

Editorial

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The 2030 Sustainable Development Goals (SDGs) advocate a global commitment to leave no one behind (UN, 2015) to ensure inclusion, non-discrimination, equality and equity for all. This includes all potentially marginalised and vulnerable groups such as ethnic minorities, women, older people, children and young people, displaced persons, LGBTI (lesbian, gay, bisexual, transgender/transsexual and intersexed), those in economic poverty and the sick and disabled.

The work of civil engineers needs to be mindful of these principles and apply an inclusive approach to every aspect of infrastructure planning and design, in relation to both provision to service users and in the workings of its own profession. This is articulated by the rewording of Tredgold's definition that 'civil engineering is the art of *working with* the great sources of power in nature for the use and *benefit of society*' (Jowitt, 2004: p. 82). The focus of *Municipal Engineer* covers the impacts of civil engineering of a range of technical, social, cultural, economic, institutional or environmental factors. These are essential dimensions of sustainable development and are part of an integrated and balanced approach to the provision of infrastructure.

The first two papers in this themed issue, by Smith *et al.* (2018) and Barnard and Dainty (2018), explore the notion of inclusion in relation to representation and anti-discriminatory work policies and practices within sector workforces, and the impacts this can have on the careers and livelihoods of individuals.

Firstly, Smith *et al.* (2018) present a New Zealand-based study, considering the factors affecting women's advancement as professional engineers and what makes significant numbers of them leave what is a male-dominated profession. The degree of inclusion and exclusion they experience is found to be the key to their longevity in the sector. Results of interviews with six women who had been in the profession for between 10 and 35 years, showed that levels of influence and inclusion linked directly to women's professional growth, and conversely, to their intention to leave.

On a similar inclusion theme, Barnard and Dainty's review paper (Barnard and Dainty, 2018) considers the case of lesbian, gay, bisexual and transgender (LGBT) workers in the

construction sector. Surveys have demonstrated the importance of sexual and gender identity, evidenced by a high degree of homophobia against those not conforming to the stereotyped white, male, heterosexual construction worker. The evolution of the research agenda on diversity and equality is also considered in this paper, concluding that the future lies in more research on transgender and sexual orientation, and discrimination in organisational contexts.

The remaining three papers discuss examples of planning and practice in relation to drainage, air cooling and, more broadly, urban planning, all of which have the potential to deliver more inclusive and sustainable processes and infrastructure.

Ajibade and Tota-Maharaj (2018) present a discussion of appropriate and innovative technology for use in refugee and internally displaced person (IDP) camps in low-income-country settings. Experimental testing of the performance of laboratory-scale sustainable drainage systems (SuDS), relating to engineered wetlands and filter drains, was aimed at attenuating stormwater. Results showed that specific SuDS can be successfully retrofitted to existing surface water drainage, to reduce the incidence of flooding, erosion and waterborne disease, and to address the effects of climate change. The authors are mindful of the 2030 SDGs that aim to improve living conditions for vulnerable populations, who are marginalised and lack a voice in society.

Thomas and Butters (2018) look at equity and planning in relation to chemical air pollution in urban environments. The case is made that overheating is inequitable as it impacts most on the vulnerable poor, the elderly and the young, living in the ever-growing megacities. Traditional air cooling (AC) systems used to mitigate these effects benefit the rich but disadvantage the urban poor, as the thermal environment in urban centres worsens. The alternative concept of district cooling (DC) is promoted to improve public health equity, due to it being more energy efficient than AC, and having lower climate emissions. Again, these technologies are particularly targeted at low-income-country settings.

Community consultation in urban planning has developed into a range of contemporary participation tools and techniques. However, the paper by Giupponi *et al.* (2018) asserts that

community mapping has methodological weaknesses that result in problems of 'spatial and temporal scale, generalisation, integration, representativeness, accessibility, relatedness and visualisation' (Giupponi *et al.*, 2018: p. 173). It reconsiders rational planning tools, such as the geographic information system (GIS), as a way of allowing the inclusive practice of using subjective data to inform planning processes.

This collection of papers covers a diverse range of issues and perspectives. However, what is common to them all is a recognition of the importance of a contemporary equity and inclusion agenda in civil engineering, and its application in all areas of the profession, from ensuring a fully inclusive recruitment and career advancement ethos, to then putting these same principles into practice in the planning, implementation and impacts of the work that the profession carries out. This issue highlights examples of these principles in action to raise awareness and demonstrate the key role of the civil engineering sector at all levels to ensuring that no one is left behind.

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