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THE CONSTRUCTION INDUSTRY AND THE CHALLENGES OF THE MILLENNIUM DEVELOPMENT GOALS

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Abstract
It has long been recognised that the role of the construction industry in socio-economic development goes beyond its share in national output. A number of studies have focused on the issue of employment creation others have emphasised its multiplier effect on other sectors of the economy. The role of construction infrastructure in the process of development has gained a new stimulus following the United Nations Millennium Declaration at the Millennium Summit in New York in September, 2000. Eight Millennium Development Goals (MDGs), measured through 21 targets, were devised. According to international development agencies, the services provided by infrastructure have a pervasive effect on the economic and social targets related to the MDGs. Using data obtained from World Bank and United Nations publications, and making use of an analysis developed in previous works, this study presents some prospects of the pattern of development of the construction industry in two groups of countries in Sub-Saharan Africa, according to their level of economic development. Some insights for the growth strategies of the construction industry in the groups of countries are also presented.

Keywords: construction industry, economic development, MDGs, Sub-Saharan Africa.

INTRODUCTION

The relationship between a country's stage of development and the level of activity in the construction sector is one, which has received great attention at the macroeconomic level for a number of years. For instance, Turin (1973), World Bank (1984) and Wells (1986) have attempted to model the relationship and found a positive correlation between several measures of construction output and the level of income per capita. These findings have been the subject of much argument due to problems related with the reliability of data, limitations of the coverage and methods of analysis employed.

Existing paradigms on the structural change in the construction industry, as a national economy develops over time tend to be based on cross-sectional data across countries rather than longitudinal studies based on one country's time-series statistics. However, longitudinal studies pertaining to developing countries of Africa have been developed in Lopes and Ruddock (1997) and Lopes *et al.* (2002). Bon (1990) also made use of a longitudinal analysis to present a development pattern for the industry, at a global scale, also based in the stage of economic development of a country's economy. Bon's 1990 study covers the period 1970-1985 and a vast number of countries from all the continents. The arguments were further developed in Bon (1992). An important aspect of the proposition was that, in the early stages of development, the share of construction increases but ultimately declines, in relative terms, in industrially advanced countries - and even at some stage, the decline is not only relative but also in absolute terms i.e. 'volume follows share'.

The positive association between construction (indeed physical infrastructure) and economic growth has been subject of debate for the part of the proponents of endogenous growth theory and international organisations such as the World Bank in the *Structural Adjustment Programme* for Africa. Indeed, in the aftermath of the 1979-980 oil-shock and the international financial crisis that followed in 1981, most of Sub- Saharan African countries experienced until the late 1990s a decreasing growth in per capita income (see Table 1) despite heavy investment in construction and other physical capital over the period 1970-1980. World Bank (1994) posited that rather than the quantity of infrastructure the main concern in developing countries should be the improvement of the quality of infrastructure. It could be argued according to this reasoning that this would be achieved through an adequate maintenance and upgrading of existing infrastructure stocks and by prioritising investments that modernise production and enhance international competitiveness.
The argument above brings about the other side of the construction sector and ancillary industries. Construction projects, particularly public infrastructure projects, require a vast amount of national resources. In less developed countries, quite often, the "real costs" of a major construction work are understated if one looks at the figures presented in the national account tables. Technical assistance (usually paid in foreign currency) and some other unexpected costs can inflate significantly the costs of a construction project. Thus, it could be argued that in the resource-constrained developing countries, part of the scarce resources available devoted to construction investment projects could alternatively be used in other important sectors of the economy (e.g. health, education and agriculture).Thus, African governments and their development partners shifted economic policies away from infrastructure investment to macroeconomic stabilisation accompanied by social intervention.

In the early 2000s, international organisations and development agencies started to become aware of the important role infrastructure would play for attaining all the Millennium Development Goals (MDGs) in Sub-Saharan Africa (Organisation for the African Unity, 2001; Commission for Africa, 2005, cited in World Bank, 2009a). An important question which should be the concern of the construction economics research community and national and international development agencies is how a well functioning construction industry could contribute to a sustainable economic growth and development (Lopes, 2011, forthcoming).

The structure of this paper is as follows: the next section discusses the role of the construction sector in the process of economic growth and development. The third section presents quantitative analyses of the relationship between the measures of construction output and those of the national aggregate in two groups of countries in Sub-Saharan Africa according to their stage of economic development: Low Income Countries (LICs) and Middle Income

Countries (MICs). The statistical sources and data are presented and commented on, and the analysis and discussions of the results are elaborated upon. The fourth section explores the link between construction investment and economic and social targets related to the Millennium Development Goals (MDGs). A concluding remark finalizes the analysis presented in this paper.

THE ROLE OF CONSTRUCTION IN ECONOMIC DEVELOPMENT

The construction industry has historically been linked with the process of industrialisation and urbanisation, particularly since the advent of the Industrial Revolution. Railways systems and canals played an important role in the connection of different regions of Europe, North America and in some parts of Latin America (Rostow, 1963). Transport infrastructures facilitated trade and co-operation between countries and also the diffusion of technical innovations from the most advanced to the less advanced areas of the globe. The construction industry played a key role in the reconstruction of the war-ravaged Europe. The heavy programme of construction improvement of housing and social infrastructure, beside its contribution to the national output, was also a reflex of a better re-distributive economic policy in Europe post World War II. The importance of the construction industry has also been recognized in the context of countries affected by natural hazards (Ruddock *et al*, 2010; Amaratunga and Haigh, 2010). Besides its multiplier effect on other sectors of the economy, a well-devised reconstruction programme of building and community service infrastructure can contribute to sustainable development and protect the natural and built environments.

With regard to the relationship between construction and economic development, Turin (1973), using cross-country comparisons, found an association between construction investment and economic growth. That finding was consistent with the classical approach in growth theory in which physical capital formation is the main engine of economic growth and development. Turin's argument about the pattern of the construction industry contrasts with the argument advanced by Bon (1992; 2000). In Bon's 1992 paper, the link between economic development and construction is discussed and Bon points out the problem with Turin's analysis, which is largely focused on developing countries. As the share of construction in total output first increases and then decreases with economic development, this is called the inverted U-shaped relationship, following Maddison, who, in his seminal study of economic development (Maddison, 1987), tracked several key advanced industrial countries (AICs). Bon's 1992 argument concerns the entire path from LDC (least developed countries) to NIC (newly industrialised countries) to AIC status.

In the aftermath of the 1979-980 oil-shock and the international financial crisis that followed in 1981, most of Sub- Saharan African countries experienced until the late 1990s a decreasing growth in per capita national income, despite heavy investment in construction and other physical capital over the 1970-1980 period (Lopes, 1998). Following the *Structural Adjustment Programme for Africa* that started in the mid-1980s, World Bank (1994) took the view that, for the developing countries, the emphasis should be on the improvement of the quality of infrastructures rather than the quantity of infrastructures. Thus, it is reasonable to argue that this would be achieved through an adequate maintenance of existing infrastructure stocks and by prioritising investments that modernise production and enhance international competitiveness. Lopes (1998), discussed the role of construction in the economic development of countries in Sub-Saharan Africa. The development patterns of construction and related sectors were modelled based upon data from the period 1980-1993 and a sample

of 15 countries comprising two different patterns of growth in that period. It was argued that construction and the national output grow at the same rate only in a declining economy, and that in a growing economy, the volume of construction, typically, would not grow faster than the rest of the economy.

THE CLOUT OF THE CONSTRUCTION INDUSTRY IN SUB-SAHARAN AFRICA

Data Sources and Methodological Issues

The main statistical sources used in this analysis are the 2010 edition of the *Yearbook of National Account Statistics: Main Aggregates and Detailed Tables* from the United Nations, *Africa Development Indicators 2008-2009* and *World Development Report 2010* from the World Bank. The internet site of the UN statistical office presents data on gross domestic product (GDP) and its components both in the expenditure and production approaches. This publication presents various sets of economic series detailing the evolution of GDP and its components in different statistical formats over the long period 1970-2008, at the world, world regions and country levels: at current prices in national currencies; constant 1990 prices in national currencies; current prices in US dollars; and constant 1990 prices in US dollars.

The indicators of economic activity analysed are: GDP and construction value added (CVA) both in constant 1990 prices in US dollars. Unfortunately, data on gross fixed capital formation in construction (GFCFC) are not provided in the UN publication. Thus, CVA is used as a proxy for analysing the evolution pattern of construction investment in two groups of countries in Sub-Saharan Africa. As CVA is roughly a half of GFCFC, it appears reasonable that the former indicator can be used as a surrogate measure of construction investment. In order to facilitate international comparisons as well as for aggregation purposes, constant 1990 prices in US dollars are used. In order to place the two country groups in the economic development arena, gross national income (GNI) per capita for the bench mark year 2008 has been chosen. This is provided by *The World Development Report 2010* (World Bank, 2009b). This report presents the following definitions of the income groups of countries according to the 2008 GNI per capita: low income countries (LICs), US$ 975 or less; lower- middle- income (LMICs), US$ 976-3,855; upper-middle-income (UMICs), US$ 3,856 -11,905; and high income countries (HICs), US$ 11,906 or more.

Data on the evolution of economic indicators in the period 1980-2006 were obtained from the *Africa Development Indicators 2008-2009* (World Bank, 2008). Thus, because of data consistency, the quantification of the relationship between the construction sector and GDP is only analysed for the period 1980-2006. Using data obtained from the *UN Yearbook of National Accounts Statistics* (United Nations, 2010 internet edition), data are presented for the share of construction in GDP (at constant1990 US dollars) for the period 1980-2006. GNI per capita is presented for the year 2008. The evolution of GDP per capita, both of Sub-Saharan Africa as a whole, as well as excluding two important economic players of that region, South Africa and Nigeria, are presented for the period 1980-2006 (Table 1).

Cross-matching sources, data are available for 45 countries and these can be split into two groups according to the level of GNI per capita in 2008. Tables 2 and 3 illustrate these two groups: Group I - low income countries (LICs); Group II- middle income countries (MICs). Thus, Group II comprises both LMICs and UMICs, and only Equatorial Guinea could, in theory, be considered a HIC, owing to its high GNI per capita.

Table 1: *GDP per capita in Sub-Saharan Africa (SSA) in 1980-2006, real*

	Constant prices (2000 US$)				Average annual growth (%)		
	1980	1990	2000	2006	1980-	1990-	2000-
SSA	593	532	508	580	-1.0	-0.6	2.4
SSA exclud. South Africa	371	339	332	368	-0.9	-0.3	2.6
SSA exclud. South Africa and Nigeria	348	331	323	379	-0.3	-0.2	2.3

Table 2: *GNI per capita and Share of CVA in GDP (%) for Selected Years (Group I)*

Countries	GNI per capita current US$ (2008)	CVA/GDP (1980)	CVA/GDP (1990)	CVA/GDP (2000)	CVA/GDP (2006)
Benin	690	3.65	3.11	3.56	3.91
Burkina Faso	480	2.90	4.67	5.05	5.49
Burundi	140	3.29	3.35	4.37	3.11
C. African Rep.	410	1.77	2.81	2.57	2.97
Chad	530	1.02	1.69	1.32	1.31
Comoros	374	9.39	3.17	5.38	6.01
Congo, D. Rep.	150	3.65	5.00	3.27	4.24
Gambia, The	390	4.86	4.51	4.05	4.77
Ghana	670	3.30	3.30	3.48	3.56
Guinea	390	10.23	10.20	11.49	12.41
Guinea-Bissau	250	13.71	9.99	6.76	10.63
Kenya	750	3.74	2.92	2.66	2.53
Liberia	170	3.89	3.33	2.07	3.45
Madagascar	410	1.69	1.11	1.45	2.83
Malawi	290	6.81	4.96	3.84	5.10
Mali	580	2.00	2.91	5.14	4.92
Madagascar	410	1.69	1.11	1.45	2.83
Mauritania	840	3.42	4.78	6.27	8.95
Mozambique	370	9.65	5.19	8.40	7.37
Niger	330	2.63	2.45	2.30	2.55
Rwanda	410	6.82	6.78	7.97	9.18
Senegal	970	2.82	3.29	3.94	5.13

Sierra Leone	320	3.31	2.12	2.07	3.96
Tanzania	430	3.57	4.76	6.84	7.81
Togo	400	5.84	5.14	4.44	5.20
Uganda	420	3.51	4,84	6.39	7.58
Zambia	950	2.71	2.56	2.15	3.40
Zimbabwe	340	3.88	2.86	2.22	0.86
Group I (mean average)	-	4.49	4.03	4.19	5.08

Table 3: *GNI per capita and Share of CVA in GDP (%) for Selected Years (Group II)*

Countries	GNI per capita current US$ (2008)	CVA/GDP (1980)	CVA/GDP (1990)	CVA/GDP (2000)	CVA/GDP (2006)
Angola	3, 450	4.64	2.92	2.73	3.45
Botswana	6,470	9.11	7.28	5.88	5.13
Cameron	1,150	6.92	4.59	3.57	3.58
Cape Verde	3,130	10.39	11.92	8.47	8.76
Congo, Rep.	1,970	7.23	2.99	4.44	5.01
Cote d'Ivoire	980	3.63	1.79	4.04	3.29
Djibouti	1,130	4.19	9.62	5.89	6.84
Equatorial	14,980	7.25	4.51	3.05	3.38
Gabon	7,240	5.70	6.71	6.37	6.54
Lesotho	1,080	9.63	14.69	13.84	12.45
Mauritius	6,400	5.74	5.62	5.88	5.96
Namibia	4,200	6.51	2.30	2.33	3.20
Nigeria	1,160	3.90	1.69	2.14	2.40
Seychelles	10,290	9.26	4.79	8.51	9.14
S. Africa	5,820	3.82	2.98	2.29	2.62
Sudan	1,130	5.56	6.04	5.01	5.00
Swaziland	2,520	5.84	2.49	6.39	6.70
Group II (mean average)	-	6.43	5.47	5.34	5.50

Analysis and Discussion

Table 1 shows the evolution of GDP per capita in Sub-Saharan Africa as well as that of Sub-Saharan Africa excluding South Africa, and then Sub-Saharan Africa excluding South Africa and Nigeria. The division shown in Table 1 is a reflection of the clout those two countries represent in the Sub-Saharan African economy. According to World Bank (2009b), South

Africa's and Nigeria's GDP in nominal prices comprised over fifty percent (51.4 percent) of Sub-Saharan Africa's GDP. The reasons for this dominance are not the same for the two countries. Nigeria plays a big role because it is, by far, the most populous country in the region, whereas South Africa is important owing to its unmatched industrial structure and technological development that makes it the economic pole of Sub-Saharan Africa.

Table 1 shows that both the region and its subdivisions, in terms of GDP per capita, experienced decreasing growth in the period 1980-2000 and a reasonable upturn in the period from 2000 onwards. According to data constructed from World Bank (2008), the LICs, as a group, experienced dramatic decreasing growth in GDP per capita in the period 1980-2000, and an average annual rate of growth of almost 2% in the period 2000-2006. The striking aspect worthy of note concerning Group 1 is that GDP per capita in the LCIs in 2006 (measured as an average for the group) was lower than that in 1980. Again, data constructed from World Bank (2008) show that the countries comprising Group II (MICs), in terms of GDP per capita, grew slightly in the period 1980-2000, with an average annual growth rate of about 1%, and notched up a spectacular rate of growth of an annual average rate of more than 4% in the period 2000-2006.

Now, looking at the relationship between the construction sector and the national economy, Tables 1 and 2 show that the evolution pattern of the share of CVA in GDP in the developing countries of Sub-Saharan Africa is markedly different according to the country's stage of economic development as determined by GNI per capita. The share of CVA in GDP in the low-income countries (Group I), despite differences across countries as well as taking into account annual fluctuations, varied, in general, from 4% to 5% of GDP, as is illustrated in Table 2. In terms of the evolution in the period, the share of that indicator was in line with the development pattern of GNI per capita: it decreased in the period 1980-1990 (from 4.49% to 4.03 % b, measured as an average for the group), remained practically stagnant in the period 1990-2000, and grew at a reasonable rate in the period 2000-2006 (from 4.19% to 5.08%, again measured as an average for the group). It is worth noting that in the latter years of the period, the share of CVA in GDP was higher than that in the earlier years of the same period. That is, in the first stages of economic development, and in an increasing growth pattern, the construction industry tends to grow faster than national output. Conversely, in an economic downturn, the industry tends to decrease not only absolutely but also relatively.

Regarding the middle-income countries (Group II), Table 3 shows that the share of CVA in GDP varied, in general, from 5.0 % to 6.5% in the period 1980-2006, also disregarding differences across countries as well as annual fluctuations. Table 3 also shows that the share of CVA in GDP decreased from 6.43% in 1980 to 5.47% in 1990 (measured as an average for the group) despite a growth in GDP per capita, as already pointed out, at an average annual growth rate of about 1% in the period 1980-1990. From then onwards, the share of construction in GDP remained practically stagnant at around 5.5% of GDP. The pattern experienced by the MICs is worthy of note: despite a significant increase in national income per capita, particularly in 2000-2006, the share of CVA in GDP in the late years of the period did not reach the value attained in the beginning of the period. It could reasonably be said that the construction industry activity in the MICs reached a peak, in relative terms, in the early 1980s. These results presented here seem to corroborate those of a previous work concerning the developing countries of Africa (Lopes, 1998) that found that in the developing countries of Africa that have middle-income status or are in a sustained process of reaching it, and have achieved a certain level of the construction industry activity (say 5 to 6 percent of GDP, depends upon the year taken as basis), the proportion of construction in GDP tends to remain

stagnant, i.e. the rate of growth of construction volume follows that of the national economy.

CONSTRUCTION INFRASTRUCURE AND THE CHALLENGE OF THE MILLENNIUM DEVELOPMENT GOALS

This section considers the role of construction in socio-economic development, particularly by exploring the link between construction infrastructure and economic and social targets related to the Millennium Development Goals (MDGs). Much of the material in this section is drawn from Lopes (2011, forthcoming).

As pointed out earlier, the construction industry has historically been linked with the process of industrialisation and development. Railway systems and canals played an important role in the connection of different regions of Europe, North America and in some parts of Latin America. Transport infrastructure facilitated trade and co-operation between countries and also the diffusion of technical innovations from the most advanced to the less advanced areas of the globe (Rostow, 1963). The construction industry played a key role in the reconstruction of war-ravaged Europe: the heavy programme of construction improvement of housing and social infrastructure, besides its contribution to the national output, was also a reflex of a better re-distributive economic policy in Europe after World War II. Following the UN Millennium Declaration in 2000, the Heads of State and Government of Sub-Saharan Africa have emphasised the role transport infrastructure can play in enhancing inter-regional cooperation and foster economic and social development (Organisation of African Unity, 2001).

In the early 2000s, the physical infrastructure in Sub-Saharan Africa was in a very poor state. External capital flows (particularly from donor countries pertaining to the Development Assistance Committee of the OECD) for African infrastructure had reached a historic low. As already mentioned, African governments and their development partners sharply reduced, over the 1990s, the share of resources allocated to infrastructure, and in the aftermath of the Asian financial crisis, in the early 2000s, private capital flows declined sharply. The Commission for Africa, in 2005, in line with another policy shift on the part of the international development agencies, singled out infrastructure as one of the continent's central development challenges (World Bank, 2009a). In the same line, a report of the UN Millennium Project (UN, 2005, cited in Easterly: 2006, p. 290) argued that poor countries were in a poverty trap: Escaping the trap requires:

"A big push of basic investments between now and 2015 in public administration, human capital (nutrition, health, education) and key infrastructures (roads, electricity, ports, water and sanitation, accessible land for affordable housing, environmental management)"

The Group of Eight summit at Gleneagles in 2005 called for action by the major economies and multilateral donors in the financing of Sub-Saharan African infrastructure. This led to the formation of the *Infrastructure Consortium for Africa.* This consortium would constitute a forum where major donors could work with continental and regional institutions to spearhead economic integration (World Bank, 2009a). One of the practical results of this political arrangement was the publication of the flagship report "*Africa's Infrastructure: A time for Transformation*" in 2009. This publication diagnosed the infrastructure needs of Sub-Saharan Africa, addressing the twin challenges of financing and sustainability, particularly the attainment of the millennium development goals (MDGs).

Table 4: *Overall Infrastructure Spending Needs for Africa, 2005-2006*
(US$ billions annually)

Sector	Capital expenditure	Operation and maintenance	Total needs
ICT	7.0	2.0	9.0
Irrigation	2.7	0.6	3.3
Power	26.7	14.1	40.8
Transport	8.8	9.4	18.2
WSS	14.9	7.0	21.9
Total	60.4	33.0	93.3

Source: World Bank (2009a)
Note: ICT- information and communication technology; WSS- water supply and sanitation

Table 4 indicates that the estimate for the overall cost to build, maintain and operate Africa´s infrastructure is US$93 billion annually over the period 2006-2015, approximately 15% of Sub-Saharan Africa's GDP in 2006. Of this total, about two thirds are for investment and about one third for operation and maintenance. In sectoral terms, about 40% is allocated to the power sector. The second-largest component is water and sanitation – a key sector for meeting the MDGs – with about 23% of the total and the third largest share of the cost is associated with transport, which is approximately 20% of the overall spending needs. In terms of regional groups, the burden of the price tag relative to the countries' GDP is markedly different across groups (World Bank, 2009a). For middle-income countries and resource-rich countries, the amount is in the range of 10% to13% of their respective GDPs. For low-income countries, as much as 25% of GDP would be needed, and for a particular sub-group of the latter-fragile states (war-ravaged countries), the burden would be an astonishing 37% of GDP. If one takes into account that the middle-income countries already spend a reasonable share of their wealth in investing in infrastructure and the spending needs are almost equally divided across groups, one can envisage the implausibility for the poorer countries in Africa to finance the funding gap of their estimated spending needs. As Table 5 shows, the funding gap for the infrastructure in Sub-Saharan Africa is US$ 31 billion or about 5% of GDP, taking into account efficiency improvements. About US$ 23 billion a year, or over 70% of the funding gap, is for the power sector. The other significant component of the gap, representing a shortfall of US$ 11.4 billion is associated with water supply and sanitation (WSS). The funding gap in the latter sector in the low-income countries, particularly in fragile states looks like an unattainable target in the foreseeable future in the light of the present economic situation and prospects of the countries themselves, and the challenges posed to the development partners by the recent global financial crisis.

***Table 5.a**: Funding Gaps, by Sector and Country Group*
(US$ billion annually)

Country Type	Power	ICT	Irrigation	Transport	WSS	Potential for reallocation	total
Middle income	10.7	(0.9)	0.1	(0.3)	0.0	(4.1)	5.5
Resource rich	4.5	0.5	1.8	(1.4)	3.7	(0.8)	8.2
Low-income non fragile	4.7	(0.2)	0.7	(0.5)	5.2	(0.4)	9.5
Low-income fragile	2.7	0.7	0.0	2.0	3.9	0.0	9.4
Sub-Saharan	23.2	1.3	2.4	(1.9)	11.4	(3.3)	30.6

Africa

Source: World Bank (2009a)

Table 5.b: *Funding Gaps, by Sector and Country Group (percentage of GDP)*

Country Type	Power	ICT	Irrigation	Transport	WSS	Potential for reallocation	total
Middle income	3.9	(0.3)	0.0	(0.1)	0.0	(1.5)	2.0
Resource rich	2.0	0.2	0.8	(0.6)	1.7	(0.4)	3.7
Low-income non fragile	4.2	(0.2)	0.6	(0.4)	4.7	(0.3)	8.6
Low-income fragile	7.1	1.9	0.1	5.3	10.2	0.0	24.6
Sub-Saharan Africa	3.6	(0.2)	0.4	(0.3)	1.8	(0.5)	4.8

Source: World Bank (2009a)

As pointed out above, international development agencies and bilateral donors have underscored infrastructure (more precisely the services provided by the infrastructure) as the key factor for the attainment of the MDGs. The MDGs are the world's time-bound and quantified targets for addressing extreme poverty in its many dimensions – income poverty, hunger, disease, lack of adequate shelter, and exclusion – while promoting gender equality, education, and environmental sustainability (UNDP, 2005). Following the adoption of the UN Millennium Declaration at the Millennium Summit in New York in September 2000 (UN, 2000), eight MDGs, measured through 21 targets, were devised. Most of the MDG targets have a deadline of 2015, and 1990 is the baseline against which progress is quantified.

Restricting here the analysis for those infrastructure items which incorporate mainly construction investment (WSS, transport and electricity – note that a significant part of the investment in the power sector is for multi-purpose use), construction infrastructure has an important role to play in the process of attaining the MDGs in Sub-Saharan Africa. The MDG Goal 7 – ensure environmental sustainability – is particularly relevant to the construction industry. This goal is translated into the following targets: i) integrate the principles of sustainable development in country policies and programmes and reverse the loss of environmental resources; ii) halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation; and iii) have achieved by 2020 a significant development in the lives of 100 million slum dwellers.

Table 6: *MDGs in Sub-Saharan Africa: Goal 7- Ensure Environmental Sustainability*

Proportion of people using an improved water source (%)		Proportion of people with access to improved sanitation facilities (%)		Proportion of urban population living in slum areas (%)		Forested area as a percentage of land area (%)		Emission of CO2 (billions of metric tons)	
1990	2008	1990	2008	1990	2010	1990	2010	1990	2007

49	60	28	31	70	62	31	28	0.5	0.7

Source: United Nations (2010b)

Table 6 suggests that Sub-Saharan Africa, as a whole, is unlikely to achieve, by the deadline of 2015, the targets related to access to safe drinking water and basic sanitation. However, some middle-income economies of Africa such as Cape Verde, South Africa, Botswana, Namibia, Seychelles and Mauritius are either on track or experiencing good progress towards achieving the targets, particularly in access to safe drinking water (WHO/UNICEF, 2010). Regarding the urban population living in slum areas, whereas some progress was noticed in relative terms, the absolute number of slum dwellers has actually been growing and will likely continue to increase in the near future.

With respect to the emission of CO2, Sub-Saharan Africa registered 0.9 metric tons per capita in 2007 compared with 12 metric tons per capita in the developed world, and, in deforestation, the rate of increase started to decelerate in the period 1990-2010.

The WSS sector, besides its direct effect on the provision of water and sanitation services, has a pervasive impact on other social targets, namely in the prevention of disease, improvement in education and promotion of gender equality so that women save time when they begin using an improved water source. Transport fosters trade by reducing the cost for transporting goods and passengers, reduces child/maternal mortality and improves access to education services. Electricity enhances productivity, eradicates poverty by fostering economic growth and reduces child/maternal mortality.

One important area related to the construction industry which needs special attention on the part of government agencies is urban planning. The rate of urbanization in Sub-Saharan Africa is increasing sharply. This has its merits. For example, higher population densities lower the per capita costs of providing safe water, sewer systems, waste collection, and most other infrastructure and public amenities. Moreover, sound urban planning restricts development in flood-prone areas and provides critical access to services, and infrastructure developments can provide physical protection for the natural environment. On the other hand, most of the urban areas have been unable to cope with the increasing populations, and large numbers of their inhabitants have a poor quality of life. As pointed out by the World Bank (2009b), overcrowding, insecure tenure, illegal settlements sited in landslide- and flood-prone areas, poor sanitation, unsafe housing, inadequate nutrition, and poor health exacerbate the vulnerabilities of the population in urban slums. These are the realities for millions of people in Sub-Saharan African countries. An efficient construction industry can contribute to the efforts to tackle these problems. For example, it can address the vulnerabilities of slum dwellers by devising labour-intensive and cost-effective technologies, and by implementing practical sustainable measures in the framework of the *Agenda 21 for Sustainable Construction in Developing Countries* (International Council for Research and Innovation in Building and Construction (CIB) and United Nations Environment Programme (UNEP), 2002) This framework for a coordinated response to the challenges of limiting the impact of construction puts an emphasis on collaboration among different stakeholders of the construction industry. Indeed, it is the flexibility of the construction industry in being able to adjust to different framework conditions that makes it such a great contributor to the process of economic development.

CONCLUDING REMARKS

The picture that emerges from the analysis of the evolutionary process of the construction industry and its role in national socio-economic development suggests that the share of construction in gross domestic product tends to increase with the level of per capita income in the first stages of economic development. When countries reach a certain level of economic development, the construction output will grow slower than national output in the later stages of their development. That is, it decreases relatively but not absolutely. Thus, it is reasonable to assume that when a certain level is achieved (say the share of CVA in GDP at around 5% to 6%) and countries enter into a path of sustained economic growth and development, the construction output tends to grow, in general, with the same rate of growth as that of the general economy.

The results of the study also underlie the twin challenge of finance and sustainability in Sub-Saharan Africa in the effort towards attaining the MDGs, and the situation is particularly acute in the low-income countries in the light of the countries' own economic circumstances and prospects, and the current global financial crisis. The results of the study may have some implications for public policies. Given the experience of the growth process in Sub-Saharan Africa, what should be the focus of growth-enhancing policy in the two groups of countries? How can the construction industry contribute to this end, and help a country in Group 1 to move to Group 2? For example, further investment in construction infrastructure might be recommended for countries in Group 1 but might not necessarily be a growth priority for countries in Group 2. Most recent data indicate that there is no significant funding gap in infrastructure investment in the middle-income countries of SSA in order to achieve the economic and social targets of the MDGs. These countries should prioritize their investment projects by balancing economic and financial factors with social targets. For the low – income countries, taking into account the dire financial stress facing these countries, the analyses suggest that most of the effort should be directed at construction investment projects in order to achieve a level of the construction industry activity of, say, 5 to 6% of GDP which is required for a reasonable functioning of the economy. The priority should be given to construction investment projects that have high multiplier effects in the economy, particularly transport and multi-purpose (power and water) infrastructures. A concerted effort to implement sub-regional infrastructure projects seems also to be the way forward.

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