



# **DEVELOPMENT OF CONSTRUCTION INDUSTRY-A LITERATURE REVIEW**

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The discussion paper series were prepared as a part of the Pakistan Infrastructure Implementation Capacity Assessment (PIICA) study and comprise of the following technical notes.

**Technical Note 1: Development of Construction Industry –A Literature Review**

Technical Note 2: Local Stakeholders’ Perception Survey

Technical Note 3: Foreign Stakeholders’ Perception Survey

Technical Note 4: Business Environment and Cost of Doing Business

Technical Note 5: Purchase Price Review in the Infrastructure Industry

Technical Note 6: A Review of Allocations and Expenditures in the Public Sector

Technical Note 7: Demand – Supply Gap Analysis

Technical Note 8: International Case Studies – UAE, China and Malaysia

Technical Note 9: Local Case Studies

Technical Note 10: Response to International and Local Bids

Technical Note 11: Focus Group Discussions

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US\$ 1 = PKR60.70 (February 6, 2007)

## ABBREVIATIONS AND ACRONYMS

AASHTO	American Association of State Highway and Transportation Officials	GIKU	Ghulam Ishaq Khan University of Science & Technology
ACI	Airports Council International	GoP	Government of Pakistan
ADB	Asian Development Bank	GoS	Government of Sindh
ADP	Annual Development Program	GoB	Government of Balochistan
AIT	Asian Institute of Technology (Bangkok, Thailand)	HR	Human Resource
APCCA	All Pakistan Construction & Contractors Association	HRDF	Human Resources Development Fund
BCA	Building and Construction Authority	ICB	International Competitive Bidding
CAA	Civil Aviation Authority	ICT	Information and Communications Technology
CAK	Contractors Association in Korea	IFC	International Finance Corporation
CAPECO	The Peruvian Chamber of Construction	ILO	International Labor Organization
CBR	Central Board of Revenue	IPC	Interim Payment Certificate
CDA	Capital Development Authority	JXB	Jebel Ali International Airport
CICA	Confederation of International Contractors' Association	KPT	Karachi Port Trust
CIDB	Construction Industry Development Board	KWSB	Karachi Water and Sewerage Board
CIJC	Construction Industry Joint Committee	L/C	Letter of Credit
CITC	Construction Industry Training Center	LCB	Local Competitive Bidding
CITI	Construction Industry Training Institute	LUMS	Lahore University of Management Sciences
COTI	Construction Official Training Institute	MBA	Master of Business Administration
CRS	Contractors' Registry System	MCA	Monopoly Control Authority
CWTC	Construction Workers Training Center	MIT	Massachusetts Institute of Technology
DBS	Development Bank of Singapore	MOC	Ministry of Construction (Korea)
DELFT	Delft University of Technology, Holland	MTDF	Medium Term Development Framework
DEWA	Dubai Electricity and Water Authority	NAB	National Accountability Bureau
DFCs	Development Finance Companies	NEPRA	National Electric Power Regulatory Authority
DIB	Dubai Islamic Bank	NESPAK	National Engineering Services Pakistan (Pvt.) Ltd.
DIFC	Dubai International Financial Center	NHA	National Highway Authority
DLC	Dubai Logistics City	NIT	Notice Inviting Tender
DURL	Dubai Rail Link	NLC	National Logistic Cell
EDR	Engineering Development Board	NPRP	National Procurement Reforms Program
ENR	Engineering News Record	NWFP	North-West Frontier Province
FBR	Federal Board of Revenue	OGRA	Oil & Gas Regulatory Authority
FBS	Federal Bureau of Statistics	P&D	Planning and Development
FIA	Federal Investigation Agency	PC-1	Planning Commission's Performa 1
FIDIC	International Federation of Consulting Engineers	PEC	Pakistan Engineering Council
FWO	Frontier Works Organization	PERT/CPM	Project Evaluation Review Technique/Critical Path Method
PIDs	Provincial Irrigation Departments	SOP	Security of Payment

PKR	Pakistan Rupee	SPO	Special Purpose Organization
PPP	Purchase Power Parity	SSGC	Sui Southern Gas Company
PPRA	Public Procurement Regulatory Authority	TEVTA	Technical Education and Vocational Training Authority
PSDP	Public Sector Development Program	ToR	Terms of Reference
PTA	Pakistan Telecommunication Authority	UAE	United Arab Emirates
RFP	Request for Proposal	USAID	United States Agency for International Development
RTA	Road & Transport Authority (Dubai)	WAPDA	Water and Power Development Authority
SECP	Security and Exchange Commission of Pakistan	WB	World Bank
SNGPL	Sui Northern Gas Pipelines Limited		

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**Technical Note 1**  
**DEVELOPMENT OF CONSTRUCTION INDUSTRY – A**  
**LITERATURE REVIEW**

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## **OBJECTIVE**

The objective of the literature review was to learn from available relevant national and international studies to guide the present study on Pakistan Infrastructure Implementation Capacity Assessment (PIICA) and avoid “re-inventing the wheel.” Since most developing countries faced similar problems, it would be helpful to draw upon such experiences of other countries and consider the lessons learnt in the local context. Therefore, the literature review is focused on understanding the capacity constraints as well as issues and problems that plague the construction industry in developing countries and documenting best practices and recommendations.

## **METHODOLOGY**

A web-based search was carried out and over forty research reports and papers (refer to Bibliography) were selected for conducting further research. The following relevant country assessment reports were extracted from the World Bank’s (WB) archives, such as; Pakistan Growth and Export Competitiveness, Poverty Reduction and Economic Management Sector Unit South Asia Region (2006b); Pakistan Country Procurement Assessment Report: Consulting Services (2006c); Pakistan Public Expenditure Management Strategic Issues and Reform Agenda (Volume I&II), Poverty Reduction and Economic Management Sector Unit South Asia Region (2004); Islamic Republic of Pakistan Country Financial Accountability Assessment, Financial Management Unit South Asia Region (2003); Pakistan Country Procurement Assessment Report, Procurement Services South Asia Region (2000), and others.

Two main websites, such as that of International Federation of Counseling Engineers (FIDIC), <http://www.fidic.org> and International Labor Organization (ILO), <http://ilo.org> among others were also consulted.

Figure 1 explains in graphics the structure of the Literature Review. It is divided into three parts. The first part highlights the review of the relevant reports, research papers, books and other web-based sources of national and international organizations on construction and consulting industry. The Review then identifies those common problems which are constraining the construction industry in developing countries in addition to highlighting some other areas of concern. Summary findings and recommendations together with international best practices that have taken the industry forward are given at the end of the report.

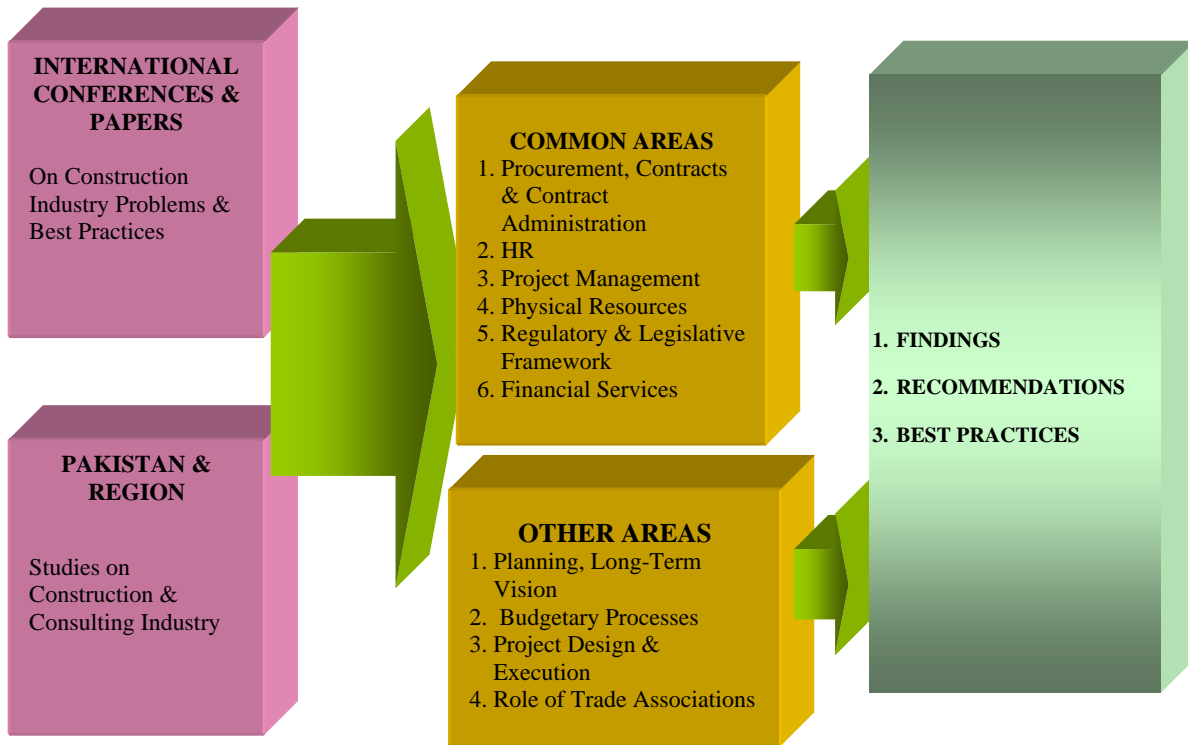
## **ABSTRACT**

The literature review further strengthens the argument that construction industry is an important sector of the economy and has multiple backward and forward linkages with other sectors. It contributes significantly to socio-economic development and creates employment opportunities in the country. However, there is a consensus on certain common issues that plague the construction industry in developing countries. The international studies have identified various best practices and recommendations for resolving such issues.

The review shows that generally the contractors and the overall business environment in developing countries is still at the development stage. Given the opportunity, they can overcome their inadequacies, but they cannot change the work environment. The challenges being faced by the industry in developing countries include insufficient education and training (lack of HR), absence of commitment from the government, lack of long-term vision and planning for the

industry, ineffective budgetary procedures resulting in cost over-runs, fluctuations in work load, defective contract documents, corrupt contracting procedures, lack of protection against adverse physical conditions, payment related delays, problems of bonding and insurance, lack of adequate financial resources, restrictions on imports, foreign exchange constraints, unfair competition from state-owned contractors and consultants, non-availability of equipment and spare parts and miscommunication of information.

**Figure 1: Structure of the Literature Review**



In addition, the Pakistan specific papers of previous two decades provide an insight into its construction industry and the business environment. They showed the problems which have persisted and the recommendations put forth. Over time some of these recommendations may have already been tried with varying degrees of success.

The literature review shows that sustainable development of the construction sector requires a long-term commitment from the government. The impetus for change has to come from the demand-side as many of the key factors requiring significant improvement are related to the role of the government itself. Over time, the government together with other industry players will have to shift from being just an external player and move towards self improvement and taking responsibility.

It is critical that the government looks at developing a long-term vision and policy for the industry supported by a coherent strategy that focuses on thinking and behaving the best, and institutionalizing a learning culture. In addition, other factors cited are development of techniques and technologies supporting high production performance, availability of basic resources and infrastructure and improvement in financial and Human Resources (HR). Due to

the unique and fragmented nature of the industry stakeholders, a comprehensive and holistic approach is needed to bring about desired cultural changes to support reforms. Stakeholders both within and outside of the industry<sup>1</sup> will all have to play their role to enable the industry's future growth.

The development of the construction industry in Singapore provides a good reference point on a holistic and comprehensive long-term approach to changing the business environment and culture. It shows that Singapore recognized the importance of this sector earlier on and institutionalized the need for continuous development through a strategy focusing on addressing HR, materials, technology, corporate development, improved documentation procedures, procurement, contracts, operating environments, payment chains, trade associations and institution building. The efficacy of a central body specifically for the development of construction industry in the developed and developing countries is cited extensively.

The construction industry in Pakistan is well aware of the challenges it faces and its issues, constraints and recommendations are also well documented in reports published from time to time. This study shows that business environment (demand-side), HR, equipment and materials are key factors restraining growth therefore showing that there are no short-term fixes for these problems. A sustained long-term committed approach to developing the construction industry (contractors, consultants and clients) is of paramount importance. Considering the Government of Pakistan's (GoP) ambitious development plans for the coming years, innovative and out of the box solutions would be required to deliver the proposed infrastructure projects.

## DETAILED FINDINGS

The areas identified which form a common thread in the literature reviewed and the corresponding recommendations are as follows:

### Inefficient Procurement Procedures

Procurement related issues are cited as perhaps one of the most serious barriers to development of the construction industry. Specific issues relate to inefficient prequalification practices and that parastatal organizations are provided unfair advantages. Additionally, inefficient bid evaluation; inequitable tender documents and inequitable contract administration including delays in making due payments and endemic corruption are also quoted as procurement related issues. (Kirmani 1988; Kirmani and Baum 1991; PEC 1990; Qamar et al. 1989; The World Bank 1984).

### Good Practices

**Prequalification:** In Singapore, any construction industry wishing to undertake a public-sector project must register with the Building and Construction Authority (BCA) under the Contractors' Registry System (CRS). The criteria for registration which is subject to occasional review include: track record; paid up capital; personnel employed; certification to quality, environmental, health and safety management systems. The CRS is considered to be a base in the industry development framework. The licensing scheme for contractors requires firms to be financially sound; have good safety records, employ qualified and experienced personnel to manage the firm and supervise works. The process has resulted in streamlining pre-qualification procedures.

<sup>1</sup> Such as, construction clients, consultants, contractors, designers, educators/trainers, government officials, professional bodies, quasi-government officials, researchers, material suppliers, machinery suppliers, construction lawyers, trade unions/representatives, and information providers, among others.

### ***Inefficient Prequalification***

Prequalification procedures are not fully transparent as the criteria are generally not declared prior to holding of bids. This makes the prequalification exercise rather subjective. Contractors in developing countries on the other hand, generally, may not have audited accounts or are reluctant to provide detailed information on their financial position and assets thus making the process of verification difficult (McKinsey 2003; Qamar et al. 1989; The World Bank 1984).

### ***Recommendations from Literature***

The literature (Kirmani 1988; Kirmani and Baum 1991; Qamar et al. 1989; The World Bank 1984 and 2006c) suggests the following measures for improving the prequalification process:

- Efficient prequalification procedures including the evaluation criteria, which eliminate incompetent contractors, reward competency and provide opportunities for fair competition should be developed. Fully transparent procedures should be made mandatory.
- Private and state-owned enterprises should be treated at par, awarding work to parastatal organizations stifles competition and restricts growth of the industry.
- Prequalification system must be linked with a good flow of information regarding the ongoing commitments of the bidders and it must be based on readily verifiable information. Employers of contractors should regularly verify information submitted for prequalification.

Several countries (Materu 2000; Ofori 2004) have formed central registries for the construction industry for streamlining and documenting the industry. The objectives of such registries, besides ensuring that contractors who observe business ethics and care for quality, safety and the environment, also include structured training in business management, on-the-job training, policy review, promotion of contractor associations, carrying out constant monitoring, observing regulations, education and promotion of the industry.

### ***Inefficient Bid Evaluation Practices***

According to the World Bank (1989), the general practice is to award the contract to the lowest-bidder without scrutinizing whether the bid is “workable” or “balanced” and whether the bidder has the capacity and capability in terms of experience and resources to carry out the contract. Often, the management fails to realize that these savings are not real. The contractor may bid low enough to win a contract but in turn there will be compromises in the quality of work done. The adverse effects of price based tendering including bankruptcies and lack of attention by contractors to quality and safety are well documented (Fox 2004; Ofori 2004; PEC 1990; The World Bank 1984).

#### **Good Practices**

***Bid Evaluation Procedures:*** The Government of Singapore has introduced a Price Quality Method (PQM) for procurement of public-sector projects to address the adverse effects of price-based tendering. The agencies have the flexibility to adopt a price to quality ratio of between 80:20 and 60:40 (with safety making up a minimum of 10 percent of the quality points), and select the relevant quality attributes and determine their relative weightage. The quality attributes are: (i) past and/or ongoing project performance (timeliness of completion and quality) (ii) relevant track record and (iii) project-specific requirements.

Similarly, it has been reported that selection of designers and contractors are almost exclusively done on the basis of bidding fee and tendered price – which is one of the greatest

barriers to improvement (Datta 2000). In the appointment of consultants, it is a common practice to renegotiate with the lowest-bidder to bring the quoted price further down even though the quoted bid may not be unreasonable (The World Bank 2006c).

The procurement of consulting services in Pakistan often resembles that of commodities and, poor capacity and integrity plagues the entire consultant engagement cycle from advertising to contract negotiation and execution. There is an excessive emphasis on price competition and negotiation, less on quality and none on independence. The small savings achieved in cost during design and supervision services is far exceeded by the wastage of public money due to poorly planned and implemented projects (Ali in PEC 1990; Kirmani and Baum 1991; The World Bank 2006c). Ali and Jafri et al. (PEC 1990), highlight the negative impact of delays in evaluation and award of contracts and negotiations.

### ***Recommendations from Literature***

- The literature (The World Bank 1989), suggests that the practice of negotiating with the lowest bidder should be allowed only if the bid is substantially higher than the engineer's estimate and that tender documents should incorporate a provision authorizing the employer to demand a higher performance security from the lowest-bidder, if this bid appears to be imbalanced or not sufficient enough for the required task.
- In countries that are developing a domestic construction industry, the long-term objectives must be reconciled with the short-term goal of providing a financial advantage to the employer, considering the capacity of domestic entrepreneurs to manage risks. Procurement practices should be fair and should lead to contracts that adequately protect the rights and stipulate the obligations of both parties (The World Bank 1984).
- Fair bidding procedures are a means for establishing good procurement practices. The preferred method is that of awards made to the lowest evaluated bid received from pre-qualified bidders (Kirmani and Baum 1991; The World Bank 1984).
- In Pakistan, the Public Procurement Regulatory Authority (PPRA) procurement rules (2004), stipulate that no negotiations should be done and the executing agencies should refrain from using the Least Cost Selection method unless projects are very simple since excessive emphasis on price discourages good consultants from entering competition. Bids should be evaluated on a Least Evaluated Cost basis which is consistent with current best practices. The application of the rules however, should be extended to cover all public procurement including those done by provincial governments and standard procedures defined to include specifically the selection and employment of consultants (The World Bank 2006c).
- Clients also need to widely advertise their requirements for professional services, constituting appropriate shortlists, properly evaluating proposals and concluding the contract expeditiously with the firm having submitted the best proposal without unnecessary haggling over price (Ali in PEC 1990; Jafri et al., PEC 1990; The World Bank 2006c).
- Public sector interprets accountability in a rather narrow sense. The industry needs to educate and assist its clients and users to distinguish between best value and the lowest price (Datta 2000).
- Minimize the use of in-house government engineering units. Such organizations should be privatized (Kirmani and Baum 1991; FIDIC 2001).

### ***Inequitable Contracts***

The literature (Kirmani 1988; Qamar et al. 1989; Palalani 2000; PEC 1990; Sultan 1999; The

World Bank 1984, and 2006c) highlights that in developing countries various forms of contracts are used and that they do not adequately protect the right or stipulate the obligations of both parties. Employers mask their inefficiencies by blaming the contractors for every setback and do not compensate contractors for adverse physical conditions and other acts of the government such as unscheduled changes in exchange rates, interest structure and import and taxation policies. Contract conditions are often vague and one-sided and generally lead to delays in payments by the owner. Contract documents are often too complex for the job to be done and sometimes inhibit participation in tenders by domestic contractors. Inexperienced and rigid contract supervision further exacerbates the problem (The World Bank 1984).

According to Qamar et al. (1989), one of the single most important constraints to the development of the construction industry in Pakistan is one-sided tender documents that are generally in use of most departments, except for a few like the Water and Power Development Authority (WAPDA), the National Highways Authority (NHA), and Oil and Gas Development Corporation (OGDC), who have worked with international agencies.<sup>2</sup> These one-sided documents also follow the same format as was used during the British period in the sub-continent. Some of the noticeable and objectionable practices of such tender documents result in causing delays in payments and making timely decisions, overruling of the engineer's decisions and are a source of endemic corruption.

Problems highlighted above encourage and lead to all kinds of imperious acts by employers during contract administration. Delay in payments by the employers drives contractors and consultants to desperation, ruins their profitability, cripples their professional integrity and hinders in meeting quality standards (Kirmani 1988; Kirmani and Baum 1991).

#### **Recommendations from Literature**

- Fair and equitable terms in contracts which can benefit the construction industry and improve the quality, timelines and cost of production. There should be legally enforceable

#### **Good Practices**

**Standardized Contract Documents:** The contract form prepared jointly by the International Federation of Consultants and Contractors (FIDIC) is often used in work funded by the World Bank and other international agencies. PPRA has in coordination with PEC, developed FIDIC based contract documents, the use of which has been made mandatory through legislation.

**Cost of delayed payments borne by employer:** General Regulations for Public Works Tenders and Contracts of Peru stipulated the accrual of commercial interests (at a rate fixed from time to time by the central bank) on delays beyond the specified payment period. It is extremely difficult for a public administrator to pay interest, which has not been budgeted. The provision, therefore, resulted in prompt contract payment.

**Assuring the payment chain:** In Singapore a severe decline in construction demand and output resulted in a spate of disputes on payments among clients and main contractors. There were disagreements among main contractors and sub-contractors, as well as suppliers too. The Security of Payment (SoP) Act 2004, was introduced by the government with the aim to facilitate cash flow in the construction industry by upholding the rights of parties to a construction contract to seek progress payment for work done, and providing a framework for quick and less expensive resolution of payment disputes through adjudication. The SoP Act applies to all parties in the construction industry for projects in Singapore and is based on similar statutes from Australia, the UK and New Zealand and makes the normal "pay when paid" clauses in contract unenforceable.

<sup>2</sup> Even in these organizations, invariably the clause for compensation due to delays in payment are deleted from consultancy services

measures in the contracts on delays beyond the specified payment periods (The World Bank 1984; Ofori 2004).

- Construction documents should be drafted on standard specifications and criteria that are suitable for the local markets and local circumstances. Contract documents should be tailored to suit the nature and size of the project and simplified documents should be used for smaller works. (Sultan and Kajewski 1999 and 2003; The World Bank 1989).
- Contractual risks should be decreased so that bidders will reduce the risk factors in their turnover and profit margins and offer keener prices. Measures could include clearer drawings and contract documents (Sultan and Kajewski 1999 and 2003).
- Payment chain needs to be facilitated and risk of delayed or denied payments be minimized. Accountability process and checks and balances should be put in place, making employers responsible for causing undue delays in making payment to contractors (Kirmani 1988; Ofori 2004; Jafri et al. in PEC, 1990).
- Cost escalation risks should be minimized and contractors and consultants be adequately compensated for increase in input costs and delays (PEC 1990).

## **Human Resources**

A shortage of professional and adequately skilled personnel at all levels of management and field operations amongst clients, contractors and consultants in the construction industry in developing countries has been widely cited across the reviewed literature (Consulting Engineering Services 2006; Datta 2000; Fox et al. 1999; Kirmani 1988; Kirmani and Baum 1991; Materu 2000; Ofori 2004; Qamar et al. 1989; Sultan and Kajewski, 1999 and 2003; The World Bank 1984, 2006b; and others).

The World Bank (1984), and Sultan (2003), reported that in developing countries a shortage of engineers, surveyors, equipment operators, and other skilled workers hampers the ability to undertake large volume of work with acceptable standards of quality workmanship. Some of the factors contributing to the suboptimal state of affairs prevailing in the industry in developing countries which are related to HR include:

- Inefficient and inexperienced management in project mobilization and logistics, especially in remote areas (Sultan 1999 and 2003).
- Low overall level of education<sup>3</sup> and lack of training of the available HR (The World Bank 1984).
- Brain-drain caused by low salaries offered to engineers and technicians leading to a general lack of discipline (Sultan 1999 and 2003) and the best ones usually looking for better prospects elsewhere (Consulting Engineering Services 2006; The World Bank 2006c). In Pakistan, in real terms, salary rates for consultants have fallen by more than 100 percent during 1985 to 2002, because of falling and intermittent demand from the public sector. A survey conducted by FIDIC in 1997, also confirms this by showing that remuneration for consultants in Pakistan was the lowest in all the countries surveyed (The World Bank 2006c).
- The industry in developing countries suffers from a lack of effective management skills, particularly in estimation of material, costing, programming, procurement and general contract administration (Materu 2000; Sultan and Kajewski 1999 and 2003; The World

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<sup>3</sup> In Haiti, for example, where the adult literacy rate is only 23 percent, the principle deficiency is clearly basic education. Many foremen cannot read or write. They can hardly be expected to take charge of construction work, which requires interpreting simple engineering documents.



Bank 2006c).

- Lack of good quality working environment and facilities and career paths (Datta 2000)

Qamar et al. (1989) have highlighted that efficient management of resources viz. human, financial, material and equipment is a prime quality required in a successful contractor. Pakistani contractors are in general weak in resource management. Moreover, they have yet to make systematic efforts to secure joint ventures with foreign contractors to promote transfer of technology that can enable them in addressing this weakness. Largely, non-professional managers and insufficiently qualified technical personnel head contracting firms in Pakistan. Even though PEC byelaws make it mandatory to employ graduates, however, most contractors fail to do so. This imposes severe limitations on capacity as well as the quality of work. Apart from technical weaknesses they also lack skills for risk management, marketing, financial control, work organization and quality control. The above mentioned contractors' inadequacies are further compounded by the dearth of trained operators of machinery, professional engineers and skilled tradesmen.

The literature cites a lack of importance given to development of good technical expertise and management skills in developing countries and the need to focus on training (Datta 2000; Fox et al. 1999; Kirmani 1988; Milford 2000; Murray et al., 2000; Rashid and Mulk in PEC, 1990; Qamar et al. 1989; Sultan and Kajewski 2003; The World Bank 1984 and 2006b).

While discussing the issues and strategies for the construction industry in developing countries, the World Bank (1984), highlights that the industry operates with limited and unreliable resources and is faced with a considerably wider and stringent range of risks. Since construction demand can vary considerably, the contractor must face the risk of sharp fluctuations in his volume of work, and hence in the number of employees and equipment needed for the job. The central issue for the development of a country's construction industry is the growth of human capacity to manage risks. Managers of construction companies generally give inadequate attention to the training of staff, especially in management skills, which is essential to the growth of the company. Owner-managers come from other industries and tend to outgrow their capacity to evaluate risks, particularly during periods of rapid expansion, which are usually associated with the upswings in the economy. Management constraints include inappropriate incentives. For instance there is a double loss when highly skilled technical personnel are promoted to a higher management level, displacing them from their field of expertise and placing in a field they are ill equipped for. In many developing countries, managers often commit their firms to bid prices based on the clients' estimates without carefully analyzing each job and its inherent risks. This failing is common in many private firms, which lack a structured management.

### ***Recommendations from Literature***

The literature puts forward the following recommendations for the enhancement of HR development;

- Salary incentives such as rewards and bonuses should be introduced to motivate people to learn and improve on their work (The World Bank 1984).
- An apprenticeship in building construction should normally be complemented with academic training in skills that are regarded as necessary to read and interpret modern construction documents, and in the basic management skills for potential foremen (The World Bank 1984).
- Needs of the construction industry for training owners, managers and workers should be assessed and institutions developed for meeting those needs (Kirmani 1988; Materu 2000).

- Encourage and promote sub-contracting to provide small contractors with employment and experience gained through working with the more experienced contractors (Kirmani 1988), and even through joint ventures with smaller firms (Murray 2000).
- Collaboration of domestic firms with experienced foreign firms on a long-term basis should be encouraged to ensure transfer of technology (Kirmani 1988; Kirmani and Baum 1991; Materu 2000).
- Contractors' associations should be motivated to encourage contractors to train their technical staff at various vocational training institutes (Kirmani 1988 Ofori 2004; Materu 2000).
- Promote excellence in the education of engineers, technicians, scientists and allied professionals. Curricula should cover technical subjects that are important to the national economy and related to business and professional management (FIDIC 2001).
- Senior officers in peer groups, in particular, should be introduced to the concept of general management and be encouraged to train their own staff in the skills required for the delegation of responsibilities (The World Bank 1984)
- Promote continued learning. It is essential that technical competence be rewarded with appropriate incentives. Promotion to a higher level must be conditioned

**Best Practices in Developing HR**

Useful practices adopted are highlighted as follows:

- **Employers pay for training:** Some countries, for example, Belgium, France, Germany and Italy require employers to pay part or full remuneration to workers who take leave for further training.
- **Transfer of technology:** A good example is of Korean contractors, who worked mostly as sub-contractors for large American companies after the Korean War, and were thus eventually able to transfer technology to their own country. Joint venturing arrangements with foreign firms which have a well defined training component for local firms have been most successful.
- **Structured on-the-job training:** The strategy followed by Guy F. Atkinson Company, a large contractor working on the Mangla Dam project in Pakistan, was very successful in training 20,000 workers. The key elements of this strategy were selection of workers with potential, enrolling them as trainees, giving initial briefings on the project and the goals of the company, imparting instructions using small scale models, giving field training with instructors, and finally allowing production under normal supervision. The same company on the Guri Dam project in Venezuela again used this successful model.
- **Institutional support:** The Building and Construction Authority (BCA) Singapore, provides opportunities for practitioners at all levels to upgrade their skills. It administers the Construction Industry Training Institute (CITI) which offers trades-level training and certification. The CITI also offers several certificate courses and also runs a number of diploma programs.
- **Continued professional development:** A recent development in Singapore is the introduction of a mandatory requirement for registered architects and engineers to satisfy a minimum requirement of continuous professional development.
- **Holistic approach:** The Tanzania CRB approach combines registration, regulation and promotion of contractors along with provision for training at all levels, education in construction business management and skills up-gradation.
- **Human Resource Development Fund:** In the context of best practices, the Malaysian experience of Human Resource Development (HRD), being emulated widely, is worth mentioning. The Human Resource Development Fund (HRDF) was set up to facilitate and encourage employers in the private sector to systematically retain and upgrade the skills of the work force in line with their business plans and national development. The trust fund is exclusively for training purposes (on the job and/or off the job) of private sector employees and in most cases expenses are paid in full. Training needs are identified by the private sector themselves and provided through approved private sector training firms, which can be local or overseas. The trust fund is managed by the private sector.

with learning of further management skills, for example, a manager should be able to coordinate work of his estimator, site manager, accountant, and the people in charge of personnel, equipment and supplies. He should then be able to reach a decision on a bid price after collating and analyzing information received from them (The World Bank

1984). Upgrading, retraining, acquiring multi-skills and continuous learning are necessary (Datta 2000; Ofori 2004; Sultan et al., 1999/2003).

- Employers of contractors as well as contractors associations should encourage construction companies to hire professional managerial staff to improve overall management at construction firms (Kirmani 1988).
- Employers of contractors should be encouraged to post consultants (other than “the engineer”) for the specific purpose of providing on-the-job training to contractors in construction planning and organizational and overall management skills (Kirmani 1988; Qamar and Muhammad 1989).
- Curriculum in universities and technical institutes should be revised keeping in view the industry needs at all levels and construction engineering should be introduced as a subject (Rashid PEC 1990).
- Consultants need to be adequately compensated (Kirmani and Baum 1991; Jafri et.srfoal, PEC 1990; Ali, PEC, 1990; George, PEC 1990; The World Bank, 2006c).
- There should be integration of technological infrastructure, and in particular public/private sector interactions, including the possibility of “extension services” supporting capacity building within the construction industry (Milford 2000).
- Structured technical collaboration and joint industry activities between the local domestic industry and international players, or between the established formal sectors and the emerging sectors should be encouraged (Devapriya et al. 2002; Milford 2000).
- Formal and structured feedback mechanisms and systems should be developed within the contractors’ and other stakeholders organizations to enable learning through project experiences in planning, design, implementation and contract administration (Datta 2000; Ogunlana and Butt 2000, Siddiqi in PEC 1990).

### **Need for Client Capacity & Institutional Building**

Ofori (2000), states that the construction industry everywhere faces problems and challenges, however, in the developing countries, these difficulties and challenges are present alongside a general situation of socio-economic stress, chronic resource shortages, institutional weaknesses and a general inability to deal with issues. The need of an apex organization in developing countries, to support institutions and capacity building and leading the process of development of the construction industry has been cited extensively in the literature (Kirmani 1988; Palalani 2000; PEC 1990; Weddikkara et al. 1999; The World Bank 1984).

Kirmani (1988) observes the need for employers of the construction industry to be trained with an emphasis on reorienting their attitudes and developing professional administration skills to implement contracts on a fair and equitable basis. Kirmani concludes that training employers is more essential than training contractors.

**Building Client Capacity**  
Since 1960, in Korea the government officers dealing with construction industry are provided training in the Construction Official Training Institute (COTI). The training is designed to instill an appreciation of respective responsibilities of stake holders. Training targets managers, provincial administrators, senior officials and staff from ministries and government corporations.

The World Bank (1984) stressed that specialized technical assistance is needed not only by construction enterprises but also by the administrators and supervisors of government projects. Weak management skills in the public sector agencies are a common problem in developing countries. The dual responsibility of the government as a client as well as a creator of the broader business environment further emphasizes the need to enhance the capacity of the government. Poor planning and weak budgetary processes lead to variability in demand for construction which

adversely impacts the industry.

Similarly, Kirmani and Baum (1991) point out that poor policies, incompetent procedures and practices of employers exacerbate the shortcomings in the industry. Fox et al. (1999), while talking about construction industry development and government, state that governments are weak and lack capacity as a client and as regulators. Post colonial attitudes are typically rigid and revolve around inappropriate systems and procedures. The role of the government needs to change from that of an investor to that of a facilitator in the construction industry (Weddikara et al. 1999). Naqvi (PEC 1990) states that the main problems are client's attitudes and lack of professional management. Sultan (2000), Khwaja (PEC 1990) and Naqvi (PEC 1990), have all identified that lack of coordination and clarity, lack of effective management skills, particularly in the areas of estimating, costing, programming and general contract administration and negative attitudes are found amongst clients. Some other factors contributing towards low client capacity and performance are poor remuneration, political pressures and distortion of development plans (Palalani 2000).

Qamar et al. (1989) observes that most employers of the contractors in Pakistan do not regard the contractors as partners in project implementation and at times treat them as adversaries. Contractors are the scapegoat for all that goes wrong and are often also blamed for the employers' own shortcomings, such as lack of familiarity with contract administration, work organization, construction planning, critical path analysis, monitoring and other aspects of construction management. Contract administration is viewed as the responsibility of the contractor alone instead of the employer and consultant working as a team. At present, there is no institution in Pakistan dedicated to the task of developing the construction industry in the country.

The World Bank (2006c) further highlights that in Pakistan implementing agencies do not have a policy of capacity building for staff involved in the selection and management of consulting services. Because of the scarcity of trained implementing agency personnel, several bilateral donors and the Asian Development Bank select consultants and negotiate contracts for projects that they themselves fund. There are indications that the best consultants are discouraged from seeking participation in GoP projects by the poor levels of capacity and integrity of those appointed to carry out selection and manage contracts. Moreover corruption appears to have become an accepted practice at all stages of the processes involving consultants. The weak capacity of clients in Pakistan and other developing countries and the significant impediments created in efficient delivery of services and works is also highlighted by Mulk and Naqvi in PEC (1990); Ofori (2006) and The World Bank (2006c).

The demand side of the construction industry does not only comprise project planners, administrators and managers but also other agencies and stakeholders such as external/internal auditors who can greatly impact the efficient delivery of infrastructure. For example, The World Bank (2000 and 2003), cites that shortage of adequately skilled audit staff hampers delivery of projects in Pakistan and highlights the training needs of auditors. According to a survey in the Pakistan Country Procurement Assessment Report (The World Bank 2000), major delays in payment result because of over indulgent accounting/auditing staff that misinterpret the clauses to serve their own purposes, in response, clients withhold payments unilaterally to provide for

**Best Practices**

**Government support:** Korea's construction industry has become highly developed and this is mainly through the proactive role of their government in its development. The Ministry of Construction (MoC) is entrusted with the execution of public works programs and it has a special bureau which is responsible for developing the construction industry. It drafts regulations related to taxation and export incentives and wages and profits in government contracts which are affecting the industry

anticipated recoveries due to audit objections. A similar negative role of audit has been highlighted by Ali (PEC, 1990). A culture has developed to avoid taking decisions and responsibility.

In a review of Pakistan Public Expenditure Management (The World Bank 2004), and George (PEC 1990) weak institutional capacity and a lack of coordination between planning and budgeting are shown to result in a mismatch between funding and proposed investment as a result of which substantial delays in project implementation and completion along with increased costs and lower benefits occur. Similar findings in other developing countries have been cited by Ogunlana et al.(2000), who highlight administrative and payment related inefficiencies in developing countries to be a major weakness.

Pakistan is clearly faced with the challenge of improving business environment for stronger sustained growth and competitiveness. Institutional capacities need to be significantly enhanced as Pakistan is presently ranked amongst the lowest with respect to governance indicators (The World Bank 2006b), and ease of doing business indicators<sup>4</sup> (The World Bank 2006a).

### ***Recommendations from Literature***

- The attitude of employers must be changed through training and should be directed towards adoption of international best practices. The training programs should be designed to highlight the importance of the construction industry in development (Qamar et al. 1989). The aim should be to alter the attitude of government officials towards contractors and consultants and create awareness about importance of construction as a factor of development, so that contractors and consultants are treated as partners instead of adversaries (Kirmani 1988). The traditional role of the government should change from that of an investor and regulator to that of a facilitator (Weddikkara 1999).
- Inculcate best practice culture through training and education which develops better ethical behavior (Fox et al. 2002).
- An independent agency should be established in the government or through public private partnership with defined objectives, responsibilities and accountability for promoting and developing the

<b>Best Practices</b>
<p><b><i>Construction Industry Development Organizations:</i></b> Singapore has taken the lead in demonstrating the effectiveness of a dedicated agency established to promote and develop the construction industries knowledge base, training and management development, promoting partnerships, best practices corporate culture, efficiency, effectiveness, professionalism and global competitiveness. The government of Singapore recognized very early on that the construction industry plays a key role. It developed a long term strategic plan and vision for the industry to change it from the three D's to the 3P's (i.e, from "dirty, dangerous and demanding" to one which is "professional, productive and progressive"). Decades of concerted and focused approach has now paid dividends – a world class construction industry is now emerging, industry exports to over 35 countries have increased from about S\$118 million during 1984 to S\$2.5 billion in 2004.</p> <p>Besides Singapore, dedicated industry development agencies are established in almost all developed nations (UK, Australia, Hong Kong, Japan and Canada) and in several developing countries such as India, Iran, China, South Africa, Malaysia, Tanzania, and Korea. Extensive networking between such organizations, government representatives, academia, professional bodies and trade associations on a regular basis through conferences and technical working groups is allowing development of an understanding of global issues and challenges and best practices.</p>

<sup>4</sup> Pakistan ranks in the 20<sup>th</sup> percentile with reference to governance indicators and 74<sup>th</sup> out of 162 countries in the ease of doing business category.

- construction industry (Fox et al. 2004; Kirmani 1988; Ofori 2000, 2004 and 2006; Campbell in PEC1990; Qamar et al. 1989; The World Bank 2004; Weddikkara 1999; and others).
- Technical assistance from international donors should be sought for developing appropriate training programs (Qamar et al. 1989).
  - Better coordination between key government departments needs to be developed (Fox et al. 2002).
  - Indicators need to be identified which assist in measuring performance and assessing behavior of the industry (Fox et al. 2002).
  - Clients need to be trained in order to better identify and appraise their needs, determine scope and content of services required, as well as qualifications of firms to be engaged and the appropriate criteria for selection, developing realistic budgets (without undue emphasis on cost saving at the expense of quality of outputs) and improved contract administration (The World Bank, 2006c).
  - Learning culture needs to be inculcated to increase the knowledge base (Fox et al. 2004).
  - Project implementation should be carried out through existing government institutions and staff in order to develop long-term capacity. Project Implementation Units (PIU) used to execute projects have shown to be less successful in resulting in sustainable institutional capacity building. In order to enhance the capacity of line ministries wherever possible, project implementation should be done through permanent government structures (The World Bank 2005).
  - Incentives should be provided along with more selective promotion criterion and expanded salary structures to attract high level managerial and professional skills. Continuous professional development can be achieved through correcting incentives for skill up-gradation and learning (The World Bank 2004 and 2006c).
  - It is critical for capacity in the management of project implementation to be built up among public administrators in developing countries. Key in this respect is an understanding of the risks which their countries face on projects and to develop capacities to ultimately manage special type of projects such as BOT upon transfer back to the government (Ofori 2005 and 2006).
  - Audit and other related government offices need to have properly trained personnel who are well-versed in the construction contracts (Ali in PEC, 1990).

### **Role of Trade Associations**

The lack of an effective contractors association is a serious constraint to the promotion of the construction industry in developing countries. Such associations are a key component in national systems of innovation and need to be strengthened (Kirmani 1988; Milford 2000; Murray et al. 2000; Campbell in PEC 1990). In industrial countries non-governmental organizations such as professional societies, universities and national or international trade associations have played significant roles in the development of mature and competent professional consulting firms (Kirmani and Baum 1991).

The literature discusses the important role of trade associations in negotiating with governments on matters affecting the industry's business environment. They can also liaise effectively with clients, suppliers and labor unions and can provide services that are best organized through a collegiate institution. They also provide HR training amongst other roles (The World Bank 1984). The experience of Singapore in developing and supporting the construction industry over a period of four decades, is exemplary and continues to offer lessons



for developing countries. The process has involved the formation of a dedicated agency for managing the industry's development, formation of medium-term strategic plans for developing the industry; and active involvement of the industry itself in the development process (Ofori 2004).

Although, there are several contractors' associations which exist in Pakistan, with generally sound stated objectives related to adoption of equitable tender documents, standardization of specifications for construction materials, promotion of excellence in performance and of ethical conduct in business.<sup>5</sup> However, in practice the associations are ineffective and seem preoccupied with obtaining tax rebates, bank loans, concessions and other such incentives. They do not have a sponsoring organization within the government and are not represented as an association in any of the chambers of commerce. They have few or in some cases, no achievements to report and are generally frustrated with the overall difficult business environment of the construction industry (Campbell in PEC 1990; Qamar et al. 1989). Similarly, consulting associations formed in Pakistan as early as 1957, have failed to be productive and unable to provide effective representation at the decision making forums. The main association (Association of Consulting Engineers of Pakistan) appears to be fragmented and weak (The World Bank 2006c).

In Pakistan, the voice of trade associations has not been listened to not only due to a lack of commitment, vision and leadership within the associations but mainly because the government has failed to recognize the importance of developing, strengthening and engaging trade associations in policy, planning and overall development of the construction industry (Ali in PEC, 1990; The World Bank 2006c).

#### ***Recommendations from Literature***

- The role of trade associations needs to be recognized, supported and developed as an effective link between the industry and government. Lessons learnt from the Singapore experience are of relevance for developing countries (Materu 2000; Murray et al. 2000; Ofori 2004)
- In Pakistan, the PEC should take a lead role in encouraging and strengthening of contractors associations and provide links

#### **Best Practices**

##### ***Effective Trade Associations***

***Imparting training:*** The literature provides example of the Contractors Association in Korea (CAK), which has been instrumental in the development of the construction industry by establishing institutes such as the Construction Workers Training Center (CWTC) and by designing training policies and methods (Kirmani 1988).

The Construction Industry Training Center (CITC) managed by the Chamber of Construction of Mexico is an independent industry financed organization which was set up to provide contractors with an industry wide facility for training construction personnel in compliance with Mexican laws (World Bank, 1984).

***Development of equitable contracts:*** The Peruvian Chamber of Construction (CAPECO) is a good example of a well-established and respected trade association. It has assisted in overcoming the trend of applying one-sided contracts for public works construction. It also collaborated with the government and the trade unions in the running of a technical training institute for the construction industry vocations (World Bank 1984).

***Medium for collaboration of all stakeholders:*** The Government of Singapore encouraged and supported the formation of the Construction Industry Joint Committee (CIJC) in 2000, to formalize co-operation among key organizations in the construction industry embracing clients, various design professionals and contractors. It comprises the presidents of nine professional institutions and trade associations in Singapore's construction industry. The ideas behind the formation of CIJC was to create a forum for discussing issues of common interest and to provide a single voice on opinions, needs and aspirations of the government and other relevant parties. It is making its expected contribution in the development of the industry by meeting regularly to discuss issues related to the construction industry (Ofori 2004).

<sup>5</sup> Objectives of the All Pakistan Construction Contractors Association (APCCA)



- between them and the government (Qamar et al. 1989).
- Trade associations should be assisted and developed in order to facilitate technological diffusion and enhance national innovation systems (Milford 2000).
  - Establishing and strengthening professional societies and trade associations should be one of the principle concerns of the government (Kirmani et al. 1999, Campbell in PEC 1990). Emphasis should be on trying to achieve the stated objectives of the associations. One way of achieving the efficacy of these associations is to ensure their adequate representation in the chambers of commerce (Qamar et al. 1989).
  - Close liaison, and cooperation through “twinning” arrangements with counterparts in developed countries should be considered to facilitate learning and training (Kirmani et al. 1991).
  - Industry associations should form high level liaison contacts between government and industry with a formal structure and mandate targeted at resolving disputes over matters such as procurement and contracting practices. These efforts should be facilitated by strong public support (FIDIC 2001).
  - Trade associations should play a role in training and technical assistance, advocacy in policy development, facilitating joint ventures and strategic planning. Role of trade associations in the development process needs to be mainstreamed (Carradine et al. 2000).
  - The construction industry is fragmented and has numerous stakeholders. An apex body which can act as a joint forum to channel the voices and common issues of all components (contractors, consultants, client agencies, regulatory bodies, financing and insurance sectors) of the industry to the government and other relevant parties should be set up, focus being on taking win-win value-chain initiatives (Ofori 2004; Campbell in PEC 1990).

### **Policy, Regulations and Legislative Framework**

Due to a lack of proper institutional support, insufficient policies, cumbersome regulations and absence of an appropriate legislative framework, the industry is not prepared to respond quickly and efficiently to the needs of clients. The literature highlights problems because of which construction work in many developing countries is suffering from administrative and allocation inefficiencies. Work usually takes much longer than expected and often the construction standards are sidelined (The World Bank 1984). The direction and impetus for change must come from major/leading clients, which are invariably the public sector agencies. Achieving an ambition lies in commitment. Construction industry’s commitment to work with major clients and deliver viable performance improvements, clients’ commitment to fulfill their role to lead the implementation agenda and government commitment to create and sustain the environment essential to enable dramatic improvement (Datta 2000). It is the strategic role of the state as the legislator and policy maker to enable new techniques of procurement and construction to be adopted. The state as legislator also sets the standards or constrains the market environment within which the industry operates. The fluctuations in demand for construction industry output are affected by the regulatory policies of the government (Kajimu-Shakantu et al. 2004).

In developing countries, reforms in areas such as monetary policies, interest rates, budgetary regulations are needed to permit multi year contracts and allow continuity of cash flows (The World Bank 1984). In addition, progressive policies are needed in areas such as registration of contractors and consultants, technical auditing and monitoring of construction programs, construction contract procedures and documentation, dispute resolution, construction services imports, exports and developing capacity (Weddikkara 1999).

The government of Singapore recognized the importance of the construction industry and a need for a complementary long-term strategy to ensure its development. Various measures were adopted such as change in policies, regulatory framework and close liaison with the trade associations. The government is quick to respond to developing needs, for example, it introduced legislation to protect the firms at the lower end of the value chain (the sub-contractors and suppliers) which have few options in payment disputes, other than expensive litigation or time-consuming arbitration. The long duration of such settlements of disputes usually resulted in many firms facing financial difficulties, or becoming bankrupt, and construction projects being disrupted and delayed (Ofori 2004).

#### **Best Practices**

##### ***Responsive industry regulation:***

A major phenomenon in Singapore's construction industry in the light of a severe decline in construction demand and output was a spate of disputes on payments between clients and main contractors, and between main contractors and subcontractors, as well as suppliers. The Security of Payment (SOP) Act 2004, aims to facilitate cash flow in the construction industry by upholding the rights of parties to a construction contract to seek progress payment for work done, and providing a framework for quick and less expensive resolution of payment disputes through adjudication. The Act was formulated after consultation by the Building and Construction Authority (BCA) and the Ministry of National Development (MND) with the industry and major public sector client agencies. It is based on the features of similar statutes from Australia, the UK and New Zealand.

The SOP Act applies to all parties in the construction industry with written contracts for the works or the supply of goods or services for projects in Singapore. The key features of the SOP Act are: a) the rights to payments for work done or supply of goods or services, which makes the normal "pay when paid" clauses in contracts unenforceable; b) adjudication instead of arbitration and litigation and c) the rights to suspend work and place lien on uninstalled materials, if not paid after adjudication (Ofori 2004).

In most developed and developing countries, the majority of the firms are small and medium firms and bulk of the infrastructure is developed through these firms as independent contractors or as sub-contractors. For example, in South Africa, 40 percent of the work is delivered by seven large firms, while the rest is through small and medium firms. The ability of large contractors to perform to demands of cost, time and quality is therefore, influenced in a direct way by the performance of the sub-contractors it employs. Capacity of the industry can be significantly enhanced by providing an enabling regulatory and policy environment which promotes professional development of this segment of the industry (Edum-Fotwe in Brooksbank 2002; Murray 2000).

The World Bank (1984) observes that taxation regimes have an important effect on the development of the construction industry. An emerging industry can be assisted in its development through tax incentives such as tax holidays, investment or reinvestment allowances or through accelerated depreciation on equipment. Such incentives however, should be temporary to assist the industry in the incipient stage. Tax incentives that have been designed keeping in mind demand fluctuations and market characteristics help foster the growth of the industry. However, currently some countries tax construction on the basis of the gross value of finished work or annual turnover. These taxes do not capture total profitability and the variability in demand. Such tax levies are usually adopted in those countries where accurate accounting practices are not adopted intentionally or due to a lack of sophistication in the industry.

In Pakistan, the quality of services is usually low due to the adoption of unsound professional practices in consulting procurement and project administration. Transparency, accountability and integrity problems are reported not only during the selection process but also during the execution of services. Good consultants whether national or international, are often reluctant to undertake assignments in Pakistan, primarily due to a lack of effective policies, weak legal, institutional and procedural frameworks and low level of enforcement. The main

shortcomings of the present regulations on consultants stem from the fact that these are inspired by practices that are appropriate for procurement of goods rather than intellectual services. There is an excessive emphasis on price competition and negotiation, less on quality and none on independence. Though the rules on public procurement were issued during 2004, but unfortunately these do not deal specifically with the selection of consultants and instead have put “consulting services” as part of other services which include works and services, and “contractors” include “consultants” (The World Bank 2006c).

While, PEC is the regulatory body for consultants and contractors in Pakistan, it focuses mainly on encouraging contractors to employ qualified engineers without a systemic effort to verify the particulars submitted such as equipment, staff, past experience, current capabilities and commitments. It does not facilitate joint ventures or programs aimed at encouraging transfer of technology or capacity building. PEC rules play a protectionist role in that foreign companies face difficulty in registration. PEC also faces a conflict of interest in that it is both a regulatory body and a quasi-trade association (Qamar et al. 1989; The World Bank 2000).

The business environment in Pakistan is further challenging due to the construction industry not being given any policy or legislative support or incentives as provided to other industries (Ahmad in PEC 1990; Rashid M, in PEC, 1990).

### ***Recommendations from Literature***

- The construction sector should be recognized as an industry through a legislation which provides a regulatory and policy framework with the objectives of sustainable long-term capacity building (Ahmad in PEC 1990; Rashid in PEC 1990; Kirmani 1988; Ofori 2004).
- An independent government department or ministry with well-defined objectives and goals for development of construction industry should be set up (Fox et al. 2004; Kirmani 1988; Ofori 2000, 2004 and 2006; Campbell in PEC, 1990; Qamar et al. 1989; The World Bank 2004; Weddikkara 1999; and others).
- Policies aimed at providing long-term active support for developing the construction industry and its stakeholders should be formulated and proactively enforced (employment, monetary, budgetary, training, continuing education, development of professional management skills, and development of an enabling environment), (Ofori 2004; The World Bank 1984; Weddikkara 1999).
- Governments should promote the growth of the industry by discontinuing the current practice of preferentially awarding contracts to public sector firms (Qamar et al. 1989; The World Bank 2006c).
- An appropriate registration and licensing system in consultation with contractor and consultant associations should be introduced (Kirmani 1988).
- All legislative and regulatory policies should be harmonized across all levels of government such as, federal, provincial, local and district (Palalani 2000; The World Bank 2006c).
- The informal sector should gradually be associated with the formal sector through the construction sector and Non Governmental Organization (NGO) membership. This could help the process of controlling and monitoring informal construction activities (Sultan et al. 2003).
- Legislation to encourage and recognize knowledge management initiatives should be put in place (Eliufoo 2005).
- Governments should develop policies to facilitate growth of small and medium sized firms such as through joint venturing with larger international or domestic firms. Such

associations should focus on management and skills training and knowledge transfer (Brooksbank 2002; Kirmani 1988; Lavoie et al. 1989; Murray et al. 2000; The World Bank 1984).

- Taxation policies in a country should be designed in accordance with the specific needs of the industry on a case to case basis. Tax regimes should encourage growth and development of the industry, and incentives should be formulated for limited time periods. Policies should promote corporate structures having proper accounting procedures in place. Fiscal policies designed to levy taxes on annual turnover or value of finished works do not take into account actual profitability and thus preclude an incentive to maintain proper books of accounts, documents and records (Murray et al. 2000; The World Bank 1984).
- Demand side interventions should be developed as they are less disruptive and lead to the creation of innovative solutions that help the target industry through new processes that are often modeled on practices of successful industries. Supply side interventions often distort markets and are expensive to administer (Hindle 2000).
- Along with policies which allow access to finance and credit, streamlining customs and import procedures to facilitate the acquisition of equipment, spare parts and materials should be implemented. Such policies have to be coupled with training of operators and skilled mechanics (The World Bank 1984).
- FIDIC (2001), make the following recommendations for developing the consultancy sector:
  1. Governments undertake policy, financial and legislative initiatives to promote the consulting engineering industry. It suggests that the government should promote excellence in the education of engineers, technicians, scientists and allied professionals. The curricula should cover technical subjects that are important to the national economy.
  2. The government should declare a public policy for the industry including support for the participation of national industry in domestic and internationally funded projects.
  3. Financial initiatives should include adequate long-term funding for educational and training institutions. Proper financing should be provided for national engineering consultants in less developed countries to modernize services and to access information technology.
  4. The creation of a legislation framework with a rigorous entry criterion for both academics and those with professional experience, the assignment of professional responsibility and accountability, adherence to a code of ethics and independent and fair disciplinary actions
  5. Provide clarity in the legal obligations of design professionals. The obligation being to exercise reasonable skill, care and diligence in undertaking services. Clear time limits need to be set failing which the liability should be terminated.
  6. Encourage the use of recognized international conditions of contract and of professional engagement.
  7. Establish tax laws and related policies that will stimulate growth of knowledge based industries, with incentives to encourage entrepreneurial private sectors. Laws should be consistent with international laws such as those of the World Trade Organization (WTO), (FIDIC 2001).
- Policies and regulations should be developed to facilitate consulting firms to participate in overseas projects. The collateral and margin requirements for bank guarantees and bid/performance/mobilization bonds as well as credit for operational expenses should be made available on favorable competitive terms (Ali in PEC 1990).
- Regulations and policies to provide a level playing ground for parastatal and private

sector organizations are needed and no discrimination should be made (Kirmani et al. 1991; The World Bank 1984).

- In Pakistan, the PEC should be appropriately strengthened and assigned the responsibility of overall development of the construction industry. In addition to its current role as registrar of contractors, consultants and professionals, it should be made responsible for ensuring introduction of equitable documents, setting up independent tribunals for dispute resolution, monitoring the performance of contractors, facilitating joint ventures and assuming a leading role in strengthening the contractors' associations (Qamar et al. 1989).
- The dual role and function of the PEC as an agent of the state and a kind of professional association should be eliminated. The PEC by-laws that deter foreign consultants and contractors from working in Pakistan should be reviewed (The World Bank 2006c).
- In Pakistan, the Public Procurement Regulatory Authority<sup>6</sup> (PPRA) procurement rules should be standardized and extended to include the selection and engagement of consultants. The regulations should reflect modern best practices and encourage fair competition, better quality and easier access to foreign firms, enabling transfer of technology to the local consulting industry (The World Bank 2006c).
- As a policy, the guidelines on selection and use of consultants being adopted by the WB and the ADB, should serve as examples when consultants are selected even under local competitive bidding (The World Bank 2006c).
- In Pakistan, sustained efforts need to be made to improve regulations and policies impacting governance, competitiveness, ease of doing business (processes), education and worker skills, since Pakistan currently ranks poorly with respect to related performance indicators (The World Bank 2006b).

## **Physical Resources**

Purchase, finance and leasing of construction equipment and machinery, credit facilities for operational costs and materials are the main physical resources used in construction and are largely acquired from sources outside the industry. In addition, availability of construction industry data is yet another challenge for the industry. The literature reviewed (Consulting Engineering Services 2006; Fox et al. 1999; Kirmani 1988; Materu 2000; McKinsey 2003; PEC 1990; Qamar U et al. 1989; The World Bank 1984, and others), cites shortage of equipment and machinery, lack of financing and availability of credit, and foreign currency restrictions as well as shortage of materials as common problems in developing countries.

### ***Equipment – Purchase, Finance and Leasing***

As in the other developing countries, in Pakistan also, there is a constant demand for equipment used by contractors primarily because of considerable variation in requirement for specific types of equipment each year for a project and also because of contractors' reluctance to invest in equipment purchase. Procedural delays, high duties on imports and a lack of necessary financing, add to the problem. Limited financial resources of construction companies and the stringent requirements of leasing institutions make access to equipment difficult for most companies. This has led to a lack of required equipment in the construction industry (Qamar et al. 1989).

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<sup>6</sup> In Pakistan, PPRA was set up during 2004, and has issued procurement rules applicable to all federal level public procurements.

Kirmani (1988), and The World Bank (1984), have given a detailed account of prior experience in financing for equipment. Contractors need financing to purchase equipment, but institutional financing is not easily available in developing countries. Unlike manufacturing and the utilities industry, construction does not operate at a fixed location or from a well established office and plant. Contractors tend to have modest offices located on cheap industrial land. The principle asset in construction is equipment, which depreciates over time. These assets provide a weak collateral basis, when considered alongside other problems, such as, weak management, poorly designed contracts, delayed payments and risks involved in construction. Therefore, companies have significant difficulties in acquiring financing.

Development Finance Companies (DFCs) are financial intermediaries which can provide an avenue for channeling external assistance to the construction industry.

Several WB projects provided support for equipment and machinery financing through DFCs in Egypt, Burundi, Ethiopia, Ghana, Pakistan, Philippines, India, Nepal and South Korea. However, the results were mixed as many DFCs and commercial banks do not have the experience in assessing construction enterprises as potential borrowers. It is clear that the strategies followed for financing equipment did not address the issues affecting contractors' costs and returns.

Similarly, leasing strategies in most of the countries were unsuccessful in making an impact and failed due to unnecessarily long bureaucratic procedures, financing of the wrong type of equipment and due to the absence of proper protection to DFCs. However, it is mentioned that the leasing models followed in Philippines by the Private Development Corporation of

#### Best Practices

**Infrastructure Equipment Bank:** SREI Infrastructure Finance Limited is the leading national infrastructure equipment finance and infrastructure project finance company in India. It is amongst the largest Non-Banking Financial Institutions (NBFIs) in the country with an asset base of more than US\$890 million (Rs4000 crores). SREI is the only infrastructure financing company from India to get listed on the London Stock Exchange (LSE).

Having prudently identified India's infrastructure sector as its principal growth area, SREI has built a unique business model, which revolves around financing of infrastructure, construction and mining equipment, infrastructure projects and renewable energy systems. In order to serve its customers better, SREI also offers: distribution of insurance products (life and non-life), investment banking and services, venture capital, foreign exchange services and retail financing services through its subsidiaries. In addition, through its associate concern Quipo Infrastructure Equipment Ltd. (QIEL) set up in 2002, SREI has pioneered the concept of renting of construction equipment in India under the brand name of Quipo which is India's only end-to-end equipment rental company serving infrastructure projects across the country. Multilateral investors such as IFC Washington, FMO Netherlands, Swedfund International AB Sweden and an international equipment manufacturer, Ingersoll Rand, together hold more than 54 percent of Quipo's stake.

Quipo provides state-of-the-art equipment on rent for a whole range of construction, telecom, oil and gas requirements along with value added services such as trained operators to run and service the equipments and on-site repairs and maintenance. With tailor-made solutions suited to specific needs, Quipo enables the customers to focus on their core competence i.e. construction and project management and leads to increased mechanization in the specific industry and superior quality of infrastructure. A key service provided is information pertaining to equipment such as availability, equipment mix, optimum utilization, accessibility, sourcing imported equipment, pooling of equipment, consultancy, application advice and method engineering. A facility for depositing idle equipment from construction companies and contractors to ensure revenue for equipment owners is also provided.

During 2005, Quipo signed an agreement with Henry Butcher (a division of the Go Industry Group - one of the largest industrial asset management companies covering Asia-Pacific, Europe and America) for the joint-venture called Henry Butcher International Valuers & Auctioneers (India) Limited. The 50:50 joint-venture provides infrastructure and industrial asset valuation and auctioning services. It is likely to be of immense benefit to asset reconstruction companies working as a catalyst for realizing cash out of non-performing assets.

Philippines, as well as by the DFCs in South Korea, were successful as it gave the freedom to DFCs to lease equipment to various industries including construction industry without any restriction and with easy loan processing arrangements (Kirmani 1988).

The success story of the First Equipment Bank, Quipo established in India during 2002, illustrates the benefits of a holistic value-added approach which takes into account the peculiarities of the construction industry and its specific needs (Consulting Engineering Services, 2006).

### ***Credit, Liquidity and Cash Flows***

The construction industry, in general, faces severe problems related to cash flows, liquidity and obtaining credit from financial institutions (Ahmad in PEC 1990; Jafri et al. in PEC 1990; Kirmani 1988; Materu 2000; Ogunlana and Sysavath 2000; The World Bank 1984). Delays in payments and construction often occur due to negative attitudes of employers, weak contract administrative capacities of implementing agencies, planning and budgetary mismatches, poor contract documents and other reasons (Kirmani 1988; Ogunlana and Sysavath 2000; The World Bank 2004). The impact of delays in payment cause negative cash flows for the major part of the project implementation period and the contractors end up acting as financiers (Rashid in PEC, 1990; The World Bank 1984; Kirmani 1988). Kirmani demonstrates that these negative cash flows can persist for periods ranging between 21 to 47 months in a typical project having duration of five years.

Kirmani (1988) mentions that in developing countries, the industry is not able to access credit easily since most companies do not have professional management, corporate structures or maintain audited accounts and verifiable documentation on assets, turnover and profitability. Therefore, these factors coupled with other uncertainties make the industry a high risk proposition. On the other hand, the World Bank (1984) highlights that most banks do not have personnel experienced in assessing construction enterprises as potential borrowers. The characteristics of the construction industry require special management

and organization assessment to be carried out together with the usual financial analysis. Some countries have successfully established special banks dedicated to the financing of construction works and the construction industry. One such example is of BANOBRAS of México. By contrast, in other countries, failures have occurred partly due to a lack of entrepreneurial vocation, management ability and resources involved in developing the banking industry.

**Best Practices**

***Special institutions:*** Banco Nacional de Obras y Servicios Públicos (BANOBRAS) of Mexico finances a wide range of activities including the construction of public works and low-cost housing. The bank, though government owned, exercises a high degree of independence. Since its inception in 1933, it has been issuing mortgage bonds and borrowing from international sources. It has, undoubtedly, helped the Mexican construction industry become one of the most developed in the world. One essential feature of the BANOBRAS' support to the industry has been its provision of short-term loans to public works contractors. Funds are advanced against the security of an assignment of the contractors' receivables from the government agency sponsoring the project. In this way, the uncertainty and responsibility of collection of funds are removed from the contractor's side. As part of its trust activities, BANOBRAS also operates a special fund that can provide up to 25 percent of the full value of the project; this is used to finance the start-up costs of construction by public works contractors (The World Bank 1984).

Qamar et al. (1989) further say that due to numerous defaults by Pakistani contractors in the past, financing institutions and insurance companies in Pakistan consider construction a high risk business and are generally over cautious in their dealings with contractors. It is not recognized as an "industry" by the financial institutions and contractors are not given credit on the same terms as is the case with other industries. Similarly, insurance bonds are not accepted



by most organizations as insurance companies have a poor track record of honoring their bonds. Contractors need credit and bonding facilities for bid and performance securities, guarantees for release of retention money, securities for advance, procurement of plant and equipment, risk assurance and working capital. According to All Pakistan Construction Contractors Association (APCCA), one of the major constraints is obtaining institutional credit on reasonable terms and conditions. Jafri et al. (PEC 1990), Ali (PEC 1990) and Kirmani et al. (1991), have also highlighted the dearth of financing and credit facilities as being a constraint for the development of consulting firms.

### ***Recommendations from Literature***

- Payment chains in the industry must be streamlined and protected, without which the industry cannot develop. Timely payments allow access to multiple financing options and reduce the uncertainty and risks (Ofori 2004; Burney in PEC, 1990; Khwaja in PEC, 1990; The World Bank 1984).
- Specialized infrastructure financing institutions on the model of Quipo (India) should be set up. The key is to couple finance, leasing with technical support, training and other related services. A holistic and innovative approach is needed to address the specific construction industry needs (Consulting Engineering Services 2006; Ahmad in PEC, 1990; The World Bank, 1984).
- Governments should proactively pursue banks to provide credit to construction and consulting firms. Construction should be recognized as an “industry” for credit purposes and stakeholders should help lending institutions develop a credit rating system for contractors. Technical assistance to the banking sector for acquiring necessary skills to assess the construction sector credit worthiness should also be provided (Kirmani 1988; Kirmani et al. 1991; Ahmad in PEC 1990; Jafri et al. PEC 1990; Haq PEC 1990; Qamar et al. 1989; The World Bank 1984).
- Where volumes of construction business are small, even existing banking channels can be used, given that technical assistance is provided to overcome managerial and technical shortcomings to help such banks appraise construction enterprises and risks correctly (The World Bank 1984).
- In the case of small and medium sized firms, to achieve long term success more innovative approaches are recommended including guaranteed cash flows, contract clauses which facilitate cash flows, establishing of revolving funds, use of escrow accounts, along with technical support to improve management and technical capability (Crouch and Park in PEC 1990; The World Bank 1984).
- FIDIC (2001), recommends that for consultants’ professional growth, they should be provided financing support in: a) education, b) capacity building and c) financial and logistical support for participating in technical events held within the country.
- To reduce the cost of doing business in Pakistan, insurance bonds should be acceptable by employers as bid money, performance security, retention and for the purpose of mobilization of advance. This provision should be provided legal cover (Ahmad PEC 1990; Burney PEC 1990; Khwaja in PEC 1990).

### ***Materials***

Uncertainty of materials availability, transportation problems, importation procedures and protection of inefficient local manufacturers and cartels are cited as common problems in developing countries (McKinsey 2003; Sultan et al.1999 and 2003 and Lister et al. 2004). For example, in Trinidad and Tobago, the protection given to local manufacturers of approximately 40 types of building materials led to high prices and insufficient supplies (The World Bank 1984).

While in places like Yemen, there is excessive use of construction materials in traditional and modern buildings, due to inconsistent use of technology and reliance on traditional methods. In addition, building materials face high costs of delivery, handling, warehousing and transport (Sultan et al. 1999 and 2003).

The literature emphasizes the fact that construction materials typically contribute more than fifty percent of construction output and influence the technology and levels of capital and labor that will be used in construction. Shortage of local materials increases the need for imports, adds to the cost and delays the completion of works. Problems cited also include lack of standardization of materials, difficulties in importing goods, poor quality of local materials and high transportation costs (McKinsey 2003; Kirmani 1988).

### ***Recommendations from Literature***

- Long-term solutions to shortages need to be carefully studied in relation to the size of the market, availability of raw materials, energy demand for processing, cost and economic implications of locally manufactured material, the availability of foreign currency for imports and the substitution by local materials through changes in technology (The World Bank 1984).
- Import restrictions should be abolished. Duty-free imports of certain materials should be permitted, and price controls be imposed on materials whose shortage had resulted in undue escalation in prices (The World Bank 1984).
- More research is required on local construction materials. These should be developed to allow the industry to benefit from the available local resources and reduce exposure to undue risks. Management of resource and efficient use of local materials should be encouraged (Datta 2000; Kirmani 1988; Sultan et al. 2003).
- State or private enterprises that monopolize or make cartels in the manufacturing, importation or marketing of basic materials affect construction industry. Imports should be allowed at realistic prices to stimulate efficiency in local production as well as counter cyclical shortages of essential materials (The World Bank 1984).
- For countries like Pakistan from which manufactured materials are exported to neighboring countries, appropriate measures and incentives should be in place to reduce abuse of export facilities and introduce robust documentation processes (Lister 2004).
- Construction industry materials and labor costs should be regularly researched and published to provide an authentic basis for price compensation (Rashid PEC 1990).

### ***Key Statistics and Industrial Data – Importance of National Databases***

The literature cites the importance of maintaining data and information, as a consolidated knowledge base for reference, planning and selection. Such databases could be linked to technical development in the construction industry and to the knowledge of construction costs and local resources and a regional cost index could be established (Sultan et al. 2003).

A database, for example, could also have information on supply of materials in which opportunities for substitution often exist. Therefore, an adjustment in the basic technology used in the design may widen the choice of materials that can be used often to achieve comparable quality and durability at comparatively lower costs or higher savings in foreign exchange. For substitutes to become available, the option for substitution must be made known. This is possible if extensive field investigations are carried out. These include geological and soil mapping, testing and experimentation with materials (The World Bank 1984).

The World Bank (2004) cites that in Pakistan, availability of reliable primary data and research and analytical work which are key for good strategic planning and investment are lacking as unfortunately, investments in primary data collection have been few and sporadic. Similarly, while discussing the weaknesses in the planning and monitoring systems, the report states that the reliability of benchmarks and indicators is undermined by the absence of reliable and credible database coupled with the capacity to interpret and analyze the data. There is considerable lag between data collection and availability. The World Bank (2006c) cites that data on firms working in the construction industry such as annual turnover, employee remuneration and projects are lacking which precludes an assessment of the industry trends. Public administration tends to underestimate the value of knowledge and comprehensive studies to support reforms, sound investments and good governance.

### ***Recommendations from Literature***

- Project designers should be linked to technical development in the construction industry and to the knowledge of construction costs and local resources (Sultan et al. 1999 and 2003).
- Establish a regional cost index to benchmark construction costs and affordability in addition indicators should be developed to measure construction industry development and performance. Such indicators should be formulated and updated on a regular basis (Sultan et al. 1999 and 2003).
- Historical and national databases for previously executed projects, containing data such as cost, time, human and construction resources, cost overruns, delays and main deficits should be developed. Standardized definitions of types of construction work should be used (Huyssteen 2001; Sultan et al. 1999).
- A worker registration scheme with the view to building a core team of foremen and tradesmen in key trades should be considered in order to raise the productivity and professional image of the industry (Ofori 2004).
- A cost database should be established to prevent government over expenditures and help prepare accurate budgets (Palalani 2000).
- A mechanism for collecting and sharing information on equipment available in the country has been recommended (Materu 2000).
- A dedicated website to promote group networking should be established on which business information such as work opportunities within the country and abroad, technical knowledge, equipment availability and material sources could be posted for quick access by the industry. In addition information pertinent to the industry should be published on a quarterly basis. Such diffusion of knowledge can help strengthen national innovation systems (Jafri et al. in PEC 1990; Materu 2000; Milford 2000).
- Qamar et al. (1989) recommends that in Pakistan, PEC should maintain an updated database for all medium and large contracts to facilitate joint ventures between local and foreign firms. This database, together with a list of local contractors interested in entering into joint ventures, should be distributed to Pakistani embassies abroad as well as to chambers of commerce, contractors associations and government departments associated with the construction industry in other parts of the world.
- Data on records of construction industry firms' annual turnover, employee remunerations, and other information should be collected to serve as a tool for planning (The World Bank 2006c).
- Given the fundamental importance of reliable data, countries need to invest in strengthening institutions and programs to continue surveys, research and analytical work pertinent to sector needs. Such data should be assimilated and disseminated in a timely

manner (Rashid PEC 1990; The World Bank, 2004).

## CONCLUSIONS

The literature review reconfirms that the construction industry is an important sector of the economy and has multiple backward and forward linkages with other sectors. The industry contributes significantly towards socio-economic development and creating employment. There is a consensus on certain common issues that plague the construction industry in developing countries. The international studies have identified best practices and recommendations for resolving such issues. The studies have all used different research methodologies ranging from survey analysis to expert opinions.

The review shows that in general, the contractors and the overall business environment in developing countries remains under-developed. Given the opportunity, they can overcome their inadequacies, but they cannot change the environment. The challenges being faced by the industry in developing countries include a lack of adequate education and training (non-availability of suitable HR), lack of government commitment, absence of a long-term vision and planning for the industry, ineffective planning and budgetary procedures, fluctuations in work load, defective contract documents, corrupt contracting procedures, lack of protection against adverse physical conditions, delays in payments to contractors, problems of bonding and insurance, lack of adequate credit (lack of financial resources), restrictions on imports, foreign exchange constraints, unfair competition from state-owned contractors and consultants and problems relating to the availability of equipment and spare parts, delays, cost overruns and miscommunication of information (Brooksbank 2002; Fox and Skitmore 2004; Kirmani 1988; Kirmani and Baum 1991; PEC 1990; Sultan and Kajewski 2003; Ogunlana and Butt 2000; Qamar et al. 1989; The World Bank 1984, 2000, 2003, 2004, 2006a, 2006b and 2006c; and others).

In addition, two decade old Pakistan specific papers (Ogunlana & Butt, 2000; PEC, 1990; Qamar et al., 1989; The World Bank 2000, 2003, 2004, 2006a, 2006 b, 2006c) provide an insight into the Pakistan construction industry, its business environment and the problems which have persisted and recommendations put forth. Over time some of these recommendations may have already been tried with varying degrees of success.

The various literature reviewed show that sustainable development of the construction industry sector requires a long term commitment from the government. The impetus for change has to come from the demand-side as many of the key factors requiring significant improvement are related to the role of the government itself. Over time, the government together with other industry players will have to shift from being just an external player and move towards self improvement and taking responsibility (Fox et al. 1999; Hindle 2000). Fox et al. (2002, 2004), state that most critical is having a long-term vision and policy for the industry supported by a coherent strategy, thinking the best, behaving the best (a best practices culture) and developing a learning culture. These three relate to changing the business environment. In addition, other critical factors cited are techniques and technologies supporting high production performance, basic resources and infrastructure (physical and institutional), financial and HR (Fox et al. 2002, 2004; Kirmani and Baum, 1991; Ofori 2002; The World Bank 1984).

Due to the unique and fragmented nature (Kajimo-Shakantu et al. 2004; Ofori 2002) of the industry stakeholders a comprehensive and holistic approach is needed to bring about desired cultural change to support reforms (Kikeri et al. 2006; Kirmani 1988; Ofori 2002; PEC 1990; The World Bank 1984). Stakeholders both within and outside of the industry all have their roles to

play, these include construction clients, consultants, contractors, designers, educators/trainers, government officials, professional bodies, quasi-government officials, researchers, material suppliers plant suppliers, construction lawyers, trade unions, information providers among others (Fox et al. 1999, 2002 and 2004).

Development of the industry in Singapore over the past four decades provides a good reference on a holistic and comprehensive long-term approach to changing the business environment and culture. Singapore recognized the importance of the sector and a need for continuous development through a strategy addressing HR, materials, technology, corporate development, improved documentation procedures, procurement, contracts, operating environments, payment chains, trade associations and institution building. The efficacy of a central body specifically for construction industry development in developed and developing countries is cited extensively (Kirmani 1988; Ofori 2000, 2002, 2004, 2005 and 2006; Widdekkara 1999 and others).

The Pakistan construction industry is well aware of the challenges it faced as evident from the publications in PEC (1990), while issues, constraints and recommendations are also well documented in reports of Qamar et al. 1989 and The World Bank from time to time. The literature review shows that business environment (demand side), HR, equipment and materials are key constraining factors and that there are no short term fixes. A sustained long-term committed approach to developing the construction industry (contractors, consultants and clients) is of paramount importance. Given the GoPs' ambitious development plans, innovative and out-of-the box solutions would be required to deliver the proposed infrastructure projects.

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