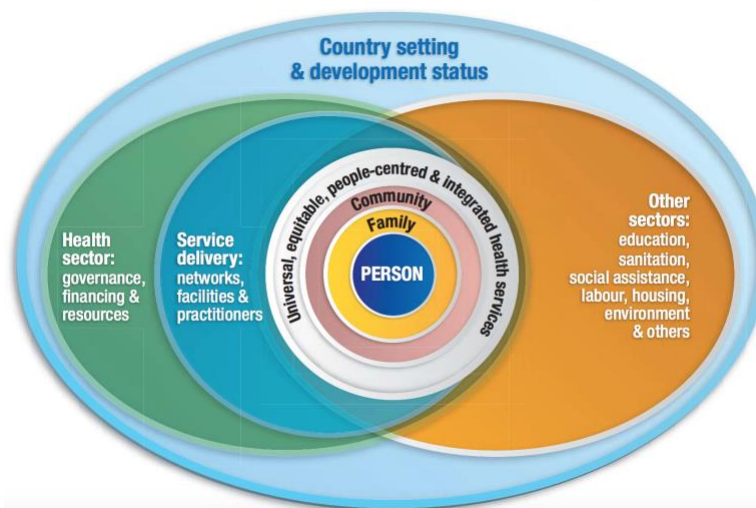


Figure 3. Conceptual framework for people-centred and integrated health services.

Figure source: WHO (2015).

A key feature of people-centeredness, as WHO emphasizes in health services, is how it seeks to align how human and financial resources are spent by seeking to provide “the right care at the right time in the right place” (WHO et al. 2015, p14). For this reason, people-centered health care should not be only a concern of rich countries where health institutions and care delivery mechanisms have built up over time, but also in less developed regions as the right to health is a basic human right that encompasses not only social and economic, but also cultural and environmental dimensions. For instance, for low-income African countries, there are ongoing problems of physical access to public services, shortages of health workers and weak supply chains, with poor responsiveness of care and high dependence on external funding. For middle-income countries which are often undergoing rapid societal change, such as China, often, people-centered health care tends to face the challenge of minimizing the difference in access to services between affluent and less affluent regions and between permanent urban residents and migrant workers. Finally, for high-income countries where the basic challenges to service access have been addressed, the challenge to improve people-centeredness is about improving health care access for marginalized or socially excluded populations. Different country contexts also mean that each has its own health profile. E.g., rich countries tend to attribute high morbidity and mortality rates to chronic and noncommunicable diseases, whilst in middle-income countries health care infrastructure and quality are in concern due to the rapidly rising rate of chronic as well as noncommunicable diseases, and health in low-income countries is often jeopardized by poor physical environments, weak supervision, low pay and limited accountability to local communities. For these reasons above, the WHO emphasizes that people-centeredness in healthcare does not have one single model or one single set of standards. People-centeredness therefore should not be treated as a new “magic sword” for resolving the mounting urban health problems even when they are worsened by climate change impacts, rather, it should be considered as an overarching service design principle which respects people’s right to health and takes into account the local context, values and preferences in decision-making across the governance, financing and resources management in the health sector (WHO et al. 2015).

In the European socio-economic and cultural contexts, people-centered approaches are considered altogether with the overall retreated economy. E.g., *Health 2020*, the current European health policy, serves as an umbrella policy framework that supports action across government and society to “find people-centered solutions and stay resilient to economic downturns” (WHO Regional Office for Europe 2013, p2). Germany for example is one of the EU countries supportive of the people-centered approach to health care. The country was ranked as amongst the top donors to WHO’s work to improve health care services around the world (WHO 2019). In addition, Germany is also actively supporting actions to address climate change impacts need to be timely, just and people-centered (German Federal Ministry for the Environment 2018). Furthermore, people-centered approaches in climate actions can also carry the connotation of decentralization when it comes to, , for example, energy transition and food production (Sieber and Graef 2018; UNFCCC 2017).

In the Chinese context, as proposed by former president Hu Jintao, adhering to people-centered development means “to achieve the goal of comprehensive development of people, to seek and promote development from the fundamental interests of the people, to continuously meet the growing material and cultural needs and to effectively protect the economic, political and cultural rights and interests of the people” (People’s Daily 2008). According to *People’s Daily*, the official

media of the Communist Party of China, the “people” in such development refer to all the workers, builders and participants who contribute to achieving China’s socialist society. China’s people-centered development principle was proposed to address the existing GDP-growth dominant development thinking, which is framed as “material-centered,” neglecting or even jeopardizing the needs and interests of people. The principle emphasizes economic growth as a means to achieve the end goal of fulfilling the material and cultural needs of people therefore promoting comprehensive development (People’s Daily 2008). The Chinese definition of people-centered development may have seemed abstract. An recent example of practical adoption of this principle in China’s socio-economic context is: to address the country’s wide-spread urban migrants marginalization and environmental pollution problems caused by the decade-long massive urbanization movement, the Chinese national government carried out the National New Urbanization Plan (2014–2020) to flag the ambition to transfer its land-centered urbanization strategy to people-oriented urbanization (Chen, Liu, and Lu 2016) through, namely, increasing the transfer of rural to urban household registrations in order to grant equal right, improving public transport, housing, utility infrastructure, health care and education services, further institutionalizing ecological and environmental protection, and notably, strengthening and developing new approaches to social governance (State Council of China 2014).

To sum up, the principle of people-centeredness as elaborated in the development context, by the World Health Organisation and by the Chinese Communist Party, literally means “putting people into the center”. It focuses on meeting the needs and interests of people in development, climate actions and urban health depending on their socio-economic, cultural and environmental contexts and values with a vision of individuals, families, communities and practitioners participating in policy-forming, therefore reducing transaction costs in the increasingly complex and uncertain urban system in the long run. Human-scale equally emphasize not the physical size but the value of people in association to their natural and cultural surroundings, or, the web of institutional infrastructure. The two principles - people-centeredness and human-scale share the commonality of not being one single predefined set of standards but rather, relative and highly dependent on the people in specific contexts. The difference is, while human-scale manifests deep logical roots from evolutionary and complex systems perspectives, the principle of people-centeredness carries a much more political and social notion which is rooted in the constant debate and reflection of mostly the established modern civilization, which, from an anthological perspective is also referred the Anthropocene.

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