

# CONSTRUCTION PROCUREMENT PROCESSES IN MALAYSIA: CONSTRAINTS AND STRATEGIES

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This paper is based on a study on the identification of constraints in resources and functions within the processes of construction procurement in Malaysia, and the development of proposed strategies to remove or alleviate the constraints identified. The study employed the triangulation research approach in data sources and analysis. Respondents to the study were Malaysian organisations involved in the processes of construction procurement in Malaysia. The findings of the study suggest the areas of most constraints and the strategies that could be implemented to remove or alleviate the constraints identified.

Keywords: Construction procurement, constraints, economic growth, Malaysia, strategies.

## INTRODUCTION

One key purpose for seeking to achieve construction growth is to stimulate and to sustain growth in the other sectors of a country's economy and to raise overall growth in the economy. Many researchers and writers have confirmed that construction plays a vital role in socio-economic growth and development.

The principal policy promoting socio-economic growth and development in Malaysia is 'Vision 2020'. The key objective of Vision 2020, launched in 1991, is to transform Malaysia from a developing country to a fully developed and industrialised country by 2020 AD (see Mahathir Mohamad, 1991). The implementation of this policy requires the establishment of physical, social and institutional infrastructures, housing and facilities for the manufacturing and services sectors capable of meeting the needs of a modern and developed society. Fulfilling these requirements will inevitably demand a high level of construction output. Malaysia therefore, requires a capable, indigenous construction sector, i.e., in terms of its relative size and the adequacy and timely supplies of the key resource and functions required for its processes.

According to Wells (1986) there is a minimum size for a country's construction industry. The size - measured in terms of construction's contribution to GDP - is dependent upon the country's level of economic growth and development. For a developing country such as Malaysia, Wells (1986) suggested the size to be not less than 5.4 per cent of GDP. Wells (1986) and Ruddock and Lopes (1996) warned that should the size of a country's construction industry fall short of the recommended minimum size, inadequate construction capability may be acting as a constraint on long term sustainable growth in the economy.

An examination of available statistics show that the size of the Malaysian construction industry between 1988 and 1996 ranged from 3.22 to 4.70 per cent of GDP (Ministry of Finance 1988-97). In relation to the minimum size recommended by Wells (1986), the size of the Malaysian construction industry is small.

In addition to the relatively small size of the Malaysian construction industry, there are several issues prevailing in the Malaysian construction industry. The issues include (1) the relatively poor performance of construction in terms of failure to implement planned development projects (Yaacob 1996), of failure to meet target delivery dates (Abdullah 1995 and Yaacob 1996) and of poor health and safety records on construction sites (Abdullah 1995 and Yaacob 1995), and (2) continuous and upward increases in construction prices (Master Builders Association of Malaysia, 1989/90 and 1996; Ministry of Finance 1988-95).

According to Wells (1986) if both inadequate construction capability and sharp rise in construction costs prevail, the phenomena suggest either that effective demand for construction is outstripping the supply or that constraints in the supply side of a country's construction industry are developing. These issues therefore, pose several questions, the more important ones being:

1. Are there constraints in the Malaysian construction industry that may inhibit the level of construction output?
2. If there are constraints, can the types of constraint be identified and their extent ascertained?
3. If there are constraints and the types identified and their extent ascertained, are there appropriate strategies that could be implemented to remove or alleviate the constraints identified?

In order to seek answers to these questions, a study was undertaken by the authors. This paper provides an outline of the study, its methodologies and findings.

## **THE ECONOMY AND THE CONSTRUCTION INDUSTRY**

An examination of the Malaysian economy and construction industry for the period between 1988 and 1996 (Ministry of Finance 1988-96) revealed the following trends:

1. The economy has attained growth in GDP of between 7.8% and 9.7%
2. The economy is virtually at full employment. The unemployment rate in 1995 was 2.8 per cent. At the end of 1995, the total number of economically active population was 8.06 million, of which 7.83 million are employed
3. Growth in construction GDP ranged from 2.7% to 19.0%
4. The contribution of construction to overall GDP ranged from 3.22% to 4.50%
5. Growth in employment in the construction industry increased significantly, i.e. from 340,000 persons or 5.5 per cent of total employment in 1988 to 659,400 persons or 8.33 per cent of total employment in 1995, an increase of 1.94 times

Long term projection of a country's economy is plagued with various national and international uncertainties (Sulaiman 1993; Merican 1993). Nonetheless, the excellent performance of Malaysia's economy thus far suggests that the economic target of Vision 2020 is attainable (Mahathir Mohamed 1991; 1997; Sulaiman 1993; UK Department of Trade and Industry 1995).

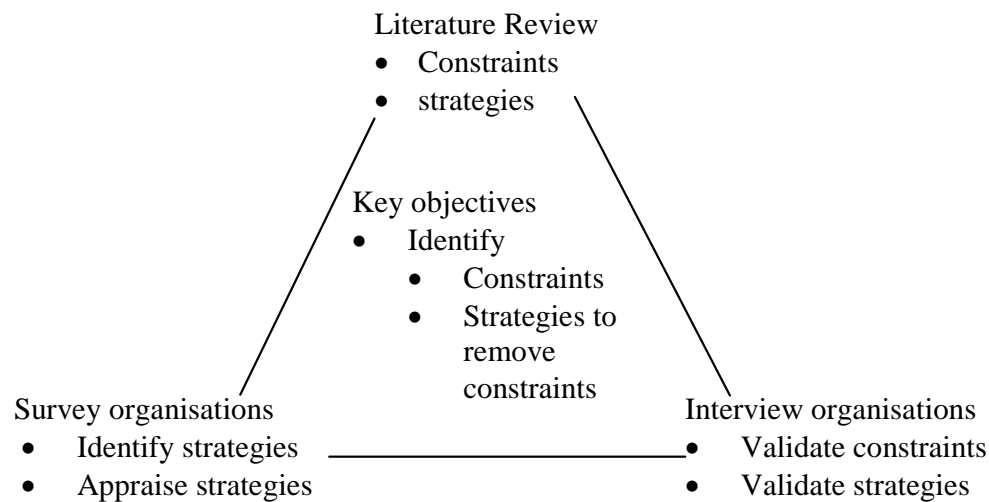


Figure 1

## CONSTRAINTS IN CONSTRUCTION PROCUREMENT

Among the many areas of constraints faced by construction industries in developing countries are constraints that exist within the processes of construction procurement (Turin 1973; Ofori 1980; Edmonds and Miles 1984; The World Bank 1984; Wells 1986; Wang 1987; 1991; Sharif and Morledge 1996; Morledge 1996; Sharif 1996). Constraints in the processes of construction procurement restrict or limit the effectiveness of the procurement process. Ineffective construction procurement would affect output and would subsequently inhibit growth in the construction industries (Turin 1973; Ofori 1980; Edmonds and Miles 1984; and Wells 1986).

Constraints in the processes of procurement could be due to either one or a combination of two or more of the following factors: unavailability, insufficiency or inappropriate use of resources, functions or institutions (Turin 1973; Ofori 1980; Edmonds and Miles 1984, The World Bank 1984; Wells 1986; Wang 1987; 1991; Master Builders 1989/90; Miles, and Neale 1991; Morledge 1996).

Wang (1991), Sharif and Morledge (1996) and Sharif (1996) argued that effective and productive construction procurement could only be achieved if the supply chain of key competencies and resources are in place. In the context of Malaysia, an efficient and effective processes of construction procurement requires inputs that include (Wang 1987):

1. Sufficient supply of qualified and experienced technical personnel
2. Sufficient supply of workers at skilled, semi-skilled and non-skilled levels
3. Sufficient and timely supply of materials
4. Sufficient and timely supply of plant, equipment and tools
5. Availability of land for construction purposes
6. Reduction of unnecessary red tape and artificial administrative obstruction

## OBJECTIVES AND SCOPE OF THE STUDY

The study represents the first major attempt to study empirically the processes of construction procurement in Malaysia.

The study is focused at a construction-wide level. In addition, the study excludes construction activities in the subsistence sector such as self-help, individual jobbers, rural construction, etc.

In this study, construction procurement is defined as the framework within which construction is brought about, acquired or obtained (CIB 1991). In the context of Malaysia, the framework of construction procurement encompasses the processes of (1) Initiation / promotion, (2) Funding, (3) Designing, (4) Statutory approval, (5) Tendering, (6) Construction, and (7) Risk allocation among the parties involved (Arbi 1985; Wang 1987; Sharif 1996).

For the purpose of this study, the concept 'constraints' within the processes of construction procurement is defined as limitations or restrictions imposed on the processes of acquiring construction projects. For the purpose of this study, 'strategies' to remove or to alleviate the constraints identified are defined as plans or methods to be employed to remove or to alleviate the constraints identified.

## **METHODOLOGY**

This study adopts the triangulation method (see Sarantakos 1993; Lenard, Raftery and McGeorge 1996). It involves: (1) an extensive literature review, two questionnaire surveys, i.e., Survey 1 and Survey 2, and semi-structured face to face or telephone interviews; and (2) multiple data sources from literature, primary data from respondent organisations and professional institutions. The research processes therefore, are robust and enabled to achieve high quality data and findings. The research methodology described is illustrated in Figure 1.

There were three stages to the study:

The primary objective of Survey 1 was to identify the types and extent of constraints in major resources and functions within the processes of construction procurement in Malaysia that may inhibit the level of construction output. Survey 1 was carried out by post between November 1996 and January 1997.

The database comprised the names and addresses of 1,852 main Malaysian organisations - clients, designers and contractors - currently involved in construction procurement in Malaysia all of which formed the questionnaire sample. The client organisations are drawn from government departments and private organisations that initiate or promote construction projects. The private organisations are all the property development companies listed on the Kuala Lumpur Stock Exchange as of July 1996. The designers comprise all registered firms of architects, engineers and quantity surveyors and the Public Works Department offices. The contractors are those firms that are registered with the Construction Industry Development Board (CIDB) Malaysia for the year 1996.

In this study, a subjective assessment approach was used to record the expert opinions of respondent organisations. Respondent organisations were asked to rate, on a Likert style scale the extent of constraint in each resource or function either 1, 2, 3 or 4 representing No, Low, Medium or High respectively. A rating of 4 (High) indicates high constraints in a resource or function thus implying that the process of construction procurement could be severely restricted or limited. While a rating of 1 (No) indicates no constraint in a resource or function thus implying that the process of construction procurement could be performed very efficiently.

However, consistent with basic economic theory that all resources and functions are scarce (Myers 1994) it would be highly unlikely that no constraint in resources and

functions within the process of construction procurement was experienced. Consequently, the scale of 1 (No) would act as a dummy scale. In the analysis of data the scores for 1 (No) would be combined together with the scores for 2 (Low) to become 1 representing Low constraint. The scoring system is set as 1, 2 and 3 for Low, Medium and High ratings respectively.

In the analysis of data, the equation used by Arditi and Mochtar (1996) was adopted:

$$S = \frac{3H + 2M + L}{H + M + L}$$

Where S is the weighted mean score, H is the percentage of respondent that gave a High rating; M is the percentage of respondent that gave a Medium rating; and L is the percentage of respondent that gave a Low rating. The interpretation of the weighted mean score is as follows (Arditi and Mochtar 1996): mean scores between 1 and 1.66 are classified as low (L), 1.67 - 2.33 as medium (M) and 2.34 - 3.00 as high (H).

In this study the resources and functions that received high or medium scores are considered to be constrained.

The primary objective of Survey 2 was to appraise proposed strategies designed to remove constraints within the processes of construction procurement in Malaysia. The constraints identified in Survey 1 provided the focus for the development of the strategies. Survey 2 was carried out by post between April and June 1997.

The database for Survey 2 was compiled from those respondent organisations in Survey 1 who indicated willingness to participate in Survey 2. In all, a list of 186 organisations was compiled.

The proposed strategies were developed from procurement strategies adopted by the construction industries in the United Kingdom, Japan and South Korea where sustained growth in construction had been achieved.

Survey 2 provided an opportunity for the parties who matter most in the procurement process - clients, designers and contractors - to appraise the suitability of the proposed strategies in the context the conditions and environment in Malaysia.

Stage 3 involved reviewing the proposed strategies in the light of the analyses and comments of the respondent organisations in Survey 2 and the carrying out of semi-structured interviews to Malaysia. The objective of the interviews was to validate the proposed strategies and to solicit additional information including information to validate the constraints identified.

Respondent organisations for the interviews were compiled from: (1) the respondent organisations in Survey 2 that indicated willingness to participate in the interview (24 organisations); and (2) a stratified random sampling from the database used in Survey 1 after excluding the organisations that indicated willingness to participate in the interview (40 organisations).

In addition, the database for the interviews includes seven professional organisations: six professional institutions, i.e., one representing the clients, three representing the designers and two representing the contractors; and the CIDB. The CIDB is a semi-government body established in 1995 entrusted to develop the construction industry in Malaysia. It is felt that these organisations, being professional bodies that command high level of integrity and reputation would offer independent and unbiased opinion on the issues being investigated. This aspect of the interview forms the third part and

is the vital process of the triangulation research method adopted in the study. In all, the interview database comprises names and addresses of 71 organisations.

In the interview questionnaires each constraint was provided with a list of strategies that have been appraised in Survey 2, listed in order of importance. The respondents were asked to indicate their agreement or disagreement to each strategy in terms of its viability and feasibility.

In all, forty-seven interviews, mostly face to face at the respondents' premises but some through telephones were performed in Malaysia between August and September 1997. From the forty-seven interviews, four interviews were with the professional institutions and one interview with CIDB.

## **RESULTS**

### **Identification of constraints**

In all, 205 organisations (11%) returned completed questionnaires for Survey 1. All 205 responses provided the basis for the research findings.

From the results, the majority of respondent organisations (83% or 170 organisations) indicate that in Malaysia constraints in resources and functions within the process of construction procurement are currently experienced. The resources and functions that are suffering constraint are given in Table 1.

Chi-square Test of Independence was performed on each constrained resource or function in relations to the categories of organisations - clients, designers and contractors. The value of  $p$  was set at  $< 0.05$ . The results show that there were no significant relationship between the constrained resources and functions and the categories of organisations. This suggests, therefore, that there is a general consensus amongst the clients, designers and contractors on the type and extent of current and perceived future constraints in resources and functions within the process of construction procurement in Malaysia.

### **Appraisal of proposed strategies**

In all, fifty-four organisations (29%) returned completed questionnaires for Survey 2. All fifty-four responses provided the basis for the research findings.

The results on the two most frequently agreed strategies that could be applied to remove the constraints identified are as shown in Table 2.

Chi-square Test of Independence was performed on each prominent strategy in relations to the categories of organisations - clients, designers and contractors. The value of  $p$  was set at  $< 0.05$ . The results show that there were no significant relationship between a majority of the appraised strategies and the categories of organisations. However, the chi-square test results also indicate that there were several proposed strategies that did not receive a full consensus. The latter illustrates the need for carrying out the validation interviews.

### **Validation of strategies**

In all, forty-seven interviews (66%) were performed. All forty-seven interviews provided the basis for the research findings.

The results on the interviews with the representatives of the clients, designers and contractors organisations show a high level of agreement with the prominent

strategies. They also indicated agreement to the relative ranking of the prominent strategies.

The results of the interviews with the representatives of the professional institutions show a high level of agreement with the constraints identified and the prominent strategies.

The respondents indicated that principally, it is the government that possesses the legal framework and should initiate and implement the strategies.

## **CONCLUSION**

The use of the triangulation method of data sources and data collection enabled a robust study to be performed without a compromise on either the quality of the data or the findings.

In relation to the questions set out at the beginning of the study, the findings indicate that:

- Constraints in resources and functions within the process of construction procurement in Malaysia are currently experienced.
- the areas where these constraints exist have been identified by this research
- the strategies focusing on the areas of greatest constraint were developed, appraised and validated indicating that there are strategies that could be implemented to remove or alleviate the constraints identified

In addition, the findings of the study indicate that government intervention is seen as the prime mover in strategy implementation.

The findings of the study provide useful guidance for the authorities responsible for the development of the construction industry in Malaysia.

The methodology used in this study may be repeated in conducting similar studies in construction industries elsewhere.

**Table 1: Constraints identified\***

Types of resources or functions	Mean score	Extent of constraint**	Relative ranking
1. At project planning stage			
(a) Constraint caused by procedures in obtaining statutory approval	2.07	M	3
2. Availability of key materials (Malaysian origin)			
(a) Cement	1.84	M	19
3. Availability of labour (Malaysian citizens)			
(a) Unskilled	1.88	M	17
(b) Semi-skilled	2.08	M	2
(c) Skilled labour (according to trades)			
(1) Concretor	1.83	M	20
(2) Bar-bender	1.85	M	18
(3) Carpenter	2.03	M	7
(4) Bricklayer/mason	1.94	M	13
(5) Plasterer/pavior	2.06	M	4
(6) Tiler	1.93	M	14
(7) Joiner	1.91	M	15
(8) Metalworker	1.83	M	20
(9) Welder	1.82	M	23
(10) Plant operator	1.89	M	16
(11) Plumber	1.70	M	29
(12) Licensed electrician	1.80	M	24
4. Availability of facilities for training skilled workers	2.18	M	1
5. Availability of key design team members (Malaysian citizens)			
(a) Professional (degree/professional qualifications)			
(1) Architects	1.83	M	20
(2) Civil & structural engineers	1.95	M	12
(3) Mechanical & electrical engineers	2.01	M	8
(4) Quantity surveyors	2.00	M	10
(b) Semi-professional (technical assistants/ technicians)			
(1) Architectural	1.97	M	11
(2) Civil & structural engineer	2.01	M	8
(3) Mechanical & electrical engineer	2.06	M	4
(4) Quantity surveying	2.06	M	4
6. Availability of technically competent, experienced and financially capable Malaysian contractors			
(a) Specialist contractors	1.74	M	27
7. Constraints caused by procedures in obtaining Certificate of Fitness	1.77	M	26
8. Constraints in contract administration due to political and/or bureaucratic interference	1.80	M	25
9. Availability of reliable source of information (on statutory requirements, cost data, project opportunities)	1.72	M	28

\* Only resources and functions that received high and medium mean scores are shown.

\*\* H = high constraint 1.00-1.66, M = medium constraint 1.67-2.33, L = low constraint 2.34-3.00.



**Table 2:** Strategies to remove or alleviate constraints within construction procurement processes in Malaysia

<b>Constraint and strategy</b>	<b>p (%)</b>	<b>r</b>
<b>1. Constraint at project planning stage caused by procedures in obtaining statutory approvals</b>		
Streamline and standardise administrative procedures in Local Authorities	88.89	1
Simplify and standardise procedures nationwide	85.18	2
<b>2. CONSTRAINTS IN AVAILABILITY OF MALAYSIAN PRODUCED CEMENT</b>		
Existing cement plant should increase production to relieve shortages	92.31	2
Improve enforcement to curb hoarding and black marketeering of cement	94.23	1
<b>3. Constraint in availability of unskilled, semi-skilled and skilled Malaysian labour</b>		
Increase intake of new trainees	94.31	1
Contractor should move towards greater use of plant to reduce the use of labour	92.45	2
<b>4. CONSTRAINTS IN AVAILABILITY OF FACILITIES FOR TRAINING SKILLED LABOUR</b>		
Current training centres should increase ability to train semi-skilled and skilled workers consistent with planned growth	96.15	1
CIDB and other bodies should set up new training centres specializing in the training of skills required by the construction sector	90.38	2
<b>5. CONSTRAINTS IN AVAILABILITY OF KEY DESIGN TEAM MEMBERS - ARCHITECTS, ENGINEERS AND QUANTITY SURVEYORS AND THEIR ASSISTANTS</b>		
Promote the construction industry and its key professions to schools	96.15	2
Expand the capacity of existing university/colleges to train more students in key construction courses	98.11	1
<b>6. CONSTRAINTS IN AVAILABILITY OF TECHNICALLY COMPETENT, EXPERIENCED AND FINANCIALLY CAPABLE MALAYSIAN SPECIALIST CONTRACTORS</b>		
Encourage Joint Ventures between foreign specialist contractors and local specialist contractors to expedite technology transfer	86.79	2
Develop mechanisms to allow local specialist contractors to gain experience	88.46	1
<b>7. CONSTRAINT CAUSED BY PROCEDURES IN OBTAINING CERTIFICATE OF FITNESS FOR OCCUPATION (CF)</b>		
Streamline and standardise administrative procedures in Local Authorities	92.31	2
Disseminate information on approval procedures	94.00	1
<b>8. CONSTRAINT IN CONTRACT ADMINISTRATION DUE TO POLITICAL AND OR BUREAUCRATIC INTERFERENCE</b>		
Superintending Officer should be fully qualified and experienced professional	98.08	1
Improve organizational and functional coordination between clients and other bodies to avoid administrative bottlenecks	92.31	2
<b>9. CONSTRAINTS IN AVAILABILITY OF RELIABLE SOURCES OF INFORMATION (ON STATUTORY REQUIREMENTS, COST DATA, PROJECT OPPORTUNITIES)</b>		

Encourage local universities/colleges to conduct relevant research and development and in publishing the findings	96.15 <sup>+</sup>	1
Encourage professional institutions to conduct relevant research and development and in publishing the findings	96.15 <sup>+</sup>	2

## 10. GENERAL STRATEGIES

Government to develop mechanisms to monitor construction demand and supply so that demand matches the capacity of the construction industry	88.46	2
Government and the private sector should prepare an overall policy on the development of the Malaysian construction industry	90.38	1

In this study proposed strategies that have been agreed by not less than eighty percent of the respondent organisations (overall) are considered to be predominant. However, in this study only the top two strategies are reported

p Percentage of respondent organisations indicating agree and strongly agree with the proposed strategy (i.e. scoring more than or equal to 4)

r Relative ranking in accordance with percentage of respondent organisations indicating agree and strongly agree with the proposed strategy

<sup>+</sup> Equal percentages; ranked in accordance with the number of organisations indicating strongly agree with the proposed strategy

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