

Editorial

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The first paper in this issue reviews the paper by Hardin (1968) entitled 'The tragedy of the commons'. This paper is seen as seminal in the field of resource management, but is perhaps not so familiar to those from an engineering or built environment background. In the review (Corker, 2011) the author aims to assess the relevance of the, quite controversial, messages for today's sustainability debate. Corker identifies several issues that resonate in the other three papers in this issue. It is therefore fair to say that Hardin's paper remains as relevant today as it was 43 years ago, and it is hoped that by including the review in this journal it will reach a new and refreshed audience.

The first of the common threads that is introduced relates to two opposing views of resource management: one based on individualism; the other on co-operation. Hardin uses the allegory of an individual livestock farmer tending to act selfishly when using common grazing ground and seeking to take more and more from an ever-reducing resource to the detriment of others in a similar position, and ultimately to himself.

This leads on to the second of the threads: that of governance. What solution can be found to the problem of the selfish farmer? Again, opposing views are presented as those which seek to privatise, regulate and control against measures and systems which seek to encourage and promote co-operation and responsibility.

A third thread is that of technological versus socially-founded solutions to what would be described today as 'wicked' problems: problems which Hardin describes as 'a class of human problems (with) no technical solution'. In his presentation of types of global issues that require an interdisciplinary response, Hardin captures the very essence of sustainability as it is framed today and illustrates the relevance of his work, but perhaps more worryingly, how long it has taken for this type of thinking to enter into (semi-) common debate.

The second paper in this issue (Grimes, 2011) examines the global issue of 'the right to water' and its relevance to water-sector governance reform in developing countries. The author states that water sector improvements have moved away from engineering (or technology-based) reforms and have concentrated on governance issues, echoing the sentiments of the second thread from Hardin's paper.

Grimes uses an example from South Africa to show how a global human rights declaration can be picked apart and interpreted at a national level and then be used as a mechanism for reforming water-sector governance at a city-scale. She shows how the boundaries of the 'right' have been defined in such a way as to promote co-operation and responsibility (for the weak and vulnerable) and to promote the collective, rather than the selfish individual. Grimes also shows that participation of stakeholders can lead to the most effective deliverance of water services and ensure their sustainability; that by empowering individuals to take responsibility they act collectively, rather than selfishly. Thus, this paper demonstrates how it is possible to use appropriately designed governance structures to change the 'tragedy of the commons'.

This is the theme that forms the central core of the third paper by Beck *et al.* (2011). The authors pick up from a previous paper, Beck *et al.* (2010), which explores the idea that re-engineering its infrastructure can enable a city to become a force for good in the environment. This paper asks what governance structures (at the city-scale) enable or disable this transformation. Interestingly, part of the consideration is what structures support or stifle technical innovation, so they still see technology as forming part of the package of solutions to sustainability issues, which is good news as far as engineering is concerned!

The authors frame the problem of water infrastructure provision as one of resource flow, in the same manner as

Hardin frames his problems. However, instead of looking at water supply, food and wastewater, they concentrate on 'nutrient infrastructure' and personal choices in diet.

The paper explores the concept of cultural theory as a means of designing governance structures which support and enable the transition of city-wide infrastructure. The theories that they present use scenarios of water supply-and-use that are very closely related to the farmer-common ground allegory used by Hardin. The paper then uses this cultural theory to interpret the current state-of-play in a number of case study cities, where examples of transformatory processes are taking place. The authors show that certain governance structures promote selfish behaviours, whilst those that recognise and balance a set of four forms of 'social solidarity' are more likely to succeed in delivering cities as forces for good, and hence long-term sustainability.

The final paper in the issue (Thomson *et al.*, 2011) presents the authors' experience of sustainability assessment (SA) at a single project scale. The paper highlights the technology-social interplay, stating that whilst SA used to be regarded as a technology-driven add-on to project appraisal, it is far more powerful in achieving sustainable outcomes when used as a project-scale governance mechanism.

The authors advocate carrying out SA throughout a project, from design through construction to post-occupancy. They maintain that by operating a policy of social inclusion for all stakeholders in a project this brings about the flow of knowledge required between players that promotes mutual responsibility and 'social learning'. This in turn brings about a more sustainable project, with lessons learned during design and construction being carried through to occupancy.

Overall, this is a highly thought-provoking issue: it demonstrates the importance of the social aspects of sustainability in achieving the desired outcomes from any form of construction, be that a single building or city-wide infrastructure renewal. It brings hope that structures can be found that change the inevitability of the 'tragedy' and can prevent wholesale selfish behaviour whilst not resorting to rigidly enforced legislative barriers. It also shows just how long it is taking for ideas to be adopted and how important it is to keep raising the profile of debate.

It will not have escaped your notice that this editorial is authored by two people, the first author being the incoming Honorary Editor, and the second being the outgoing Honorary Editor who wishes briefly to reflect on changes to *Engineering*

Sustainability during his tenure over the past 42 months. While it was always acknowledged that there should ideally be a strong core of sustainability thinking permeating every branch of civil engineering, and underpinning every action, and thus papers on the subject should lie in disciplinary bases, this is not the case and the need for a journal to make this thinking explicit remains. Moreover the need for a journal that publishes papers on the 'how to' of sustainability, a feature of most of the editorials in this period, remains as evident as when the journal was first conceived and I believe we are now seeing such papers in greater quantity and delivering greater clarity. The Institution of Civil Engineers is progressively taking a longer-term view, as evidenced by the recent focus on futures thinking in a futures working group, and this inevitably leads thinking towards what might be sustainable and what might not. In conclusion, the journal has matured over these 42 months and its need remains as strong as ever. On that note, I wish the first author well in steering the ship into new waters, which might be dominated by the need for 'engineering in the age of austerity' and questions such as 'can we afford sustainability?' tensioned against 'can we afford not to have sustainability?'.

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