Promoting BEQUEST:
Building Environmental Quality Evaluation for Sustainability through Time.

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Abstract
The broad aim of the BEQUEST Network is to create a forum for concerted pan-European research, training and practical action in assessing the quality of the urban environment in order to identify the basis for a common understanding and implementation of sustainable urban development. The network has been funded for three years under the European Union Environment and Climate RTD programme, and is due to start operation in April 1998. This paper gives an account of the key features of the network and its modus of operation. We are developing an internet supported system for working and communicating that will address the role and responsibilities of industrial, commercial, and all other societal actors involved in the development and use of the built environment across the scale from individual buildings to whole cities, in EU member states.

At the core of the network are the 14 partners from research institutions across Europe who will drive the programme forward by a series of workshops at intervals of a few months, and continuous use of a dedicated intranet. The results of our work will be tested by the societal actors who are associates of BEQUEST, on an extranet of partners and associates. The extranet will allow for formative assessment of BEQUEST products with immediate feedback.

In the first year of the programme we will identify and analyse existing sustainability blueprints, and current approaches to implementation. Through this process, we will build up a common understanding, and recognition of cultural and environmental diversity. In the second year we will produce:
1. An analysis and classification of assessment methods
2. A protocol for sustainable development
3. A decision matrix to promote understanding of the protocol.
4. A directory of sustainability advisors to promote implementation of the protocol.

The remainder for the project will be concerned with testing and disseminating the protocol and its “tool kit” firstly with our associates and then with all other interested parties in Europe responsible for shaping the built environment. We will also set up Internet and other structures to promote continuity of this initiative.

Keywords: Built, City, Environment, Extranet, Internet, Intranet, Sustainability, Urban.
1 Introduction

The BEQUEST Network arose out of the conference, “Environmental Impact Evaluation of Buildings and Cities”, held in Florence in September, 1995 [1]. The main objective of this group is to lay the foundations of a common EU understanding of sustainable urban development through a multi-disciplinary network of representatives of all actors involved in the provision, use and maintenance of the built environment. An integrated approach to built environment quality assessment is to be developed which will help to reduce the environmental uncertainty facing decision makers in the development and infrastructure industries. For this major European project the network is to be expanded from the present size of fifty members in 10 countries to create a broad international, interactive community composed of a very wide range of disciplines from both the demand and supply sides of the development, infrastructure and construction industries, in order to assess the built environment at a range of scales, from building component design through to strategic city planning, across a range of cultures and regions. The context of research project is shown in Figure 1. The groups represented in this figure are derived from the work of ATEQUE[2]

2 Background

The difficulties in reconciling the demands of modern commerce and transport with the desire to provide a good quality environment have long been recognised. The associated congestion, pollution, noise, deterioration of streets, public places and architectural heritage and general loss of amenity experienced is seen as a very difficult collective problem requiring broad understanding and multi-disciplinary action. [3]

The problem is compounded by other factors:

* the increasing urbanisation of humankind - two thirds of Europeans now live in urban areas [4],
* the longevity of buildings and city infrastructure - 60 to 100 years is not unusual for individual buildings,
* the very large quantity of resources which existing cities contain and which are consumed annually to continuously develop, maintain and use them. In the UK it has been estimated that the construction industry uses about 6 tonnes of building materials annually for every member of the population [5].

If all these factors are considered together then the built environment sector presents one of the biggest challenges for society, both in terms of the development of a collective aspiration for better quality, more sustainable patterns of living and the time it will take put these ideas into effect [6].

A key issue is the scale of impact on a spectrum extending from the individual to the global level embracing buildings, urban districts and cities. It is clear that some definitions of sustainable urban environments seek a better environmental and economic balance between the city and its hinterland, whilst others look towards greater autonomy of urban communities. Increasing the density of urban areas as a means of intensifying land use and transportation efficiency is being examined, but this approach is also questioned in terms of the functionality of the cities and the quality of environment that might result[7, 8].

At the district/city scale local authorities have established various local objectives under Agenda 21 [9]. The usual response is to identify local “indicators” which will be used to benchmark the current environmental performance of a community and against which future improvements can be measured. A wide range of alternative indicators are being used by differing local authorities and these do not always coincide with those suggested nationally [10] which will mean differing objectives and standards, not just across national boundaries, but even between neighbouring local authorities. In this
context it is important to note that Agenda 21 proposals constitute entirely voluntary action. In the meantime major city or infrastructure projects must continue to undergo environmental impact analysis in line with EU Directives [11]. These regulations are interpreted in national planning control guidelines which will, at best, ameliorate the negative environmental consequences of larger scale projects.

Figure 1  **Context of the research** showing influences and primary outcomes

At the building scale regulations in the **majority** of Northern European Countries are aimed at ensuring good standards of energy efficiency in new buildings. Increasing numbers of new buildings may undergo some form of broader environmental assessment at design stage, e.g. **BREEAM**[12] and **BEPAC** [13]. Other systems are under development in a number of countries, e.g. Sweden and Germany, and internationally through the Green Building Challenge [14]. However, as with Agenda 21, these systems or methods are not regulatory-requirements and so standards and application is very variable across building types and across different nations.
Many of these environmental assessment techniques were conceived with a view to reducing the environmental impact of building and urban development, rather than pursuing the broader goal of sustainable cities. At present each of these areas of assessment have developed and continue to operate discretely and as such it is far from clear that individual actions are actually contributing to real improvements in the sustainability of towns and cities. How then should the professionals within the construction and development industry recognise and respond to these features and criteria? What has emerged is a very clear need for greater dialogue between all societal actors at each level of the building-city spectrum, together with better sustainable development assessment “tools”, in order to converge towards a more common understanding of what constitutes a good quality, sustainable urban environment. This is the reason for existence of the BEQUEST Network and its primary objective is to develop a taxonomy or “road map” through this difficult territory.

3 Research method

In EU parlance the BEQUEST project is a “Concerted Action”, i.e. it attempts to bring together current research thinking and practice. Therefore throughout all three years of the project consultation and negotiation with a wide range of actors from both the demand and supply side of the property and infrastructure sectors across the EU will take place via a consultative network described as the BEQUEST Extranet, see Figure 2. This process will tap the highly diverse knowledge and expertise of a wide range of environmental researchers, professionals, infrastructure providers and managers in order to build a consensus definition - or, where this is not possible, to clearly recognise and understand where the differences lie between member states, levels of action, interest groups and professions. Mature deliberation, debate and evolution are key elements of the whole project and so an iterative learning cycle of workshops and report back to the Extranet members is planned. The members of the consortium, to be known as the Intranet, see Figure 2, will act as mentors and facilitators of this process. Interim findings are to be made available through an electronic news letter.

In the second and third years of the project finished documents will be inter linked, and logical pathways through the documents will be provided by a decision matrix. By the end of the project this will create a decision support tool-kit which will make use of, and be interlinked to, existing Internet sites concerned with all aspects of sustainability and sustainable development.

4 BEQUEST objectives

The members of the network have identified five main objectives which taken together provide a detailed Agenda for all professional actors to consider in the context of sustainable urban development:

* development of a common language & understanding of sustainability between all the parties engaged in the built environment.
* better understanding and the development of more appropriate environmental quality assessment methodologies for sustainability
* development of a common integrated framework for assessment
* identification of environmental quality standards and the dissemination of best practice.
* to implement these ideas in order to catalyse change.
Intranet. In the initial stages of the project an intranet will be set up to facilitate immediate communication between members of the research team. The intranet will be a discussion forum and will also hold documents in the process of production; it will thus be a means of collaborative working. Access will be limited to researchers, who will be able to air embryonic or partially formed ideas within a closed community.

Extranet. The extranet will be a forum for Actors’ representatives. They will also use the extranet to test the products of research in conjunction with the BEQUEST research team.

Internet. When the tool kit is fully developed and tested it will be published on the Internet.

Figure 2. Communications and workspaces

5. Assessment methods and models
An essential paradox of a sustainable society is the conflicting requirements of sustaining the local and global environment whilst at the same time providing for the flows of production and consumption needed to maintain a good quality of life for humankind and, simultaneously, taking account of issues such as social equity and bio-diversity. The project is examining a number of blueprints and concepts that have emerged which attempt to answer all or some part of this challenging agenda, such as “Natural Step”, the “Service Economy”, PICABUE, “Ecological Footprints” and Natural Capital.

In the pursuit of sustainable urban development, what tools and models do we need and how will we use them? In order to completely represent the complex interactions that represent the city are we faced with a problem akin to “modelling the universe”? How can we, at the same time, remain modest? A wide range of environmental quality and performance assessment methods are available, such as EIA, BREEAM, BEPAC, Eco-Points, Multi-Criteria Analysis, etc. New techniques are emerging from current EU programmes such as SPARTACUS, ULYSSES, SUSTEE, etc. Can these techniques be integrated into an effective multi-modal framework that addresses all aspects of
sustainability and how is this to be achieved?

We have defined the essential characteristics of this framework as developed from the working of CIB TG8[15]:

* object orientated, i.e., capable of describing the city and its sub-elements
* functional, i.e., capable of assisting decision makers to make trade-offs
* transparent, i.e., capable of identifying data buried in an aggregated score (poor aggregation destroys information)
* value sensitive, i.e., capable of expressing values from a range of individual perspectives.
* integrative, i.e., capable of assisting professional co-ordination

To be able to handle complexity we need to identify, from the long list of parameters that can and should be considered in an assessment, those which are the primary effects. As identified earlier, the degree of difficulty of meeting different assessment requirements could be reduced or eliminated by transforming or amalgamating some parameters into fewer, more general indicators. Conventionally the main candidates for this are money and energy. Identification of reliable indicators is a problem in itself - there is a risk of false or incorrect understanding, like measuring the speed of the car by the tachometer. A process of gradual research and evolution will be necessary in order to increase our confidence in the selected indicators and provide better understanding of which indicators we can safely use in which circumstances and in which locations a process that will take longer than the lifetime of the BEQUEST project.

Central to the identification of indicators is the issue of the sphere of investigation - the spatial dimension. Different factors in assessment - energy flows, commuting travel distances, pollution, food production, building raw materials etc. - each have a separate area of influence with its own boundary, that can be traced from a particular community. In the affluent countries food is clearly sourced world wide. It is increasingly obvious that building materials are also glob& commodities, and this is becoming common between both the affluent and less affluent countries. The selected domain has major implications. The problems of international agreement over these issues is a major stumbling block to the development of life cycle analysis tools for buildings and construction products. We need these agreements if we are to have effective cooperation from manufacturers, who argue that there must be a standard system - a level playing field so that, for example, manufacturing does not move to locations where there are lower pollution control requirements.

6 Facilitating change

A city is a living entity. The environmental impact is the sum of that resulting from all the individual actions of the population. Thus, to continue the motoring analogy, trying to facilitate change is akin to tying to mend the car whilst driving along. We have to carry all the citizens with us - they must wish to change their behaviour and aspirations if we are to have any hope of moving towards sustainable patterns of living and working. Thus it is crucial to developing effective means of public participation. The key issues are:

* How are unexpressed interests of stakeholders taken into account?
* How is access to information provided to all stakeholders?
* Are they able to participate, do they have the appropriate language and understanding?

Answers to these questions are vital if we are to empower individuals to change their own lifestyle.

In market economies, participative mechanisms are unlikely to create change unaided due to the strong influence of capital in directing and determining the nature of much urban development. BEQUEST’s aim is to establish methods and procedures which individuals and groups (see Figure 1) can readily appreciate and use, both in terms of environmental quality assessment and in terms of participative procurement systems. The project is designed to involve a significant number of the “doers and shakers” and to use
their comments and views to develop really workable environmental assessment and procurement tools.

7 Conclusions

The membership of BEQUEST represents a significant cross section of the professional actors involved in the urban development process and so the spread of views and lack of consensus on what constitutes sustainability is very worrying in terms of developing concerted, coherent action towards Sustainable Urban Development, SUD, in practice. Clearly this requires all actors to begin to address the broader problem, to “think about things they have not seen as part of the problem”. Essentially designers and developers need to accept the need for wider participation in development decision making. Financiers and developers and their design teams should seek much greater resource efficiency in all aspects of building and infrastructure procurement. Policy-makers need to recognise the broad principles involved and begin to provide a clearer lead, a clearer vision of what SUD is and the types of life style that r-night accompany it. They also need to provide a better regulatory and fiscal background that will clearly facilitate appropriate change. All need techniques which will adequately value the quality of the built environment as well as the social, resource and natural capital contained in our existing communities.

A key conclusion to be drawn from the work of the BEQUEST Network to date is that in the pursuit of greater sustainability in buildings and cities, simple technical and economic analyses will prove to be inadequate, without better multi-modal assessment techniques and more thorough social and political integration. Thus society as a whole has to seek answers to the following questions:
* What can and should we be aiming-for in SUD?
* What targets should we set ourselves and which are the right sustainability indicators in any individual situation?
* What are the best environmental assessment methods to use where, to identify indicators and measure progress?
* How can these indicators and methods be integrated to reduce uncertainty in decision making?
* How can the results of a more integrated analysis be made more meaningful to all actors so that they can more clearly understand the options and thus effectively participate in the development process?

Answers to all of these questions are necessary for us, i.e. both BEQUEST and society in general, to begin to have a common language so that we can recognise whether affluent countries are really moving towards more sustainable patterns of living and working, rather than just thinking (or wishing) that they were there!

Acknowledgements

The authors thank the membership of the BEQUEST Network for their contributions to this paper.

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**Bibliography**


