Fact or fiction; Surveyors and research in informing decision-making for environmental sustainability

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ABSTRACT

The paper refers to those United Nations' millennium development goals, which are of core interest to the Surveying professions, and briefly notes some of the major issues which inform much of the current debate on meeting some of these goals in regions with temperate climatic conditions. Some of the major issues for the Construction Industry are highlighted, and the potential functions and responsibilities of National Governments are referred to.
The paper goes on to identify areas of knowledge, relating to the Development and Construction industries, in which continuously updated research is needed to enable Surveyors to continue to provide a fully professional service to clients.

Key words; Construction economy; costs; data; environmental sustainability; research.

INTRODUCTION

Although there are many colloquial uses of the term 'professional', definitions of a learned profession generally specify that a person offers such services for a fee, and needs to possess a specific body of knowledge, regulated by formal qualifications overseen by a supervisory body, which also ensures that such a service is delivered in a competent and ethical manner, within an appropriate code of conduct.

Historically, this was generally taken to mean that the contract of service was between the professional and a specific client, and was an impartial quasi-judicial service. It has been argued by some people, such as James Nisbet the well-known UK Quantity Surveyor, that this meaning excluded those people who work for a salary for an organisation, but the rise of government departments and corporate firms over the last century has tended to obscure the fee-earning feature of the definition. Also, the quasi-judicial aspect of some professional decision-making is specifically acknowledged by some professional bodies.

Whilst the definition of the term 'professional' may have changed over the years, there can be no doubt that the professional person should possess an up to date body of knowledge, and be part of an organisation which upholds ethical behaviour, and the acquisition of such knowledge. The author suggests that, in today's world, this requires focussed research, and some avenues for such work are described below.

SURVEYING- A RESEARCH-BASED PROFESSION?

Whilst there are many fields in which Surveyors can profitably undertake research, either in academia or in practice organisations, there is a problem of the validation of work undertaken. The traditional academic model is for work to be undertaken, individually or in a team, and for the data and results to be presented in a peer-reviewed publication. Unfortunately, as a rule, forward-looking research is not co-incident with the current needs of the profession, and therefore there is a requirement for more than one model of research activity. Of course, research work usually needs to be funded, and this is often done through government-backed grant-awarding bodies or departments, charitable foundations, or private companies.

Naturally, some funding organisations, particularly private companies, often seek some business advantage from their investment in research, and place restrictions or even an embargo on publishing. Thus, from the point of view of the common good, the research does not advance the profession in general, particularly if it is not impartial. It is suggested that research undertaken in order to confirm a prejudice towards opinions or policies should be rightly viewed with suspicion, unless the opposing views are given appropriate weight, and yet it is surprising how often biased 'research' is published by 'official' sources of all types, and reproduced in the popular press. Issues such as those concerned with sustainability are a current fashion, and should be treated with great care, being too important to our future to be used dishonestly.

Therefore, it is suggested that professional bodies in Surveying have a role to play, in debating issues of the day, in order to help to define what research might assist in the improvement of the service provided by their members, by encouraging research into matters related to their main functions, and by helping to disseminate peer-reviewed research reports. Of course it is not suggested that professional bodies are universally competent to foresee all aspects of research needed in their fields, nor are they often aware of what might be needed in the near future, but it is argued that the concept of the learned profession should at least be paid more than lip-service.

Let us also be aware, however, that people who have been deeply involved with research over a number of years are rightly sceptical about statements such as 'research shows that…..', because research is almost always subject to limits of one sort or another. Such limits are usually concerned with matters such as time available, problems in obtaining suitable data, lack of money to employ staff to record and analyse data, lack of expertise in the team, and lack of time to manage the project adequately. People undertaking research in fields like Surveying often seem to think that researchers in the physical sciences are dealing with good quality data, and the following quotation from Dr. Jacob Bronowski in his 1974 work 'The ascent of man' reminds us that this may not be the case.

'The exact picture of the physical world—that aim is unattainable. There is no absolute knowledge, all information is imperfect, and we have to treat it with humility. Observations are uncertain, we seem to be running after a goal, which lurches away from us to infinity every time we come within sight of it. We look at the position of a star. Here are our original observations; we are astonished and chagrined to find them as scattered within themselves as ever. We had hoped that the human errors would disappear, and that we would have God's view, but it turns out that the errors can't be taken out of the observations.'

Therefore, let us accept that difficulties exist within all research work, but that our duty to our clients, and for the common good, requires to us acquire the best knowledge that we can in our field. If Surveyors don't do it then we can expect that others will, to our disadvantage. Therefore, let us consider some of the challenges.

ENVIRONMENTAL SUSTAINABILITY

The United Nations' Millennium Development Goals provide us with a series of targets, which emphasise the need for more information in these particular fields:-

Target 7a Integrate the principles of Sustainable Development into country policies and programmes, and reverse the loss of environmental resources. E.g. Deforestation, response to climate change.
Target 7b Reduce biodiversity loss, achieving by 2010, a significant reduction in the rate of loss. E.g. conservation, habitats and species, fish stocks
Target 7c Halve, by 2015, the proportion of the population without sustainable access to safe drinking water and basic sanitation.
Target 7d By 2020, to have achieved a significant improvement in the lives of at least 100 million slum dwellers.

These goals will require the Construction Industry as a whole, not only to respond to the challenges, but also to provide leadership by identifying and defining problem areas, and by offering ways of improving knowledge of feasible solutions.

WHAT ARE SOME OF THE PROBLEMS, AND OPPORTUNITIES FOR RESEARCH IN SUSTAINABILITY ISSUES?

Renewable energy in the United Kingdom
In 2008, EU required that, overall, twenty percent of energy should be generated by renewable means by the year 2020. UK proportion of this is fifteen percent, mainly in the fields of electricity generation, transport, and heating. How is this to be achieved?

Power generation, and transmission
Wind, tidal and wave power-onshore and off shore. Geothermal energy, imported and local, ground and air heat pumps. Radiation from the Sun to provide light, and power by photo-voltaic and water-heating panels. Fossil fuels (carbon capture?), including some renewables as well as nuclear or chemical generation of power. What do these cost overall?

Conservation of energy and water
What are costs of this in initial construction, by retro-fitting, and/or by reducing useage.

Planning, development and regulatory issues
How do we respond to macro challenges, such as demographic change, population increases, and movement of people, use of agricultural and marginal land, inundation and coastal defence. How will changes in nature and location of economic activity; housing, and development of infrastructure for transport, water and power distribution, integrated waste and sewage reclamation, and new, unforecast business/industrial development. be managed?

SOME POTENTIAL FACTORS IN THE SOLUTIONS

Government
Much of the effectiveness of governments in Europe is conditioned by supra-national agreements, such as with UN, EU, and by geographic, climate, economic and similar constraints, as well as the short-term nature of much of political and managerial life.

However, more will need to be done in fields like the definition and recording of land and water resources and boundaries, and their evaluation. The nature of the law relating to real property, the impact of town and country planning systems, and financial regimes such as taxation and incentives at each stage of development will require attention.

Changes in alternative potential land uses related to needs need to be related to regional policies, resources, energy and communications, which may require macro evaluation of factors and level of input values using methods such as Cost-Benefit analysis. The availability of resources for development and financing must be evaluated against the potential value of different types of development within a long-term vision of needs.

The Construction industry
This sector is highly subject to factors affecting demand, and trends, including economic conditions and fashion. Also State intervention in matters such as professional competence, liability, health and safety, employment legislation and similar matters affects the industry.

The capacity of the Construction Industry, its potential workload, costs and pricing related to finance and resource availability need to be better evaluated, as does the effects of changes in commercial law and contracts, and specific construction contracts and regulations.

Construction is subject to the vagaries of financial climates, and Government has signalled that it may regulate some aspects of the financing and re-financing of development, which could affect the viability of investments, and the developer/client/contractor interaction.

It would be helpful to make some improvement in the availability and use of supply and demand statistics, particularly in relation to regional variations in design and construction factors, and public-sector demand, but it is not likely that governments will assist here.

Of course, the sector is affected by factors of organisational change, mechanisation, prefabrication, innovation, communications and information technology, and the availability of a competent workforce. Not all of this is within the control of the industry, but we need to know more in order to influence policy-makers.

Construction processes
New challenges are arising regarding choices of alternative design and construction solutions in sustainable development, but we currently suffer diseconomies, which result from late changes in clients' briefs, as well as incomplete designs. We hear calls for economy in use of space and improvements in flexibility, but how is this to be paid for? What is 'design quality', and 'buildability', and how do we evaluate designs for initial and continuing costs, and plan for long-term building (facilities) management.

Public and private development differ, particularly in respect of procurement of construction work, and types of contract, so bidding strategies, cost-recovery, and related processes differ. How good are we in the planning and management of construction work, supervision of site processes, design completion and realisation of designs, and are we satisfied with our cost control of work in process, negotiation, handover and accounting for completed work.

SOME LONG-TERM ISSUES IN DEVELOPMENT ECONOMICS

Economy of development
Changing market forces and economic factors affect investment and potential value, and need to be managed. Values of properties vary according to use as investments, or for occupation as factors of production. Thus, managing and maintaining properties for economy and function varies over time, as does managing performance of buildings related to original design solutions, adaptations, or new standards required by new legislation.

It must be emphasised that there are economic levels of recording and classifying the nature and quantity of built assets and elements, their costs in use, and sustainability in operation, according to needs of the organisation. Also the economics of adaptation and modification of buildings in use, flexibility, and impact on the utility of the investment are affected by factors such as the life of buildings, and components, and change of use.

Dealing with data
The economics and management of collecting, storing, and accessing information are crucial to the long-term effectiveness of sustainable development solutions. Methods of describing and classifying information affect data reliability and comparability, and must take into account the effects of managerial influences in historical.data. Adjusting and analysing information for regional, economic, time, market-forces, morphological and other factors is not easy, and any system of data analysis and presentation must be designed for purpose.

Attempts to formalise data, and methods of approximation and averaging, for comparison and forecasting for various purposes, include the recording and preparation of cost, price, and similar indices. Analysis may take advantage of Gaussian distribution curves, and curve-fitting, as well as the devising of formulae to describe data, such as Poisson distributions, probabilistic theory, Monte-Carlo simulation, regression analysis, and fuzzy logic.

Summary
The acquisition of good quality data, and the development of techniques to quantify, record and analyse the outcome of policies at all levels relating to the Development and Construction Industries, are fundamental to the implementation of processes needed for Sustainability.

This paper has set out to describe some of the areas where investigation and research can be fruitfully conducted, both for the common good, but also in pursuance of professional functions relevant to the future of Sustainable Development.

Surveyors are well placed to lead such developments.