

- Miller, R. W., Hauer, R. J. and Werner, L. P. (2015) *Urban forestry: planning and managing urban greenspaces* (Waveland Press, Long Grove, IL).
- Moudon, A. V. (1997) 'Urban morphology as an emerging interdisciplinary field', *Urban Morphology* 1, 3–10.
- Russo, A., Escobedo, F. J., Cirella, G. T. and Zerbe, S. (2017) 'Edible green infrastructure: an approach and review of provisioning ecosystem services and disservices in urban environments', *Agriculture, Ecosystems and Environment* 242, 53–66.
- Samuels, I. (2019) 'Mind the gap', *Urban Morphology* 23, 169–70.
- Shrivastava, A., Curran, A. and Briar, D. (2019) 'Resilient approach to East Parcel Riverfront Redevelopment Plan, Sleepy Hollow, NY', in Hanzl, M. and O'Reilly, J. (eds) *ISOCARP Review: planning for metropolitan areas 15* (International Society of City and Regional Planners, Jakarta) 262–9.
- Stewart, I. D. and Oke, T. R. (2012) 'Local climate zones for urban temperature studies', *Bulletin of the American Meteorological Society* 93, 1879–1900.
- Tötzer, T., Loibl, W., Neubert, N. and Preiss, J. (2018) 'Towards climate resilient planning in Vienna. From models to climate services', in Hanzl, M. and O'Reilly, J. (eds) *ISOCARP Review: climate change planning 14* (International Society of City and Regional Planners, Bödo) 190–206.

Designing for sustainability: retrieving a systemic role for urban form

Teresa Marat-Mendes, Department of Architecture and Urbanism, Instituto Universitário de Lisboa (ISCTE-IUL), 1649–026 Lisboa, Portugal. E-mail: teresa.marat-mendes@iscte-iul.pt Orcid: 0000–0002–4447–0413

Approaching the study of urban form from a sustainability perspective has generated encouraging responses (Maretto, 2018; Sioen *et al.*, 2016). The implications are, however, twofold. On the one hand, the growing number of studies has taken two particular scales of approach – the city and the building. At the city scale there are the 1990s theories about sustainable urban form (Jenks *et al.*, 1996; Rogers, 1997), the formation of new urban movements advocating principles of how cities should be built (Duany and Plater-Zyberk, 1991; Congress for the New Urbanism, 1999) and the arrival of new scientific journals dedicated to the study of urban form, such as *Urban Morphology*. Notwithstanding the lack of consensus about the most preferable urban forms, debate on the efficiency of the urban environment rapidly emerged, echoed in various disciplines: in particular, in fields of study that aimed to explore the metabolic outcome from an environmental or socio-ecological perspective (Fischer-Kowalski, 1997), or through an efficiency perspective, mostly focused on resources and energy (Banister *et al.*, 1997; Thomson and Newman, 2017). The impacts of these on planning and industry were fast and obvious, in particular through the transportation, construction and material sectors. Sustainability, however, would emerge as a convincing argument

for the promotion of new technological applications (for example, new building materials, photovoltaic panels, energy-efficient light bulbs and electric vehicles), as a way to restore and maintain resources and energy necessary to guarantee that patterns of flows could continue operating within the natural system.

However, on the other hand, the acknowledgement of urban form itself as a contributor to sustainability somehow went unnoticed by the wider audience. Design solutions for improved urban form progressed, but were conditioned to arbitrary perceptions of sustainability and taste values. The linking of form and sustainability to how the city works, or should work, has always remained a challenge in the absence of actual evidence of urban performance and further data, contributing to the city being labelled a 'black box' by urban metabolic studies. This is not an isolated opinion. As a teacher of urban projects for architecture students, who are keen to design and create solutions for which urban form considerations are important, I have witnessed their concern about the sustainability appraisal of urban form, in particular at the city scale.

Yet advances made in new forms of data, especially those related to environmental performance, are challenging urban design to go beyond current

urban planning paradigms. These are essentially based on modernistic planning theories; of which the fixed physical shape of cities created clearly lacks flexibility (Sioen *et al.*, 2016). There is also a need to engage transdisciplinary approaches more effectively (Baccini and Oswald, 2008). Approaching urban form from a performative perspective is necessary for the delivery of sustainability readings (Marat-Mendes, 2015), but that requires the integration of new data and evidence related to environmental performance that eventually impacts the form and the regional entities of cities.

At a time when climate change urges us towards a sustainability transition and the implementation of a 'new urban agenda' (United Nations, 2017), the effects of the existing relationship between urban form and the environment should not be minimised, nor countered by mere technological applications. Urban form itself should be regarded as a potential resource that society could use, re-use or dispose of; and should be understood in terms of its role in relation to the environment. Only then can its environmental potential be fully acknowledged and become familiar to a wider audience. A recent contribution to *Urban Morphology* (Marcus *et al.*, 2019) has provided important insights in such a direction, through the integration of urban morphology and landscape ecology. Ultimately, the authors propose a unified spatial morphology of cities as socio-ecological systems. Although this is not an entirely new field or approach (see Baccini and Oswald, 2008; Calthorpe, 1993; Hopkins, 2002; Osmond, 2010; Thomas, 2003; Yeang, 1972), this study suggested a further revision of the understanding of spatial form, with the desirable effect of accommodating socio-ecological concerns within planning. A set of polygons is suggested to describe the landscape according to three specific entities (social, ecological and a socio-ecological overlap) while transcending conventional spatial descriptions from a town-plan perspective (based on streets, lots and buildings). In some ways, this exercise recalls the early-twentieth century experiences of abstract art that, through the visual language of shape, form, colour and line, aimed to depict a geometric representation of the landscape while providing new readings of it. This research provides powerful readings of the eventual dynamic processes which operate within the landscape. Similar exercises are most welcome, as new insights into the spatial analysis of the metabolic performance of the built environment (Kennedy *et al.*, 2010; Niza *et*

al., 2016) might be revealed. For that, a proper reading of the urban form itself and of its specific role in the environment should be considered as fundamental.

As has already been argued, urban form is a potential artefact for improving the environment and its metabolic performance, as it determines and scale of specific ecological fluxes (Fisher-Kowalski, 1997). The links between sustainability, the performance of urban form and the functionality of such ecological fluxes are therefore central to understanding how society has embraced the ecological dimension as a driver to shaping the spatial habitat. The key issue is that society has, through time, perceived urban form and its inherent role in relation to the environment differently. Thus the occurrence of specific environmental dynamics and flows has also varied through time. The present dominant human perception of urban form contrasts with the ecological-human perception that was dominant in agrarian society (Haberl *et al.*, 2016). Therefore, the flows and dynamics occurring in such distinct cultural landscapes also operate differently in relation to urban form.

Water is a useful element with which to demonstrate this. In contemporary society, flows of water are preferably separated from human activity and hidden from human sight (Gandy, 2004, 2014), through specific water supply and sewage disposal systems, or culverting of rivers that also form part of the built environment, but separated from conventional urban forms such as streets or squares. Furthermore, in the context of urban design, water is frequently associated with outdoor recreational activities.

In agrarian societies, water is a determining factor for the maintenance of the dominant agrarian economy, and its flow occurred within a spatialized urban landscape that made use of conventional urban forms, such as streets, buildings and squares, to guarantee its flow but also that of humans in a combined manner (Marat-Mendes *et al.*, 2016). The Italian medieval city of Siena is an excellent example of this. The particular form of its sinuous streets, the concave form of its main square and tower-shaped buildings were not arbitrary, as specific hydrological purposes determined their shape and location in order to collect, conduct and retain the highest possible quality and quantity of water, for human and agricultural uses, within the city and its surrounding environments.

Throughout time, cultural changes have pushed society to value technology and efficiency

(Moorcroft, 1972), but at the cost of undervaluing urban form in terms of its potential role to benefit the environment. Retrieving readings of a systemic role for urban form constitutes a crucial task for urban morphologists. This can be done using either historical precedents or contemporary examples. For example, current urban agriculture examples can provide readings of contemporary modes of urban form control with specific social and ecological purposes (Viljoen *et al.*, 2005; Parham, 2016; Steel, 2013) but also demonstrate how specific flows and dynamic systems operate within the landscape and are perceived by humans. The eventual lessons that can be learned from such examples might challenge new directions in the description and analysis of urban form (Berger *et al.*, 1977) and promote new data on urban form performance, while finding agreement on a necessary systemic vision of urban form as already advanced by Marcus *et al.* (2019), and inspire refreshing design solutions for the prescription of more creative sustainable built environments.

References

- Baccini, P. and Oswald, F. (2008) 'Designing the urban: linking physiology and morphology', in Hadorn, G., Hoffmann-Riem, H., Biber-Klemm, S., Grossenbacher-Mansuy, W., Joye, D., Pohl, C., Wiesmann, U. and Zemp, E. (eds) *Handbook of transdisciplinary research* (Springer, Cham) 79–88.
- Banister, D., Watson, S. and Wood, C. (1997) 'Sustainable cities: transport, energy, and urban form', *Environment and Planning B: Planning and Design* 24, 125–43 (<https://doi.org/10.1068/b240125>).
- Berger, J., Blomberg, S., Fox, C., Dibb, M. and Hollis, R. (1977 [originally 1973]) *Ways of seeing* (BBC and Penguin Books, London).
- Calthorpe, P. (1993) *The next American metropolis. Ecology, community and the American dream* (Princeton Architectural Press, New York).
- Congress for the New Urbanism (1999) *Charter of the New Urbanism* (McGraw-Hill, New York).
- Duany, A. and Plater-Zyberk, E. (1991) *Towns and town-making principles* (Rizzoli, New York).
- Fischer-Kowalski, M. (1997) 'Society's metabolism. The intellectual history of materials flow analysis, Part I, 1860–1970', *Industrial Ecology* 2, 61–72 (<https://doi.org/10.1162/jiec.1998.2.1.61>).
- Gandy, M. (2004) 'Rethinking urban metabolism: water, space and the modern city', *City* 8, 363–79.
- Gandy, M. (2014) *The fabric of space. Water, modernity, and the urban imagination* (MIT Press, Cambridge, MA).
- Haberl, H., Fischer-Kowalski, M., Krausmann, F. and Winiwarter, V. (2016) *Social ecology. Society-nature relations across time and space* (Springer, Cham).
- Hopkins, M. I. W. (2012) 'The ecological significance of urban fringe belts', *Urban Morphology* 16, 41–54.
- Kennedy, C. A., Pincet, S. and Bunje, P. (2010) 'The study of urban metabolism and its applications to urban planning and design', *Environmental Pollution* 159, 1965–73 (<https://doi.org/10.1016/j.envpol.2010.10.022>).
- Jenks, M., Burton, E. and Williams, K. (eds) (1996) *The compact city. A sustainable urban form?* (Spon, London).
- Marat-Mendes, T. (2015) 'Adaptabilidade, continuidade, flexibilidade e resiliência. Algumas considerações sobre as propriedades das formas urbanas', *Revista de Morfologia Urbana* 3, 132–4.
- Marat-Mendes, T., Bento d'Almeida, P. and Mourão, J. (2016) 'Access to water in the Lisbon region in 1900', *Water History* 8, 159–89.
- Maretto, M. (2018) 'Teaching urban morphology in a sustainable perspective', in Oliveira V. (ed.) *Teaching urban morphology* (Springer, Cham) 243–64.
- Marcus, L., Berghauer Pont, M. and Barthel, S. (2019) 'Towards a socio-ecological spatial morphology: integrating elements of urban morphology and landscape ecology', *Urban Morphology* 23, 115–24.
- Moorcroft, C. (1972) 'Designing for survival', *Architectural Design* 42, 413–21.
- Niza, S., Ferreira, D., Mourão, J., Bento d'Almeida, P. and Marat-Mendes, T. (2016) 'Lisbon's womb: an approach to the city metabolism in the turn to the twentieth century', *Regional Environmental Change* 16, 1725–37 (<https://doi.org/10.1007/s10113-015-0918-7>).
- Osmond, P. (2010) 'The urban structural unit: towards a descriptive framework to support urban analysis and planning', *Urban Morphology* 14, 5–20.
- Parham, S. (2016) *Food and urbanism: the convivial city and a sustainable future* (Bloomsbury, London).
- Rogers, R. (1997) *Cities for a small planet* (Faber, London).
- Sioen, G., Terada, T. and Yokohari, M. (2016) 'Sustainability science as the next step in urban planning and design', in Esteban, M., Akiyama, T., Chen, C., Ikeda, I. and Mino, T. (eds) *Sustainability science: field methods and exercises* (Springer, Cham) 117–35.
- Steel, C. (2013 [originally 2008]) *Hungry city – how food shapes our lives* (Vintage, London).
- Thomas, R. (ed.) (2003) *Sustainable urban design. An environmental approach* (Spon, New York).
- Thomson, G. and Newman, P. (2017) 'Urban fabrics and urban metabolism. From sustainable to regenerative cities', *Resources, Conservation and Recycling* 132, 218–29.

United Nations (2017) *New Urban Agenda*. 71/256 Resolution adopted by the General Assembly on 23 December 2016. (https://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_RES_71_256.pdf) accessed 7 May 2020.

Yeang, K. (1972) 'Bases for eco-system design', *Architectural Design* 42, 434–6.

Viljoen, A., Bohn, K. and Howe, J. (eds) (2005) *Continuous productive urban landscapes: designing urban agriculture for sustainable cities* (Architectural Press, Oxford).

A commentary on (V)ISUF COVID-19 crisis calls (V stands for virtual)

Todor Stojanovski, Embodied Social Agents Lab, KTH Royal Institute of Technology, Borggården, Valhallavägen, Sweden. E-mail: todor@kth.se, ORCID: 0000–0002–1790–0254; **Ivor Samuels**, Urban Morphology Research Group, School of Geography, Earth and Environmental Sciences, University of Birmingham, Birmingham B15 2TT, UK, E-mail: ivor.samuels@googlemail.com, and **Paul Sanders**, School of Architecture and Built Environment, Deakin University, Geelong Waterfront Campus, Locked Bag 20001, Geelong, VIC 3220, Australia. E-mail: paul.sanders@deakin.edu.au, ORCID: 0000–0001–5070–1479

The rapid emergence of COVID-19 brought incredible uncertainties, panic and lockdowns of cities. Many were constrained to remain in their homes. The authors of this report had just submitted a final version of a viewpoint on City Information Modelling (CIM), urban morphology and digitizing urban practices (Stojanovski *et al.*, forthcoming) when the COVID-19 pandemic was declared. We made a pledge to meet online, and this was the birth of the (V)ISUF COVID-19 crisis calls. By the start of June 2020, we have organized seven meetings and the format has developed. We began with one Eurocentric meeting (12:00 UTC), but subsequently we introduced a second 'night owl' late-evening meeting (20:00 UTC) to allow urban morphologists in the Americas and Australia to join. The meetings were not time-friendly for the morphologists in Australia who had to wake up early in the morning (as 'early birds') or very late in the night ('night owls'), and we offer our apologies. Time zones are major problem with global virtual rooms.

(V)ISUF originated as an informal virtual space for urban morphologists to discuss ongoing projects, methodologies, schools or just say anything that can help to pass the time under lockdown. The topic of the meetings included analogies from cooking, Star Wars and 1980s movies memorabilia. The meetings are organised by a Cajun cuisine non-school of urban morphologists. Ivor

Samuels refers to them as 'eclectics'. Why Cajun cuisine? Sofie Kirt Strandbygaard posed a question about the use of typomorphological methodology (for urban design or research): do you stay within the 'borders' of a tradition (which may be called a 'morphological school'), or do you use the concepts as a 'Cajun cuisine' when you perform analyses outside your tradition? Cajun cuisine (*cuisine cadienne*) is an 'eclectic' style of cooking incorporating African, French and Spanish cooking techniques. The eclectics (also now informally known as the Cajun cuisine non-school of urban morphology) prefer to mix morphological traditions (or schools) in informing their urban design practices. There is a long tradition within ISUF advocacy for operational urban morphology and morphologically-informed urban design (Marshall and Çalışkan, 2011; McGlynn and Samuels, 2000; Samuels, 1990, 1999, 2009; Sanders and Baker, 2016; Sanders and Woodward, 2015).

There were requests to change to more formal ISUF meetings, but the participants kept the informal and spontaneous approach at (V)ISUF. The informal setting allows a special 'space' to flourish, where we are free of academic protocols, and can explore ideas with freedom, underpinned by our appetite for rigorous debate, all in the company of established friends and new acquaintances. We were very happy to escape detailed agendas and preserve anarchistic traditions of eccentric