G Barker, Richard Hill, Paul Bowen & Kathy Evans

Economic and regulatory approaches to improve the environmental performance of buildings in South Africa

Peer reviewed

Abstract

In the past, economic instruments for environmental purposes were strongly resisted by industry, government and the public. As such, they were used only in exceptional circumstances. More recently, there has been a realisation that economic instruments can be a powerful complement to direct regulations. Consequently, economic instruments[1] are playing an increasingly important role in the environmental management of buildings. The activities of the con struction industry are driven by economic forces, so using market mechanisms is a logical strategy to pursue the objectives of sustainable construction.[2] Perhaps the question is not whether economic mechanisms should be employed to improve environmental building performance, but rather how this should be achieved.

This article suggests that it can be achieved by using the economic instrument of ecolabelling to create market competition for improved building perform ance. Ecolabelling has traditionally been associated with household products, but has more recently been applied to a wider range of products, including buildings and building materials. The basis for building ecolabels is provided by

[1] *Economic instruments* are mechanisms that affect the costs and benefits of alternative actions open to economic agents, with the effect of influencing behaviour in a way that is favourable to the environment (OECD, 1989).

[2] *Sustainable Construction* 'seeks to fulfil the principles of sustainable development within the arena of the construction industry (Walker, 1999)'. It describes a process that starts before the construction phase (in the planning and design phases) and continues into the operation of the building and its eventual decommissioning. It includes socio economic, technical, biophysical and process orientated dimensions of sustainability.

G Barker & Richard (RC) Hill, Department of Environmental and Geographical Science, University of Cape Town, Private Bag, Rondebosch 7701, South Africa

Paul (PA) Bowen & Kathy Evans, Department of Construction Economics and Management, University of Cape Town, Private Bag, Rondebosch 7701, South Africa

the results of building environmental assessments, which evaluate building per formance. In developed countries, these assessments have stimulated market demand for 'green' building developments. Building environmental assessment methods have used the concept of ecolabelling to provide consumers with an additional benchmark in renting or purchasing buildings.

Yet, it is unknown whether the South African building market will be similarly responsive to 'green' market incentives. In South Africa, where the majority of the population are struggling to satisfy their basic needs, and lack proper education, the environmental 'ethos' of the general public has not developed to an extent where environmental issues are seen as a serious priority.

Building environmental assessment methods in South Africa are evolving from 'green' evaluations that were pragmatically developed to respond to immediate needs, to the measurement of 'sustainability'. Ecolabels can now reflect the performance of building development in terms of all aspects of sustain ability, including socio economic, technical and environmental dimensions of sustainable construction. This has been made possible by the development of a unique South African building environmental assessment method that measures sustainability, namely the "*Sustainable Buildings Assessment Technique*."

Although much has been written about economic mechanisms, practical guidance on how to implement these mechanisms in building developments is scarce. This article outlines some of the opportunities and constraints associated with market driven and environmental performance in buildings. The limitations of economic approaches in South Africa include a lack of environ mental awareness, misconceptions of 'green' buildings, building industry constraints and the market dependence of voluntary assessment protocols. Regulatory approaches are not without their own limitations, the most significant of which is the acute shortage of resources in South African environmental authorities, a factor that is likely to restrict the effectiveness of regulatory approaches.

The article goes on to examine the particular problems associated with developing world markets (such as South Africa's). Furthermore, the relationship between regulatory, 'command and control' approaches and economic, market driven approaches is discussed. It is concluded that the ideals of sustain able construction can best be achieved by using regulatory approaches in conjunction with economic instruments.

Keywords: ecolabelling, market driven approach, building environmental assessment methods, economic instruments, sustainable construction, regulatory approach

1. Introduction

1.1 Background Information and Research Focus

Many building developments have not taken proper account of their effects on the natural, social, economic and cultural environment (CIRIA, 1996). This has led to widespread damage to the environment, and increased pressure for stricter environmental protection. The construction industry has responded to this pressure by formulating building environmental assessment methods, which have emerged as part of a move towards environmental sustainability in buildings.

By providing a common and verifiable set of targets and criteria, building environmental assessment methods allow developers and building owners to demonstrate their efforts in striving for high environmental performance. Building developments are awarded a certified rating based on the results of the environmental assessment. In this way, building environmental assessment methods act as ecolabels for building developments (Blum *et al*., 2000). The focus of this paper is on ecolabels for building developments themselves, rather than those which apply to building materials or appliances.

In developed countries, building environmental assessment methods have effected significant market-driven improvements in the environmental performance of buildings. Yet, it remains to be seen whether the environmental awareness of South Africans has increased to the extent where green or sustainable buildings are seen as a serious priority. If not, the effectiveness of voluntary, market-driven methods may be severely limited in developing countries such as South Africa. In this case, a regulatory approach to improving the environmental performance of buildings may be a more successful strategy. This article investigates the viability of using regulatory approaches to enforce environmental building standards. In addition, the suitability of employing traditional, 'command-and-control', legal mechanisms and market-driven, economic instruments in the construction industry is evaluated.

In the past, economic instruments for environmental purposes were subject to harsh controversy and strong resistance from industry, government and the public (OECD, 1991). As such, they were used only in exceptional circumstances. More recently, people have realised that economic instruments can be a powerful complement

to direct regulations. Market-driven mechanisms can be used as a substitute or as a complement to other instruments such as legislation and co-operative agreements with industry (OECD, 1991) to achieve environmental goals. This paper outlines the strengths and weaknesses of economic and regulatory approaches, and suggests the use of a combined approach that incorporates both of these elements.

Growing concern about environmental degradation in South Africa has led to a plethora of environmental policy [The Environmental Conservation Act (No. 73 of 1989), The Constitution of South Africa (Act No. 108 of 1996), The National Environmental Management Act (No. 107 of 1998)]. These policies may be enforced by traditional command-and-control approaches, but there is increasing support for the notion that market-oriented policies can be more effective to achieve the goals of sustainability (Chau *et al*., 2000; DEAT, 1994). Internationally, it is generally recognised that economic instruments enhance the flexibility, efficiency and cost-effectiveness of environmental policy[3] (OECD, 1991). Locally (in South Africa), economic instruments are seen as useful alternatives to regulatory controls, as individuals and organisations are induced to act in a particular way through economic pressure, rather than the threat of sanctions (Kidd, 1997).

Yet, although there is official support for the use of economic instruments in South Africa (DEAT, 1996), their use at present is not common (Kidd, 1997). Scant attention has been paid to the specific economic, social and political circumstances in which economic instruments for environmental management can be accommodated (DEAT, 1995). The purpose of this paper is to explore and discuss the viability of using the economic mechanism of eco-labelling to implement improvements in building environmental performance. The merits of using regulatory approaches to improve the performance of South African buildings are also investigated.

---

[3] Major studies (e.g. OECD, 1989) have revealed that the use of economic instruments in environmental management has increased significantly worldwide.

1.2 The Problem

By using ecolabelling in tandem with regulation, environmental assessment methods may effect significant market-driven improvements in the performance of South African buildings. However, the success of these methods relies on their ability to create marketbased competition and incentives for building owners and developers to increase the performance of building developments. It is unknown whether the economic mechanism of ecolabelling will be able to increase the environmental performance of South African buildings to the point where they are environmentally sustainable. Regulatory approaches are often used instead of economic instruments, but traditional 'command-and-control' strategies have their own inherent problems (Du Plessis, 1999). Although ecolabelling has been applied to South African products, these schemes are still in their infancy, and have met with limited success (Katzschner, 1998).

The objective of this study is to determine whether the limitations of ecolabelling schemes can be overcome by building environmental assessment methods. In order to identify the best strategy to improve the environmental performance of South African buildings, the roles of economic, regulatory and combined approaches to improve the sustainability of buildings are explored.

1.3 The Nature of Building Environmental Assessment Methods

Building environmental assessment methods are generally voluntary, self-financing schemes for the environmental labelling of buildings. They are the 'benchmarks' whereby economic mechanisms can be used to produce building developments that have high environmental performance and which operate in a sustainable manner. The basis of these schemes is normally their certification process, whereby certificates clearly describing environmental performance are awarded to individual buildings. Recognition of high environmental building performance is made possible by the results of building environmental assessments, and can give discerning clients a competitive market edge over their competition. Environmental ratings provided by building environmental assessments may allow designers, developers and building owners who pursue the goals of sustainable construction to gain a significant commercial advantage (Baldwin *et al*., 1998).

1.4 Defining Ecolabels for Building Developments

An ecolabel[4] is any label that describes or identifies environmentally-related characteristics of products or services (Kibert, 1998). A wide range of ecolabelling systems have emerged worldwide for the purpose of informing consumers of environmental aspects of the products they are purchasing (Katzschner, 1998). Ecolabelling has traditionally been associated with household products such as aerosols and detergents, but has more recently been applied to a wider range of products, including buildings. In the case of buildings, ecolabels (in the form of certificates) are the logical outcomes of environmental assessments.

The objective of ecolabels is to encourage the demand for, and supply of, products and services that cause minimal environmental degradation, thereby stimulating the potential for market-driven environmental improvements. This is achieved by communicating verifiable and accurate information on environmental aspects of products and services (SABS, 1999). Environmental assessments allow building developments to be rated and certified as environmentally preferable to their counterparts. This allows purchasers to make decisions based (at least partly) on the environmental impact of the building's lifecycle. "*The vast majority of people, if offered credible green products*[5] *with similar prices and technical performance to conventional products, would discriminate in favour of the green product*" (Peattie, 1995: 155).

Ecolabels provide a market advantage to buildings with high environmental performance, and assure developers, building owners and end-users that the project has met strict criteria overseen by an independent organisation (Kibert, 1998). Labelling schemes can either work on a pass/fail basis, or can involve some form of gradation of performance. Grading schemes are preferable to simple pass/fail ratings as they are more informative, and provide an incentive for qualifying companies to continue to improve the environmental standards of their products or services (Peattie, 1995). In the construction industry, the 'products' are building

---

4 Otherwise referred to as an 'environmental label' or a 'green label'

5 A product or service is 'green' when its environmental and societal performance, in production, use and disposal, is significantly better than conventional products (Peattie, 1995: 181).

materials and buildings themselves. Labels for buildings typically classify the performance into descriptive categories (e.g. 'fair', 'good', 'excellent', or 'bronze', 'silver', 'gold'). These categories function as performance benchmarks for building owners, developers, designers and builders. They are generally determined by adding the various scores of building performance categories (e.g. resource consumption, indoor quality) (Cole, 2000).

Environmental labelling schemes are an important phenomenon worldwide and are having positive impacts on the built environment (Katzschner, 1998). If properly implemented, they can provide increased assurance to developers, owners and end-users that their buildings will have a low ecological footprint[6] throughout their lifecycle. Yet, ecolabelling has not yet gained much acceptance in the South African building industry (Katzschner, 1998). To implement ecolabels more effectively, it may be useful to consider the factors that determine their success or failure.

1.5 Factors that Determine the Effectiveness of Ecolabels

The usefulness and effectiveness of ecolabels depends on how well they convey reliable and meaningful environmental information about a building. For building ecolabels to be credible, the environmental information that supports them (i.e. the results of building environmental assessments) should be gathered and assessed using professionally recognised and accepted methods (SABS, 1999). The main intention of environmental labelling and rating schemes is to provide consumers with the information necessary to make decisions based on the environmental characteristics of products and services[7] (Crawley & Aho, 1999).

If they are to form an effective basis for labelling schemes, building environmental assessments need to satisfy certain fundamental requirements. To provide relevant and accurate information, building environmental assessment methods need to follow standards that

---

[6] *Ecological Footprint* represents the corresponding area of productive land or water required to produce the resources used, and assimilate the wastes produced, by a building development.

[7] The 'product' is the building itself, and the 'services' are those provided by the construction industry (e.g. design, construction, maintenance).

are internationally applicable (SABS, 1999). Ecolabels should inform consumers that a product has met certain predefined environmental requirements, and allow for meaningful comparisons of environmental performance with alternative products (Crawley & Aho, 1999). Furthermore, the method, data and assumptions that influence the outcome of assessments and consequent rating of buildings need to be explicit and accessible to all role players in the building development. A lack of accessible information compromises the ability of consumers to make meaningful comparisons and informed choices, and jeopardises the capacity of building sector companies to improve their performance (Crawley & Aho, 1999).

Therefore, the information provided by building environmental assessments should include underlying assumptions, and needs to be presented in a format that allows consumers to compare products easily. In addition, life cycle impacts need to be evaluated to allow consumers to account for the full range of factors that impact on the environment.[8] Omitting lifecycle information from an ecolabel significantly reduces its import (SABS, 1999).

The degree of acceptance and understanding (or environmental awareness) that purchasers have about the information provided by the label clearly influences its effectiveness. People and organisations who use ecolabels therefore have an incentive and a responsibility to provide useful and accurate information that can easily be understood. Yet, the information needs to be sufficient to substantiate the nature of the environmental claim being made (SABS, 1999). The effectiveness of ecolabels in the construction industry ultimately depends on their ability to enable developers and building owners to take responsibility for, and make informed choices about, the environmental aspects of their buildings (SABS, 1999). In so doing, they may influence the decisions of others in their selection of building products or services.

This introduction has explained the economic instrument of ecolabels in buildings. However, for ecolabels to realise their full potential in

[8] Lifecycle analysis evaluates environmental impacts of a building lifecycle, from acquisition of raw materials through to production, use and disposal of buildings and building materials.

enhancing the environmental performance of building developments, several limitations of market-driven mechanisms need to be overcome.

2. Limitations of market-driven building performance

2.1 Green Limitations in a Developing Country

In South Africa, where the majority of the population are struggling to satisfy their basic needs, and lack proper education, the environmental 'ethos' of the general public has not developed to an extent where environmental issues are seen as a serious priority (Kidd, 1997). In developing countries, the relationship between environmental problems and the resources available to solve them results in a widespread need to improvise in response to the most acute shortages of manpower and resources (Graybill, 1985). Under these conditions, the environmental management of buildings becomes a case of "*sailing the boat while building it*" (Graybill, 1985). The interests of society are judged in terms of immediate benefits and future needs are considered an unaffordable luxury (Fuggle, 1991).

To avoid 'reinventing the wheel', South Africa has adapted building environmental assessment methods that have been developed in other countries. But developing nations need to be wary of adopting 'first world' assessment tools, as these methods fail to cover socio-economic and cultural issues that are vital in a third world context (Barker & Kaatz, 2001; Hill & Bowen, 1997). Building environmental assessment methods need to avoid their current overemphasis on the biophysical dimension of sustainability by evaluating all aspects of sustainability, including social, economic, technical and process-orientated factors (Hill & Bowen, 1997).

2.2 Business and the Environment

"*The likelihood that environmental issues will affect the 'bottom line', positively or negatively, is high and increasing steadily*" (KPMG, 1998: 1). Even so, South African companies have performed poorly in implementing environmental initiatives (Visser, 1998). In developed world countries, leading companies in the construction industry have accepted that the economy and the

environment are inextricably linked. They recognise that environmental management makes good business sense, and that eco-efficiency[9] pays off in terms of increased profits (Yeld, 1997).

In the building industry, this entails more than 'window-dressing' to improve public relations and company image. Resource-efficient technologies, energy efficiency, waste reduction and pollution prevention can and do increase profits substantially (Yeld, 1997). Yet, in South Africa, few built-environment professionals and organisations have realised the economic efficiencies that come with sound environmental management. KPMG (2000) reports that the environmental management of South Africa's companies is lagging against international standards, and that considerable improvement is required. Nevertheless, environmental issues are important to South Africa's top companies, and are expected to become increasingly so, driven by a number of key market forces (KPMG, 1998). Market forces in the building industry present significant constraints to the achievement of sustainable construction.

2.3 Building Industry Constraints

The finance of buildings is adjusted to the short and medium term, which is in conflict with sustainable construction, which has long term goals (Bon & Hutchinson, 2000). Consequently, the quest for short-term financial gains often compromises environmental standards at the expense of environmentally sustainable buildings, which are cheaper in the long-term (Roodman & Lenssen, 1994). Perhaps in the context of a market place that is highly sensitive to the importance of environmental sustainability, particularly in buildings, this fundamental obstruction can be overcome. However, it is unknown whether South Africa currently has such a market, particularly in the construction and building sector.

For environmental assessment tools to initiate market-driven competition for 'green' buildings in developing countries, sustainability needs to be economically viable. This implies not only long-term gains, but also immediate benefits. Building owners, designers, developers and contractors must be able to demonstrate the tangible profits of sustainable construction to less discerning practitioners if they are to change the way people think about

[9] *Eco efficiency* implies that protecting the environment can produce financial savings. i.e. that savings can be achieved by using resources more efficiently.

sustainable building. Short-term benefits, particularly financial gains, are likely to be very important in changing the perception of 'green' building in South Africa. This is not the only perception that needs to be changed. The next section describes several misconceptions regarding green building. Also of concern is the lack of environmental awareness of the public and role players in the building process.

2.4 Environmental Awareness and Misconceptions

The demand side of the building market are generally uneducated about what 'green buildings' are, why sustainable construction is important, and how to improve the performance of their own buildings (Flora & Moser, 2000). Contrary to the perception of many environmentalists, most decision-makers have never heard of a 'green' building and do not understand how to manage a green building development (Flora & Moser, 2000). Even people and organisations who are aware of these concepts tend to focus on the traditional competitive building factors of cost, quality and time (Bourdeau, 1999). As a result, environmental sustainability is often accorded low priority by property developers and building owners.

There is currently a widely-held view in the South African construction industry, particularly amongst developers, building owners and contractors, that increasing the environmental performance of buildings entails unwarranted additional costs (Barker, 1999). The perception that the initial construction costs of 'green' buildings are much higher than typical buildings has significantly limited their feasibility (Bartlett & Howard, 2000). Perceptions are important, as they influence market behaviour through consumer decisions. Recent studies by Flora & Moser (2000), have revealed several misguided market perceptions concerning green buildings. Green buildings are thought to cost more than conventional buildings and perform unsuitably (Flora & Moser, 2000).

Bartlett & Howard (2000), refute the erroneous perception that the construction of 'green' buildings is significantly more expensive than normal. In fact, the difference in cost between 'green' and typical construction practice is approximately 1% or less of the total construction cost (Bartlett & Howard, 2000). Furthermore, many developers see return on building investment as a more important consideration than capital cost (Bordass, 2000). In the same way

that the costs of 'green' buildings are overestimated, their benefits are underrated. 'Green' buildings provide value in terms of performance benefits, operational costs, flexibility, durability, operational and maintenance costs, and occupant comfort. Assessment methods are used to gauge the extent of these benefits, but voluntary methods have to overcome a significant conflict.

2.5 The Conflict of Voluntary Assessment Methods

There has been a recent upsurge in the use of voluntary approaches as a tool to improve environmental performance and increase sustainability (UNEP, 1998). The concept of rating the environmental performance of a building development has gained popularity, and a variety of voluntary assessment schemes have been developed worldwide to evaluate building performance (Chau *et al*., 2000). Voluntary methods depend entirely for their effectiveness on the market, so credibility is essential to building assessments. Yet, it is uncertain whether credibility alone will be sufficient to realise necessary improvements in the environmental performance of buildings.

Voluntary building assessment protocols have to overcome a significant conflict. They need to function as objective and sufficiently demanding evaluations (to have credibility with environmentalists), but must also serve as an attractive proposition for developers and building owners (who demand positive recognition for any efforts to improve environmental performance). Satisfying these two requirements invariably compromises the integrity of the assessment (Cole, 2000).

Because building environmental assessments are largely based on voluntary application, the success of any method ultimately depends on whether it furthers the building investor's self-interest (UNEP, 1998). As a result, these methods tend to accommodate the goals of their developers and investors, because the assessments are produced in a format that caters for the attitudes and interests of developers and financial institutions.

According to Cole (2000), the fact that all existing building environmental assessment methods are voluntary in their application significantly compromises both their comprehensiveness and rigour. A more optimistic scenario is put forward by Doxsey (1997), who argues that building environmental assessment methods will continue

to improve their ability to find acceptance with target markets as the environmental awareness of building owners, developers and end-users increases. "*In so doing, they will target environmental issues that reflect tangible value to building owners, and low cost will dictate their overall character and emphasis*" (Doxsey, 1997). While it is important that assessment methods can induce market-driven environmental performance improvements in buildings, they should not compromise their accuracy and integrity for economic reasons. The limitations of ecolabels for buildings stem from their dependence on voluntary building environmental assessment methods.

2.6 Limitations of Ecolabelling for Buildings

The most significant limitation of ecolabelling for buildings is their reliance on voluntary assessment methods, which rely greatly on market acceptance. The underlying premise of voluntary assessment methods is that fundamental changes in market demand will be needed to trigger substantial improvements in performance of new and existing buildings (Cole, 2000). These methods assume that if the market is provided with improved environmental information and mechanisms to enhance building performance, discerning clients will take the lead in environmental responsibility and others will follow their example in order to remain competitive (Cole, 2000). In South Africa, relatively few building owners and developers have been guided by market demand for green buildings. The question remains whether the South African building market will respond to this economic incentive.

Environmental labels for buildings will need to overcome the similar limitations to those of green labels for other products (e.g. household items). A major weakness of many existing ecolabels is the nature of the claims they make with regard to the environmental performance of the product or service that they describe. Some labels are prone to making claims that deceive consumers. Examples of these are (Peattie, 1995: 241):

- Excessive claims – general claims such as 'environmentally friendly' are not specific enough to be helpful to consumers);
- Multiple claims – different terminology for products with the same environmental performance (e.g. 'ozone-friendly' and 'ozone-safe') creates unrealistic consumer perceptions;

- Unexplained claims – environmental claims such as 'biodegradable' and 'enzyme-free', are poorly understood by consumers; and,
- Meaningless claims – misleading claims (e.g. labelling washing-up liquid as 'phosphate-free' when these products have never contained phosphates).

It is clear that some ecolabels make unsubstantiated and misleading claims regarding the products and services they represent. Similarly, building projects that are marketed as 'green' are often supported by questionable building data. For green building to become a mainstream concept, it needs to be clearly communicated to the demand side of the market (Flora & Moser, 2000). Objective assessments of building developments are required for this purpose, and it is unacceptable for buildings with low environmental sustainability to be marketed as 'green' under false pretences. If these limitations can be overcome, economic mechanisms that embrace a market-driven approach are bound to have a major influence on building environmental performance.

3. The Market-driven Approach: Economic Mechanisms

3.1 Shifting from Direct Regulation to Market-Driven Performance

Under the paradigm of environmentalism, a direct regulatory approach was favoured to manage the environment. The emphasis under the paradigm of sustainability has shifted to economic approaches (Liddle, 1994). This assertion is reflected by building environmental assessment tools, which currently rely on market-mechanisms for their implementation. The best way to approach built-environment companies may be to accentuate the positive aspects of sustainable construction rather than force developers, designers and building owners to comply with legal requirements.

This sentiment is echoed by experts in the field of sustainable construction (Chau *et al*., 2000), who have recognised that sustainability goals are achieved more efficiently through market-orientated policies than by regulation. However, the market can only stimulate demand for sustainable buildings if consumers are provided with

credible environmental information. This information can be provided by building environmental assessments, the results of which effectively provide consumers with detailed environmental labels.

For green building practice to gain acceptance in the South African construction industry, building owners and developers need to be convinced about the long-term benefits of high environmental performance. This requires the careful planning of economic and environmental performance (Chau *et al*., 2000). Decision-making processes in the construction industry often involve conflicting or even competing environmental and economic objectives. Building assessment methods can help to achieve optimal environmental improvement within given financial resources (Chau *et al*., 2000). Although these methods are facilitating the shift from a regulatory to a market-driven approach, they will need to overcome several inherent limitations if they are to be effective.

3.2 Limitations of Green Building Assessment Methods

There has been much discussion about whether the criteria for environmental product labels should be strictly ecological, or whether they should cover ethical, health and social issues (Peattie, 1995). A similar quandary has emerged in debate regarding building environmental assessment methods. There is growing support for the inclusion of socio-economic and cultural considerations into these methods, which until now have focused mainly on biophysical environmental issues. The predominant focus of 'green' building assessments on environmental dimensions of sustainability, and their neglect of socio-economic and cultural aspects of sustainable construction, are major limitations of these methods (Hill & Bowen, 1997).

Building environmental assessments have tended to focus on the design and operational phases of the building lifecycle. The planning, construction and decommissioning phases of building developments have not received as much attention (Barker & Kaatz, 2001; Hill & Bowen, 1997). The manufacturing of building materials is a less obvious dimension of the building lifecycle that cannot be ignored. Ecolabelling of building materials should be integrated into the overall environmental labelling of the building development. For environmental labelling schemes to be effective, all aspects of the building life cycle must be considered (Kibert, 1998). Environmental assessment methods should therefore encompass all phases

of building development, including planning and design, manufacturing (of building materials), construction, operation and decommissioning.

Green assessment methods make the assumption that the cumulative positive environmental impact of continually improving the environmental performance of individual buildings will be sufficient to fully address environmental problems (Cole, 2000). It is uncertain whether this approach will be sufficient to create enough improvement in the environmental performance of buildings to satisfy broader national environmental and sustainability targets. 'Green' assessment methods cannot easily be used to measure progress towards environmental sustainability because they are shaped by practicalities and market forces (Cole, 2000). They emphasise comparative building performance at a regional and local scale, through which building owners and developers can demonstrate a marketing edge over their competition. In order to ensure that the construction industry meets the goals of sustainable construction, a different approach may be necessary. The construction industry needs to move beyond eco-efficiency measures toward the concept of sustainability assessment.

3.4 Going Beyond Eco-efficiency, Towards Sustainability Labelling

The weakness of existing 'green' environmental assessment methods is their dependence on comparative evaluation of buildings without having an ultimate goal in sight, making it difficult to measure progress towards sustainability in the building industry. In contrast, within the context of sustainability, building environmental assessments are based on the progress that building performance has made towards a declared, ecologically sustainable condition. Accordingly, ecolabels derived from sustainability assessments reflect the condition of buildings in terms of their performance relative to sustainability indicators.

Sustainability-labelling schemes provide information that reflects the performance of building developments in terms of environmental, social and economic sustainability. Building environmental assessment methods are evolving from 'green' evaluations that were pragmatically developed to respond to immediate needs, to the measurement of 'sustainability' (Kohler, 1999). Hill (1998), has

put forward the notion that a national sustainability-labelling scheme for buildings could be harnessed in South Africa. Cole (2000), supports the notion of sustainable building assessment methods, and suggests that extensive marketing of the benefits of improved environmental performance is necessary to create positive change.

Until recently, building environmental assessments were restricted to environmental aspects of sustainability. Socio-economic, cultural and process-orientated dimensions of sustainable construction have now been included in a South African assessment method (the Sustainable Buildings Assessment Technique), giving the construction industry the opportunity to apply economic instruments to gauge the sustainability of building developments (CSIR, 2001).

Cole (2000), suggests that sustainable assessments have several advantages over 'green' methods. Firstly, the number of criteria required to judge the performance of a building can be relatively few in comparison with 'green' assessment methods. Secondly, the performance of buildings in different built-environments around the world can be compared using the common yardstick of sustainability targets.

Using sustainability as a criterion for labelling products is an appealing concept, but it creates problems in developing and marketing products (Peattie, 1995). Because markets fail to account for environmental factors, conventional products are substantially cheaper than sustainable products, which cover the true costs of pollution and resource use. It is unrealistic to expect consumers to cover the entire price difference that would exist between sustainable and conventional products (Peattie, 1995).

Sustainable and environmental performance as a competitive tool remains a new business opportunity that allows investors to profit from environmental products and services (Visser, 1997a), but it is unknown whether this idea will gain acceptance in South African markets.

Can Economic Instruments Gain Acceptance in the South African Market?

Although environmental issues may not feature as prominently in South Africa as in more developed countries, there is growing environmental concern in the country (Kidd, 1997). The increasing receptiveness of South Africans to environmental matters (KPMG,

2000) may be an indication that market mechanisms will be sufficient to promote sustainable development in the building industry. Assuming this is the case, the difficulties of a 'command and control' approach to increasing the environmental performance of buildings could be avoided.

But in South Africa, where the environmental awareness of the general public has not developed to the point where environmental issues are taken seriously Kidd (1997), this is a highly questionable assumption to make. The South African building market may not provide the response necessary to significantly improve the environmental performance of buildings in the near future. Cole (2000), argues that there are significant practical constraints associated with dependency on market acceptance. Hill (1998: 9), shares this concern, stating that, "*given the general lack of demand for sustainable building from end-users, it is hard to predict who will take the lead in pulling or pushing the construction industry towards sustainability*".

4. The Regulatory Approach

Having raised doubts over the ability of the South African market to chase the 'carrot' of market-driven environmental performance in building developments, perhaps enforcing compliance with the 'stick' of regulation would be a more appropriate strategy for building environmental assessment tools to adopt. According to Hill (1998), economic incentives alone may not be sufficient to effect necessary changes, so the construction industry may need a legal push towards environmental sustainability from government.

Government policy and legislation remains the most powerful agent of change in ensuring that environmental issues are a high priority for South African companies (Visser, 1997b).

Furthermore, almost half of South Africa's top companies are not striving for compliance with any voluntary environmental standard (Visser, 1997b), which suggests that voluntary, market-driven building environmental assessments may not have the desired impact on building performance. To be effective in South Africa, assessments may require the support of a regulatory approach. This could take the form of making the assessments mandatory, or may prescribe certain minimum requirements in terms of environmental standards for buildings.

The regulatory approach is the traditional 'command-and-control' approach that has been favoured in South Africa. The most significant problem associated with regulatory approaches is that they require enforcement, which is often lacking. Unlike market-driven methods, which operate more or less automatically, conventional regulatory approaches imply direct controls that require constant vigilance from authorities. This places demands on government administrations that are already stretched in terms of human resources (DEAT, 1994). However, there remain situations in environmental building management where this is the best approach. Regulation will always have a role to play in enforcing minimum levels of environmental performance in building developments. For example, compliance with regulations may need to be enforced in cases where buildings are required to meet certain minimum sustainability requirements.

The case for regulating building performance is strengthened by the dynamic nature of legal instruments. Generally, laws can be changed relatively quickly in response to new environments, circumstances, locations and technologies. In practice, however, regulators often lack the combined economic, engineering and environmental expertise that is necessary to promulgate effective laws (OECD, 1991).

Building environmental assessment methods may allow for the incorporation of environmental performance requirements in national building regulations. In so doing, they would significantly reduce the negative environmental impacts of building developments (Crawley & Aho, 1999). However, policing the compliance of buildings with regulations is a time-consuming and costly task, which may not be welcomed by designers, developers, building owners and end-users (Crawley & Aho, 1999).

The extent to which regulation will be used to control the environmental impacts of buildings is unknown, but it has been suggested (Cole, 2000) that environmental assessment methods for buildings are unlikely to be adopted as standards or regulations in the near future.

5. The Combined Approach: Best of Both Worlds?

There are currently two viable broad approaches for meeting the challenge of sustainable construction (Bon & Hutchinson, 2000).

The first is governance through standards, and legal and regulatory methods. The second is by market-oriented policies that influence the costs of particular forms of construction. Both approaches have a significant role to play in improving the environmental performance of buildings, but market-oriented policies are thought to be more effective at a strategic level (Bon & Hutchinson, 2000).

Economic instruments are usually applied in conjunction with other instruments. Indeed, combinations of economic mechanisms and direct regulation are quite common (OECD, 1991). Economic instruments may be used to reinforce regulation. In terms of building environmental performance, direct regulations will take time to be developed and promulgated. Market-driven measures to improve building environmental performance can accelerate compliance with direct regulation in advance of their actual implementation (OECD, 1991). Economic instruments therefore have a major role in enhancing the environmental performance of buildings.

As tools to improve building environmental performance, economic approaches such as ecolabelling have the advantage that markets are superior to regulators in processing information from many different sources, resulting in a better allocation of resources (OECD, 1991). Market-based mechanims for improving environmental building performance have an advantage over 'command-and-control' techniques in that they allow the designer, builder, building owner or building end-user to choose how environmental standards should be achieved.

Environmental economists have found that market-based incentives are generally better than 'command-and-control' methods (Pearce *et al*., 1989), although such a statement disguises many practical problems associated with implementing economic approaches. Even so, 'command-and-control' approaches adopt a regulatory stance that ignores the inefficiencies of the market mechanism.

Yet, even where economic instruments are successfully implemented, there remains a role for regulation as the means of ensuring that the basis for market transactions is properly defined (OECD, 1991). Building environmental assessments have a crucial role to play in this respect, as they provide the data on which market incentives are based.

6. Conclusions

Ecolabelling of building developments is rapidly becoming a reality in the South African construction industry through the implementation of building environmental assessment methods. Yet, it is questionable whether the market-mechanism on which ecolabelling depends will be sufficient to create the improvements in environmental performance of buildings necessary to meet sustainability targets. This is of particular concern in developing countries, where building environmental management is often a case of 'sailing the boat while building it'. As such, the construction industry may need a legal push towards sustainability from government. However, acute shortages of manpower and resources in South African environmental authorities are likely to undermine the effectiveness of regulatory approaches.

Furthermore, the construction industry's acceptance of existing assessment methods derives largely from their voluntary application, which suggests that enforcing compliance by regulating building performance may not be a successful strategy. A co-operative, market-driven approach to sustainable construction could be more effective.

At this time, it is difficult to ascertain which strategy will be the most appropriate for building environmental assessment methods to carry forward: the 'carrot' of market incentives; the 'stick' of legal compliance; or perhaps a combination of economic and regulatory approaches. The ecolabelling of buildings is unlikely to operate successfully without some regulatory support, and *vice versa*. There is much debate concerning whether economic, regulatory or combined approaches are the most suitable to improve the environmental performance of buildings. In South Africa, the most suitable strategy for the construction industry is likely to be one of adopting an approach that combines economic and regulatory mechanisms.

Building environmental assessments in South Africa have evolved from 'green' evaluations to sustainability assessments. Nevertheless, the concept of ecolabelling is likely to remain the dominant economic mechanism whereby improvements in environmental building performance are implemented. The effectiveness of ecolabels ultimately depends on their ability to enable potential purchasers to make informed choices about the environmental

aspects of buildings. An opportunity now exists for far-sighted designers, building contractors, developers and building owners to capture a market niche in terms of environmental performance. In so doing, they can steer the building industry towards sustainable construction by stimulating market demand for green buildings.

References

Barker, G. & Kaatz, E. 2001. *Environmental Sustainability Assessment Methods for Buildings in South Africa*, Unpublished Masters Project Report, Department of Environmental and Geographical Science. Cape Town: University of Cape Town.

Barker, G. 1999. *The Practical Implementation of Environmental Management Plans in Construction Projects*. Unpublished Honours Dissertation, Department of Environmental and Geographical Science. Cape Town: University of Cape Town.

Bartlett, E. & Howard, N. 2000. Informing decision makers on the cost and value of building green. *Building Research and Information*, 28(5/6), pp. 315-324.

Baldwin, R., Yates, A., Howard, N. & Rao, S. 1998. *BREEAM 98 for Offices*, Building Research Establishment. Watford: UK.

Blum, A., Deilmann, C., Neubauer, F. 2000. Eco labelling for Buildings Examples and Requirements. *Proceedings of the International Conference on Sustainable Building 2000*, Maastricht, The Netherlands, pp. 243-245.

Bon, R. & Hutchinson, K. 2000. Sustainable construction: some economic challenges. *Building Research and Information*, 28(5/6), pp. 310-314.

Bordass, B. 2000. Cost and value: fact and fiction. *Building Research and Information*, 28(5/6), pp. 338-352.

Bourdeau, L. 1999. Sustainable development and the future of construction: a comparison of visions from various countries. *Building Research and Construction*, 27(6), pp. 355-367.

Building Research and Information. 1998a. *Research Information: Environ mental management in project design,* 26(2), pp. 113-117.

Chau, C.K., Lee, W.L., Vik, F.W.H. & Burnett, J. 2000. Towards successful voluntary building environmental assessment schemes. *Construction Management and Economics,* 18(8), pp. 959-968.

Construction Industry Research and Information Association (CIRIA). 1996. Environmental Assessment. Special Publication. Westminster London.

Cole, R. J. 1999. Building environmental assessment methods: clarifying intentions. *Building Research and Information*, 27(4/5), pp. 230 246.

Cole, R. J. 2000. Building environmental assessment methods: assessing construction practices. *Construction Management and Economics,* 18(8), pp. 949-957.

Cole, R. J. & Larsson, N. 1999. GBC '98 and GBTool background. *Building Research and Information,* 27(4/5), pp. 221-229.

Crawley, D. & Aho, I. 1999. Building environmental assessment methods: Applications and development trends. *Building Research and Information*, 27(4/5), pp. 300-308.

Department of Environmental Affairs and Tourism (DEAT). 1994. *Towards a National Policy for the use of Environmental Resource Economics in Environmental Impact Management.* Discussion document 1. Cape Town: CTP Book Printers.

Department of Environmental Affairs and Tourism (DEAT). 1995. *A possible model for the use of Economic Instruments in Environmental Resource Management in South Africa.* Discussion document 2. Cape Town: CTP Book Printers.

Department of Environmental Affairs and Tourism (DEAT). 1996. *A proposed method for the introduction of Economic Instruments as tools of Environmental Management in South Africa*. Discussion document 3. Cape Town: CTP Book Printers.

Doxsey, L. 1997. Practical considerations and strategies for the marketing of environmentally sensitive building: lessons learned from the Austin, Texas USA Green Building Program. *Proceedings of CIB TG8 Second International Conference on Buildings and the Environment*, Paris, June 9-12, Vol. 2, pp. 507-513.

Du Plessis, C. 1999. Sustainable development demands dialogue between developed and developing worlds. *Building Research and Information*, 27(6), pp. 379-390.

Flora, R.L. & Moser, M. 2000. Driving Market Demand for Green Buildings in Pittsburgh. Green Building Alliance. *Proceedings from the International Conference on Sustainable Building 2000*, Maastricht, The Netherlands, pp. 70-72.

Fuggle, R.F. 1989. The need for environmental management procedures in Third World Countries. *Fourth Sino South African Conference*, Taipei, January 19-21, 1989.

Graham, P. 1997. *Using Environmental Assessment Techniques to get the Big Picture: A review of current techniques in the context of sustainable construction*. Response by P. Graham submitted to BRE regarding the applicability of a document called "The Green Guide to Specification".

Graybill, D.L. 1985. If Environmental Impact is Everything, maybe it is nothing some arguments for more attention to practical aspects of implementation. *The Environmental Professional*, 7(4), pp. 344-351.

Hill, R. C. 1998. *Report on August 1998 conference in South Africa on Sustainability in the Built Environment*. Department of Environmental and Geographical Science, Cape Town: University of Cape Town.

Hill, R. C. & Bowen, P. 1997. Sustainable construction: principles and a framework for attainment. *Construction Management and Economics*, 15(3), pp. 223-239.

1997. Sustainable construction is more than 'green' construction. *Urban Green File*, 2(1), March/April.

Katzschner, T. 1998. Sustainability in the Built Environment. *IAIA South Africa Newsletter*, December.

Kibert, C. J. 1994. *First International Conference of CIB TG 16 on Sustainable Construction*, Tampa, Florida, 6-9 November.

Kibert, C.J. 1998. Environmental Labeling Programs and Construction Industry, '*Sustainability in the built environment a practical approach' Conference Proceedings*, South Africa: Northgate Randburg.

Kidd, M. 1997. *Environmental Law A South African Guide*. South Africa: Juta.

Kohler, N. 1999. The relevance of Green Building Challenge: an observer's perspective. *Building Research and Information*, 27(4/5), pp. 309-320.

KPMG Environmental Health and Safety Unit. 2000. *Survey of Environmental and Social Reporting in South Africa*, 7th edition.

KPMG Virtual Library 1998. *SA industry faces credibility gap on environ mental issues*. http://www.kpmg.co.za/library/nov98/gap.htm

Larsson, N. K. 1998. *A Strategy for GBC 2000 and Beyond*. Natural Resources Canada, Ottawa.

Liddle, B.T. 1994. Construction for Sustainability and the Sustainability of the Construction Industry. *Proceedings of the First International Conference on Sustainable Construction, CIB TG 16, November 6-9, 1994*, Tampa Florida.

Movement for Innovation. 2000. *A Vision Shared The Movement for Innovation Second Anniversary Report:* 54-55, Commercial Colour Press.

OECD. 1991. Environmental Policy: How to Apply Economic Instruments. Paris: OECD.

OECD. 1989. Economic Instruments for Environmental Protection. Paris: OECD

Pearce, D., Markandya, A., & Barbier, E.B. 1989. *Blueprint for a Green Economy*. London: Earthscan Publications Limited.

Peattie, K. 1995. *Environmental Marketing Management Meeting the Green Challenge*. Great Britain: Pitman Publishing.

Roodman, D. M. & Lenssen, N. 1994. Our Buildings, Overselves. World Watch: 21-29, November/December.

South African Bureau of Standards. 1999. SABS ISO 14020:1998, South African Standard *Code of Practice: Environmental labels and declarations General principles*. South Africa: SABS Printers.

UNEP 1998. *Industry and Environment*, 21(1-2).

United Kingdom Government Publications. 1998. *Opportunities for change: Consultation paper on a UK strategy for sustainable construction*. UK: Crown, Norwich.

Visser, W. 1997. *Rainbow nation's corporates go green.* [online] South Africa: KPMG Virtual Library. http://www.kpmg.co.za/services/specialist/changes1.htm

Visser, W. 1997. *Changes needed in the approach to environmental manage ment to ensure organisation and national growth.* [online] South Africa: KPMG Virtual Library. http://www.kpmg.co.za/services/specialist/changes.htm

Visser, W. 1998. *SA environmental mindset needs to shift.* [online]. South Africa: KPMG Virtual Library. http://www.kpmg.co.za/library/1997/nov97/rainbow.htm

Walker, J. 1999. *A sustainability assessment method for greenfields, low cost, cement brick housing developments on the Cape Flats.* Unpublished Masters Project Report. Cape Town: University of Cape Town.

Yeld, J. 1997. *Caring for the Earth A Guide to Sustainable Living*. South Africa: WWF South Africa.