Editorial

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The nature of the *Engineering Sustainability* journal allows it to bring together commentary addressing real-world research and applications promoting more sustainable management practices, changes in industrial behaviour both in terms of policy and practice, and ways in which we can assess or model the vulnerabilities of our cities to climate change, waste, and water management. Working at the nexus of policy–industry–practice provides scope to think both broadly about the impacts we, as humans, have on the environment, and the responses being proposed by specialists in the engineering, built environment, waste, water and construction sectors to these.

This issue of *Environmental Sustainability* is no different and provides insights into current thinking on changing environmental circumstances and the responses to these from the water, construction and governmental sectors. The papers in this issue discuss the role of technology in its many high and low forms – as well as through modelling environmental change, its function in addressing the challenges associated with efficient water management in Africa (Swan *et al.*, 2018), and the recycling of construction waste to produce a reusable form of fly ash (Arroyo *et al.*, 2018). Both these papers examine the role of technology as an alternative to existing management and development practices that can help limit the costs and damage to the environment and human health.

The papers presented in this issue also make a strong case for a more detailed review of stakeholder engagement and leadership in promoting sustainability. Each paper argues that a greater sharing of industrial and practical knowledge between construction and manufacturing organisations, and their uses in the public or private sector, would benefit the delivery of more efficient services. Moreover, by approaching sustainability from a multi-partner perspective the papers by Qays *et al.* (2018) and Swan *et al.* (2018) argue that a longer-term improvement in service delivery and provision can be met. Likewise, Pushkar (2018) discusses how knowledge of the wider life-cycle assessment systems and the specific operational issues of heating and cooling can provide a more nuanced understanding of building management in an Israeli context. The paper by Hunt *et al.* (2018) may be more data-driven in nature but again raises questions regarding the sharing of information between stakeholders to address air pollution, urban heat island impacts and climate change more generally in the growing number of megacities across the globe. Although Hunt *et al.* are exploring such issues at a larger scale, there are direct comparisons to the paper by Swan *et al.* (2018) in terms of the collection, analysis and use of data for more localised delivery.

The spatial difference in approach between the paper by Hunt *et al.* (2018), which addresses global concerns regarding climate

change, through Qays *et al.*'s discussion of Malaysian housing policy, and down to specific approaches to development in Israel and sub-Saharan Africa highlight a further key issue debated within *Engineering Sustainability*: scale. Although the papers reflect on different geographical locations, the research being presented in this issue is potentially transferable between countries. The papers addressing issues in Spain, Israel and Malaysia are all located within climatic and development contexts that are visible across the Mediterranean and south and south-east Asia. Moreover, although the political contexts may support or detract from the promotion of sustainability in these locations, the research findings presented transcend such issues. The choice of building material and management is a critical issue in all arid countries; the management of water resources and the delivery of an effective service, a UN Sustainable Development Goal, is an ongoing problem in Africa, Asia and Latin America. We can also identify opportunities to rethink the use of fly ash post-leaching as a supplement for construction in Europe, but also in China or parts of Africa. What the papers in this issue do effectively is to situate their research within a localised context but reflect on the wider application of their findings in other locations. This is a pressing issue in rural locations, as discussed by Swan *et al.* (2018), and as Hunt *et al.* (2018) argue in terms of the growing number of megacities seen around the world.

A further common thread that sews the papers together is the notion of finance and economic viability. Each of the papers is grounded, in some case explicitly and in others more implicitly, in the need to ensure that sustainability policies, projects and agendas are economically robust. Thus, the application of the findings in the paper by Pushkar (2018) could have implications for the funding of new buildings and their heating/cooling systems across arid countries. We can also view the paper by Arroyo *et al.* (2018) as feeding into a wider conversation about the financing of development, and possible ways to lower the environmental damage caused by over-exploitation of natural resource; a point also raised by Hunt *et al.* (2018). The papers by Swan *et al.* (2018) and Qays *et al.* (2018) specifically ask how the adoption of smart technologies or more efficient building practices can save money by limiting the time spent repairing or replacing equipment and materials. They also both argue that such cost savings could be passed onto consumers or residents, and that there are potentially additional socio-cultural benefits to the development of more efficient environmental management practices.

Throughout this issue of *Engineering Sustainability*, the role of different production, development and monitoring stakeholders has been reviewed from the local to the global scale. This has

provided insights into how the construction, water, waste and policy sectors are approaching environmental change in their practices and their behaviour. It has also made links between the ways in which the scale of a project or approach can be transferable between locations, fostering a more inclusive and innovative forum for discussion between interested parties. Finally, this issue of *Engineering Sustainability* has focused on the financial costs and benefits of rethinking, reusing and retrofitting environmental and built infrastructure resources in cities and rural areas to meet both UN Sustainable Development Goals but also to support economic and socio-ecological sustainability in the long term.

REFERENCES

- Arroyo F, Fernandez-Pereira C, Leiva C *et al.* (2018) Reusing leached fly ash as a cement replacement. *Proceedings of the Institution of Civil Engineers – Engineering Sustainability* **171**(6): 286–295, <https://doi.org/10.1680/jensu.16.00060>.
- Hunt JCR, Aktas YD, Mahalov A *et al.* (2018) Climate change and growing megacities: hazards and vulnerability. *Proceedings of the Institution of Civil Engineers – Engineering Sustainability* **171**(6): 314–326, <https://doi.org/10.1680/jensu.16.00068>.
- Pushkar S (2018) Life-cycle assessment of windows in Israel. *Proceedings of the Institution of Civil Engineers – Engineering Sustainability* **171**(6): 296–303, <https://doi.org/10.1680/jensu.16.00031>.
- Qays M, Mohamed MF, Che-Ani AI and Raman SN (2018) Sustainability of industrialised building system for housing in Malaysia. *Proceedings of the Institution of Civil Engineers – Engineering Sustainability* **171**(6): 304–313, <https://doi.org/10.1680/jensu.16.00061>.
- Swan A, Cooper N, Gamble W and Pritchard M (2018) Using smart pumps to help deliver universal access to safe and affordable drinking water. *Proceedings of the Institution of Civil Engineers – Engineering Sustainability* **171**(6): 277–285, <https://doi.org/10.1680/jensu.16.00013>.