LOCAL PROBLEMS IN THE CONSTRUCTION INDUSTRY OF YEMEN

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ABSTRACT

The problems plaguing the construction industry of Yemen are fairly typical of most developing economies. There exists a strong requirement for improved construction methodologies, management practices and legislative reform. Research is being conducted into the Yemen construction industry in an attempt to develop an industry that is efficient, economical and ultimately, sustainable. Preliminary findings from this research are presented in this paper and focus initially on determining the major impediments to any intended development in the local construction industry from an assumed start point that any strategy formulation should be cognizant of, and in harmony with, the local conditions and capabilities. Data associated with the research was collected using a structured questionnaire, distributed to appropriate professionals and other stakeholders operating in Sana'a and Aden cities. This survey scrutinized the views and knowledge of the professions and stakeholders of the construction industry in Yemen as it currently exists and comprised questions relating to major barriers to the development of the local construction industry and building materials development. This paper presents this research, its findings and proposes a set of recommendations for industry development in Yemen and other similar developing countries.

Key words: Yemen, construction industry, building materials, development barriers,

INTRODUCTION

As construction booms began in the gulf countries in the 1960's and 1970's labour was attracted from throughout the region, including Yemen, which has exported labour to the region [Nader Fergany **(**2001), ESCWA, (1993)]. In 1975, about 280,000 Yemenis were working outside the country, remitting some 375 million US dollars annually. In 1979 this remittance rose to 1.5 billion US dollars [Kulkarni, (1983)]. The national exchanger gained much-needed foreign exchange for development, but the nation lost its pool of skilled workers and human resources.

The late eighties saw the end of construction booms in the gulf. It was expected that those who returned would bring with them valuable experience. Perhaps as a result, the construction industry in Yemen expected to start with a higher benchmark. However, recent history has demonstrated that it was not possible for the local Yemen construction industry to cope with the rapid growth needed for the modern forms of construction that

have occurred over the past decades. The inadequacies of building materials as well as inadequacies in design and project management potential have been a further hindrance. A lack of any approved national system of codes, standards or specifications have only compounded the industry's problems. The result is that construction projects are often over-designed or inappropriate to local needs and priorities [UNIDO/world bank (1981)].

Further, in the early 1990's, the economic and social conditions in the country of Yemen started to deteriorate noticeably due to many factors but mainly due to 'The Gulf' wars; the reunification of Yemen in 1990, which has caused even more confusion and chaos; and the civil war in 1994. Inflation soared in 2003, jumping from 4.3% in 2002 to 13.6% in 2003 [World Bank (2004)]. The heavy reliance on imports is a continuing problem as materials comprises 60% to 70% of the construction costs in the modern sector in Yemen [Miles, (1984)], moreover there is no indication of any significant development, if not degeneration by the sudden growth of the construction activities associated with the expulsion of over 1 million Yemenis from the gulf due to the Gulf War of 1991. This has created an instant increase in the population, the loss of remittances (the country's primary source of income), increased unemployment in Yemen reaching30% [CIA, 2003)], housing shortages, and pressure on the existing infrastructure.

For the purpose of proposing any solution there is a need to gain knowledge of the current situation and possible barriers within the local industry. The paper will focus initially on determining the major existing impediments to any intended development in the construction industry in Yemen. Hence any solutions strategy and policy formulation will be within the local conditions and capabilities.

METHODOLOGY

Due to the lack of existing data and research in this sector, it was reckoned that a local survey of construction industry issues was needed; to provide some insight into the current local obstacles. Surveys are considered a popular method for gathering information needed for identification and assessment as they allow inputs from various sources (clients, key informants and target populations) and help to build consensus for solutions.

It was also felt a survey would be beneficial to scrutinize views and knowledge of the stakeholders and professionals in the sector as it exists. Thus, it was hoped that the results obtained would generate some idea on the various issues occurring and affecting the industry. Data was collected using a structured survey questionnaire. The questionnaire was distributed to a selected professions and stakeholders operating in the capital Sana'a and Aden city. The questionnaire contained questions relating to major issues affecting the local industry performance and the factors causing high construction waste and cost. Variables were compiled form existing literature; mainly World Bank reports such as [Kimani, (1988)], the [UNCHS (1984a and b) and Wells (1986)], and using the judgment gained through 12 years of work experience in the local market.The survey was made as simple and as clear as possible, to encourage the participants to respond as quickly as possible. Further, the survey questionnaire was designed to enable respondents to add any further variables or suggestions that they considered necessary for inclusion.

The survey was distributed electronically (emails) and via local representatives who delivered, collected and returned the surveys. A total of 49 responses were received, 5 of which have been discarded for being incomplete, making it a total of 44 participants. These responses represented a wide range of stakeholders who have been involved in construction activities including the construction of informal housing units, as well as experienced engineers working privately in small to medium size consulting and contracting construction firms or on government projects. While the choice of the survey location was mainly in the capital city of Sana'a, where major construction and economic activities are taking place, the participants were in fact from different parts of the country and are currently working in the capital. Therefore the survey unintentionally embraced other regional parts of Yemen.

THE SURVEY STRUCTURE

The survey comprised three sections. This paper will deal only with section (A) which comprised of 4 interrogations:

Q.1. Barriers to the construction sector development
Q.2. barriers to building materials industry development
Q.3. Causes of high construction cost
Q.4. Causes of construction waste

Each interrogation has a set of selected factors/variables which the participants had to give a ranking according to its perceived effect on the industry and construction activities. These variables are outlined in later parts of this paper

ANALYSIS OF RESPONSES FROM SECTION (A)

Respondents were asked to indicate their perception on the factors for each interrogation. A frequency distribution of the responses was used to assess the prevalence of these factors. Factors were identified as either an "important factor", "medium importance factor", or "low importance factor". For each factor, an importance index was determined by calculating the total percentage of respondents.

Following the frequency recording and percentage calculation, the 'Importance Index' was used to find the relative importance and ranking of each variable. This could be expressed as:

$$\text{Importance index} = \frac{100 \sum (w f)}{WF}$$

Where $\boldsymbol{w}$ is the weighting, ranging from 1 to 3, given to each factor; $\boldsymbol{W}$ is the highest weight, that is, 3; $\boldsymbol{f}$ is the frequency of the response; and $\boldsymbol{F}$ is the total number of respondents. When a tie occurs, ranking is in accordance with the percentage of respondents rating the variable as very important (i.e. 2 or 3). A low importance index indicates that the variable is perceived to be of a low importance, while a high importance index indicates a high importance factor.

BARRIERS TO CONSTRUCTION SECTOR DEVELOPMENT

The first interrogation asked the participants to give a ranking to the factors that they thought were the major barriers to achieving development of the construction industry in Yemen. Figure 1 summarizes the responses. In general it was found that there was moderate agreement between professions and stakeholders to most factors.

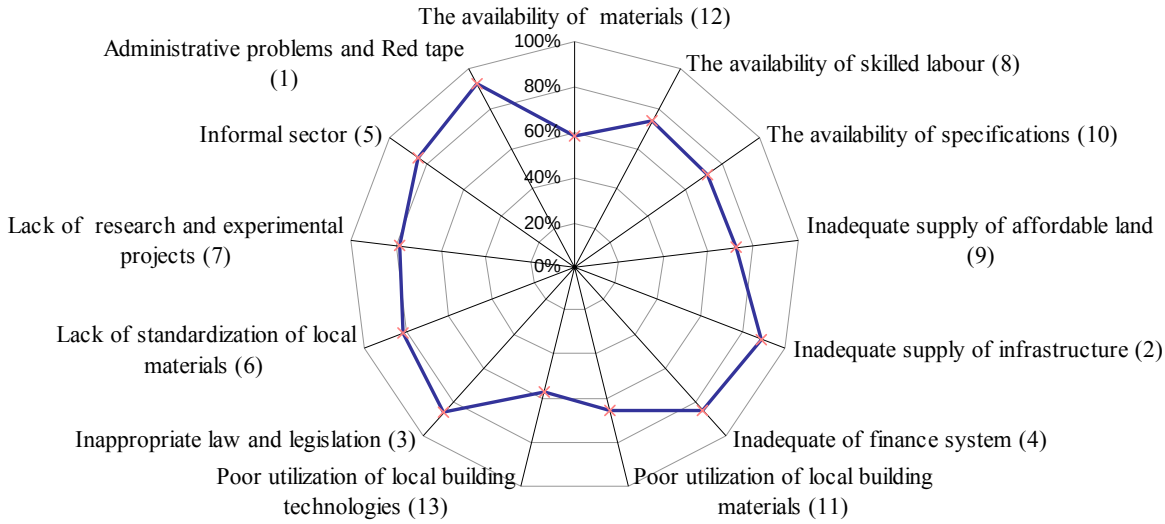

Figure 1 Importance Index for Barriers to Construction Development

Administrative problems and red-tape (including corruption) was ranked the first barrier to the construction development. Excessive bureaucracy is a cause of project delays at all phases, and is characterised by an abundance of laws and regulations, excessive paperwork, too many permits and overlapping authority of government agencies.

The second ranked barrier is inadequate infrastructure, lack of infrastructure such paved roads or electricity power and water supply, road access and associated damage to vehicles, delay and difficulty of delivery of resources. This has inflated inner and urban land prices and increased the load on existing infrastructure which already stating to deteriorate.

The ineffective penalty on delay or damage and frustrating dispute resolution, which has often been blamed on inefficient and ineffective law and construction legalisation is ranked third.

Inadequacies of the finance system were ranked fourth. Clients, investors and contactors often experience a lack of the financial support from institutions or the there are very difficult conditions associated with getting a loan or assurance certificate. Often, contractors have to carry out the project or investment using their on expenses and by doing so they have to cut few corners in the attempts to reduce costs and risks.

The fifth factor highlights the existence and increasing dominance of the informal sector, although section (B) of the survey indicates a high use of the informal sector by stakeholders perhaps indicating its acceptance. This may be as a result of the absence of regulations, difficulties in obtaining permission and the many difficulties and expenses involved in using the formal sector.

BARRIERS TO BUILDING MATERIALS INDUSTRY DEVELOPMENT

This section of the survey investigates the reasons behind the lack of achieving satisfactory manufacturing and production capacity in local building materials. The factors were carefully chosen from a blend of work experience, extensive literature reviews and international reports on developing countries. Theses are

1. Market problems
2. Difficulty in getting materials
3. Financing
4. Difficulties in acquiring skilled labour and technicians
5. Machinery lacking
6. Poor plant locations and land problems
7. Poor local conditions and infrastructure
8. Lack of studies and information
9. Administrative problems and Red tape

As indicated in Figure 2, the most important factor considered is the excessive bureaucracy and difficulties in obtaining work and plant permits. The second ranked factor is poor local conditions and infrastructure, lack access roads and adequate electricity and water supply and any other services necessary to establish any economic activity.

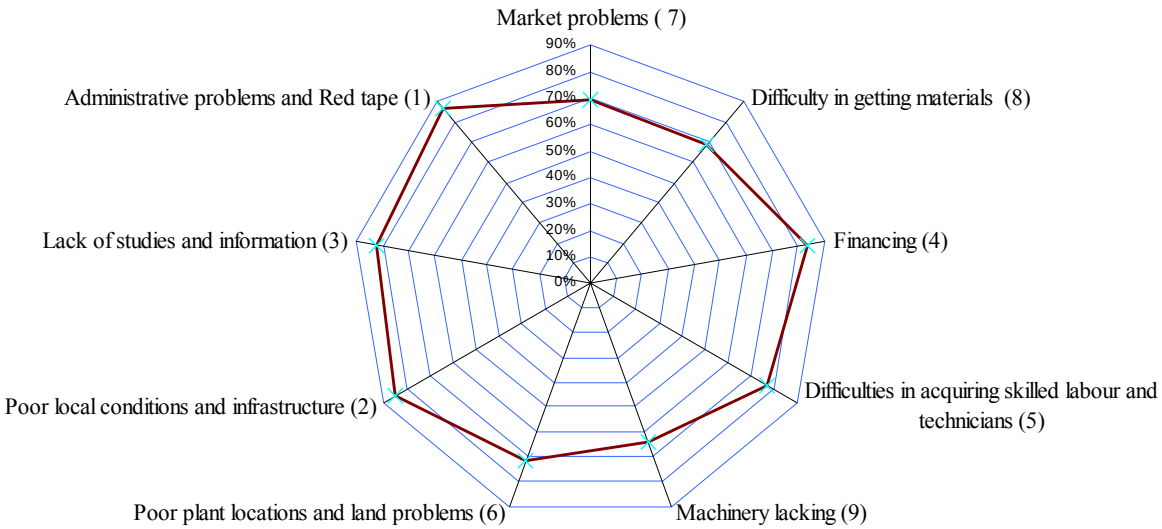

Figure 2 Barriers to the Local Building Materials Industry

The lack of information was the third ranked impediment to the development of an appropriate building materials industry. The World Bank (2002) has already indicated

Yemen's less-developed market institutions, and how firms face specific uncertainties due to lack of information. These include the inability to identify markets; insecurity and unenforceability of contracts; and the lack of specialized business skills, such as accounting and bookkeeping, marketing, exporting. Such factors increase the uncertainty faced by the firms about its future earnings and prospects, and once again induce them to indulge in low-risk, short-term activities. Reducing such firm-specific uncertainties would require a range of institution-building, and the need to make available planning and business resources to the firms.

CAUSES OF HIGH CONSTRUCTION COSTS

In this section, participants were asked to give a ranking to the factors that they think contribute most to high construction costs. It was agreed by most participants that the most important factors causing high cost, from highest to lowest, were inflation and price fluctuation, imported materials and excessive waste. Factors that emerged clearly as not very important were labour cost and local materials cost. Figure 3 summaries the responses.

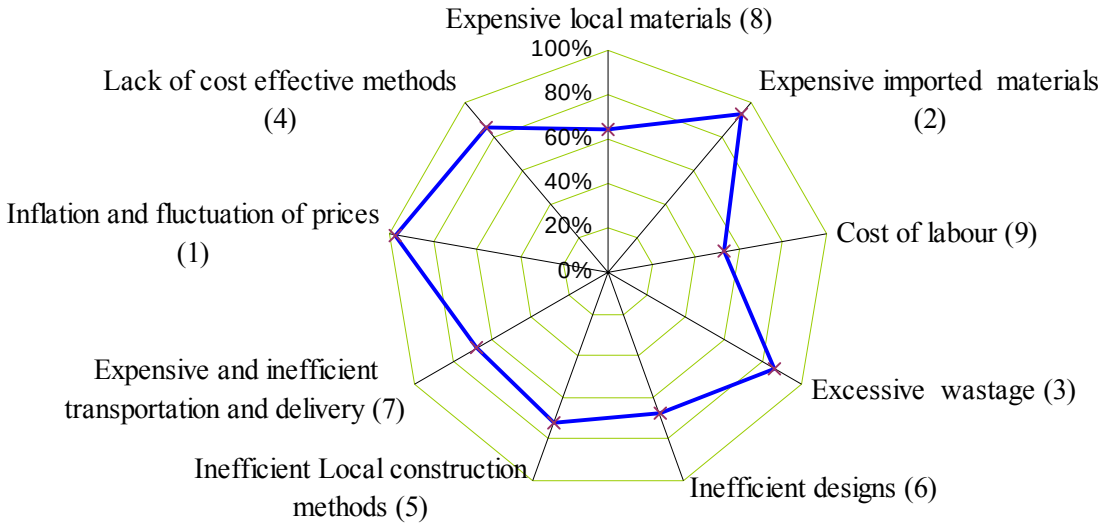

Figure 3 Importance Index for Construction Cost factors

Inflation and price fluctuations identified as the most important factor by stakeholder and professions (97% Importance factor) and was ranked 1st as shown clearly in (figure 3). The inflationary trend is probably due to: demand exceeding supply, artificial scarcity of goods, unstable economy and political instability. Furthermore, fluctuation in prices affects the prices of raw materials, labour and services and other ancillary materials.

The consequences of expensive imported construction materials came 2nd (over 79% of the responses agreed upon and a score 93% in the Importance index) this always only lead to the selection of cheap but poor quality and less durable materials. Additionally the

life-cycle cost required for maintenance and replacement will sharply increase, all this can be avoided by the selection the correct and most durable materials for the job.

3rd excessive wastes due to lack of efficient execution and lack of skilled labour, supervision, lack of management and planning of the project procurement and absence of reuse mechanism. 4th factor was lack of cost effective methods, quantity surveyors and accountants are hardly involved in the construction phases. Inefficient local construction methods was ranked 5th, with an importance index of 72%, with 79% of respondents giving it a medium causing ranking.

CAUSES OF CONSTRUCTION WASTE

This section was used to rank the factors causing construction waste. Waste has been defined as "any thing different from the absolute minimum amount of resources of materials, equipment, and manpower necessary to add value to the product". Alwai et al. (2002) also indicated that waste is not only associated with waste of material in the construction process but also other activities that do not add value, such as repair, waiting time and delay.

In general, all construction activities that produce cost, direct or indirect, but do not add value or progress to the product can be called waste. Any improvement effort should be focused on identifying waste in the construction process, analysing the causes that produce this waste, and acting over these causes to reduce or eliminate them. Any improvement effort should be focused on identifying waste in the construction process, analysing the causes that produce this waste, and acting over these causes to reduce or eliminate them. (Serpell & Alarcon, 1998)

The participants had to give a ranking for the following variables:

- Lack of planning and management
- Resources misused
- Unclear information and information quality problems
- Resources quality problems
- Lack of execution skills
- Lack of control
- Inefficient procurement and unnecessary transportations

On ranking the factors which cause construction waste, professions agree on most factors with the results ranging between 62% and 80% for the importance index values as indicated in figure 4.

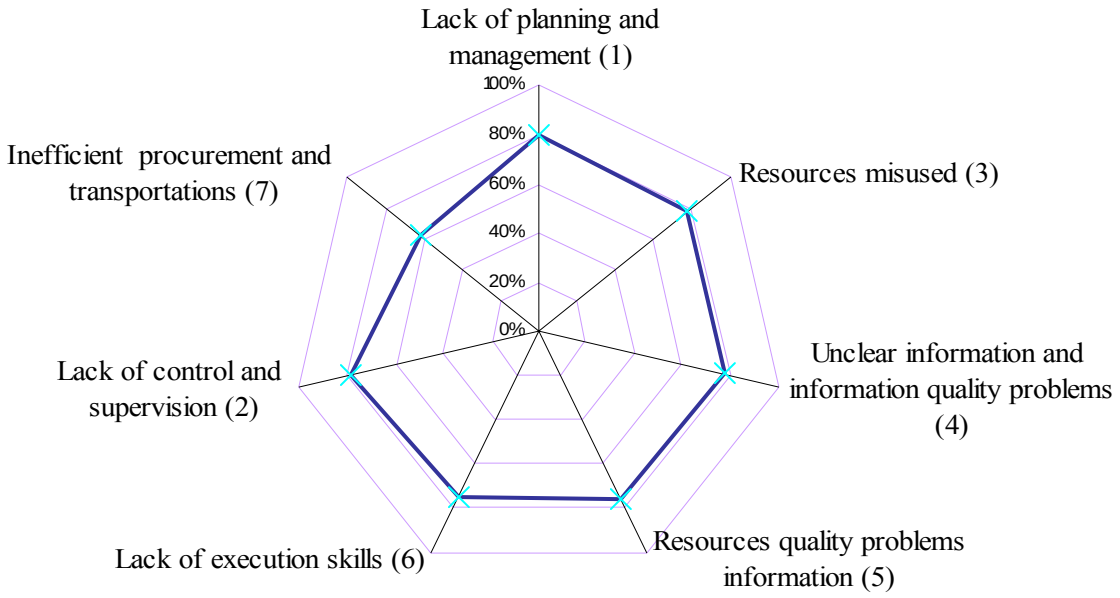

Figure 4 Importance Index for Construction Waste

Lack of early planning and poor contract management are ranked first. Good project management entails planning, coordinating and controlling all aspects of the work and could lead to significant improvement in productivity without necessarily increasing input. Local formal and even more informal contractors lack any managerial skills that can increase productivity and prevent time and cost overrun. Inadequate economic analysis of the project or over estimation of the financial capacity of the owner is also symptoms of poor planning. Adequate contract management is very important since most other variables result from the lapses in the management of the contract by either the client or the contractor. Lack of managerial skills has been highlighted by the World Bank (1984) and Ofori (1991) as a major deficiency of local construction enterprises in developing countries

The second ranked factor was lack of control and weak supervision of site activities perhaps due to qualified engineers limiting their supervision to match fee rates or deliberate underpayment. In addition, the market often uses unqualified supervisors and technicians in the control of labour and minor works.

Resources misuse was ranked third, perhaps due to unnecessary or inefficiently managed labour use onsite, and inappropriate materials storage and transportation. Unclear information is ranked fourth, despite the fact that this factor is frequently used by contractors as rationalization for delay or choice of low quality materials. This problem can be improved if professions are more prudent in their design, and more knowledgeable of material availability, suitability and usage.

CONCLUSION AND RECOMMENDATIONS

The general conclusion for the barriers of development came as institutional and administrative weakness, red-tape and corruption followed by the availability of infrastructure required for economic activities and human settlement, third was law and legal matters followed by and financial issues. Participants think that industry technical problems are of lesser concern. They also indicated that economical stability is important for any development because it creates less risk for investment. In addition, the most important factors that caused high construction costs were identified as imported materials, inflation and unstable economy and construction wastes. Factors that emerged clearly as less important are labour cost, local materials cost, availability of local materials and standardisation.

There exists demand for serious strategies and policies that should be implemented and exercised by both public and private sectors; to initiate and sustain any economic development. The adaptation of explicit strategies and policies to reduce the impact of unemployment and consumption of foreign exchange should be implemented through appropriate and more thoughtful labour employment and local materials protection policies. There is most of all an urge for institutional and administrative development to facilitate and monitor any required development.

Moreover, the local development of the construction material industries should be influenced by the adequate choice and implementation of policies and strategies that balance local and global issues, moreover balance local industry protection policies, foreign investment and importation control. Lending organizations could perhaps help the implementation of the local policies rather than imposing their own.

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