Urban geography in the era of globalization: the cities of the future Emerging knowledge and urban regulations

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1 Introduction

Globalization, cities and their modes of regulation are part of the epistemic regime of the total social fact. The complexity of forms, structures, and transformations of contemporary cities thus requires an openness to and implementation of several different methodologies as well as the integration of different perspectives and geographic approaches. The geographical approach presented in this contribution rests on three analytical steps to understanding urban spaces: first, the identification of a conceptual field suitable for working with interferences between facts and scales, i.e. between the concrete as well as the existential and temporal dimensions of globalized urban spaces; second, the exploration of their permanent reconfigurations in relation to actors' representations, strategies, balances of power, usages and territorialized shaping practices (economic, socio-cultural and environmental); and third, the suggestion of possible modes of regulation that can lead to more sustainable and more livable cities.

2 Interferences: globalization and metropolization

Territory can be understood as the material form of flowing time. As such, it feeds on the continuity and discontinuity of history. Its organization can be explored through the ordering of time. The notion of «historical regime», which Hartog (2003: 22) defines as a modality of self-consciousness proper to a given society, allowing the articulation of «past, present, and future», can be extended to identify successions of «urbanization regimes». Following most notably the analyses by Mumford (1964), Benevolo (1983) and Ascher (2009), the notion of «urbanization regimes» is seen here as the identification of those configurations – be they demographic, economic, technical or political – that characterize the organization, functioning and development phases, as well as the modes of regulation, of an urban system over a given period of time (Da Cunha 2005; Da Cunha & Both 2004). Based on this understanding of urbanization regimes, we argue that present-day cities are experiencing a novel mutation, of the order of those that first gave birth to the «classical city» and later to the «industrial city».

The era of globalization is one of a «metropolitan urbanization regime». Globalization refers here to that recent part of the process characterized by increasing interdependencies between nations, ease of international movement, and the network-based functioning of multilocalized systems of action and of economic, cultural, and political transnational actors. It is further linked to the emergence of a megapolitan archipelago as structural cornerstone of a world system that has undergone major transformations (Dollfuss 1995). Globalization therefore marks the passage from modern cities to contemporary cities and the transition towards a metropolitan regime characterized by hierarchical and globalized urban systems, as well as urban sprawl.

Today, world might is unquestionably being exerted within the geographic concentration of powers, a concentration which combines the globalization of societies and their economies with the metropolization of the world. In City in History, Mumford (1964) described the city as the nerve center of our times. Lefebvre (1970) saw the general urbanization of the times as an expression of both the absence of boundaries/clear territorial limitations (thereby doing away with the urban-rural dichotomy), as well as the preeminence of city networks that spread their influence over extensive areas. Several researchers today see metropolitan growth intensified by the selectivity of functions and amplified by the connectivity of urban systems (Friedmann 1986; Rozenblat 2007, 2010; Rozenblat & Pumain 2007; Sassen 1991; Veltz 1996). As put forward by Camagni (1994), this growth is thus the articulation of (global) network effects with (local) milieu effects

Cities, all of which are integrated to varying degrees in globalization, develop as systems of multiple interactions that place them in direct competition to each other so as to attract the most productive or prestigious activities. The complexity of these interactions unfolds not only through financial activities but also, and above all, through industrial activities, most notably those based on knowledge economy, within global value chains that organize the spatial division of labor and the control of knowledge in certain privileged places (Porter 1986; Gereffi et al. 2005; Grabher 2006).

The major players of such networking remain multinational firms that directly or indirectly influence the

development of local business communities (Dicken & Malmberg 2001). By deploying their activities at the greatest geographic scale within centralized organizations that are being managed more and more consistently inside global value chains, firms bypass local and international customary territorial scales of action, and merge spatial strategies with organizational and economic strategies (Yeung 2002). Thus, globalization simultaneously questions the multidimensional dynamics of actors' strategies and multilevel territorial dynamics. This is far from the notion of the constitution of a global scale severed from the local. On the contrary, there are several levels of scales where space is only one dimension of the challenges posed by world competition, the increasingly uneven distribution of social resources and the ecological imperative.

These transformations affect all countries – be they developed, emerging, or less developed – and utterly change the living conditions and habits of a great share of humanity, both in big, global cities and in «ordinary cities» (Robinson 2006). Even though the coupling of globalization and metropolization is linked to the emergence of a new accumulation regime combined with the appearance of knowledge economies and new technologies, it also leads to new social instabilities and increases pressure on ecosystems which then require new urban regulations.

3 Reconfigurations: economic, social, and ecological implications

The analysis of ongoing territorial reconfigurations at different scales is thus an object of general analysis most scholars could agree on. The insular metaphors of archipelago economics or metropolitan archipelagos describe a discontinuous spatialization, structured by strategic places, receiving directional activities, global actors and the logistics of distant communication. The Institute of Geography studies globalization in order to identify its implications at the national, regional, or local levels from the viewpoint of three major perspectives: urban dynamics and firm networks, vulnerability of groups and political ecology.

3.1 Urban transformations, firm networks and actors' strategies: centralities and resiliencies
Cities and firm networks constitute a duality. To a great extent, networks form cities, which in turn provide the resources and markets that underpin firms. The multilevel methodology developed at the Institute of Geography integrates in the evaluation of the centralities of cities within globalization (macro level) their ability to create local networks (meso level) by linking both levels with the individual networks of major multinational groups (micro level) (Rozenblat 2010).

This approach allows identifying, measuring, and integrating the processes that develop at different levels of urban organization (micro, meso, and macro). Complimentary thereto, the multidimensional approach to networks that is currently being developed in communication sciences (Contractor et al. 2011) allows cities to be studied within their actors' environment. The simultaneous consideration of these two approaches may provide a better understanding of urban development in relation to its permanent reorganization.

The configurations of networks reveal the individual and collective strategies that drive them. Thus, their forms interact with their functioning and the measure of such forms provides some insight into their action within social space, through their properties of equity, hierarchy, or fragmentation and exclusion. The two-fold – relational and structural – property of networks integrates some of the probabilities of their future developments by using more extensively communication or transportation possibilities, as well as through the collective memory that sustains historical networks (Dicken & Malmberg 2001). These collective processes are partially formalized by the new graph theory, which was developed as of the end of the 1990s and which shows the importance of small-world and scale-free networks in the organization of societies and in their dynamics (Newman, Watts & Barabasi 2006). Two specific properties stand out by virtue of their implications.

The first property is the redundancy of paths connecting cities within a given network. This redundancy contributes to strengthening direct and indirect interactions as it allows for the development of clusters within cities or between cities, an observation already made by Granovetter (1973) in «The Strength of Weak Ties». It is within these clusters of economic ties of proximity that processes of agglomeration or network economies may develop. Thus, it is within the weak ties between clusters that the motor to diversity can be found that allows cities both to function and to renew themselves (Csermely 2009; Guimerà et al. 2005; Uzzi 1997). Such types of clusters between cities were identified on the basis of the networks of multinational firms, using individual measures at the level of each city or collective measures at the level of each group of cities (Rozenblat & Mélançon 2009; Rozenblat et al. 2011).

The second property is scale-free hierarchy, which also follows a dynamic logic. It was made popular by Barabasi & Albert (1999), who argued that the high level of hierarchy of connections observed in scale-free networks stems from preferential attachment: new ties emerge more easily around those nodes that already have several ties, as potential benefits are higher there.

This may be seen as a multilevel process, in that it uses networks that grow both within and between cities. The intensity of this phenomenon was exemplified in the case of London, where 75% of the branches of the firms present in the city were to be found within its urban area. This may be contrasted with a world average that stands at about 25%. Individuals or organisms acting as connectors between or within clusters strengthen the relational capital of the network, but first and foremost their own social capital. A city can act as a bridge in a system of cities if it lies at the interface of several groups or clusters or between different territorial entities (Rozenblat et al. 2011). Clusters and hierarchies beget dynamics that can either sustain or sap the resilience, geographic orientation, and social variety of urban systems. The Institute has developed and empirically tested indexes of centrality, cohesion, transitivity or hierarchy on European and other cities, so as to assess the possible global and local levels of resiliency of these networks (Rozenblat & Mélançon 2009, 2012). In dynamic terms, such urban positioning calls for networks that show a high level of flexibility. It also calls for cities and their associated actors that show a strong ability to adapt. In fact, too strong a hierarchy between nodes can block the whole system and can also lead to the marginalization of individuals who find themselves excluded from all networks.

3.2 Urban exclusions and vulnerabilities: social geography between flows and places

The global economic transformations that affect the urbanization regime inevitably act upon the social structures and dynamics of cities. The interconnectedness of metropolises within a global network and the action exerted by globalized networks and multiple flows on these territorial and economic logics change the social space of cities. As was noted by Castells (1996), metropolitan spaces interweave two logics – albeit in an unequal and sometimes contradictory fashion: a logic of flows that organize distant exchanges, and a logic of places which assumes that experiences are grounded in territory. The tension between these two logics and the different types of actors they affect constantly calls for reevaluation of opinions as to for whom and how cities ought to be built.

Beyond the analysis of the causes and effects of urban sprawl (Da Cunha 2005), researchers in Lausanne also study the ability of urban policies to promote social integration, and most notably a right to the city (Lefebvre 1970). According to this principle, authorities must defend the social function of the city and urban property, as well as promote a more democratic urban management. Studying rights to the city thus requires that urban fabric and urban practices be analyzed. What are the logics and systems of actors that drive the modalities of urban governance and urban usages? What mechanisms define who can be where, when? What are the processes that assign a position within the global space of a city? What mechanisms drive away those deemed undesirable?

Within this context, a major avenue of research in Lausanne is the study of conditions leading to weakening socio-spatial trajectories. Several projects have been conducted from this perspective, ranging from regional analyses of the difficulties experienced by people in highly precarious situations to gain access to the primary job market (Da Cunha et al. 2001, 2004; Mager 2002, 2003, 2006; Mager & Stofer 2009) to studies on the ways socially vulnerable populations gain access to and keep housing (Da Cunha et al. 2009, 2010; Da Cunha & Schmid 2007a, 2007b; Mager & Matthey 2010).

From a Bourdieusian point of view, interactions and multiplicative effects between the degree of social affiliation, the residential situation, and the spatial practices within an imposed context, made of social, political, and economic relations, are important aspects of research in this area (Da Cunha et al. 1994). Consequently, a special focus has been given to the contemporary modalities of production of an urban citizenship (Bonard & Matthey 2010; Matthey & Steiner 2009a) able to move beyond the usual frameworks of political action (e.g. the party, the union, the association) to ensure equality of opportunity and of place (Donzelot 2004).

This interest is part of a research focus that aims at a prudent reception of what could be termed the capabilist turn in public policies of integration (Mager & Matthey 2010), in that they mobilize a rhetoric of empowerment that is expected to help those who are most vulnerable to improve their living conditions. This notion of social justice enhances those tools that stem from community action or from a third sector (Marengo, Racine & Blanc 2004), which includes members who, at the same time, participate in solving «problems». Thus, neighborhoods now constitute a relevant scale of production of interpersonal or intergenerational solidarity and immigrant associations are being summoned as community workers in certain Swiss communes (Matthey & Steiner 2009b). A marked leadership by the State characterizes the new Swiss policy of integration. Within this context, Swiss cities often play an innovative role in their search for new forms of governance as well as in their translation of identities in migration.

Thus, what lies at the heart of this approach is first and foremost an exploration of the way in which social groups fill objective space with subjective space – the former being spaces of control, power and institutions;

Fig. 1: Diverse forms of isolation: gated middle-class housing, Granada, Spain, 2011
Vielfalt der Isolationsformen: geschlossene Mittelklasse-Wohnanlage, Granada, Spanien, 2011
Diversité des formes de repli: logement de classe moyenne fermé, Grenade, Espagne, 2011
Photo: L. MATTHEY

the latter being ones of lived space-time sequences and representations – as well as the socio-spatial consequences of this territorialization (DA CUNHA & MATTHEY 2007). Results until now have brought to light the importance of claims by residents and possible reasons for diversions of urban order.

One of these changes to urban order stands out in particular, that of gated communities. Gated communities introduce into urban territory the characteristics of a postmodern society that allows the dream of individualism to be combined with the desire of being with one's own kind (cf. fig. 1). Even though these residences are still few in number, they are a widely discussed component of the Swiss housing market because, in their idealization of the notion of private city, they dispute the very relevance of public space

management. The Institute of Geography seeks to determine what motivates public-private arbitration, i.e. the contestation of the legitimacy of the regulation of space by public authorities, and explores the underlying forces of a growing movement for self-initiated and self-managed urban development (LE GOIX 2006). These research fields are tested in different environments, so as to highlight the multilevel implications of the privatization of space (MAGER, MATTHEY & ZOTOVA 2011; SCHIFFRIN 2011).

3.3 Socio-economic process and urban ecological dynamics: a political ecology approach
Privatization of space and resources, socio-ecological vulnerability, geographical scales and networks, urban politics, movements and governance are also topics and concepts central to political ecology, an approach

used in different geographical contexts by a research group at the University of Lausanne. Urban Political Ecology regards cities as socially and politically produced «urban nature». The urban environment is transformed into forms of social and economic power, leading to contestations over urban amenities and resources. Urban Political Ecology thus examines the co-production of society and the environment and, in particular, unequal access to natural resources in cities as an implication of power differentials at local, national and global scales (SWYNGEDOUW 1997).

Most of the urban-political-ecological studies follow a Marxist approach stressing the urban metabolic transformation under the current system of global capitalism and neoliberal ideology and practice. The «capture of nature» for urban development in the contemporary era of neoliberal globalization is generally regarded as uneven, leading to both environmental problems and socio-ecological vulnerability and marginalization. Furthermore, environmental discourses of scarcity are used to legitimize the commodification and privatization of urban resources and amenities (SWYNGEDOUW et al. 2002).

Projects underway or recently completed include empirical studies on different urban resources (including air, water and land) in various geographical contexts (mostly India and more recently also Niger and Switzerland). Furthermore, an attempt is being made to develop theoretical and conceptual alternatives to mainstream Marxist approaches by drawing, in particular, upon Foucauldian views.

Thus, for example, research on the political ecology of air pollution in Delhi brought to light that recently introduced air-quality measures, including the conversion of public transportation vehicles to compressed natural gas, need to be interpreted in the wider context of (middle-class) initiatives to beautify India's capital and so render it a global city (VÉRON 2006). Such initiatives are often detrimental to poorer social groups, as also was shown by the recent slum relocations from inner cities to the metropolitan peripheries (DUPONT 2008). Furthermore, political and judicial practice reaffirmed clean air as a public good and demarcated an (artificially) clear-cut boundary between private and public spaces, environments and resources (VÉRON 2006). This practice of boundary-making facilitates new forms of environmental governmentality whereby the state refocuses its interventions on environments demarcated as public while it can retreat from environments defined as private.

A current project examines the effects of recent political decentralization on housing and land development and on the provision of urban amenities in the periph-

ery of Niamey, as well as its implication for democratization and citizenship. This study takes conceptual cues from previous research on decentralization, participation and the everyday state in rural eastern India (CORBRIDGE et al. 2005) (cf. fig. 2).

In the context of industrialized countries, we aim to reinterpret the history of urban water management in Switzerland in a Foucauldian framework showing an uneven and incomplete coexistence of and transition from forms of biopower to neoliberal governmentality. Similar interpretations of shifting state control and power that used the concepts of «technologies of power» and «technologies of the self» have also been attempted in the very different geographical context of rural Madhya Pradesh (VÉRON & FEHR 2011).

Furthermore, we are in the process of developing a research program on small and medium cities that have generally been neglected in policy and in urban-political-ecological and globalization research. These cities are characterized by the simultaneous confrontation of two types of environmental problems: «green agenda» problems related to development (e.g. pollution or resource exhaustion) and «brown agenda» problems related to under-development and poverty (e.g. inadequate urban infrastructure and amenities). Many of these small and medium cities face a «triple challenge» of environmental governance, as they have limited financial and human resources to address these problems. To complicate matters, public and private investments in these cities have generally declined over the last decade as the focus in the current era of neoliberal globalization is on the metropolises (VÉRON 2010). Research on small cities allows closer examination of rural-urban linkages that have remained of great importance for many urban, periurban and suburban dwellers despite the rise of global city networks.

4 From global implications to local regulations: urbanism and sustainable mobility

In the face of multiple reconfigurations of urban spaces, innovative regulatory actions have been put forward at the transnational, national, and local levels so as to reflect and organize change. The city provides a viable platform for studying global change, as well as collective action, resistance and local political intentions. The metropolitan urbanization regime thus goes hand in hand with novel urban thought and new public modes of action.

What control systems and urban development strategies can speed up the transition towards a more sustainable regime? What alternatives are there to urban sprawl? How can complex urban projects be imple-

Fig. 2: Chilika Lake Bird Sanctuary, Orissa, India, 2011
Vogelschutzgebiet von Chilika Lake, Orissa, Indien, 2011
Réserve ornithologique de Chilika Lake, Orissa, Inde, 2011
Photo: P. RATTU

mented and led when conditions are uncertain? In view of exploring these general questions further, a network of researchers associated to the Institute of Geography through the Observatoire Universitaire de la Ville et du Développement Durable (University Observatory for the City and Sustainable Development) was initiated about ten years ago to coordinate research on alternatives to an unsustainable city, thus ensuring that geographers play a major part in defining and designing future cities.

The research of this network addresses three issues. First, it aims to describe and understand the processes by which the city is built and changed in the long term in order to identify more precisely the originality of recent changes within the urbanization regime. Second, it seeks to diagnose the major eco-

nomic, social, and environmental implications of these changes. Third, it analyzes the possibilities of a creative alternative model of urban development (DA CUNHA & RUEGG 2003).

From this perspective, «rebuilding the city on the city» appears as a major strategic orientation. However, action in favor of sustainable urban development should not limit itself to densification, and thereby risk ignoring issues of mobility and the rights of all social groups to access urban infrastructure and amenities. Therefore, a further major challenge for sustainable urban development lies in identifying urban forms linked to a regime of mobility. How should a given territory be organized so as to not generate useless mobility? How can people be encouraged to use transportation means more sustainable than cars? How does a

new transport infrastructure affect mobility? Ongoing research at the Institute of Geography provides some insight into these issues.

The analysis of a micro census on mobility in Switzerland (Observatoire universitaire de la Mobilité - OUM 2008) and different field surveys contributed towards creating a clearer picture of mobility behavior and general openness to trying out alternative means of transportation. It appears that car usage in denser parts of big cities is declining, while walking and cycling have become increasingly popular. Nonetheless, propensity to change modal behavior is weak: individuals do recognize that their choice of mobility results in negative externalities and yet they keep on using their car.

Mobility plans for public authorities (Observatoire universitaire de la Mobilité - OUM & Observatoire universitaire de la Ville et du Développement durable - OUVDD 2010), private (Logitech, Honeywell) and semi-private (OUM & OUVDD 2011) companies have been put together in recent years. While all these plans share the same goal, namely to reduce the use of individual cars, the motives behind them are very different. Thus, whereas public authorities are interested in showing the viability of a more sustainable mobility that leads to reduction of energy consumption and carbon emissions, private and semi-private companies are more interested in optimizing parking space because of the lack of suitable space in cities.

Thus, it appears that control of mobility by authorities could be a prerequisite for any changes targeting sustainability (Boillat & Pini 2005). The most obvious example is the departmental coordination of urban and mobility policies in view of reducing public need for individual transportation. Similarly, an interdepartmental planning of a regional railroad network allows authorities to explore consequences on the mobility, economy, urbanization, and the environment, as well as to estimate potential for change triggered by such an infrastructure (Pini 2009). Hence, the challenge for public actors is to predict people's mobility behavior before implementing a policy and installing an infrastructure designed to support greater sustainability in their territories.

Sustainable development is currently being used as a tool to regulate – albeit still tentatively – the interplay between economic, social, and ecological dynamics. However, the design and implementation of sustainable urban policies of transformation require a new understanding of urban narratives, which bestow on urban space new values, and the ability to give meaning to the city.

5 Concluding remarks: communicating our practices

This very brief overview clearly shows that our daily research activities result in the researcher being as much – if not more than – a *homo faber* as a *homo sapiens*. In other words, we explore while constructing our research fields and other experimental tools, but we also drive to build our conceptual frameworks, in the awareness that scientific thought highlights gaps and in-betweens which need to be filled as we become more and more aware of our ignorance, within a context of lability and intellectual nomadism that intrinsically leads to emancipation and to the creation of objects.

It is known that Paul Feyerabend (1975) pleaded in favor of methodological anarchism based on generalized skepticism and healthy agnosticism able to distinguish between science and political propaganda. Indeed, this anarchism seems to apply to the logic of emergence of new geographic products of knowledge. This anarchism is no longer an anomy. What makes a researcher creative is the existence of interiorized and metabolized schemata of thought – assimilated and transformed into the researcher's flesh. Not only do these schemata build our knowledge, they also structure our heuristic imagination and make us fit for exploration.

Therefore, the objectives of this contribution may not be only epistemological, but also pedagogical. Are not our efforts to clearly describe – i.e. to transmit realistically – our research practices on a daily basis tantamount to training potential young researchers, made sensitive towards the outlines of our evolving knowledge rather than to the dogmatism of certain categories of professorial understanding?

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Abstract: Urban geography in the era of globalization: the cities of the future. Emerging knowledge and urban regulations

Urban geography is the main focus of the research agenda of the Institute of Geography at the University of Lausanne. The emphasis is on globalization-driven changes within urbanization regimes. This article presents the emerging understanding of our various research groups, understanding which has been formed by the analysis and modeling of different expressions of relations to space continuously produced and transformed by individuals and social groups.

Keywords: metropolitan regime, urban networks, urban exclusion, political ecology, sustainable urban planning

Zusammenfassung: Stadtgeographie in der Ära der Globalisierung: die Städte der Zukunft. Neue Erkenntnisse und städtische Regulation

Stadtgeographie ist ein wichtiger Teil des Forschungsprogramms des Instituts für Geographie an der Universität Lausanne. Forscher/-innen des Instituts analysieren von der Globalisierung mitgeprägte Prozesse innerhalb des Urbanisierungssystems. Dieser kollektiv verfasste Beitrag berichtet über neue Erkenntnisse der Lausanner Geographen/-innen bezüglich der Analyse und Modellierung verschiedener Formen von räumlichen Beziehungen, welche von Individuen und sozialen Gruppen fortwährend produziert und verändert werden.

Schlüsselwörter: Metropolenregime, städtische Netzwerke, städtische Ausgrenzung, politische Ökologie, nachhaltige Stadtplanung

Résumé: La géographie urbaine à l'ère de la globalisation: les villes du futur. Savoirs émergents et régulations urbaines

Faisant de la ville et de l'urbain une part essentielle de sa pratique disciplinaire, l'Institut de Géographie de l'Université de Lausanne analyse la mutation des régimes d'urbanisation sous l'influence de la globalisation. Cette contribution collective rend compte des savoirs émergents mobilisés par les géographes lausannois en matière d'analyse et de modélisation des diverses formes de relation à l'espace que les individus et les groupes sociaux ne cessent de produire et de transformer.

Mots-clés: régime métropolitain, réseaux urbains, exclusion urbaine, écologie politique, urbanisme durable

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