Virtual lens for planning evaluation

Towards a Sustainable Urban Renaissance

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Introduction

This presentation argues that a Sustainable Urban Renaissance implies a new urban planning approach toward the city and the territory. New instruments to better inform on the environmental urban consequences generated by planning decisions and urban design options, as new virtual lens, are therefore need. Therefore, two main tasks are requested for the urban discipline. First, to identify and acknowledge the impacts generated by the city over the environment, informed by methodologies such as Material Flow Analysis (MFA). Second, to search for new simulative tools, as the virtual lens, provided by the virtual architecture science, to simulate and evaluate the effects of urban planning decisions and urban design options over the environmental impacts accessed by MFA. This abstract is organised in two main parts. The first part, The Urban Environmental Challenge, justifies the need for the first identified task, while the second part, The Virtual Lens at the service of the Urban Environment, centres the debate and the original discussion of the present abstract, at the same time that justifies the second task.

TheUrbanEnvironmentalChallenge

Environmental impacts generated by urban and territorial changes have been preferentially approached by Social Sciences. Garrabou [1] and Tello [2] provide a rigorous scientific account on territory evolution, and warn about its future. Fischer-Kowalski [3] historical account on MFA, as an instrument to evaluate the global environmental versus the human activity, distinguishes its use by disciplines such as biology, ecology, anthropology and geography. Yet, for Urban Planning, Patrick Geddes and Lewis Mumford played an import contribution to the account of
environmental evaluation tools [4], however their metabolic perspective seems to have been vanishing from most of the current literature on urban planning. In turn, the suburban transformation, mainly in the USA [5] and in the UK [6, 7] together with the environmental discussion focused on the Sustainable City [8] and on the Sustainable Urban Form [9] seems to predominate the central debate of urban planning. Moreover, the lack on rigorous evaluative accounts on the environmental consequences generated by such urban and suburban transformations and of an accurate territory understanding, by urban planners and those that take planning decisions, do constitute one of the main reasons for the lack of valid prescriptive tools to support planning interventions, while coping with the social, economic and the environmental problems [10]. Nevertheless, other scientific disciplines, such as economy and law seem to take advantage on such debate. Moreover, the society’ demand against the destruction of our living urban environment, exposed on the various international and national legislation to control water, air or land use [11, 12] stresses such need of intervention to control environmental degradation.

Geddes [13] and Mumford [14] work appears to constitute an important foundation for the establishment of an urban agenda that targets a greater environment control. An agenda that requires however the establishment of new instruments, as the existing ones are proven to be inadequate to support planning decisions against urban environment degradation [15]. From Howard [16] and McHarg’s [17] work to the HABITAT I Conference, urban planning practice and methodologies have varied considerably. Yet, the acknowledgment of the city-territory as an entire urban living system that requires a vital account and evaluation of its urban system, in order to guaranty and assure its feasibility, seems to subsist as a common idea. While Howard’s Garden City focused on the green areas productivity structure to control urban planning, Geddes calculus based on energy and material flows surely influenced his planning approach to the city-territory unity based on open and green productive areas. Mumford’s critic against urban sprawl claimed for an urban planning approach working both for the people and their living spaces. In addition, McHarg’s territorial planning proposal was very critical against the destructive environmental consequences produced by the modern urban-industrial productive system.

**The Virtual lens at the service of urban environment**

Existing research has already claimed for a better understanding of how change occurs on our living urban environment [18, 19]. Yet, despite being supported on valuable social, economic and environmental accounts, it does not evaluates or quantify the environmental degradation generated by the urban form and planning decisions. In order to evaluate the urban metabolism of a city, Niza et al. [20] have provided a valuable material flow account (MFA) for the Metropolitan Area of Lisbon. However, such methodology does not provide any relation between the city urban form and its environmental consequences. Instead, it considers the city as a black box within such analysis.
In such sense, we believe that urban planning must intervene exactly within the city urban form, in order to improve its MFA. To do that new tools, as for example virtual lens, that do relate precise evaluations and quantifications of the metabolic changes occurred within the city according to occured urban planning and design decisions, are urgently needed; in order to transform the metabolic urban expression of our cities, as Geddes has already proposed in 1884. Indeed, since Industrial Revolution, man witnessed simultaneously rapid urbanization and environmental degradation. Taking society to restrict environmental impacts and request for more sustainable urban approaches. A request to control environmental impacts from the Urban Planning evaluation was already claimed [21]. Prompting urban planning to apply MFA and the material flow dynamics concept, as claimed by Forman [22]. Yet, the sustainable development debate has diverted from such contributions. Instead, it appears to be lacking of precise and valid tools to quantify environmental degradation against urban planning decisions. Finally, this presentation proposes the use of virtual lens to support the construction of such planning tools, in order to operate on the urban environment, while providing rigorous accounts of the expected environmental consequences. And, therefore support the urgent society demands to control urban planning decisions and urban design options, on a Sustainable manner.

References


