

Action for Sustainability: preparing an African Plan for Sustainable Building and Construction

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Abstract

Sustainable development, and by extension sustainable building and construction, is an evolving concept that relies for its implementation on the development of regional and local approaches and solutions. There is in particular a split between the definitions, approaches and priorities in developed and developing countries, and this has been highlighted in a number of publications and international conferences. Subsequently, the International Council for Research and Innovation in Building and Construction (CIB) has initiated a process for developing an international agenda for sustainable building and construction that would recognise these regional and local differences. Part of this process is the development of regional action plans for sustainable building and construction at a number of regional sustainable building conferences. These action plans would form the basis of a discussion session at the next World Sustainable Building Conference in September 2005 in Tokyo. This paper provides a brief overview of the international debate about sustainable building and construction and the context within which these discussions are taking place in Africa, and present the outcomes of a discussion session held at the SB'04 Africa Conference held in Stellenbosch, South Africa (September, 2004) which attempted to identify the key elements of an action plan for Africa.

1. Introduction

On September 18, 2000, in its 55th session, the General Assembly of the United Nations adopted the *Millennium Declaration*. Paragraph Eleven of this declaration proclaimed the following undertaking:

“We will spare no effort to free our fellow men, women and children from the abject and dehumanizing conditions of extreme poverty, to which more than a billion of them are currently subjected. We are committed to making the right to development a reality for everyone and to freeing the entire human race from want.” (United Nations, 2000)

Africa, as the least developed continent, stood to be the main focus of this renewed drive for development, and Section VII of the Declaration specifically deals with meeting the special needs of Africa. The Declaration set a number of goals for achieving a world without want, including a significant improvement in the lives of at least 100 million slum dwellers, as well as the provision of clean water and improved sanitation to half of the world’s population who currently live without these services. These goals were echoed by the *Johannesburg Plan of Implementation* adopted at the World Summit on Sustainable Development (WSSD), September 2002, which added adequate shelter to the list. Key to the achievement of both the *Millennium Development Goals* and the *Johannesburg Plan of Implementation* is the provision of infrastructure. The governments of Africa have also recognised this and bridging the infrastructure gap is one of five priority areas of the New Partnership for Africa’s Development (NEPAD, 2001).

This agenda should see billions of dollars flowing into Africa for infrastructure development and general interventions in the built environment. However, as the *Cocoyoc Declaration* (UNEP/UNCTAD, 1974) and numerous subsequent critics have pointed out (e.g. Serageldin, 1992; Sachs, 1995; Ake, 1996; Mkandawire & Soludo, 1999; Harrison and Huntington, 2000; Cheru, 2002; Stiglitz, 2002) fifty years of investment in infrastructure development in Africa has failed to produce the rapid economic growth, democracy and social justice hoped for, and had instead created widespread environmental and social problems. This history begs that development agencies, and all those involved in development, ask one question: *How can a repeat of this failure be prevented and what can be done to ensure that the development that will happen in Africa in the 21st century will be sustainable on all fronts – economic, social and environmental?*

Building and construction is probably the sector that can play the biggest role in determining whether 22nd century Africans will inherit a continent where the miserable living conditions experienced today will be but a bad memory, while still being able to enjoy the awesome natural beauty, abundant resources and biodiversity for which the continent is famous. The building and construction sector, in partnership with its stakeholders, will therefore have to prepare itself for shouldering this responsibility. As suggested by the *Agenda 21 for Sustainable Construction in Developing Countries* (Du Plessis, *et al*, 2002) one of the first steps is to determine a plan for action, a roadmap that will guide the sector onto a path that is not just financially sustainable, and not only focused on sustaining development, but that truly supports the principles of sustainable development.

This suggestion was made with full awareness that the developing world is not a homogenous entity. There are many differences between the regions, and different countries within those regions are experiencing different challenges and are at different stages of development. Having suffered under numerous attempts at homogenisation: first the colonial 'civilisation' project, then 'modernisation' and now 'globalisation', those living in developing countries are all too well aware of the dangers of blindly adopting global solutions. Thus it is accepted that while a common goal – achieving a state of sustainability – is shared, there are different ways of defining and approaching this goal, and that these ways can best be determined at a local level (Du Plessis, *et al*, 2002). It is therefore necessary to cascade the development of such an action plan for sustainable building and construction down to regional and ultimately national levels.

To assist with the development of a regional Plan for Action for Africa, a special discussion session was held during the SB'04 Africa conference (September 2004, Stellenbosch, South Africa). The purpose of this paper is to report the outcomes of that session,

However, it would be useful to briefly describe the context to these discussions as regard the international debate on sustainable building and construction, as well as the state of the built environment, the perceptions of and challenges to sustainable development and sustainable building and construction (SBC), and the current uptake of SBC in Africa.

2. The international debate

Sustainable development, and with it sustainable building and construction, is an evolving concept, and our understanding of the type of responses and choices necessary for sustainable development are continuously evolving as our ability to understand the complex dynamics advance, but also as more and more actors enter the debate. The cognitive framework of what was to become sustainable development was already laid down in the early 1970s by *The Cocoyoc Declaration* (UNEP/UNCTAD, 1974). This seven page document contained the fundamental ideas around which sustainable development would be constructed in the years to come. These are:

- Meeting basic human needs within environmental limits,
- through limiting impact and consumption,
- in a co-operative world of networked settlements,
- in partnership with nature, and
- in solidarity with future generations.

While there is general consensus that sustainable development is about restructuring the relationship between humans and their needs, and the environment within which these needs have to be met, to one that has a net positive impact (with the understanding that this is done for the benefit of both current and future generations), there is considerable divergence in opinion regarding which approaches, priorities and drivers should take precedence (see Marshall and Toffel, 2005 for an extended discussion). At the root of most of these differences of opinion lies the debate about which is most important: the environment or human needs (including such needs as maximising shareholder value and achieving a high standard of living). This dualistic tension can be found in the debates around weak and strong sustainability (Turner and Pearce, 1993), Brown and Green Agendas (McGranahan and Satterthwaite, 2000; IIED, 2001), and Shallow versus Deep Ecology (Naess, 1995).

The question that underlies these debates is: are we saving the planet or are we saving the world, and if we are saving the world, who's version of it are we saving? The geological record tells us that the planet can survive very well without *Homo sapiens* - thus what sustainable development intends is to save the world (the sociosphere and the conditions that sustains it), and it can rightfully be construed as an anthropocentric concept (Worster, 1995). However, as the health of the sociosphere is determined in large by the health of the biosphere, it is in the interest

of humans to protect the biosphere. Until fairly recently the management of the human-biosphere relationship was seen as a matter of determining limits and then living within these limits (e.g. ecological footprints, fair shares, sink and source capacities, Factor 10 efficiency) – in other words, how much damage can we get away with?

More recent thinking is seeing a shift away from the either/or approach to one of development through cooperative regeneration – people working with nature to restore ecosystem health and communities working together to restore the social fabric. McDonough and Braungart (2003) epitomises this thinking when they ask us to imagine “buildings that make oxygen, sequester carbon, fix nitrogen, distil water, provide habitat for thousands of species, accrue solar energy as fuel, build soil, create microclimate, change with the seasons and are beautiful” – just like a tree.

There is also growing understanding that sustainable development (and sustainable building and construction) is a relative concept, with different interpretations and solutions depending on both the natural and the cultural context (Hobart, 1993; Lorch and Cole, 2003; Guy and Moore, 2005). Thus while there are certain universals (e.g. the five aspects of sustainable development outlined by the Cocoyoc Declaration), the achievement of these ideals is determined by local conditions, including local cultural constructs, especially value systems. As an intervention in the sociosphere (changing human behaviour), sustainable development will therefore require more than technological or economic fixes, and there are calls for the use and methods of anthropology and for an integration of sociological and technological approaches (see Hobart, 1993; Curwell, 2003; Rohracher, 2005 for deeper discussion). These debates are mirrored in the debates around sustainable building and construction.

2.1 A global agenda for sustainable construction

While the terms ‘green building’, ‘ecological building’ and ‘sustainable architecture’ have been in use for some time, the first definition of sustainable construction was proposed by Charles Kibert during the First International Conference on Sustainable Construction in Tampa, 1994: “Sustainable construction is the creation and responsible management of a healthy built environment based on resource efficient and ecological principles” (cited in Bourdeau, 1999).

Other definitions include: “Sustainable construction, in its own processes and products during their service life, aims at minimizing the use of energy and emissions

that are harmful for environment and health, and produces relevant information to customers for their decision making” (Huovila and Richter, 1997, cited in Huovila, 1998); or as “ a way of building which aims at reducing (negative) health and environmental impacts caused by the construction process or by buildings or by the built environment” (Lanting, 1998). The European Union defines sustainable construction simply as: “the use and/or promotion of a) environmentally friendly materials, b) energy efficiency in buildings, and c) management of construction and demolition waste” (UNEP, 2003). All these early definitions have an almost exclusive focus on environmental impact.

In an attempt to create a global framework and terminology for sustainable building and construction, the International Council for Research and Innovation in Building and Construction (CIB), in cooperation with the International Union of Testing and research Laboratories for Materials and Structures (RILEM), The Construction Engineering Research Foundation (CERF), the International Energy Agency (IEA) and the International Society for Indoor Air Quality and Climate (ISIAQ) produced the *Agenda 21 on Sustainable Construction* (Bourdeau, 1999). This document highlighted the futility of attempting to achieve a common short definition, or even common strategies, and called for locally appropriate approaches to respond to both global and local challenges and opportunities.

The *Agenda 21 for Sustainable Construction* also pointed to a number of differences between developed market economies, transition economies and developing countries. These differences related to interpretations of terminology, technological needs, market emphasis, identified priorities, and the scale and types of challenges and barriers to be faced. The report also acknowledged that there is some truth to criticism that the international discourse on sustainable building and construction showed “an almost complete absence of the developing world and its problems” (Du Plessis, 1999).

The World Sustainable Building Conference 2000 in Maastricht called further attention to the need to include developing countries in the international debate on an equal basis (instead of as merely the recipients of thinking and knowledge generated in the developed/industrialised/high income countries). The final resolution to the conference recommended that the CIB initiate specific activities to develop sustainable building in developing countries (SB2000, 2001).

As a first step to increasing the voice of developing countries, the CIB, in partnership with UNEP-IETC¹ and the CSIR² in South Africa, developed an *Agenda 21 for Sustainable Construction in Developing Countries* (A21SCDC) (Du Plessis, *et. al.*, 2002). After a process involving 21 people from 13 countries the final document was launched at the World Summit on Sustainable Development (Johannesburg, 2002) and the World Sustainable Building 2002 conference in Oslo.

The process of developing the A21 SCDC brought two largely ignored perspectives to the foreground. The first of these is the idea that sustainable building and construction should be based on the “search for an ecological model that views both realms [the natural and the built environment] as fundamentally interconnected“(Adebayo, 2001). The second, that “in its deeper meaning the sustainability concept has ethical, moral and spiritual connotations implying attitudinal changes and value reorientation” (Shah, 2001) Thus the A21SCDC (Du Plessis, *et al.*, 2002) defined sustainable construction as: “a holistic process aiming to restore and maintain harmony between the natural and the built environments, and create settlements that affirm human dignity and encourage economic equity“. This definition takes sustainability further than a mere reduction of negative impact, (as implied in the earlier definitions) by introducing the idea of restoring the environment. It also brings in the social and economic aspects of sustainability. By calling for economic equity, it foreshadows the World Summit on Sustainable Development’s reformulation of the “People, Planet. Profit” slogan of the triple bottom line, which replaced ‘profit’ with ‘prosperity’ – a much wider concept. More telling, perhaps, about the differences in worldview between the developing and developed countries, is the notion that the most important social consideration for sustainability is human dignity. Dignity and respect should provide the context within which ‘human needs’, ‘human development’ or ‘human well-being’ should be addressed.

The A21SCDC outlined a generic framework for a R&D Agenda and Strategy for Action for introducing sustainable building and construction in the developing countries. This framework was based on the idea that three sets of interdependent enablers are required for sustainable construction. The goals of sustainable development cannot be met without the use of science and technology that supports the principles of sustainability – these are the **technological enablers**. However, for

¹ United Nations Environment Programme – International Environmental Technology Centre

² Council For Scientific and Industrial Research – specifically the Division of Building and Construction Technology

technology enablers to be successful, supporting processes for stimulating technology development, technology transfer and management are required, as well as access to those technologies. This requires the presence of functioning **institutional enablers** such as supporting institutional structures (e.g. universities, professional councils and government departments), policy and strategies, educational programmes, financial mechanisms and regulations and legislation. Furthermore, specific **value system enablers**, such as shared codes of conduct and new ways of measuring value and reward are necessary to bring about the successful uptake of technologies and behaviours that are conducive to sustainable development. These value systems are also inextricably linked to local cultural ideas of ethics and morality. Therefore the A21SCDC concluded that this framework needs to be fleshed out at a regional level through the development of regional Agendas or Plans for Action that respond to the specific needs and priorities in each region, and that this process should eventually be cascaded down to a national level. .

While the A21SCDC provided a basis for further dialogue, it only partially addresses the problem of meaningful developing country participation in the international discourse. At the 2002 World Conference on Sustainable Building in Oslo it was decided that a series of five regional conferences will be held in Africa, Latin America and the Caribbean, South East Asia, China, and Central / Eastern Europe in 2004. This would allow the development of detailed action plans to advance sustainable building agendas in these regions, build regional networks and encourage the sharing of locally relevant knowledge and experience. The regional Action Plans will be presented at the 2005 World Sustainable Building Conference in Tokyo, in order to place developing country needs and priorities on the agenda. This paper reports the recommendations made at the regional SB'04 Africa conference regarding the way forward for sustainable building and construction in Africa.

3. Contextual background to SBC in Africa

3.1 The state of the built environment in Africa

Africa's built environment ranges from sophisticated modern cities to isolated traditional villages in deep rural areas. The continent faces a number of challenges regarding the provision of adequate housing, infrastructure delivery and dealing with rapid urbanisation. In many countries a large percentage of the population, including

those in urban areas, live in either traditional dwellings built with adobe or wattle and daub, or in shacks constructed of a range of marginal and/ or discarded materials.

The full extent of the problem is difficult to gauge, as reliable statistics about Africa is very difficult to source and usually outdated. The last available data (1993) shows that in Sub-Saharan Africa, 61.4% of households lived in permanent dwellings. However, only 48.6% of households lived in housing that complies with local regulations (UN-Habitat, 2003). In Namibia, for instance, about 50% of the population live in “traditional” homes, 14 % in “other” or improvised dwellings and only 37 % in conventional brick & mortar dwellings (Mendelsohn, et al, 2002). Even in South Africa, which is considered to be the most developed country in the region, only 63.8% of the population (or 6.2 million households) live in formal dwellings (Statistics South Africa, 2003). Of these, 1.6 million households live in government-provided subsidy housing (*ibid*) of a very basic nature and debateable quality.

The picture is not much better for infrastructure. In Sub-Saharan Africa only 12.9% of roads are paved, 58.1% of the population has access to an improved water source, and 27 out of every 1 000 people have access to a telephone (DBSA, 2003) Capital expenditure (2000 data) by governments in Sub-Saharan Africa ranges from 4% (South Africa) to 45% (Uganda) of total expenditure (*ibid*). However, when the same bundle of countries (based on data available for both years) are compared with expenditure from 1990, a decline in expenditure is visible from an average of 23% in 1990 to 18% in 2000, with some countries showing a dramatic decrease in expenditure - Lesotho went from 44.6% to 19.3, Kenya from 19.9 to 7,5, South Africa from 10.4% to 4% (*ibid*). Africa is also receiving the beggar’s share of foreign investment and development aid – in 1995 Africa received only 5% or \$5.7 billion of the total flow of capital to developing countries (*ibid*), and wealthy Africans chose to locate 39% of their wealth outside the continent, as opposed to external investment of 3% in South Asia and 10% in Latin America (Collier and Gunning, 1999).

Indicative statistics such as these speak of Africa’s legacy of underdevelopment and need. Apart from the lack of infrastructure, there is the additional burden of badly deteriorating infrastructure due to lack of maintenance or damage during periods of conflict. It is therefore not surprising that infrastructure delivery plays such a large role in both the priorities of NEPAD (New Partnership for Africa’s Development) and the Johannesburg Plan of Implementation adopted during the World Summit on Sustainable Development in 2002.

3.2 Perceptions and challenges

In a need-driven environment there is real danger that development initiatives will focus on quantitative delivery, without due consideration of sustainability issues. This is of especial concern in a context where there is little knowledge and therefore little understanding of sustainable building and construction (SBC) practices, as is the case in Africa. This lack of knowledge is further compounded by the conflicting interpretations of what constitutes sustainable development.

Globally the proponents of sustainable development can be roughly divided into two streams. Those who see it as a process of ensuring that current modes of development can be sustained (e.g. the UN, most members of the World Business Council for Sustainable Development, almost all governments), and those who see it as a new model of development based on a fundamental shift in human consciousness (e.g. Schumacher, 1974; Bossel, 1998; Naess, 1995; Sachs, 1995; Capra, 1996 and 2002; Kumar, 2002; AtKisson, 1999 and 2001). Between these two poles is a grey area, exemplified by the work of Hawken, *et al* (1999), Elkington (1998) and others, who suggests a subtle gear shift that results in broad improvements to current development models, (e.g. the concepts of natural capital; Factor 10 efficiency, the triple bottom line, etc.), without questioning too deeply the fundamentals of the current development paradigm.

In this first decade of the 21st century, it is the aspiration of achieving “sustained development” that is enjoying prominence, as evidenced by the UN Millennium Development Goals, the WSSD Johannesburg Plan of Implementation, and, in Africa, the New Partnership for Africa’s Development. The emphasis of these strategies is on development and economic growth: ensuring that the developed countries can maintain their current lifestyle and that developing countries are placed “on a path of sustainable growth and development” (paragraph 67, NEPAD, 2001) that will place them on par with the developed world.

Thus in Africa, “sustainable development” is often equated with “sustained development” and most responses are geared towards putting systems and support structures in place to support development based on models followed in the industrialised countries. The recent SB’04 Africa conference, as well as the CIB W107 1st International Conference on Creating a Sustainable Construction Industry in developing countries (November 2002, Stellenbosch) highlighted the limited

understanding, and therefore application, of SBC on the African continent. While a number of researchers have written about SBC in Africa, the focus is mainly on the challenges facing African construction industries (Ebohon, 2002; Ofori, 2000; Smallwood, 2002; Watuka and Aligula, 2002), especially the ability of the industry to sustain itself.

Dlungwana and Rwelamila (2004) points out that many contractors and other participants in the economy consider the creation of economic value (e.g. company profits) above environmental aspects (e.g. depletion of the ozone layer and forests) and social issues (e.g. the well-being of workers). However, there are additional challenges that add to the slow uptake of SBC. Two such challenges identified by Dlungwana and Rwelamila (2004) are:

- *“A lack of comprehensive models, programmes and tools to assist in contractor development in terms of, inter alia, assessment, training and mentoring. Where they exist, the programmes are often haphazard and unstructured, hampering the contractors’ development effort instead of helping it”*
- *Lack of a balance between sustainable building trade-offs, for example the creation of jobs using local labour, has an impact on the quality of construction products due to high labour turnover. Quality can also vary due to the difference in the work ethic and skills levels in different geographical locations. ”*

Given such a limited understanding of sustainable development and SBC, it is difficult to get an accurate picture of the current uptake of sustainable building and construction.

3.3 Uptake of SBC in Africa

As part of the SB’04 Africa conference, a regional Best Practice Awards competition was initiated in partnership with the African Union of Architects and the South African Institute of Architects. Built environment practitioners from across the continent were invited to submit projects to an assessment process based on the Sustainable Building Assessment System (SBAT) developed by the CSIR (see Gibberd, 2002) specifically for use in the African context. Submission could be done electronically and was open to not only architects, but also to NGO’s and communities. A total of nine projects were submitted of which six were deemed to fulfil the basic

requirements of a sustainable building according to the SBAT model. While no entries were received from outside South Africa, two other projects (from Namibia and Botswana) were presented during the conference, but were not entered for the awards.

Though disappointing, the lack of projects should not be seen as a true reflection of the state of SBC in Africa. A number of projects were not entered because the architects “did not have time” or “found the assessment system too complex”. Others had technical problems such as non-compatible computer software, or did not have access to an internet connection with sufficient bandwidth to do the electronic submission. The language barrier between Anglophone and Francophone countries also excluded all those who could not complete the English forms³. Furthermore, the bulk of SBC in Africa happens in donor-funded, NGO driven low cost housing projects, and while these projects were not excluded (and some did enter) their project teams may not have been in the communication loop through which the Awards were promoted. A later drive by the Holcim Foundation, which included the lure of substantial prize money and visits by the Foundation to different African countries to solicit entries, resulted in just over 70 entries from across Africa (Schoeman, 2005).

The seemingly low levels of uptake of SBC, and the confusion about what sustainable development means, is cause for concern given the amount of built environment development that can reasonably be expected to happen in Africa over the next few decades. As Spencer Hodgson, CEO of the South African Construction Industry Development Board stated in his keynote address at the SB'04 Africa conference, a multi-faceted approach is needed to promote sustainable building for Africa. One of the key objectives of the SB'04 Africa conference was to identify and prioritise the elements of such an approach.

³ While the conference itself was simultaneously translated, there was no additional funding available to translate the SBAT spreadsheets.

4. Sustainable Building: Action for Africa

During the SB'04 Africa conference a day and a half discussion session was held to identify the key priorities for action in Africa. This section of the paper describes the outcomes of this session.

It should be stated clearly that this discussion session was not intended as a replicable scientific study, nor was it meant to engage with the theoretical debate. The theoretical framework suggested in the A21SCDC was accepted as the point of departure, and the discussions focussed on defining a practical way forward. It was also not intended as a 'mandated' political process with participants being elected stakeholder representatives. Instead, it was a voluntary process that provided ordinary practitioners with the opportunity to identify the barriers they are experiencing and suggest a way forward that would assist them in mainstreaming sustainable building and construction.

All attempts have been made to make the sessions as representative as possible of the different African countries. The SB'04 Africa conference was attended by 134 delegates representing 21 African countries. Fifty four of these delegates, representing 9 African countries chose to participate in the discussion session.

While the practicality of an African Plan for Action may be questioned, given that Africa itself can be divided into six different sub-regions, and has vastly different cultures, levels of development and climatic conditions, there are two main reasons for focusing on a common action plan for the continent. The first is the existence of the African Union and the New Partnership for Africa's Development (NEPAD), which provides a common development framework for the continent, in much the same way that the activities of the European Union do for Europe. In fact, NEPAD is seen as the main *'instrument for advancing people-centred sustainable development'* (Dlamini-Zuma, 2005). A common action plan stands a better chance of influencing the NEPAD agenda. Secondly, despite their differences, African countries have a number of critical issues in common, including a scarcity of resources for knowledge generation and sharing. An agenda that focuses on the commonalities would enable the sharing, and therefore optimisation of resources.

4.1 Methodology

Open Space Technology™ was used to facilitate the session. This methodology was chosen because it was specifically designed to surface and prioritise key issues in complex environments in a participatory, democratic manner. Each participant at the discussion session was invited to identify any issue or opportunity they felt was important around the theme “Africa: Action for Sustainability”. These topics were discussed in small, self-selected groups and the discussions were documented. Participants then had the opportunity to vote for four topics to take to further discussions. These four topics were discussed in detail the next day, again by groups who self-selected a particular topic. The groups were then given an opportunity to rotate between the topics, adding to the notes, and the initial group consolidated the thinking. This process served to identify the priority areas for action and go deeper into the specific actions required. The notes from these further discussion sessions are being used as the basis from which to formulate a draft action plan. This Draft Action Plan will be circulated to participants and posted on the Web for comments before a final version is presented at the International SB05 Tokyo conference (September 2005) and distributed to stakeholders both in the region and internationally. The elements discussed below are based on the author’s analysis of the notes from the discussion sessions, and do not constitute the Draft Action Plan.

4.2 First steps to action

While it is recognised that there are enormous differences between the different African countries, there are also a number of common problems. The discussion session identified a two-fold strategy, based on these common problems as basis of the Action Plan. The first part of the strategy was the establishment of a Knowledge Foundation for SBC; the second part was the establishment of a champion agency that would drive the process.

4.2.1 The Knowledge Foundation

A knowledge foundation consists of five basic elements that feed into each other. The starting point is the gathering and creation of knowledge. However, for knowledge to be of value requires that it be shared amongst peers and transferred to others through education and wider dissemination. This enables implementers to access relevant knowledge and apply it in project design. Projects should be monitored and evaluated and the results fed back into the process of gathering and

creating new knowledge (Du Plessis and Havemann, 2004). Participants at the discussion session identified a number of components required of a knowledge foundation for SBC in Africa, Fig. 1 maps the identified components (discussed below) against the elements of a knowledge foundation.

<FIG. 1>

a) A research collaboration and exchange programme

Due to a number of factors, Africa's research capacity has fallen behind that of other regions and many of its brightest scientists are working outside the continent due to lack of funding and facilities. In order to strengthen the African S&T base and generate knowledge that is not only relevant to Africa but also to local intellectual property, it is suggested that a programme be established that encourages and enables research collaboration between researchers working within Africa and between African research institutes and researchers from countries dealing with similar problems in both the developed and developing regions of the world.

b) An information portal

There is a critical need for a regularly maintained, easily accessible source of information that can be used by practitioners, educators and other interested parties such as clients, local government and funding agencies. The proposed information portal would provide, *inter alia*;

- access to tools, guidelines and Best Practice examples relevant to Africa;
- a regional database of accredited 'green building' practitioners;
- information about funding opportunities and programmes;
- news about training courses, events and new publications;
- a network of related information sources within other developing countries and countries with similar climatic conditions.

c) Education and training programme

A three-pronged education and training programme is required. The first leg would be to introduce sustainable building and construction as an integral part of built environment courses taught at tertiary institutions through the development of new curricula monitored by professional bodies responsible for international accreditation such as the International Union of Architects. The second would be the development of continued professional development courses that would provide a credible accreditation system for "green" building professionals. The third is a basic education

programme for other stakeholders such as local government and suppliers. Du Plessis and Havemann (2004) provide a more detailed framework for such an education and training programme.

d) Outreach and awareness raising programmes

To promote sustainable building and construction with the general public that eventually constitutes the client base a number of public awareness campaigns or outreach programmes were suggested. These ranged from programmes in schools and the media (e.g. magazine articles or television programmes) to low-level activism like the preparation of “pester questionnaires” with which to interrogate material suppliers and even developers, placing pressure on them to improve their offerings.

e) Building support centres

Building support centres would provide the public with technical assistance in retrofitting existing and building new buildings to improve their sustainability. This was seen as a particularly valuable tool in Africa where the majority of houses are owner-built. Such building support centres would also act as training centres and can be linked to existing NGO activities, or run as part of a community service programme for built environment graduates and the tertiary training institutions.

f) Assessment, rating and labelling systems

To facilitate the application of knowledge developed, as well as the monitoring and evaluation of SBC assessment, rating and labelling systems specific to Africa is required. Although the CSIR has developed an assessment system (see Gibberd, 2002) suitable for use in Africa, it relies on the further development of indicators specific to the challenges experienced on the continent. There is also currently no system for rating and labelling building components and materials except that developed in the industrialised countries. In most cases the development of these tools does not require new frameworks, but rather detailed research to determine specific values related to manufacturing processes and the performance of materials and components in the various climatic conditions of the continent.

g) Best Practice recognition scheme

The final element to be developed is a Best Practice recognition scheme to capture and share knowledge between practitioners, evaluate the impact of the Knowledge Foundation and generate new knowledge.

4.2.2 A Sustainable Building and Construction Champion

Establishing a knowledge foundation for SBC in Africa is going to require a coordinated approach with dedicated human and financial resources. To drive this process it was suggested that a SBC 'champion' body be created to take the A21SCDC forward in Africa. In the medium to long term, this champion would be tasked with ensuring that sustainable building and construction is taken up and pursued in not only the development of research agendas, but also in strategic planning, policy formulation and other decision-making fora. In the short term, the champion will be required to establish a network of stakeholders and partnerships with a view to furthering the development of a sustainable built environment. In doing so, the champion would be required to lay the foundations for knowledge development as a first priority.

While the structure of such a body is not yet clear, it could be coordinated by knowledge organisations like the Development Bank of Southern Africa or the CSIR in South Africa, or it could be a network of regional champions such as DBSA, CSIR, RIDA in Rwanda, etc., and the regional professional associations. The main functions of such a body could be to:

- manage the Information Portal;
- solicit funding for and coordinate the knowledge foundation programme of work outlined above;
- build regional and international partnerships;
- prepare reviews of the state of SBC in the different sub-regions and sectors;
- identify priority areas for intervention;
- monitor and develop if necessary, the various assessment, rating and labelling schemes, as well as the content of new curricula; and
- manage the Best Practice programme and database.

For such a body to be effective, it will have to be recognised by the African Union and work closely with the relevant NEPAD structures, especially science and technology, energy, and infrastructure development.

5. Conclusion

Introducing sustainable building and construction practices into the construction sector in Africa will require an approach that take into account regional needs and priorities, and that draws on local initiatives. This paper sketched the components of

an Action Plan for mainstreaming sustainable building and construction in Africa, as surfaced during a workshop at the SB'04 Africa Conference, South Africa. The crux of the plan is the establishment of a solid knowledge foundation for Africa that will equip the public, professionals, development agencies and governments with accurate and relevant knowledge, generated within the framework of the continent's social needs, its cultures and its biophysical environment, to guide their decisions and actions towards establishing a sustainable built environment.

Given the many obstacles facing the implementation of the proposals outlined in this document, a strong and dedicated champion will be required that can elicit the following pledges from all stakeholders: commitment, encouragement and assistance.

- **Commitment** to adopt sustainable development as the underlying foundation of their work;
- **Encouragement** through the acknowledgement and sharing of innovation and good and best practice; and
- **Assistance** in creating an enabling environment through a frank and open sharing of knowledge, regulatory and financial support and cooperation in training and knowledge generation.

Improving the quality of life in Africa in a manner that supports true sustainable development is going to require not only huge investments, but also a sound knowledge base from which to work. Uganda's President Yoweri Museveni (2004) recognised this when he said that one of the most important factors to be addressed is to build up the human resources of the continent, and especially the science and technology base. And he is prepared to make some sacrifices to do this:

"I intend to cause a revolution by generously supporting scientists. Scientists must be paid well to remain at home...It does not matter if the president does not have the highest salary. Let the scientists earn the most even if I, as president receive much less".

That is the kind of commitment that is required if Africa is going to harness its huge resources to lift itself out of poverty and underdevelopment. The biggest challenge is to make sure that decision makers such as Museveni and all the layers filtering down to the ground, have the knowledge that will ensure the continent embarks on a path of sustainable, not just sustained development and that is the aim of the proposed action plan for SBC in Africa.

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Fig. 1 Elements of a Knowledge Foundation

