Introduction

In 1999 the International Council for Research and Innovation (CIB) published its Agenda 21 on Sustainable Construction (CIB Report Publication 237). This report gave a detailed overview of the concepts, issues and challenges of sustainable development and sustainable construction, and posed certain challenges to the construction industry.

As the majority of the contributors were from the developed countries, the CIB Agenda 21 suffers from an understandable bias towards the issues, challenges and solutions of the developed world, and this is emphasised in the report. However, creating a sustainable built environment in the developing world requires a different approach to that taken by the developed world and this is not often clearly understood and discussed. Not only are the priorities, capacity and skills levels often radically different, there are also certain cultural and worldview differences between the developed and developing world countries that impact on the understanding and implementation of sustainable development and construction.

Therefore, a special Agenda 21 for Sustainable Construction in Developing Countries was commissioned as part of the Action Plan for the implementation of the CIB Agenda 21 on Sustainable Construction and to further the CIB’s pro-active approach on sustainable construction. Although the process is driven by the CIB, it is not a CIB exclusive project and is involving many other networks on sustainable human settlement development and developing countries.
The project is lead by Chrisna du Plessis of CSIR Building and Construction Technology.

Objectives

- To identify the key issues and challenges facing sustainable construction in the developing world, as well as the major barriers to practising sustainable construction.
- To identify a research agenda that focuses on possible responses to the challenges and needs of the developing world.
- To guide international investment in research and development in the developing countries.
- To stimulate debate and encourage the exchange of learning on sustainable construction within the developing world, thus drawing the developing world into the international debate as an equal partner.

Method

Phase 1
Nine expert position papers were commissioned, three each from Africa, Asia and Latin America. These papers were to give comment on the following:
- The different regional understandings of sustainable construction.
- The issues and challenges facing the regions.
- The impact of the construction industry on the economy, the environment and society in the regions.
- The barriers to sustainable construction.
- The strengths and opportunities presented by the cultures and traditional practices of the regions.
- Suggested actions for the research community, governments and the construction industry.

The experts involved in preparing these papers were:

- **Africa**
  - Prof. Ambrose Adebayo who is based at the University of Natal and currently Chair of Education for the International Union of Architects; Dr. Daniel Iruhra from the University of the Witwatersrand; Dr. Obas John Ebohon, Director of the Developing World Built Environment Research Unit at De Montfort University (UK); and Prof. P. D. Rwelamila from the Graduate School of Business Leadership at the University of South Africa. Although mainly based in South Africa, they also represent Nigeria, Kenya and Tanzania.

- **Asia**
  - Prof Anil Laul, director of the Anangpur Building Centre, India; Kirtee Shah, President of Habitat International Coalition; Dr. Ahmad Sanusi Hassan from the University of Malaysia.

- **Latin America**
  - Arch. Liliana Miranda and Arch. Liliana Marulanda from non-governmental organisation *Ecociudad* in Peru; Prof. Vanderley M. John and Prof. Vahan Agopyan from the University of Sao Paulo, in association with Prof. Christer Sjöström from University of Gävle, Sweden; and practising architect Mauricio Pinto de Arruda from Brazil.

Together they represent academia, NGOs and practising professionals, as well as the disciplines of architecture, civil engineering and construction economics.

From these papers a first discussion document was prepared to act as a common starting point for further debate.

Phase 2
Over the next six months, the discussion document will be used as the basis for a consultation process aimed at defining the Agenda 21 for Sustainable Construction in Developing Countries. This process will use both workshops and the Internet to enable discussion and identify the key priorities for action regarding the creation of sustainable built environments in developing countries, as well as concrete suggestions for the way forward. The document will be circulated to the CIB membership and to international and regional sustainable development networks. All interested parties are invited to comment, submit further contributions and fill the gaps.

Phase 3
Based on the results of the consultation process, a draft Agenda will be prepared and submitted for final comment to the regional expert working group, to members of CIB commissions with a direct interest in developing country issues, and other interested parties. The final Agenda will then be readied for publication and launched at the Earth Summit 2002 in Johannesburg.

The first discussion document

The contents of this document represent a synthesis of the nine regional position papers. Its purpose is to set the scene for discussions regarding the scope and contents of the final Agenda. To this end certain common issues, barriers, challenges and opportunities have been identified that the Agenda will have to address. The document also begins to suggest necessary actions by the various role players in the creation of the built environment. It is hoped that through the workshops and Internet discussions, concrete suggestions for action regarding each of these issues can be identified and prioritised.
The issues identified

Neeing a new model of development
We are beginning to realise the price we have to pay for the kind of development the world has pursued for the past few centuries. The environment is rapidly deteriorating, social structures have been destroyed and the gap between rich and poor is bigger than ever before. In response, the developing countries are beginning to ask if Western-style development is the best route to take and if catching up with the West really represent development. One thought that came out clearly is that economic growth by itself is not development, nor are higher standards of living as measured by the ability to consume. What is needed is a new development paradigm based on moderate demands on the earth’s resources and their more equitable redistribution. This would mean moving to a simpler lifestyle, evolving development strategies and processes that express local conditions, aspirations and control over resources, according women their rightful place in society, and considering religious and spiritual ethics and values when formulating the new paradigm.

Urbanisation and rural development
There are several interlinked issues under this heading. The first is that we are not paying enough attention to the linkages between urban development and investment strategies and the impact this has on rural areas, as well as the possible synergies that can be developed through, for instance, transportation links and tourism. The second is that we need to reassess our ways of assigning value and ownership to land. The third issue concerns the practicalities of making sure that new buildings and other construction projects in the formal sector create sustainable built environments, and that existing buildings and other urban elements are used in ways that contribute to sustainability. There is an overall request that we need to rethink city patterns to support the new model of development and suggestions are made that models for new patterns can be found in the traditions of the developing world and its use of villages as the basic building blocks of human settlement.

Sustainability in housing
The integrated concept of housing as part of the urban fabric is not often contemplated by the construction industry, yet it is one of the most pressing problems of the developing world. The housing problem concerns both formal and informal housing provision, as well as the policies that regulate housing provision. The informal sector is the biggest producer of housing stock in most developing countries and it is imperative that ways be found of harnessing the sustainability benefits offered by this sector.

It is rarely recognised that the shack, and informal settlements, represents a level of sustainable construction that many formal buildings and housing development projects will never be able to achieve. And while it does present some of the problems of inadequate shelter such as overcrowding, bad indoor air quality, inadequate services and insecure land tenure, the formal low cost housing developments does not necessarily improve on these problems.

Several problems around rural housing were also identified. These centre on the effects of Western-style development models and attitudes to traditional materials and construction technologies, as well as the unavailability of financial and professional support.

Housing policies that focus on quantity, instead of quality, and that ignore the most basic sustainability guidelines, as well as the fact that many developing countries have no housing policy to speak of are also issues that need to be addressed.

Education
Ignorance and a lack of information on sustainable construction issues and solutions is a major obstacle that needs to be overcome. To bridge this gap will require interventions at all three levels of education, continued education programmes for professionals and technicians, education and awareness raising programmes for government officials and politicians, and a concerted public education programme. It is also necessary to create better mechanisms to allow transference of knowledge from research institutions to the market.

Innovation in building materials and methods
Sustainable construction can make a huge difference to global environmental sustainability, particularly through a drastic reduction in the use of natural resource consumption and energy intensive materials like cement, steel, aggregates and aluminium. Availability of conventional construction materials will fall considerably short of their demand despite improved productivity and it is necessary to develop alternatives for them. One area that is receiving much interest is the use of agricultural waste products and other biological materials as building products. The other is innovative re-use and recycling. To support local economic development studies on how to marry traditional materials and construction methods with modern processes and technology in micro-production facilities are also needed. Above all the development of new materials and technologies need to take into account that the majority of the population is poor with very limited investment capacity and that technologies and materials that represent increased costs will not easily be adopted.

Modernising the traditional
Traditional communities have practical experience of the fact that humans are dependent on the earth’s life
support system, and have developed construction practices that make use of the natural materials from their immediate environment, re-using what they can and leaving demolition waste to biodegrade. Whether these practices are still viable in the current urban context is uncertain, but it is necessary to learn the lessons offered by these technologies and adapt them to modern times. However, these traditions not only provide us with examples of more sustainable construction patterns, but also with examples of processes for social sustainability and cosmological models that encourage more sustainable settlement patterns that can be used to inform modern solutions. It is suggested that the built environments created for cultural tourism are providing good examples of how the traditional can be modernised.

Gender equity
In many of the developing countries, women are still considered second-class citizens. It is important that the role of women as legitimate owners, users and producers of the built environment is recognised. Among informal sector workers, women doing construction work are some of the worst victims of discrimination and special efforts need to be made to improve their skills levels and earning capacity, as well as to make the construction site more female-friendly.

Financing and procurement
There is a need to develop financing and procurement systems and regulations that will provide a level playing field for small, local contractors in tendering for government projects; that enable and encourage eco-friendly building practices; and that assist poor home builders and those in the informal sector to access financing for housing and house improvements.

Governance and management
It is necessary to radically improve the capacity of government at all levels to play an active role in sustainable construction. This would mean improving the understanding of strategic decision-makers, training local government officials and finding financial resources to support them, and developing government procurement policies and legislation that encourage sustainable construction. The capacity of the construction industry itself to deal with sustainable construction also needs to be improved.

In conclusion
The document further identified barriers to sustainable construction such as the lack of capacity of the construction sector, an uncertain economic environment, lack of accurate data, poverty and low urban investment, lack of interest of stakeholders in the issue of sustainability, technological inertia and dependency, lack of integrated research and entrenched colonial codes and standards. A range of actions is suggested for the research community, government, local government, the construction industry, non-governmental organisations and the public. All these issues and suggestions for action is hereby placed on the table for consideration and further discussion. Being drawn from nine papers only, the document can be seen neither as conclusive, nor fully representative of the complexities found in the developing world. It is hoped that the consultation process will identify further issues and suggestions for action that will lead to a final ‘blueprint for action’.

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