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MAKING SENSE OF SPACE SYNTAX FOR BROAD SOCIETAL ISSUES

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ABSTRACT

Space Syntax algorithms have been applied to a wide variety of territorial situations. Although this technology has potential to help understand, analyse and suggest decision-making processes and public policy solutions for a myriad of urban morphologies, spatial layouts, roadway designs, built environments, and landscape types, its applicability to complex social situations remains understudied. Social interactions within unmediated urban settings are rather difficult to predict and can potentially lead to the perpetuation of social injustices. It is known that such unfair behaviours usually place disproportionate burdens on those whom, quite often, cannot do much to preclude future recurrent practices from repeating themselves under the same or slightly different circumstances. I argue that space syntax thinking and methodologies can also be utilized to reduce, and, perhaps, eradicate many of those social problems especially in cities. The paper analyses the potential use of traditional and innovative social and community oriented planning instruments and concepts, such as social impact assessments (SIA), social audits, social capital indicators and metrics, social sustainability, and social innovation through the lenses of space syntax methodologies.

KEYWORDS

Space Syntax; Societal Complexity; Social Impact Methodologies; social Innovation.

1. INTRODUCTION

Space Syntax algorithms have been applied to a wide variety of territorial situations (Hillier and Hanson, 1984; Vaughan, 2007). Although this technology has potential to help understand, analyse and suggest decision-making processes and public policy solutions for a myriad of urban morphologies, spatial layouts, roadway designs, built environments, and landscape types, its applicability to complex social situations remains understudied. Cities are shaped not only by many political, technical, regulatory and planned decisions but also by unintended, spontaneous, random and intuition-driven sets of actions and reactions.

The physical determinism paradigm has contributed to the pre-conceived notion that design professionals can influence one's urban environment, therefore influencing, even if only partially, the outcomes of a set of disjointed forces at play. Social interactions within unmediated urban settings are more difficult to predict and can potentially lead to the perpetuation of social injustices in the realms of land-use, transportation, housing, employment, school, race, gender and age discrimination (Harvey, 2009). It is known that such unfair behaviours usually place disproportionate burdens on those whom, quite often, cannot do much to preclude future recurrent practices from repeating themselves under the same or slightly different circumstances. I argue that space syntax thinking and methodologies can be utilized to reduce, and, perhaps, eradicate many of those social problems especially in cities.

The paper analyses the potential use of traditional and innovative social and community oriented planning instruments and concepts, such as social impact assessments (SIA), social

audits, social capital indicators and metrics, social sustainability, and social innovation through the lenses of space syntax methodologies.

This paper is organized into five parts. Part one is the analytical framework centred on social problems, urban and regional planning, and syntax methodologies. Part two provides an overview of several typical social planning instruments and concepts. Part three addresses some of the main issues with the implementation of social instruments at three scales: Local, regional and national. Part four discusses the social realm of urban development from a dynamic processes perspective. Finally, part five presents some concluding remarks.

2. ANALYTICAL FRAMEWORK

This analytical framework comprises a review of three areas: Social problems, urban and regional planning, and syntax methodologies. The intent is to provide the background necessary to understand social planning instruments. The premise is that urban and regional planning has traditionally placed more emphasis on the physical aspects of development, such as land use, transportation, housing, and economic development than on community planning. Societal forces and trends are perceived as being too complex to warrant careful planning along the lines required for planning and designing built structures. Prior attempts at using social planning instruments have had mixed results mostly due to an institutional inability to fully grasp human motivations, desires and resultant, planned and spontaneous, behaviours (Howe, 1988). Social programs usually are developed and implemented to address the needs of disenfranchised groups, and quite often they are pejoratively perceived as belonging to welfare programs (Vaughan, 2007; Fincher et al., 2014). This includes affordable housing, employment services, language and skills development programs for underrepresented groups such as ethnic minorities, public health initiatives and community clinics for low income groups, legal representation, fiscal and financial support programs, and community support for at-risk youth in the form of after school programs, among others.

2.1 SOCIAL PROBLEMS

Urban development occurs according to a myriad of complex forces, laws and regulations. In the built environment however, there is a prevalence of laws on the physicality of development. Those laws allow the relatively well understood computation, modelling and control of most variables and elements. It is known that many of the elements in urban development have a finite nature, which enables their measurability.

On the other hand, social problems such as poverty, spatial segregation, racism, sexism, domestic violence, xenophobia, jingoism, discrimination and social injustices are characterized by their traditionally wicked nature, which means that (1) they do not obey to stopping rules, (2) responses are considered to be only better and worse and not true or false, (3) they are also ill- and variously defined and shaped by strong inter-related variables which interact among themselves often in unknown ways, (4) they suffer from a lack of consensus regarding theirs causes, (5) they have numerous links to other problems, (6) they do not easily allow the opportunity to learn by trial and error, and finally, (7) every wicked problem is essentially unique (Rittel and Webber, 1973).

In the past, physical determinism initiatives were aimed at intervening in the built environment while hoping to achieve results in the social realm such as influencing human behavior. The intensity of this phenomena has evolved over the last few decades. However it accepted that globalization and the information revolution have increased the complexity of social phenomenon (Latour, 2005) due to growing information availability and exchanges.

For instance, in the 1960s-70s the urban renewal program in the U.S. demolished many aging homes when they could still potentially be renovated and upgraded to better living conditions. Although individuals were relocated elsewhere some of the resulting social ills included the place displacement and the breaking down of social networks. These actions were led by the government under notions of scientific rationality and human progress. Quite often, the cleared land was made available for new public private partnerships (PPP).

In the 1980s, the emphasis was on urban redevelopment through a mostly market oriented approach to revitalizing waterfronts and inner city areas. The built form preferred typologies (hotels, museums, aquariums, convention centres) targeted mostly central city locations. The typical outcomes of such redevelopment activities were exclusivity and social discrimination due to an elitization of those spaces (Balsas, 2007).

In the 1990s, many cities and regional metropolitan organizations in the U.S. implemented urban perimeters and urban growth boundaries in order to manage suburban expansion. From a land use perspective, the goal was to encourage development in certain areas and preclude it in others. The main problem with such approach was the strictness of the administrative boundary, which due to political reasons required its periodical adjustment either due to strong market forces or any other public sector goals.

In the late 2000s, the global financial crisis caused severe housing and property markets devaluations. The response adopted was in certain cases based on the resilience paradigm imported from ecological systems. The dilemma was that getting back to the prior modus operandi tended to perpetuate unjust dualities. One finding from such responses was that the need to rebound ought to create more robust realities and stronger social networks (Wasserman and Faust, 1994). Finally, during the early 2010s, the Occupy Wall Street movement in the United States was a social revolt against unfair and undemocratic procedures mostly in cities. The spontaneity of the movement achieved almost epidemic proportions with manifestations in cities as far away as Turkey, Brazil, and Mexico, among others.

2.2 URBAN AND REGIONAL PLANNING

The practice of Urban and Regional Planning has different emphases depending on one's own regional culture and prevailing or individual ideologies. At the onset, it is important to distinguish the substantive from the procedural nature of planning. The substantive nature pertains to the various professional specializations such as housing, transportation, economic development, etc. The procedural nature refers to the methodological aspects such as plan making, public participation, planning scenarios, policy recommendations, etc. Moreover, planning also varies depending on its scale of intervention.

Planning has been defined as "a process through which society's goods and services are distributed as equally and efficiently as possible according to the will of the people and with regard to the future" (Mullin, 2000, n.p.). Klosterman (1985, p.5) claims that urban and regional planning can be justified through four basic dimensions: "(1) planning attempts to remedy the negative effects of market actions, (2) planning promotes the common collective interests of the community (provision of public goods), (3) planning provides the data needed for effective public and private decision-making, (4) planning considers the distributional effects of public and private action, and attempts to resolve inequities in the distribution of basic goods and services."

On the other hand, Angotti (2008, p.8) argues that progressive community planning "seeks to achieve local and global equality, social inclusion, and environmental justice". Progressive community planning has emerged in opposition to traditional mainstream orthodox plans and their inability to bring about social progress for disenfranchised groups, leaving no other option but to organize and fight for participatory community action, racial equality, socio-economic inclusion, and environmental justice.

Marcuse (2011) has emphasized three currents in planning: a technical current cantered on scientific and designer and contractual planning, and two currents cantered on social issues, one privileging social reform (i.e. equity planning), and the other emphasizing social justice (i.e. ethical and cultural principles, community-based planning, radical or critical planning, and utopian planning).

The mainstream planning espoused by for instance the American Planning Association in the United States is relatively similar to the many of the spatial syntax applications, which attempt to use rational planning (i.e. ability to influence the urban environment through scientific

principles) to solve complex problems. Moreover, quite often mainstream planning has failed to recognize the tensions between eliminating injustice and preventing gentrification, and its outcomes are invariably marked by spatial injustices. Angotti (2008) suggests de-emphasizing the power of rational planning in the neoliberal city in favour of a stronger emphasis on progressive community planning and its roots in advocacy and social movements (Burdge, 1999; Benford and Snow, 2000).

This type of planning is much more cantered on communicative and collaborative planning and on conceptions of the just city. Progressive community planning also recognizes "bundle of processes including conflict, contradiction, and complexity" (Angotti, 2008, p.19). It results in great part from political struggles for social justice (Harvey, 2009) and not from idealistic desires for social harmony. Progressive community planning also requires the need for new visions towards more participatory democracy.

2.3 SYNTAXES (WITH SPECIAL EMPHASIS ON SPATIAL AND SOCIAL SYNTAXES)

Syntaxes are constituted by principles, tenets, rules, laws and best practices. Syntaxes serve to map patterns and to codify rhythms and behaviours, while establishing the grammatical rules for proper procedural practices (Smith, 1977; Hillier and Hanson, 1984; Vaughan, 2007). Their initial utilization emerged out of the study of language and the need to understand the relationship between geometric objects. More broadly speaking, among the various strands of syntaxes one finds physical/spatial, morphological, social, economic, cultural and environmental.

The physical/spatial syntax rules pertain to the characteristics of a location or agglomeration. Topography enables the modelling of development with its natural or man-made features such land use patterns and transportation infrastructure, etc. The morphological syntaxes are greatly influenced by the type and hierarchy of transportation infrastructure as well as the type of built environment, with the latter being directly impacted by legal regulations and norms. Social syntaxes result from societal values, cultural and political traits and behaviours. Over the years in most developed countries, pro-inclusion and pro-diversity viewpoints were converted into anti-discrimination laws (Fincher et al., 2014). For instance, Titles VI and VII of the 1964 Civil Rights Act prohibits discrimination on the basis of sex, race, colour, national origin, and religion in programs and activities receiving federal financial assistance, and employment discrimination, respectively.

Economic rules pertain mostly to the rules of the market and to the functioning of supply and demand for goods and services and to the use of fiscal and financial instruments to accomplish public policy goals. Among some of the most common economic instruments one finds incentives and sanctions. Cultural syntaxes are aimed mostly at promoting cultural diversity and at respecting the authenticity of the built environment through, for instance, the historic preservation of structures and their classification, protection and conservation. Such procedures include among others, cultural asset inventories and the mapping of cultural initiatives and programs.

Finally, environmental syntaxes aim to protect and enhance the quality of the natural environment while reducing nuisances and negative externalities such as pollution and the extinction of endangered species. Critical to environmental syntaxes has been the setting of regulations, programs and standards to help monitor the quality of the natural environment, and to facilitate its administration through incentives and coercive measures. In the United States, the federal government passed the National Environmental Policy Act (NEPA) in 1970, which was then followed by similar measures at the state level (little NEPAs). Also important in terms of environmental syntaxes is the environmental impact assessment mechanism that requires a comprehensive study of all environmental impacts anticipated by new major developments.

These various syntaxes constitute the genesis of contemporary professional specializations. They have resulted from intense theoretical and practical developments, which now enable certain individuals to claim specific bodies of knowledge and to also influence their evolution, tendencies, and future developments (Abbott, 1988; Wallerstein, 1999).

Spatial syntax had its beginnings in architecture, the study of geometric forms, harmonies and proportions in what pertains to a myriad built environment utilizations. Vitruvius Pollio's and Alberti's architecture treatises, and their contemporaneous, such as Christopher Alexander (1977), Leon Krier (1998), and Bill Hillier (1996) have looked at issues of urban form, structure, the use of fundamental elements (i.e. roads, land plots, building types, yards, open spaces) and their patterns, and their grammatical (syntax) rules (i.e. width, height, setbacks, usable areas, etc.) (Figure 1.). The practice of urban design has evolved over the centuries to influence not only the siting of fundamental elements, but also to create the most harmonious, efficient, effective, comfortable, safe and secure relationships possible. Since these outcomes were not always well accomplished by dominant syntaxes (e.g. modernism movement in architecture) with the creation of inhospitable urban spaces for instance, more recently there has been emphasis on utilizing syntaxes to improve prior architectonic conditions and to create more human friendly forms (Gehl, 2011) embodied in cathartic architectonic praxis (Morgado, 2016).

Figure 1 - Various urban morphologies in a suburb of São Paulo, Brazil
(Credit: Author, 2016).

Societal evolution has been the prevue of sociology, anthropology and other social science disciplines. However, it has long been recognized that one's built environment impacts that person's wellbeing and social development opportunities and relationships (Hillier and Hanson, 1984). Although unravelling those relationships is quite complex due to various economic, historic and family milieus, more and more we are assisting to growing social struggles for empowerment, equal opportunity, equal rights, diversity and inclusion, tolerance and solidarity. A paradox in our societal evolution is the fact that the status quo tends to impact disproportionately those with fewer resources and capabilities to alter the situations, which typically are beyond their own control (Sen, 1999). This requires strong grass-roots involvement and the reaching of a critical mass of developments, usually through social mobilization and the

constitution of social movements (Benford and Snow, 2000), in order for problems to receive political attention and for corrective measures to be codified into law, regulated, implemented, monitored and enforced.

3. SOCIAL CONCEPTUALIZATIONS AND INSTRUMENTS

There are at least five social instruments and methodologies aimed at conceptualizing social problems, inventorying at-risk social situations, characterizing issues, assessing social realities on the ground, and proposing solutions to minimize, and if possible, eradicate socially problematic conditions. These frameworks and instruments are used to remedy situations, which if left to their own devices are very unlikely to get resolved on their own. In addition, there are also other instruments, such as social media (Evans-Cowley, 2010), and social marketing (Lazer and Kelley, 1973; Corner and Randall, 2011), which usually are used without the explicit purpose of advancing certain social causes, but are still recognized as possessing some innate potential to do so.

3.1 SOCIAL IMPACT ASSESSMENTS (SIA)

Social impact assessments (SIA) are processes aimed at identifying, assessing, and administering responses to eradicate unresponsive social practices. SIAs are used to proactively assessing the pathologies of development and consciously eliminating disparities resultant from unfair developments and practices (Barrow, 2000; Becker, 1997). SIAs are similar at least in method to health impact assessments (HIA) (Forsyth, Slotterback, and Krizek, 2010) and to environmental impact assessments (EIA) (Partidário, 2000). For instance, a community forum within an environmental impact assessment involves the projection of social impacts by participants and their identification of the measures necessary to mitigate those impacts (Becker et al. 2003). Some of the most important SIA variables include population characteristics; community and institutional structures; political capabilities; and individual, family, and community resources.

According to the Inter-organizational Committee on Guidelines and Principles for Social Impact Assessment (ICGP), the fundamental SIA principles are: (1) Involve diverse publics, (2) analyse impact equity, (3) focus the assessment, (4) identify methods and assumptions and define significance in advance, (5) provide feedback on social impacts to project planners, (6) use SIA practitioners, (7) establish monitoring and mitigation programs, (8) identify data sources, and (9) plan for gaps in data (ICGP 1995, p.35). ICGP's framework was recently updated by Arce-Gomez, Donovan and Bedggood (2015) to reflect recent tendencies to dedicate more attention to participatory processes (Becker et al., 2003), ex-post use of SIA mechanisms, and SIA practitioners (Wong and Ho, 2015) (Figure 2.).
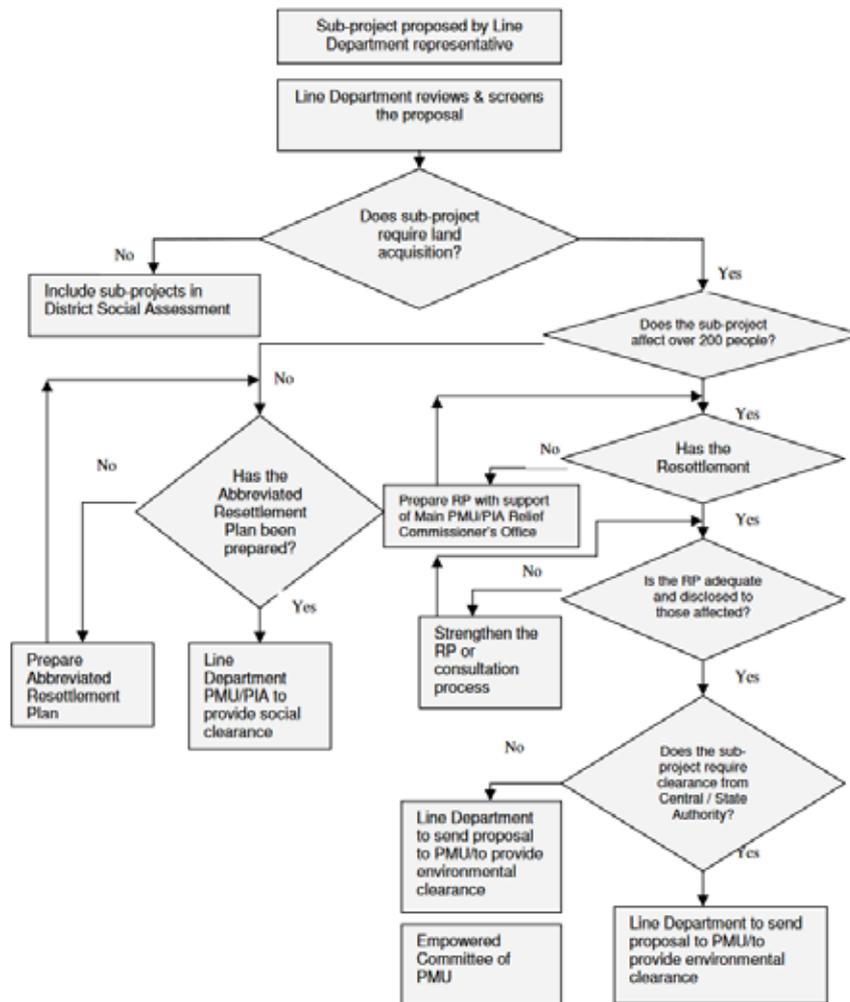
Figure 2 - Scoping process for social impacts – An Example (Adapted from Emergency Tsunami Reconstruction Project, Government of Tamil Nadu and Pondicherry)

(Credit: Centre for Good Governance, 2006, p.15).

3.2 SOCIAL IMPACT ASSESSMENTS (SIA)

Social audits are conducted to analyse the extent of social connections, dependences and interdependences, and autonomies of a given person or entity. Asset mapping on the other hand, is more global and reflects a community planning aimed at inventorying existing social and cultural assets in a community with the main intent of optimizing local resources while minimizing dependence on external ones. Part of this asset mapping technique includes cataloguing assets and making information about those assets known to community members (Wates, 1998).

3.3 SOCIAL CAPITAL

Social capital is an asset that contributes to the development of other forms of community capital (e.g. human, financial, physical, political, cultural and environmental) (Putnam, 2000) (Figure 3.). Although there have been conflicting findings regarding the extent of social capital in communities, there is consensus on three broad conceptualizations of social capital: (1) Linking social capital, (2) bridging social capital, and (3) bonding social capital. Linking social capital takes place within one particular community while bridging social capital pertains to the social relationships between individuals in two or more communities. On the other hand, bonding social capital pertains to the social relations within specific community networks without necessarily transferring capital across different communities (Aldrich, 2012).

Figure 3 - Fruition of Boston Common's activities as a form of social capital

(Credit: Author, 2016)

3.4 SOCIAL SUSTAINABILITY

Sustainability's most overlooked dimension has been its social aspects and how social variables not only interact among themselves but also with the economic and the environmental dimensions of development (Polèse and Stren, 2000; Bahadure and Kotharkar, 2012). All three major dimensions of sustainability ought to be analysed according to the various syntax methodologies in order to accomplish most of these broad societal goals: (1) Meeting basic needs, (2) overcoming disadvantage attributable to personal disability, (3) fostering personal responsibility, (4) nurturing the stock of social capital, (5) equitable distribution of opportunities, (6) cultural diversity, tolerance, and empowerment (Colantonio, 2007, p.5).

3.5 SOCIAL INNOVATION

Social innovation comprises novel ways to resolve societal problems. Quite often innovation requires a felt need to do something differently and the intervention of an outside person to either mediate or facilitate the resolution of existing situations (Wates, 1998). Social innovation is also equated with social entrepreneurship, a movement going back to the 1980s, which is dedicated to solving societal problems through "innovative, sustainable and scalable businesses models" (Santos et al., 2016, p.8) and other non-profit activities. At the core of social entrepreneurship is the notion of impact-oriented economy and the understanding that societal problems can be at least substantially ameliorated, if not completely eradicate. Santos et al., (2016, p.11) recommend placing greater emphasis on how one envisions opportunities through value propositions, through design (i.e. solution architectures, sustainable models, impact frameworks, and value generators), and through specific actions (e.g. pilot designs, resource mobilizations, and inspirational pitches).

4. ISSUES WITH IMPLEMENTATION OF SOCIAL INSTRUMENTS

Social problems are filtered through societal routines, economic dynamics, cultural lenses, and are likely or unlikely to receive media attention almost in a direct proportion to the extent that they benefit a considerable number of individuals. Prior to social media, many social problems would take a long time to be recognized – if they were recognized at all, embraced and resolved. Information and communication technologies (ICT) have created greater awareness of social problems, even if decision makers are unlikely to fully utilize those same technologies to effectively resolve social problems (Rheingold, 2002; Evans-Cowley, 2010).

The effective resolution of social problems requires the implementation of social instruments. And although the first phases of those implementations require mostly data collection, data analysis and the identification of plausible and adequate solutions, the later implementation phases requires knowledge, skills, resources, political will and continued actions such as regular monitoring, evaluation, retooling and refinement, and in certain extreme cases also enforcement (Neigher, 2003).

Politicizing problems usually brings the added visibility needed to increase attention, awareness and the willingness to resolve those complex situations. I argue that different scales create distinct challenges. Professional training has to be combined with the human sensibility that emerges from regular interactions with and among affected people. Such interactions lead to greater ownership of the problems, something which is unlikely to result from the distant and impersonal collection and analysis of statistics and the charting of evolutive trends. It is obvious that those interactions have to be made on the basis of sound data analysis; however in certain cases the legalistic requirements of certain public policy processes have derailed what could have been very fruitful social innovation processes (Balsas, 2017).

4.1 @ THE LOCAL SCALE

The advantage of the local scale is that individuals are closer to reality, there are relatively few participants and there is a limited number of relationships (i.e. family ties), which enable the maintenance of local identities.

4.2 @ THE REGIONAL SCALE

As one moves to the regional scale, problems are marked by regional nuances and the number of participants is also likely to increase, straining resources and turning the participatory processes slightly more complex. At the regional scale there are also various types of relationships (i.e. present, virtual, biophilia, loyalty, etc.). When individuals get involved in social programs and actions aimed at resolving certain issues markedly of a social nature, they may also be interested in maintaining their regional identities. There is likely to be a higher tolerance to innovation from outside than in closer local circles at the lower level of intervention. Finally, there is also a wider utility pool of assets, and hopefully not of liabilities, to draw upon.

4.3 @ THE NATIONAL SCALE

When social issues are common to various regions within a country or major economic trade block, regional differentiation requires tailoring interventions to social realities. Among these, one finds the combination of multilateral interventions in policy making and implementation. Social issues tend to emerge out of bottom-up participatory (and exceptionally, spontaneous) processes, where problems and their root causes tend to be very well known. When those issues reach the national stage they may require the re-conceptualization of solutions, in order to devise adequate shared co-implementation and co-enforcement strategies. To the traditional bottom-up and top-down processes, one can add a sideways process, which to a certain extent results in co-monitorisation and the possibility of implementing adjustments (Ellin, 2013).

5. DYNAMIC PROCESSES AND PROFESSIONAL RELEVANCE

There are at least two ways to look at the development of societal trends. The first places trust in the almost auto-pilot or autopoiesis nature of socio-biological relations (Maturana and Varela, 1980). This view assumes that markets correct themselves with little to no need for public policy intervention. The second recognizes that certain social problems will get worse without the deployment of appropriate measures to understand their root causes, and to limit their scope and incidence especially among disenfranchise societal groups. Both views benefit from systems thinking. Systems thinking theories apply to the relationships among community stakeholders, their networks, skills and capabilities. One of the principles of systems thinking is the acceptance of a dynamic equilibrium and its temporal oscillation due changes in feedback loops (Meadows, 2009). These dynamic processes contemplate (1) design, (2) planning, (3) implementation, and (4) monitorisation (governed by accountability, adjustment, the rewarding of novel approaches, the liminality of attrition, and the penalization of non-compliance).

Another aspect that has experienced a resurgence in attention, is the tendency to rely on the notion of "the commons" (Ostrom, 1990) to preserve the stability of natural stocks by imitating or replicating natural systems in what is known as biomimicry. If necessity is the mother of invention, then creativity is likely to be the answer to finding novel solutions to complex problems. An overarching goal of applying systems thinking to social problems aims at stimulating adaptive behaviours in hopes of accomplishing corrections within logics of social responsibility. One of the most recent social innovations at the international level has been the approval of a social responsibility norm, called ISO 26000 (International Organization for Standardization), which is cantered on principles of (1) organizational governance, (2) human rights, (3) labour practices, (4) the environment, (5) fair operating practices, (6) consumer issues, and (7) community involvement and development.

The importance of these dynamic processes within syntax frameworks pertains mostly to the professional relevance not only for all those who intervene in urban environments, but, above all, for those who are likely to benefit from those societal innovations. Sanyal (2000) identified four general criteria to evaluate City and Regional Planning's relevance: (1) Analytical rigor and social relevance, (2) service function, (3) consensus on core professional values, and (4) intellectual capital formation. In an increasingly globalized world, professionals are asked to address ever more complex and multifaceted problems. Although traditional professional relevance of the type responsible for the formation of disciplinary knowledge (Howe, 1988), which resulted from and in silo information systems, still has pertinence, there is need for more multi-disciplinary, multi-tier, holistic and integrated approaches. In the past, Urban and Regional Planning was even blamed for having created dual cities marked by spatial determinism, segregation, social isolation, inhumane habitats, long commutes, etc. A systematic search for more just and equitable cities in the last decade or so has to a certain extent helped to change the profession's reputation and acceptability (Soja, 2010; Fainstein, 2010).

As we approach the third decade of the twenty first century, we are compelled not to lose track of Pielke's (2007) four positionalities for how scientists (and professionals broadly defined) can relate themselves to public policy: (1) Pure scientist, (2) science adviser, (3) issue advocate, and (4) honest broker. Although the various levels of intervention are likely to condition each positionality and the role of social science professionals, broader and more encompassing notions of social justice ought to be subjected to regular accountability and introspection.

6. CONCLUSIONS

The purpose of this paper was to analyse the potential use of traditional and innovative social and community oriented planning instruments (Burdge, 1999) through the lenses of space syntax methodologies. These methodologies are widely recognized as adequate to interpret, characterize, analyse and propose solutions to problem in the built environment. I argue that applying such methodologies to social problems requires multi-scalar commitments in terms of visions, agendas, resources, time and efforts. Big data methodologies are likely to also provide new opportunities to resolving societal problems (Townsend, 2015).

To conclude, it is important to reflect on the value of three important notions: Social capability, social accountability, and social capital. Social capability involves the recognition and awareness of the self and the other. Although the golden rule may seem too rudimentary to some, its longevity has withstood the test of time. Social accountability recognizes the contributions and benefits to the creation, maintenance and or eradication of social problems. In political science and political economy these are commonly presented in the form of rights and responsibilities (see Coleman, 1990).

Social capital involves the notion of the common interpreted in terms of three fundamental aspects: (1.) assets – resources, (2.) syntax – the rules, and (3) the goals aimed at (3.1) nurturing and managing what exists, (3.2) growing and augmenting existing assets when possible, and (3.3) never descending below certain thresholds, as Campbell and Fainstein (2012, p.549) suggest, "a minimum threshold level of resources below which no one is allowed to sink (economics, health, self-respect, access to education, political rights)".

Finally, it is important to recognize that spatial realm syntax varies from social realm syntax in the sense that the former applies mostly to the physicality (material) of the built environment, and the latter applies to the immaterial, individual and aggregated behaviours marked by relationships of trust, cooperation, desertion, and deterrence – the social glues of dynamic and complex human systems.

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