

Construction competitiveness. Some opportunities for the Venezuelan case.

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ABSTRACT

Construction is one of the world's main activities because of the benefits it provides to society, and this justifies efforts for its improvement. Because of the complexities of this industry the benefits of construction do not reach all sectors of society thus creating shortcomings and social demands. Through examples related to the Latin American and Venezuelan competitiveness and housing situation, authors evaluate various goals and opportunities of this industry, revise some public policies, sustainable construction and knowledge management shortages and present a compilation of strategies oriented to create better conditions for construction. This paper is part of ongoing research oriented at improving construction performance and competitiveness. The study highlights the responsibility of individuals, governments, academic and productive sectors to disseminate information about existing shortages and opportunities and joint efforts to face problems that may be common for diverse developed and developing countries. Final goal is to propose some basic solutions based on the innovations and technology available using knowledge and learning as the most valuable resources to support construction competitiveness progress as path to improve quality of life.

Keywords: Competitiveness, sustainable construction, knowledge management, Venezuela

1. INTRODUCTION

On preliminary researches authors found that diverse international organizations have developed studies about the international competitiveness problem including the construction sector. Few references about Venezuelan specific case were found. This paper is part of ongoing documental and empirical research related to construction competitiveness and construction challenges.

Research findings demonstrate that in diverse countries competitive policies present improvement opportunities in aspects as institutional strengthen, education and labor skills, knowledge creation, innovations, technologies, and socio-political stability. In general those enhancement opportunities are evidenced on life quality shortcomings for important sectors of communities.

Because it provides shelter and helps satisfy some of the most basic needs of the people, construction is one of the productive activities with more impact on the quality of life for societies. This implies the convenience to propitiate that the integral and quality construction services to arrive to wider sectors.

Because of its nature, construction industry faces important technical, financial and social challenges in diverse developed and developing countries. In this research the Latin American and Venezuelan case are presented as a reference to evaluate construction behavior. The national figures show that in addition to infrastructure and services weaknesses, in Venezuela the housing sector presents important shortcomings in construction and

competitiveness. By this reason public and private sectors are struggling to solve the severe needs that affect large segments of society.

With the references offered about the Venezuelan case, the research tries to identify some housing goals and opportunities present in this construction sector, determine if current policies are the adequate to propitiate the increase of the residential and infrastructure solutions and propose some basic ideas to improve the performance and competitiveness of construction. Construction sustainability, knowledge management and the use of technologies, innovations and previous learning are remarked as key processes required to extend construction benefits to wider sectors of society.

2. WHAT KIND OF CHALLENGES FACES CONSTRUCTION IN DEVELOPING COUNTRIES? SOME REFERENCES OF LATIN AMERICA

Important sectors of society take for granted construction services availability without understanding the complexities and needs that lie within this sector.

For the importance of the services it provides supporting all human activities in housing, infrastructure, industrial, transport and energy needs, construction is considered one of the main productive activities worldwide. This importance is remarked because it generates an important number of employments, sustaining economic growth and development (CIB&UNEP-IETC, 2002; Kamara, et. al, 2002; Egbu et al., 2003; Ng, et. al, 2009).

Aware of the importance of this sector and the essential challenges that construction present, some researchers, governments, companies and citizens are working to highlight the importance of sustainable construction, sustainable development, construction competitiveness and knowledge management as strategies required to support construction performance in order to improve the quality of life (Pietrosemoli et al., 2010).

Different challenges are imposed to construction. Most are related to traditional construction processes as client's requirements, technical or financial constraints or even market changes; but some other arise from the particular conditions of developed and developing countries as public policies, legal and technical changing conditions, institutions weakness, insecurity, the global challenges imposed by diverse crisis, ethics failures, or natural disasters.

Throughout the years, while growing in complexity and technification, construction has evolved from a traditional conception based on materials and man power usage to become knowledge based and actually supports its growth on innovations, technology and knowledge (Anumba et al, 2005). Due to the many variables involved it is common that construction challenges, constraints and clients new demands generate projects delays, loss of knowledge, competitiveness problems and projects costs increases. This severely affects the performance of this sector and the national and citizens budgets (CIB, 1999; CIB&UNEP-IETC, 2002; Love et al 2005; Anumba et al 2005).

Such challenges and construction constraints are present both in developed and developing countries with the particularities related to each geographical context, internal realities and strategies that every nation follows. In fact, while some countries strive to reach for the prime available construction conditions, supporting global goals as construction sustainability and sustainable development, others present different approaches that seem unsuitable to support the challenges faced by construction.

Some of the challenges and constraints that construction faces are evident looking at the Latin American case, because even with urbanization, globalization and privatization processes presented on recent years, the regional approach to sustainable development and construction development still presents important shortcomings (Gomes and da Silva, 2005). Such problems are evidenced by figures of infrastructure and housing, self-help construction,

piped water, water treatment, sanitation facilities, paved roads and energy that show an important gap between incremental consumption of population and the availability of such primary services. These shortcomings create escalating social tension in population meaning that is imperative to find timely solutions to reduce their impact.

As an introduction to some of the problems that may affect the construction sector in different countries, the authors present some details about housing construction opportunities related to the Venezuelan case.

3. VENEZUELA. THE OPPORTUNITIES FOR HOUSING AND INFRASTRUCTURE SECTOR

Even if no specific studies about Venezuelan construction competitiveness were identified, Venezuela evidences an important housing deficit, worsened by general infrastructure shortcomings that involve areas as wide as housing, schools, hospitals, roads, energy system and recreation, among other (Azpúrua, 2009; Lafuente and Genatios, 2009a; España, 2009, CVC, 2011).

From all those shortcomings the impact of housing deficiency is the worst for Venezuelan population. Researchers refer that most of the Venezuelan population lives in slums (53% according with last 2001 Venezuelan census), that are frequently located around large cities.

Accordingly with the Venezuelan Chamber of Construction, in 2009 Venezuela presented a deficit of more than 1.850.000 houses, for a population that based on last official census realized on 2001, was of 23 million. For 2009, Venezuelan population was estimated around 28,6 million (WEF, 2010).

The construction problem is so relevant that even if government has invested in diverse housing solutions (i.e. Petrocasas: aimed at substituting shanty towns and slums for formal homes, or the bi-national agreement signed with Uruguay to import prefabricated homes to Venezuela, among other) recent studies demonstrate that formal housing system built less than 25% of the homes needed on Venezuelan market (España, 2009).

In such conditions the main constructors in the country are the poorest people, since 69,5% of homes built last years were self constructed, created by informal sectors to solve their own living needs with dramatic increase of the precariousness in infrastructure and services accrued (Lafuente and Genatios, 2009b; España, 2010).

The problem has increased in Venezuela on recent years, with deprived records of housing solutions offered to the society and deficiencies on basic services availability and infrastructure problems related to schools, hospitals, energy, water or sewage systems, among other, thus evidencing severe planning and construction problems.

Accordingly with a research project developed during more than 20 years about poverty in Venezuela (España, 2010), the home is the more valued and desired social object for Venezuelan people, and this is why the distress caused by housing and infrastructure shortcomings has generated a growing situation of social claims being these the second cause of protests in Venezuela after the ones related to safety reasons.

This conclusion evidence the general acknowledgement about the prevalence of housing and infrastructure solutions as a mean to reach for the stability desired by the individuals and society to improve their life quality and confirms the obligation to find strategies that may help to reduce the problems described.

4. WHAT CAN EXPLAIN HOUSING AND INFRASTRUCTURE SHORTAGES IN VENEZUELA?

Understand the cause of housing and infrastructure shortcomings is fundamental in order to develop practical and timely solutions for all countries. Even if the lack of reliable data is a limitation that affects research in this field, especially on Latin American and Venezuelan databases, some references may be found on international studies.

In fact, the Global Competitiveness Report, being an international and multivariable study, offers valuable indexes for identifying some conditions affecting the countries performance in areas as wide as institutions, macroeconomic environment, health and primary education, higher education and training, goods market efficiency, labor market efficiency, financial market development, technological readiness, market size, business sophistication, innovation and infrastructure (WEF, 2010).

Even if this study cannot present a complete evaluation of internal realities because of complexities related to every country, accordingly with WEF Latin American competitiveness indexes present an irregular behavior as can be seen on following Table 1.

Table 1: Latin American competitiveness indexes evolution

Global competitiveness							
Index. Ranking from 1 to	GCI 2010-	GCI 2009-	GCI 2008-	GCI 2007-	GCI 2006-	GCI 2005-	Performance last
139	11 Rank	10 Rank	09 Rank	08 Rank	07 Rank	06 Rank	5 years
Argentina	87	85	88	85	69	54	Worsened
Bolivia	108	120	118	105	97	101	Worsened
Brazil	58	56	64	72	66	57	Worsened
Chile (Best position in Latin America)	30	30	28	26	27	27	Worsened
Colombia	68	69	74	69	65	58	Worsened
Ecuador	105	105	104	103	90	87	Worsened
Paraguay	120	124	124	121	107	102	Worsened
Peru	73	78	83	86	74	77	Improved
Uruguay	64	65	75	75	73	70	Improved
Venezuela	122	113	105	98	88	84	Worsened

Performance evaluation criteria:

Improved: Actual score lower than 2005-2006/ 2006-2007

Worsened: Actual score higher than 2005-2006/2006-2007

Source: WEF. The global Competitiveness Report, 2010-11, 2009-10, 2008-09, 2007-08, 2006-07.

Compilation: Pietrosevoli, 2011

For the period presented from 2005 to 2010, available data evidence that only Peru and Uruguay improved their position with Venezuela, Paraguay and Bolivia as the countries with the worst performance.

While other countries evidence relative recovery on their economical indexes from 2008 global crisis to this date, (with moderate variations on their competitiveness indexes - alternating periods of deterioration and recovery), in general Venezuela presents some worrying indexes such as having the highest inflation rate in Latin America and one of the highest inflation rates and upward trends in the world or records as having one of the peak violence rates in the world with important depletion of life quality conditions and private sector weakening.

Apart from the figures of competitiveness indexes presented, the consequences of this situation are evidenced by the number of protests and social claims that have been increasing in Venezuela since 2006 as may be seen on the Table 2.

Table 2: Protests in Venezuela

Períod	N. of protests
1999/2000	1,414
2000/2001	1,313
2001/2002	1,262
2002/2003	1,542
2003/2004	1,255
2004/2005	1,534
2005/2006	1,383
2006/2007	1,576
2007/2008	1,763
2008/2009	2,893
2009/2010	3,315
Total	19,250

Source: Provea. Una década de protestas 2000-2010. Compilation Pietrosemoli, L. 2011

These figures evidence important challenges for Venezuela and possibly other Latin American countries meaning that government and citizens have the goal to propitiate quality of life improvements.

Following the authors propose the revision of some conditions that may be linked to the shortcomings that affect construction performance in Venezuela and other Latin American countries. Among other factors authors suggest considering public policies, sustainable construction and knowledge management as important variables needed to support better performance of the construction sector. Some references follow:

4.1. PUBLIC POLICIES

The shortcomings affecting the diverse countries, especially under developed ones, generate inequities, socio-economic unbalance, uncertainty and raw materials dependence, among other problems. According to various researchers, such consequences derive from the fact that until recent times some developing countries have been operating without formal competition policies because of elevated rate of state control over economic activity and direct government's intervention over prices of products and services (Alburquerque, 2001; Singh, 2002).

Mercado and Testa (2003) consider that in general Latin America suffers the consequences of productive structures that continue to be dependent of the exploitation and exportation of raw materials. Additionally, Latin American countries are affected by elevated rates of volatility on macroeconomic environment in aspects as GDP growth, domestic investments and fiscal variables. Even if diverse authors recognize some advances on public policies with technological learning and a growing awareness of environmental impact, the continuous dependence on raw materials means that Latin American countries are not yet fully prepared to integrate on the global economy under sustainable and long term vision.

The problems described also affect construction. In fact some construction problems in Latin America are related to the lack of individual and consolidated national strategies and the shortage of political, institutional and legal guidelines that may support sustainability. This situation is worsened by problems such as elevated public debt and poverty, fast population growth, unequal incomes concentration, low proportions of investments on infrastructure and properties, as well as the large use of renewable resources to produce energy that determine severe limitations to reach the goal of sustainable construction.

Genatios and Lafuente (2004) indicate that Venezuela is affected by the common problems described for other Latin American countries: political and economical instability, low educational level, underutilization of human talent and low investments on science and technology. Those problems are magnified by the institutional weaknesses of government, low development of social capital, reduction of the public investment in infrastructure, social security and education, the strong dependence on the oil sector and the lack of policy coordination and institutional difficulties in adapting to market changes.

As a consequence of such conditions Venezuela has suffered a decline in the real income of the population in the last decades, worsened because of high inflation, variations in the real exchange rate and an erratic and unpredictable level of economic activities that generate economic exposure, instability and frequent crisis of insecurity to the citizens, companies and society in general.

Some authors explain such Venezuelan deteriorating life quality and competitive behavior as consequences of restrictive productive policies imposed to rule country in legal, political, social and economic aspects.

Confirming such criteria, España, (2010) sustain that beyond the scarcity of housing solutions, Venezuela is affected by a severe deficit of life quality conditions because of the shortages of basic urban and social services needed. In fact the figures of housing and infrastructure deficit evidence important improvement opportunities for Venezuelan policies since the initiatives promoted have not succeeded to solve the severe country housing problem.

According to Venezuelan construction experts the increase on housing problem is a direct consequence of a complex situation related to raw materials scarcity for goods as important as rebar, cement and other construction materials together with inflation, high levels of legal and personal insecurity, expropriations, and in general public policies that generate low levels of investments from public and private sectors. Those constraints consequently reduce the investment intentions as well as the production capacity of cement, steel and quarrying and other resources needed for construction sector. All those measures together distress the poorest sectors because construction projects are stalled or invaded thus severely reducing housing options for the families and worsening current housing and infrastructure problems.

Being a problem very relevant for Venezuelan society, recent government initiatives, including the new law for lands and housing emergency and the Misión Vivienda proposals has been criticized by ample sectors.

This is because instead of creating conditions to promote more constructions and reduce habitation deficit under an public-private balanced and integrated effort in general keep oriented to develop housing projects under a populist public vision that generates uncertainty, legal insecurity, criminalize private sector and centralize the decision making process.

Experts consider that all those proposals and construction strategies to be successful need a long term and sustainable orientation to support the integration between public and private sectors based on stable legal, financial, economical and political conditions. Those basic fundamentals may help that the expertise of main building constructors together with public sector make available to the public important number of homes needed to progressively reach for the goal the 2.000.000 residences of Venezuelan housing deficit. Otherwise those initiatives will not be able to eliminate the cause of the problems described.

4.2. SUSTAINABLE CONSTRUCTION AND KNOWLEDGE MANAGEMENT SHORTAGES

Sustainable construction is defined as the creation and management of a healthy environment built on the basis of efficient resources and ecological principles, or the use of local solutions for local problems, while respecting

people and planet's eco-capacity (CIB 1999; Gomes, and da Silva, 2005). This is a complex process related to human beings and material resources so it is deeply associated with sociological, political, economic and cultural elements. Because of its importance for construction most researchers are developing strategies oriented to promote its long term improvement goals.

Complementarily to sustainable construction, knowledge management is described as the continuous process of creation and transmission of new knowledge throughout the organization (Takeuchi and Nonaka, 2004). By these means allows the integration of new products, services and technologies that facilitates organizational change and help to face the new challenges presented by the environment. With tools and technologies available, knowledge management allows individuals and organizations to create and share explicit and tacit knowledge thus facilitating organizational growth and the improvement of decision making processes (del Moral, et al., 2007).

For construction there is a growing acknowledgement of the positive impact of construction sustainability and knowledge management. Both processes facilitate social and environmental balance, costs savings, improvement of general project indicators, innovations, knowledge transfer and provide answers to customer requirements, thus offering products with higher added value. This permit performance improvement and supports competitiveness that help to face construction challenges, with clear support to construction sustainability and sustainable development itself (Kamara, et al., 2002; Egbu, et al., 2004).

Construction stakeholders must be aware that in the practice several elements can impede the expansion of sustainable construction and limit knowledge management benefits. Among them we find lack of capacity in the construction sector, uncertain economic environment, political insecurity, poverty, low levels of investment in urban, technological inertia, flaws of integrated research, lack of knowledge and reliable data, disinterest in issues related to sustainability and knowledge management, the shortage of structures, systems and processes oriented to preserve, share and create new knowledge as well as ignorance and lack of understanding of the problems by professionals in construction, public, private and public in general (Barón, 2004; Kazi, 2005).

The understanding of the available processes to improve construction and the limitations to obtain them highlight the need to establish common strategies that may help to support the tendency toward sustainable construction and sustainable development as final goals.

5. CONCLUSIONS AND PROPOSALS

Empirical expertise on construction sector confirms that a lot of problems are repeated once and again because opportunities for improvement are overlapped by the day to day problems. This leads to the loss of resources, increased costs, knowledge, man hours and materials wasted and specially lost opportunities to reduce housing and infrastructure shortages and with them the possibility to minimize related social problems.

This is a global problem affecting developing and also developed countries. In such general surrounding, the lack of understanding or time available to evaluate construction problems and opportunities to reduce them are some of the main limitations that stakeholders must confront. This is the starting point that justifies making relevant information available and accessible for the diverse groups interested to obtain construction improvements.

In such a context the references presented about Latin American and Venezuelan housing construction opportunities must be understood as an introduction of general problems affecting competitiveness in diverse geographical surroundings that may provide a complimentary view and learning about construction performance and should be seen as an invitation to revise from each particular reality the diverse competitive policies, strategies and public and private decisions regarding construction challenges.

Following are presented some basic guidelines to make available for constructors and all related stakeholders - including professors and students - knowledge that frequently are ignored because not known or because the

decision makers have to concentrate to face the urgent day to day challenges. That knowledge need to be disseminated and implemented with individuals, governments, companies, universities and research centers cooperation:

- Authors should continue empiric researches to identify improvement opportunities for each country, combining results with knowledge coming from academia, linking theory and practice to propose useful solutions.
- The countries should re-design their productive policies in order to interrupt the continuous dependence on natural resources exploitation and evolve to a new productive paradigm based on competitive policies. Those new policies should be addressed to integrate an industrial model that include the productive, technological, social, cultural organizational and environmental considerations needed to support sustainable development and sustain social welfare, with ethic and democratic considerations and controls to corruption.
- The new policies should be oriented to build housing and infrastructure integral solutions combining the existing formal and informal construction processes and initiatives in order to coordinate the society impulse, integrate it to public efforts and make society interested part of long term solutions.
- Institutions, public, private and communitarian cooperation must be strengthened to keep adequate balance between local productive systems and the private sector, promoting regional productivity, competitiveness and social cohesion. This will enhance macroeconomic, microeconomic and institutional efficiency.
- The education must be strengthened with the use of new technologies and assessment techniques to be able to identify local and regional needs, identifying the specific circumstances that affect countries in the economic, social and natural fields. Based on such findings new construction sustainability strategies, networks and capabilities must be developed in order to propitiate poverty reduction, economic growth and better income distribution and face the urban sprawl. This must be pursued always taking into consideration the basic conditions needed to guarantee social justice.
- The new integral developments should consider the availability of services including piped water, sanitation and sewage systems, educational, social, commercial, and recreation services, and must be close by to centers that offer employment opportunities to residents as basic requirements to enhance life quality conditions.
- The importance of sustainable construction and knowledge management as valuable processes needed to support individual, organizational and social growth and performance improvement must be highlighted since the beginning of educational process on public, private and communitarian environments.
- The convenience to build sustainable construction and knowledge management systems useful for diverse kind of individuals, organizations and communities must be highlighted during all stages of technical, engineering and business schools to create the base for the cultural changes needed to support sustainability. Sustainability concepts must be included as topic for discussion since children's early school.
- In Venezuela official building agenda must be depoliticized. Competencies must be reassigned to different public, private and communitarian actors in order to sustain the new integrated social policy oriented to produce integral housing and infrastructure solutions all over the country with long term and sustainable orientation.
- All the Venezuelan construction stakeholders should support the creation of the proposed Venezuelan national building project (Pacto Nacional de Vivienda). With the participation of government, workers, constructors, financial sector, housing promoters, universities, professionals and society this project must be based on dialogue, knowledge and expertise and integrate public and private efforts to solve housing and infrastructure problems with long term and sustainable orientation.
- Citizens, governments, companies and academia must work together to develop and implement and make clear the importance of the integrated policies and strategies needed to contribute to competitiveness improvements, construction sustainability, knowledge management and sustainable development.

- Project, political and social leaders are required to face construction challenges with the support of innovations, knowledge, and technologies in order to facilitate project completion timely, in budget and respecting the ethic, social and environmental requirements.

With the combination of such efforts will be possible to progressively reduce the frequency and impact of construction problems, taking better chance of existing resources and propitiate the sustainable construction benefits to arrive to wider sectors of societies.

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