

# W107 - Construction in Developing Countries

Research Roadmap  
Report for Consultation



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Authors: P D Rwelamila & S Ogunlana

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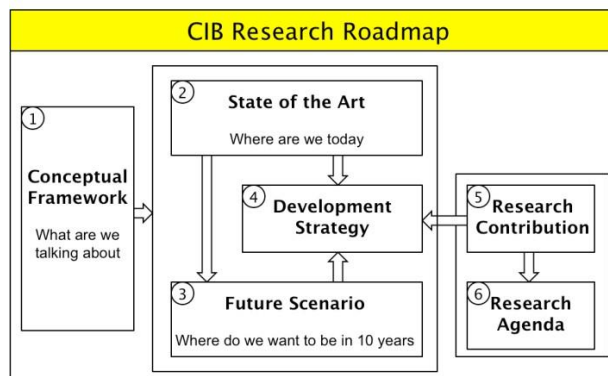
# CIB W107 CONSTRUCTION IN DEVELOPING COUNTRIES RESEARCH ROADMAP

## REPORT FOR CONSULTATION

MAIN AUTHORS OF THE RESEARCH ROADMAP REPORT AND  
EDITORS OF THE REPORT FOR CONSULTATION:

**Professor P D Rwelamila**  
(University of South Africa,  
South Africa)

**Professor Stephen Ogunlana**  
(Heriot-Watt University, UK)



# Construction in Developing Countries

## CIB W107 Report for Consultation

### SUMMARY

This research road map for construction in developing countries, clearly outlines the conceptual framework of the domain along with a review of the historical challenges which have been facing the built environment in developing countries and vision for the future, both for construction industries and the research community. This leads to a review of the research contributions overtime and a development strategy and research agenda for 2020.

### CONCEPTUAL FRAMEWORK

#### CONSTRUCTION IN DEVELOPING COUNTRIES - CONTEXT

The construction industries of developing countries have been studied since the 1950s. Ofori (2001) presents a history of such studies, noting that the first of these took place in the early 1960s; the United Nations' Expert on Housing suggested a programme for developing the construction industry (Department of Economic and Social Affairs, 1962). Similarly, the Economic Commission for Africa (1965) recognised that the construction industry must be strengthened in order to meet the huge volumes of housing needs in Africa. In the late 1960s and 1970s, researchers on construction industry in developing countries sought to enhance the capacity and capability of the industries to facilitate socio-economic development (Ofori, 1993a). For example, Turin (1969, 1973) hypothesised the role of construction in national development by examining the relationships between value added in construction and GDP; between capital formation in construction and gross domestic capital formation; and between employment in construction and the total workforce. Turin then suggested a strategy for improving the construction industry. Other researchers have tried to build upon Turin's foundations, and several of them have tested and largely confirmed the relationships between construction and the economy which he first highlighted (a review in Ofori, 1993a, 1993b).

Efforts have been made to improve the performance of the construction industries in many developing countries (Ofori, 1993b). These have taken many forms but studies show that the industries continue to face problems including poor cost, time and quality performance; lack of work opportunities; poor level of professionalism and entrepreneurship; obsolescence of some statutes and codes; ineffectiveness of implementation of existing statutes and codes; and bureaucracy in formal procedures relating to project planning and administration. In terms of performance, the industries in developing countries fall short when compared with other sectors of the economy, as well as with their counterparts elsewhere with regard to productivity, quality, safety and health, and environmental performance. Most of these shortcomings were noted in Tanzania's Construction Industry Policy (Ministry of Works, 1997). Whereas construction industries in all countries face problems and challenges (Ofori, 2001), those in the developing nations face the additional general difficulties of economic stress, resource shortages, and institutional and legal weaknesses. These make the task of improving their performance even more demanding.

Clients, governments and the community are dissatisfied with the performance of the industries, and the procedures and practices they adopted (Ofori, 1991). Opening the Task Group 29 (TG29) conference in Gaborone, Botswana in 2000, the country's Minister of Finance highlighted the government's assistance programmes for local construction firms, including a funding scheme, a training programme and a contract reservation policy; and then expressed the public client's dissatisfaction with the performance of local contractors. The performance of the industry in Malaysia has come under public scrutiny following failures on several large construction projects, including cracks in columns supporting a highway flyover, leading to road closures and heavy traffic disruption; a hospital which had to be closed a few months after its opening, because defects in the air-conditioning system led to a serious fungal outbreak; and a major public office building which is 7 years behind schedule (The Straits Times, 2004; Ahmad, 2004).

## DEVELOPING COUNTRIES - CONTEMPORARY ISSUES

### Introduction

The genesis of this Working Commission can be traced back to Arusha in Tanzania at the first meeting of Task CIB Group 29 (which later became CIB W107), where it was agreed that the fundamental objective of the ultimate CIB Working Commission (now CIB W107) should be to promote *construction industry development in developing countries*. The deliberate decision to focus on construction industry development was in agreement with the challenges which were facing construction industries (CI) within developing countries then and occupying the minds of researchers and policy makers.

The works of Gale and Fellows (1990); Ofori (1990), just to mention a few, bear testimony to the challenges which were and still facing the CI in developing countries, acknowledged as infinitely more fundamental, more serious and more complex, and their solution much more pressing than those confronting the industrialized countries.

As a starting point, the Arusha Task Group 29 conference agreed that construction industry development should promote: increased value for money to industry clients as well as environmental responsibility in the delivery process; and the viability and competitiveness of domestic construction enterprises. It was important then that the conference decided to define construction industry development in order to chart the way for this Working Commission. The Task Group defined *construction industry development* as a foundation of this Working Commission as:

*“.....a deliberate process to improve the capacity and effectiveness of the construction industry in order to meet the demand for building and civil engineering products, and to support sustained national economic and social development objectives.”*

Deliberately the above definition was informed by the origin and impetus of the nature of construction industry development from the *first research leaf* as reported by Ofori (1993c), including works by Department of Economic and Social Affairs (1962); Abrams (1964); UNCHS (1990a) on the need to address the appalling housing conditions in many countries; Turin

(1973); Edmonds (1979); World Bank (1984); Ofori (1990) on recognition of the role construction plays in national economies and socio-economic development; Ofori (1990) on concerns about the poor performance of the construction industries compared with their counterparts in the industrialized countries; Ministry of Works (1977); Ofori (1981); World Bank (1984); Kirmani (1988) on the desire of donors to obtain best value for their development assistance; School of Building and Estate Management (1991) on realization that buildings and infrastructure require maintenance during their life-cycle; UNCHS (1984, 1990a) on potential for using construction programmes to alleviate poverty; and UNCHS (1990b) on the role of construction in achieving sustainable development.

The second leaf of the challenges facing developing countries is a synthesis of the nine regional position papers [du Plessis (Ed.) (2001)]. Its purpose is to set the scene for discussions regarding the scope and contents of the salient challenges. 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.

## **What are the Challenges?**

### **The need for a new model of development**

The final document of Agenda 21 (du Plessis 2001) strongly argues for the need for a new model of development across developing countries. It refers to the price which is being paid for the kind of development the world has pursued for the past few centuries. The rapid deterioration of the environment, destruction of social structures and the bigger gap between rich and poor seem to show an ugly face across the world. It notes the developing countries response, where a fundamental question is being asked if Western-style development is the best route to take and if catching up with the West really represent development. One fundamental and sobering belief across countries is that economic growth by itself is not development, nor are higher standards of living as measured by the ability to consume. Agenda 21 argues for the need to search for a new development paradigm based on moderate demands on the earth's resources and their more equitable redistribution. There seems to be consensus, that this would mean moving to a simpler lifestyle, evolving development strategies and processes that express local conditions, aspirations and control over resources. It further advocates for the need to address the embedded gender divide where women are expected to take their rightful place in society, and the need to consider religious and spiritual ethics and values when formulating the new paradigm. Construction industries are expected to practically embrace this new model for development.

### **Linkages between urban and rural development**

The neglect of linkages between urban and rural development has caused a number of challenges across developing countries. Agenda 21 notes several interlinked issues under this challenge. 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 creates sustainable built environments, and that existing buildings and other urban elements are used in ways that contribute to sustainability.

### **The need for sustainable housing**

The integrated concept of housing as part of the urban fabric is not often contemplated construction industries in developing countries, yet it is one of the most pressing problems of the developing world. Agenda 21 strongly suggests that 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, there are strong indications to suggest that 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.

### **Sustainable education**

Ignorance and a lack of information on sustainable construction issues and solutions is a major obstacle that needs to be overcome. Bridging 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.

The developing countries should target their investments in education and training at the best programmes aimed at producing professionals, technicians and skilled tradespersons suited to deliver the best possible projects in the context of each country.

There are visible weaknesses across developing countries with regard to the relationship between the construction industries and the universities. There is lack of research on how this linkage can be strengthened.

### **Sustainable construction through innovative 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 indigenous/traditional 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, though not extensively adopted, is the use of agricultural waste products and other biological materials as building products. The other is innovative re-use and

recycling. 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.

### **Indigenous technologies in the modern era**

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.

### **Bridging the gender divide**

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. Their skill levels and earning capacities are very low, and construction sites are less female-friendly (Ogunlana *et al.* 1993).

### **Appropriate financing and delivery systems**

Across developing countries small local contracts lack capacity financially and skills levels are very low. Sustainable affirmative actions by government through developing financing and procurement systems could make a difference in improving local capacity.

### **Issues of governance and management across the industry**

A significant number of governments in developing countries lack capacity at all levels in order to play an active role in sustainable construction (Toor, Ogunlana & Ofori 2012). Strategic decision-makers seem to have very little understanding of sustainable construction requirements, local government officials are in a more worse situation to embrace sustainable construction initiatives. Furthermore, this situation is negatively affected by lack of financial resources, and appropriate government procurement policies and legislation to provide a conducive environment for sustainable construction.

### **Appropriate procurement systems**

Project delivery in most developing countries is through imported ready-made procurement systems. These procurement systems are significantly misfits to respective countries cultures and business traditions. Most of these imported procurement systems have created a new culture of disputes and claims which have affected the whole fabric of project delivery with negative consequences on project parameters.

### **Project management**

There is sufficient evidence to strongly suggest that most future growth and successes of public and private sector organizations will result from successful development of projects: that generate new and state of the art infrastructure facilities, excellent public domain services to



citizens and sustainable policies which will create a conducive environment for appropriate investments; and new products, services, or procedures respectively (Rwelamila 2012). According to Graham and Englund (2004); Rwelamila (2012), such projects will also be a principal way of creating organizational change; implementing change and growth strategies will usually also be entrusted to project managers. However, they argue, project success is often as much as results of the organizational environment (with public and private sectors) as of the knowledge (author’s emphasis) and skills of the project manager. Current assessments of various projects in developing countries (Rwelamila 2010; Rwelamila 2000; Ssegawa and Ngowi 2009; Rwelamila and Phungula 2009) paint a picture of project failures across public and private sectors. The majority of failed projects depict the following umbrella dimensions:

- *Inefficient projects* – projects failing to meet budget and schedule expectations
- *Weak impact on customers/stakeholders* – projects unable to meet technical specifications, unable to address customer/stakeholders needs, and unable to create projects that satisfy clients/stakeholders needs.
- *Unsuccessful business/or unsuccessful development strategy* – projects not achieving significant commercial success (private sector) or development programmes/projects unable to achieve developmental goals (public sector).
- *Unsustainable potential* – projects unable to contribute towards improving standard of living or provide better infrastructure or help to create a conducive environment for foreign direct investment.

#### Access for Local Firms

Corporate development is a key issue in developing countries, and the availability of suitable work opportunities is important (Ofori 2012). Majority of local construction firms are not enabled to participate in as wide a range of the projects undertaken in their home markets as possible.

## LOOKING AT THE FUTURE SCENARIO

In a critical analysis on differences between developed and developing countries with respect to major driving forces of construction, Ofori (2012) uses Flanagan (2005), CIB (1999), Du Plessis (2001), McGraw Hill Construction (2008), Gunhan and Arditi (2005), Millennium Development Goals Task Force (2010), United Nations (2010), Nam & Tatum (1997), Egan (1999), Ofori (2003) and Kumaraswamy & Shrestha’s (2002) lenses on business drivers of international construction against global drivers (opportunities) to identify issues and their respective themes. In doing so, he creates a basis to identify issues which characterise the ideal environment/future scenario of construction development in developing countries. The issues and what the ideal will be are identified as illustrated in Table 1.

**Table 1 Ideal future scenario on major driving forces of construction in developing countries**

<i>Issue</i>	<i>Expected future scenario</i>
Environmental Issues and climate change	As a major consideration in practice and across all construction industries in developing countries.

Safety and health in the population workforce	<ul style="list-style-type: none"> <li>▪ Low accident frequency and severity rates and fatalities on construction sites.</li> <li>▪ Infant and maternal deaths, HIV/AIDS and malaria contained &amp; no longer major national health problems.</li> </ul>
Population Issues	<ul style="list-style-type: none"> <li>▪ Acceptable population growth levels, contained poverty and unemployment and acceptable pressure levels on infrastructure and social services, especially from rural-urban migration.</li> <li>▪ Manageable gap between construction needs and provision.</li> </ul>
Poverty Alleviation	<ul style="list-style-type: none"> <li>▪ Not a critical issue at broad national level.</li> </ul>
International Construction	<ul style="list-style-type: none"> <li>▪ Firms have high market share at home, on costly and complex projects.</li> <li>▪ Strategy is to expand activities to outside the national border markets with appropriate economic and legal systems.</li> </ul>
Globalization	<ul style="list-style-type: none"> <li>▪ Business opportunities in booming markets outside national borders, for direct investment and technical activities.</li> </ul>
Technology Development and Innovation	<ul style="list-style-type: none"> <li>▪ High level of technology development</li> <li>▪ Transferors of technology</li> <li>▪ Innovation is a business driver for enhancing competitiveness, where it is keenly pursued.</li> <li>▪ There government incentives for technology development.</li> <li>▪ High extent of innovation</li> </ul>
Information & Communications Technology (ICT)	<ul style="list-style-type: none"> <li>▪ Sophisticated hardware and levels of knowledge</li> <li>▪ Advanced development and strategic application</li> </ul>
Quality and Productivity	<ul style="list-style-type: none"> <li>▪ Given due attention (as a norm) – part of industry and project key performance indicators.</li> </ul>
Disaster Prevention and Reconstruction	<ul style="list-style-type: none"> <li>▪ Preparedness as a norm: strong legislation, codes and enforcement leading built items that are able to resist the effect of disasters.</li> </ul>

Source: Adopted from Ofori (2012)

## DEVELOPMENT STRATEGY FOR CONSTRUCTION IN DEVELOPING COUNTRIES

Since 1997 when Task Group (TG) 29 was established and when it became a working commission (W107) in 2002, the central has been to help build the body of knowledge on the construction industries in developing countries, and to develop and disseminate the ideas, tools and techniques which can be applied to improve the performance and prospects of these industries. The research agenda of W107 upon its formation comprised:

- poverty alleviation through construction (Dev1);
- sustainable construction in the context of developing countries (Dev2);
- safety and health in construction, including community health, especially the relationship between construction and the propagation of HIV/AIDS (Dev3);
- implications of privatisation on construction enterprises and practitioners in developing countries (Dev4);
- merits of a central agency for managing construction industry development and potential of regional groupings of such national agencies(Dev5);
- implications of globalisation on local construction enterprises in developing countries (Dev6);
- application of information technology (IT) for construction in developing countries(Dev7);
- appropriate construction management and economics techniques for developing countries (Dev8); and
- post-disaster reconstruction(Dev9).

Various initiatives through conferences and Focus Groups in 1998 in Tanzania conference; 1999 in the Uganda conference; 2000 Botswana conference; 2001 South African conference; 2003 Singapore conference; 2004 Thailand Conference; 2008 Trinidad and Tobago conference; 2009 Malaysia conference; 2011 Vietnam conference; 2012 and 2014 Nigerian conference have been undertaken to address the agenda items above. Two major books were edited by Ofori (2012); namely: New perspectives in construction in developing countries and Contemporary issues in construction in developing countries. One permanent feature of implementing the agenda items was the establishment of a research dissemination medium in the form of a Journal – the Journal of Construction in Developing Countries (JCDC) which is currently managed from Universiti Sains Malaysia in Penang. The journal has been one of the central deliverable of CIB 107 and a salient vehicle for disseminating research outputs at present and in the future.

Indirect achievements based on broad agenda issues above are many. Using the World Bank's (2003) regional aggregates as basis of taking stock, the following are notable areas of development:

After identifying countries falling within the developing countries band, the World Bank (2003) slots these countries into regional aggregates. The regional aggregates include:

- Arab States (20 countries – including Saharan African countries) – significant developments in Dev9; Dev8; and Dev7. Algeria, Egypt, Morocco, United Arab Emirates (specifically Dubai); Saudi Arabia, and Qatar have notable developments.

- Asia and Pacific – divided into two areas: (i) East Asia and the Pacific (28 countries) and (ii) South Asia (9 countries) – significant developments in Dev2; Dev5; Dev7; Dev9; and Dev8. Notable countries in this group are Singapore, Malaysia, India and Hong Kong.
- Latin America and the Caribbean (33 countries) – significant developments in Dev3; Dev5; Dev7; Dev9; and Dev8. Brazil, Trinidad and Tobago, and Barbados have shown positive developments than other countries.
- Southern Europe (2 countries) – notable developments in Dev7; Dev9; and Dev8.
- Sub-Saharan Africa (45 countries) – significant developments in Dev1; Dev3; and Dev5. South Africa, Zambia, Malawi, Ghana and Tanzania seem to be front-runners.

The above findings indicate that there is an urgent need to deal with the challenges. The number of countries that have registered significant developments is very small. Most of the developing countries' construction industries have failed to meet the expectations of governments, clients and society as a whole (Ofori 2012). Rightly Ofori (2012) argues for a more comprehensive research programme, which is necessary to facilitate the development of appropriate policies and strategies for improving the performance of the industries. W107 is in a position to lead, and monitor the research agenda. Effective dissemination of the results of the research is also necessary. W107 must find suitable channels of communication with the implementing agencies in the various countries. Again using Ofori's (2012) lenses, it should be acknowledged that the proposals and recommendations from this document to be applied in each country must be country-specific, and take into account of the cultural and resource contexts, as well as the governmental mechanisms and the business networks. However, the countries can learn from each other's experiences. Thus, periodic meetings to share experiences under the aegis of W107 would be useful.

## RESEARCH AGENDA

A closer reflection of W107 activities since its inception, including indirect initiatives which are connected with the described activities above, strongly suggest that ideas are required which will help the construction industry in each developing country to perform to its full potential within the constraints prevailing in its operating environment which, from all indications, are unlikely to be resolved soon (and may get worse). This new W107 Agenda is motivating for a new kind of applied appropriate research as indicated below. These should seek to recognize the circumstances of the developing countries, and to adapt and use the available analytical techniques to help solve the difficulties facing their construction industries.

### **A New Model of Development**

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 creates 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 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. 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.

### **Human Resource Development**

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.

Research on national plan for construction human resource development in each country is required; the strategy. The studies should develop the relevant curricula, based on a review of models and recent developments elsewhere. For example, UK introduced four-year engineering degree programmes a few years ago. Research should also determine how developing countries can institutionalise continuous learning to ensure that practitioners as well as administrators improve and maintain their knowledge; and how firms can adopt a strategic approach to human resource management.

Efforts should be made to further enhance the relationship between the construction industries and the universities which are currently strong. Research on how this linkage can be strengthened should be undertaken.

### **Innovation in Building Materials and Methods**

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/owners 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.

### **Procurement**

Research should be undertaken on a set of criteria for contractor selection including price, which is suitable for the context of each developing country. Given the nature of the culture of most developing countries, where trust and goodwill are valued, partnering appears to have scope in these countries, as business relationships in the construction industries are, as yet, less adversarial than in the industrialised countries.

In order to reflect culture in project procurement and management, there should be research studies on the culture of construction and construction-related firms, projects and workers in each developing country. The findings would: (a) help project managers to integrate the contributions of the participants; (b) reveal incentives and actions which can steer construction

firms to deliver the best possible product; (c) help managers in contracting and consultancy organisations to understand how to communicate with, and motivate, their workers; and (d) provide insights into the most effective way to transfer technology to local construction firms.

### **Project Management**

The industries in developing countries should develop mechanisms to enable them to continually monitor trends in the industrialised countries and to draw lessons from them. Ways of doing this most effectively must be found. These include gatekeeping to identify the new developments, adaptation of the new concepts or procedures to suit the circumstances of the countries, and monitoring of the results of the application of these measures. The way in which projects are managed should also be studied from a fundamental viewpoint in order to find better approaches in the circumstances of the developing countries.

The approach of the evaluation of project feasibility in developing countries should be reconsidered. In these countries, the concept of land value is bound up in the cultures of the different peoples. Thus, the imputation of value should be based on a different set of issues. Moreover, the majority of the populations of these countries earn their living from the land. Developing countries should build up capacity among public administrators in the evaluation and management of construction project implementation, especially that of privatised works. Managerial and technical expertise should also be built up to enable local firms to operate the privatised projects upon their transfer to the government at the end of the concession period.

### **Industry Development**

Local construction firms should be enabled to participate in as wide a range of the projects undertaken in their home markets as possible. Research into the most appropriate approach to the development of this capability in each country is required. Innovative schemes will be necessary, and involving the potential beneficiaries in the design of the programmes would help.

Institution building is also relevant. The best mechanism for administering the development of the construction industry in each country should be found. Developing countries adopt different approaches here. A few of them have agencies dedicated to this task such as the National Construction Council of Tanzania (formed in 1982); Building and Construction Authority, Singapore (set up in 1984); Construction Industry Development Board, Malaysia (established in 1994); and Construction Industry Development Board, South Africa (set up in 2002). Some of these organisations have made progress but the, as yet, small number shows that developing countries are not convinced that they are beneficial. Research should be undertaken on the merits and disadvantages of such central agencies.

The construction industries in the developing countries should form effective professional institutions and trade associations with a progressive agenda. Also worth considering is the formation of umbrella organisations embracing these institutions and associations to play a championing role in the development effort, and to speak with one voice in representing the industry's needs and concerns to the government.

### **Other Topics**

The above is by no means an exhaustive list of topics. Additional issues to be covered could include:

- Project performance parameters and measures of success (at the project level)
- Corruption and project governance
- Information Technology application at the project level

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- Strategic planning for the construction industry
- Performance of existing construction industry development agencies
- Domination of foreign firms in the construction industry and the effect on the national economy.



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E-mail: [secretariat@cibworld.nl](mailto:secretariat@cibworld.nl)

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