THE BUILT ENVIRONMENT AS THE KEY AGENT FOR CHANGE IN THE SCOTTISH CONTEXT

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Summary

In this polemical paper we seek to argue that the process of assessing sustainability in the built environment has developed towards quasi or explicit forms of regulation and that a developmental shift towards assessing how well the existing built environment and future interventions within it can "sustain" is both desirable and necessary.

Existing built environment Sustainability Assessment Tools (SATs) habituate a series of passive attributes designated as being "sustainable" and they are as yet poorly adapted to reconciling the three paradigms of sustainability (**Fig. 1**) [1].

We argue that SATs have a role to play in embedding "Sustainability Intelligence" in society, shifting the role of the built environment to that of a proactive instrument and this paper concludes by outlining the building blocks needed to develop SATs which counter current unintelligent anthropogenic behaviour and deliver transformational change.

Keywords: Sustain, Proactive, Assessment, Holistic, Intelligence

1 Context

Scotland's ecological footprint is twice that available on the planet [2]. The built environment is responsible for a substantial proportion of this, for example Scotland's homes and non-domestic properties are responsible for 34 % and 18 % of Scotland's CO_2 emissions respectively [3&4]. The built environment also has a significant impact on physiological and psychological well-being [5–8] and financial impacts beyond a simple payback or whole life costing [9] such as increases in property values delivered by new infrastructure [10] or conversely the financial and social costs of decline [11].

The replacement of existing buildings in Scotland is virtually static and the performance of the built environment overall is therefore locked predominantly into existing assets. It doesn't matter how efficient new buildings become they are not helping if they don't replace inefficient ones [12] for Scotland a significant improvement across the built environment as a whole can only be achieved if the performance and utilisation of existing buildings is transformed.

2 Current Assessment Methods

The SUEmot project [13] identified nearly 700 SATs. The built environment SATs most regularly used in Scotland are the Code for Sustainable Homes (CfSH) and BREEAM. The methodologies embedded in these tools bear comparison with their equivalents elsewhere [14] and rather than recognising that each intervention in the built environment sits within an existing resource context, these SATs resorted to setting thresholds across a series of Key Performance Indicators (KPIs). While these may have some practical benefits as a checklist for practitioners during the design phase they fail to recognise that buildings are agents for change.

Fig. 1 *Carley Christie Diagram*

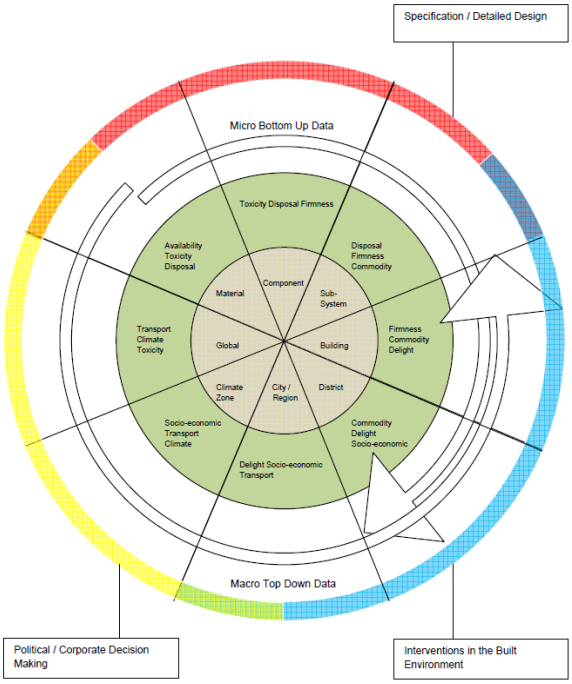

Fig. 2 *Context, Issues, Information and Action*

3 The Counterview

There is undeniably a challenge to be faced in developing a common currency able to reconcile the mixture of qualitative and quantitative data within the environmental, social and economic paradigms. Understanding these is the key to being able to develop and calibrate SATs which can accurately reflect current performance and be used to scenario plan and validate post intervention improvements. The questions we should ask are:

- What positive economic, social and environmental contributions does it make?
- How can the sustaining qualities be maximised and damaging qualities minimised?
- What does it contribute as a part of the bigger system? and
- How does it change that system?

This moves sustainability from a passive attribute of the built environment to an active process. This is not a new concept. “Soft Landings” [15] offers a 5 step design/procurement/ handover process aimed at tapping in to previous experiences, setting project specific targets and then assessing these on completion through Post Occupancy Evaluation (POE) but it falls short of providing a contextualised assessment framework.

4 "Sustainability Intelligence"

For the built environment to sustain it's very use must endow society with a level of "Sustainability Intelligence" which carries through to all aspects of social, environmental and fiscal interaction. In the use of SATs this becomes explicit and immediate project by project. For every day users, however, it is vital that the built environment supports and requires environmental issues to be addressed at every level. Specifically, the built environment must encourage or even force those life style changes which allow societies to stay within their environmental zone of equilibrium [16]. This demands an integrated conceptual framework for understanding sustainability in its broadest sense – something conventional SATs fail to deliver.

By *Sustainability Intelligence* we mean the aggregation of knowledge, skills and values that are required by individuals and organisations to meet the complex challenges of a "hot, flat and overcrowded" world in crisis, The question is whether human societies will be able to develop the collective cognitive power to re-order their affairs in a manner that reflects an understanding of the interconnected workings of natural and built systems and to navigate a path to a different kind of world, a different kind of society and a different kind of economy, in ways that are as humane and as fair as possible to as many as possible [17].

The 21st century will be the century of complexity, connectedness, change, collaboration, and customisation. Bringing such a radical change in perspective to bear on the challenge of global sustainability will be critical, because it inherently recognizes the kinds of interconnectedness and interdependencies so frequently ignored in current discourse. The authors propose the use of the term "sustainability intelligence" to refer to the ability to see systems, to collaborate across boundaries and to visualise a creative future across diverse cultural settings; embracing values, knowledge and skills.

5 The Next Generation of SATs

Developing the next generation of SATs requires an inter-disciplinary approach to identify the linkages and interplay between the 3 paradigms. It must start with the contextualised performance of the existing built environment. This will provide designers, stakeholders and policymakers with tools which can be used at any scale. Interventions in the built environment can then be assessed in the light of local requirements, regional opportunities, national policy and global necessity.

In doing so the accelerating IT power and software developments, such as Building Information Modelling (BIM) allow SATs to incorporate both top down data, such as global CO_2 levels, and regional/national data such as local emissions rates with bottom up data from Post Occupancy Evaluation (POE), low cost data loggers, Building Energy Management Systems (BEMS), etc (**fig. 2**).

It is this level of "Systems Thinking" twinned with the practical benefits which stem from technology which is the key to the development of sustainability intelligence within society [18].

6 Conclusions

We believe it is possible to conceive of a built environment which can sustain the societies that produce them, that SATs will be vital in achieving this goal, that the cost of

developing and using such tools is not only affordable but that they will deliver added value across all three paradigms. Organisations that actively and strategically seek to ensure that its people, and the people it serves, possess sustainability intelligence will be more robust in the face of global challenges. We invite readers to use the definition to assess the "sustainability readiness" of themselves and the organisations they represent.

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