

DEMAND AND SUPPLY TRENDS AND CONSTRUCTION INDUSTRY DEVELOPMENT (A Case Study in the Sri Lankan Construction Industry)

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1.0 INTRODUCTION

The construction industries in DCs, particularly in Asia, have exhibited trends to globalization in the recent past. They have created a need for construction industry development to accommodate such changes within the domestic industry (Aziz, 1993; Ofori, 2000; Raftery et al, 1997, 1998). However, studies in the identification of causal factors that result in current global trends and their impact on the domestic industry are incomplete. They in particular lack identification of constraints that originate locally to benefit from existing global trends. This paper attempts to fill this gap by taking the Sri-Lankan construction industry as a case study. A demand and supply framework has been adapted to analyze the causal factors and their implication on supply characteristics in order to identify the industry developments required. Although, the analysis is focused primarily on the Sri Lankan construction industry, the findings also shed light on other allied construction sectors in the DCs.

The paper first introduces the analytical framework. Then the causal factors are analyzed to identify how the supply side is affected. This identification serves to establish the immediate construction industry development measures to foster indigenous construction capacity in the context of global trends.

2.0 ANALYTICAL FRAMEWORK AND RESEARCH METHODOLOGY

The analytical framework (Fig. 1.0) is based on demand and supply side factors in the construction industry discussed by previous writers including Stone (1983); Raftery (1991); Hillerbrandt (1985) and Ofori (1994), who best characterize the operating environment in the industry. An

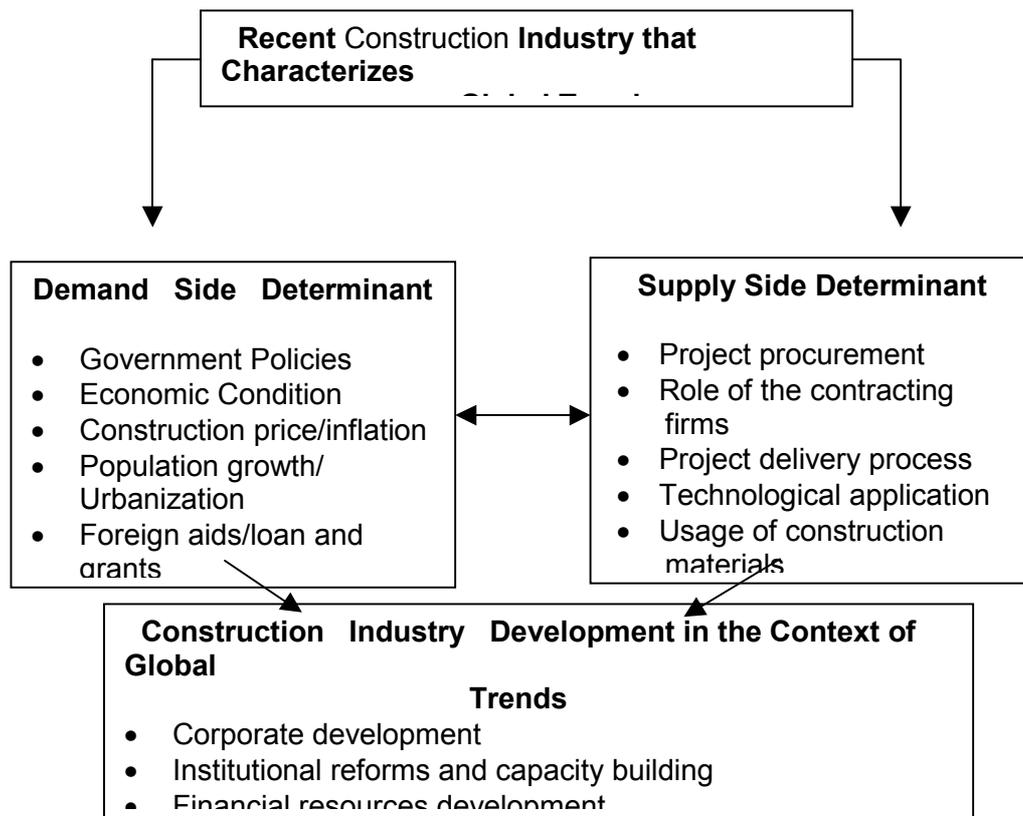
economic analysis on these factors serves to identify those construction industry developments necessitated by forces, which operate in both the demand and supply sides of the sector.

The analysis is supported by means of a literature review of recent publications, interviews and statistical data gathered from government publications and other occasional papers. Insights from recent practical cases within the Sri Lankan construction industry are also highlighted to assist the analysis further. All currency measurements have been denominated to US \$ in respective years.

3.0 UNDERLYING FACTORS CAUSING CHANGES IN DEMAND AND SUPPLY FOR CONSTRUCTION

The construction industry is very diverse and subject to changes in the environment within which it operates to produce investment goods and services. Stone (1983) and Hillerbrandt (1985) rationalize such demand and supply sides factors within those environments. Raftery et al (1997) also reveal some of those factors, which have also been driving forces for change in Asian countries in the recent past. With respect to the Sri-Lankan construction industry, the framework (Fig. 1.0) brings together the causal factors that contribute to the globalization trends locally as well as those factors that exert pressure on domestic industry to change its production characteristics. The following section analyzes these various demand and supply driven factors in order to identify the immediate industry development measures.

Fig. 1.0 Analytical Framework



3.1 Demand Side Factors

Among the demand side factors, the following results in trends towards globalization and have significant implications on the supply side characteristics of the industry.

3.1.1 Government policies

Despite allocating 40-45% of public investment for infrastructure development, the Sri-Lankan government pursues the policy of private sector led growth. The government has already undertaken institutional, legal and economic reforms to promote private sector infrastructure development in sectors such as power generation and telecommunication. In addition to the sectoral reforms, the government's budgetary constraints have forced it mainly to introduce a policy on private sector participation in infrastructure development. As a result of this policy, both local and foreign private investments in BOO/BOT (Built-Operate-Own/Built-Operate-Transfer) type projects are

increasing and new projects are in the pipeline (Table-1).

The government is also "fast tracking" the construction of industrial estates and the export processing zones. The main facilitating body for both local and foreign private investment, the Board of Investment (BOI) in Sri Lanka, has been assigned a leading role in this with a sum of \$ 21 Million. to fund directly the necessary infrastructure for these projects (Central Bank, 1998). During the first ten months of 1998, 143 new BOI approved projects commenced construction. This represents approximately about 34% increment with compared to the same period of 1997(EIU, 1999). With the implementation of BOO/BOT infrastructure and other high-rise commercial developments, foreign direct investment on construction is expected to grow in this decade.

Table 1. Major proposed private sector (BOO/BOT) infrastructure projects.

| SECTOR | PROPOSED INVESTMENT US\$ Million. |
|---------------------------------------|--------------------------------------|
| (1) Power | |
| A. Thermal - (200-240MW) | 192 |
| B. Coal - (300MW) | 480 |
| (2) Port | 1020-1320 |
| (3) Road (Expressways - 135km) | 240 |

(Source: Bureau of Infrastructure Investment, 1999 March)

In addition, the construction sector was given a boost with the announcement of a reduction in the tax rate from 35% to 15%, and an exemption from duty on imports of machinery and equipment. As a result of certain concessions, e.g. double taxation relief agreements with numerous countries, and preferential tax rates, construction related imports would continue to rise year by year.

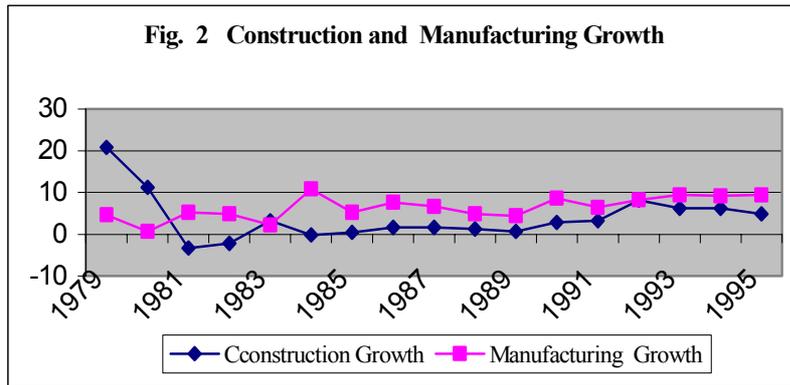
The changing nature of the government's traditional role from a regulator and investor to that of a facilitator in the construction industry is taking place in many DCs. For example, in China, India, Indonesia, Malaysia and Thailand considerable investments in infrastructure projects with private participation has taken place from 1990 to 1998 (Roger, 1999). However, the scale of such movement differs across the Asian region due to the effectiveness of reforms and policies to attract private participation in large-scale projects.

3.1.2 Economic condition

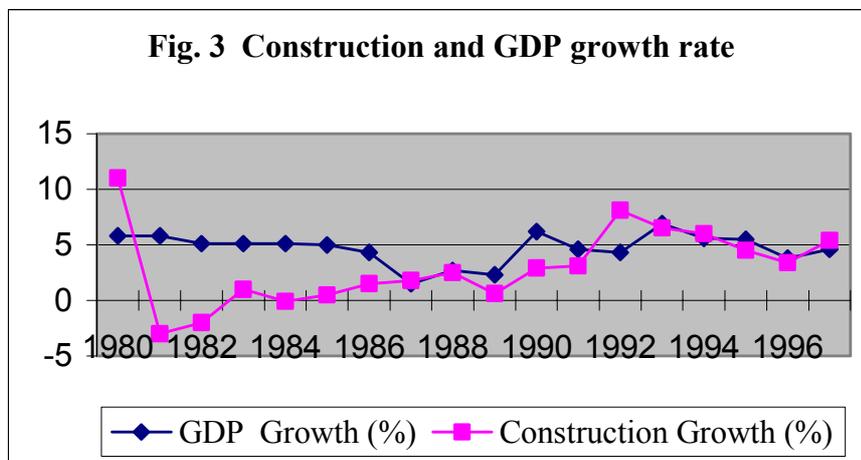
Economic growth has focused mainly on the manufacturing and services sectors rather than the dominant agricultural sector. After a moderate growth period from 1983 to 1988 and the economic boom in the first half of the 1990s, construction growth has increased again. At its peak in 1992, the construction growth prevailed at 8.1% (Central Bank,

1998). According to the Central Bank, (1998) the growth in the above sectors is expected to continue steadily for the next few years. This will favorably affect the construction sector, as there is a close relationship between the growths of the two sectors (Fig.2).

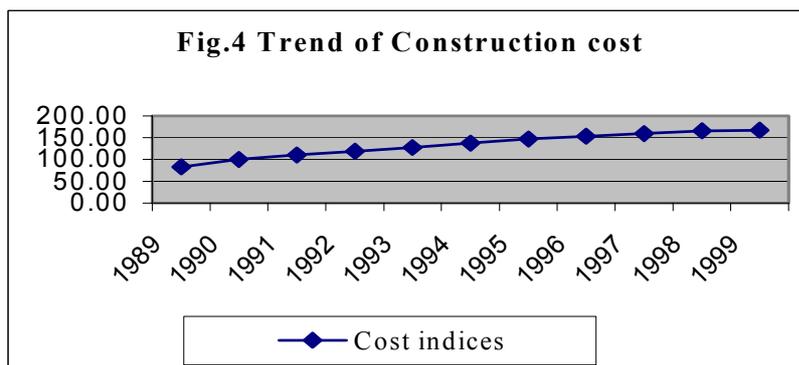
Furthermore, the prediction by the Dept. of National Planning for their Six-Year Program Parameters for the period 1999-2004, identifies an increase in GDP (Gross Domestic Product) of an average rate of 6.5% per annum, a steady level of Gross Domestic Fixed Capital Formation (GDFCF) at about 28% of GDP, amounting to a total of approximately \$ 33 billion for the period. Private sector investment is predicted to be 70% of total investment (Dept. of National Planning, 1998). Recent experience shows that the construction sector has been a pivotal ingredient in the robust economic growth of the Asian economies, as investment in building and infrastructure was needed to expand further growth (Rafferty et al, 1998). Private-sector-led infrastructure and commercial development are clearly necessary to achieve the forecasted GDP growth pattern in Sri Lanka. It will be followed by the construction growth pattern since there is a close correlation between the growth patterns of both construction and GDP. This is illustrated in figure 3.



(Source: Central Bank, 1998)



(Source : Central Bank, 1998)



(Source: ICTAD Cost indices, 2nd Quarter 1999)

3.1.3 Construction prices / inflation

The gradual increase of the cost indices reveals a rising construction cost in the domestic industry (Fig.4). Inflation has been the main reason for rising construction cost. Although, the trend indicates a slowing rate of increase, this phase of rising construction costs will increase in the next few years due to the newly introduced Goods and Services Tax (GST). According to the Central Bank (1998), GST has raised consumer prices by 2-3%. This factor together with high cost of finance will adversely affect construction activities particularly of individual housing, commercial development and infrastructure projects.

Furthermore, the inflation rate in Sri-Lanka has long been higher than the average inflation rate of her trading partners and competitors. This has forced the exchange rate to depreciate by about 5 to 6% per year to enable Sri Lanka to remain competitive in the world commodity markets (Central Bank, 1998). This has

resulted in fewer prospects for construction demand; since more imported materials form a major part of the cost of construction, particularly in the private sector financing large-scale project developments.

3.1.4 Population growth / Urbanization

Urban population growth is accelerating in Sri Lanka. According to Munindradasa (1995) the country's population growth was 1.8% in 1995, whereas in city areas the corresponding figure fell to 1.4% while increasing to 3.5% in the suburban areas near Colombo city limits. This growth in the suburban areas has led to the development of satellite cities resulting in the conversion of cultivated lands such as paddy fields, marshy and low line areas close to the suburbs of Colombo into housing units (Munindrada, 1995). There will thus be a continuing demand for high-rise apartment construction and pre-constructed houses since lateral expansion is restricted because of the limited land area within the city.

Table-2. Urban housing requirement in the year 2005

| | |
|---|-----------------------------|
| A. State Agencies | 65,000 |
| B. Private sector (Foreign and Local property developers) | 75,000 |
| C. Individual Home Builders (With housing loans) | <u>185,000</u> |
| | <u>325,000</u> units |

(Source: Report of the Presidential Task Force on Housing & Urban Development, 1998)

Furthermore, the presidential task force (1998) recognizes that the urban population will reach 65% of the total population by 2030 and the projected requirement for housing in the year 2005 will be 512,000 with an urban requirement of 322,500 units (Table-2). To achieve this target the government has identified the necessity for private sector property developers to participate. However, as the report itself identifies, the government should provide buildable lands with infrastructure facilities (particularly for large scale vertical and horizontal housing

developments) so that the completed houses will be affordable for the middle-income group.

3.1.5. Foreign aids / loan and grants.

Foreign assistance is critical to Sri Lanka to achieve the desired level of public investment. At present, foreign aid accounts for approximately 50% of the government's capital expenditure budget with the funding agencies supporting mainly major infrastructure projects and social development. It is estimated that the current annual expenditure in construction is \$ 1.11 billion of which 75%

is donor funded (Munasinghe, 1998). As such, planned investment in different infrastructure sectors (Table-3) is to be

met primarily by means of foreign aid/loan in the next few years (ICTAD, 1997).

Table-3. Public Sector planned investment in infrastructure

| Sector | Planned Investment |
|---|--------------------|
| (1) Transport infrastructure (Expressway -184km total) | US\$ 570-600 Mn |
| (2) Electricity (Generation - Hydropower) | US\$ 598 Mn |
| (3) Port development | US\$ 400 Mn |
| (4) Water supply project | US\$ 305 Mn |

(Source:ICTAD, 1997)

This happens because sectoral aid disbursement from 1991 to 1996 reveals that a direct construction related sectors absorbed a major component of foreign aid of which a higher percentage was utilized for economic infrastructure (Table-4). Dependence on grant aid and loans from multilateral agencies will continue till

such time as Sri Lanka is in a position to bridge the saving and investment gap which has resulted in limited local finance available for development projects at present. With the increase of private sector participation in economic infrastructure such loans and aid should however be mainly mobilized to social infrastructure development in the future.

Table 4. Foreign aid disbursement from 1991 to 1996.

| Sector | Year (in Millions of US\$) | | | | | | | | | | | |
|------------------------------------|-------------------------------|------|-------|------|-------|------|-------|------|-------|------|-------|------|
| | 1991 | % | 1992 | % | 1993 | % | 1994 | % | 1995 | % | 1996 | % |
| Total Aid Disbursement | 898.3 | 100 | 557.2 | 100 | 736.3 | 100 | 576.8 | 100 | 641.3 | 100 | 583.9 | 100 |
| (1) Economic Infrastructure | 195.9 | 21.8 | 112.2 | 20.1 | 142.5 | 19.4 | 233.7 | 40.5 | 229 | 35.7 | 205.9 | 35.3 |
| (2) Social Infrastructure | 78.6 | 8.7 | 100.4 | 18 | 140.5 | 19.1 | 124.8 | 21.6 | 137.4 | 21.4 | 125.9 | 21.6 |
| (3) Industrial Development | 37 | 4.1 | 32.7 | 5.9 | 24.1 | 3.3 | 17.1 | 2.9 | 19.9 | 3.1 | 26.9 | 4.6 |

(Source: External Resource Department, 1998)

3.1.6 Global and regional economic co-operation

Sri Lanka together with other SAARC (South Asian Association for Regional Corporation) member countries formed SAPTA (SAARC Preferential Trading Agreement) in 1995 and so far thirty-one items have been identified for further tariff concessions under the agreement at the moment. Such materials included bars and rods of high-speed steel, aluminum plates, and sheets that account for a considerable foreign component in construction in the domestic industry (ICTAD, 1997). In the context of increasing construction costs, if the costs of most of the imported construction materials and plant can be reduced under these agreements, this will have very positive effect on reducing overall costs, and increasing overall quality (ICTAD, 1997). This is particularly important in view of the increase of private sector participation in large-scale projects. Identification of the correct construction materials /items for further tariff concession could, therefore, have a huge impact on the construction industry in the short term.

3.2 Factors underlying supply side characteristics

The above discussion reveals why and how demands conditions are changing in the construction industry at present. The following supply side factors were also found subject to the consequences of the above changing demand conditions and

attributes arising from the impact of globalization. Their analysis reveals what changes in supply side characteristics are necessary to accommodate the new demand conditions for the benefit of the domestic industry.

3.2.1 Project procurement

According to Senavirathne (1997) the shift from traditional to non-traditional procurement arrangement (Table-5) has additionally been governed by technology improvements, increases in the size /volume of projects and client requirements in the recent past in Sri Lanka. However, the policy of encouraging private sector participation in large-scale infrastructure projects still has a direct bearing on new project procurement. For example, private investments in such projects have been procured under project finance modalities such as BOO/BOT and this will continue in the foreseeable future.

The increasing demand for development financing has changed the industry service provider into becoming the client. They have been forced to utilize their financial capacity and project financing skills to identify opportunities to develop projects and then transfer their ownership (eg. BOT projects). However, continuity of BOO/BOT type projects is governed largely by favorable financial terms (including domestic financial market conditions), institutional support and healthy economic conditions. The ability to raise long-term debt finance from the local

Table 5. Trends in contractual procurement arrangements (1977-1997)

| PROCUREMENT ROUTE | PERIOD | | | |
|-------------------|--------|--------|--------|--------|
| | 77-82 | 82-87 | 87-92 | 92-97 |
| Measure and pay | 55.00% | 50.00% | 58.50% | 46.00% |
| Design and Build | 14.00% | 26.00% | 24.00% | 30.00% |
| Lumpsum | 12.00% | 10.00% | 8.00% | 7.50% |
| Primecost | 10.00% | 8.00% | 5.00% | 4.00% |
| Design and Manage | 8.00% | 5.00% | 4.00% | 3.00% |
| Mgt. Contracting | 1.00% | 1.00% | 0.50% | 1.00% |
| Joint Venture | 0.00% | 0.00% | 0.00% | 2.50% |

(Source: Senavirathne, 1997)

capital market averts the inherent foreign exchange risk in these alternative project procurements and thereby enhances continuity in project development and also meets the requirement needed by the infrastructure.

Furthermore, where projects depend on bilateral aid, and the tenders are usually restricted to contractors of aid giving countries, Sri-Lankan contractors are now permitted to bid in collaboration with foreign construction contractors from the aid giving countries. It is stated that in this context, the minimum share of local collaboration should be 35% of the contract sum and whereas the foreign contractors should have 15% of local collaboration when 100% of the contract sum is given as an outright grant (ICTAD, 1997). This arrangement is particularly important, since foreign aids/loan and grants will finance a considerable portion of the planned infrastructure projects despite the current trend of the private sector participation in the same.

However, a move from traditional to non-traditional procurement implies that alternative project arrangements must be available to the local contractors even in donor-funded projects. For example, packaging large scale projects within the competence of local contracting firms in DCs is needed to make it easier for local contractors to participate in such projects to gain technology and managerial capacities (Kummaraswamy, 1998).

In a recently completed Japanese Government funded Seethawaka Industrial Estate Project work packages such as land preparation, water supply, sewerage scheme and standard factory buildings were organized and given to local contractors. About eight leading contractors were employed as local participants (i.e. as domestic contractors) in the venture in order to give recognition of being a partner rather than the usual sub-contractor (Wijesundara, 1999). In the first ever project in this nature, the National Construction Contractors Association of Sri Lanka (NCCASL) has initiated and provided necessary

assistance to form the local collaboration with the Japanese main contractor of the project. However, success of these strategies is strongly governed by the management capabilities of the domestic firms, how the parties honor obligations and the existence of proper institutional arrangement to oversee such ventures.

3.2.2 Role of the contracting firm

With the increase of private sector participation and investment in large-scale infrastructure projects, there is a need for a single source solution-requiring co-operation in the project delivery process based on good partnering relationships. In this context firms will seek integration to provide the entire project services with horizontal- integration, strategic alliance, joint ventures or consortia to combine their strengths and to become a single source problem solver for the client (e.g. BOO/BOT project developments). Raftery et al (1998), observe that vertical integration of construction projects in Asia is necessitated by an effective way of overcoming a firm's weakness or other drawbacks in competitive markets. Aziz (1993) also asserted that in the global market place the role of the contractor includes a comprehensive range of services from feasibility study, design, project financing and start-up to operation, on top of the main construction works.

Such a change of roles in the contracting sectors was recently exhibited in the bidding for the Colombo-Katunayake Expressway, which will be the first expressway in Sri Lanka. Bids were called on a Design-Build and Turnkey (DBT) basis and bidders were also requested to furnish a proposal with regard to the project financing (RDA, 1999). A leading local contractor joined the bidding with the association of foreign contractors who had gained specialized expertise in various areas such as dredging and road paving. A consortium consisting of 23 other local contractors was arranged to carry out associated structures. This alternative project arrangement supported the argument that foreign collaboration is necessary, particularly in first time large scale project developments, since the

scale of technology and management know-how for such undertakings cannot be fulfilled locally in DCs (Raftery et al, 1998, Tiong, 1992).

3.2.3 Project delivery process

With more and more interest being vested in project development by the contractor (as a equity contributor / partner) productive efficiency will gain greater recognition both at the project level and firm level. Productive efficiency is concerned with minimizing cost for a given level of production, by optimizing the costs and quantity of individual inputs (Hillerbrandt, 1985). In this context, quality standards will be the main driving force to maintain productive efficiency. Quality standards will also be used to differentiate competitors on grounds other than price. This is particularly important since competent experienced contractors who can deliver the project on time and to the required quality standards has been one of the most necessary conditions for success of BOT type projects in Asia (Tam and Leung, 1999 Cited in Ofori, 2000). Contractors will therefore be forced to adhere to international standard certifications such as ISO9000, which has become one of the quality benchmarks in doing business in the global market place.

The domestic contracting sector is therefore now under pressure to adopt recognized quality practices, giving priority for adequate training and systematic supervision particularly with regard to labor sub contracting procedures. These measures are significant to Sri Lanka since a survey of 3300 construction workers and 56 direct construction related agencies by Jaywardane et al (1998) revealed that 80% of the workforce is employed on casual basis. They further asserted that only 40% of them are fully utilized and 86% of the skilled work force has received only informal training in the construction industry.

Furthermore, the demand trend for construction automation, mechanization and optimum plant utilization generates a demand for higher quality and cost-effective construction. The introduction of

local and international standards together with standard conditions of contract to meet the quality and time targets will also boost mechanization in the industry.

3.2.4 Technological applications

Application of new technology in the construction industry is necessitated by the nature of changing demand. These technological changes demand that construction firms enhance their technological capacities. These will be governing factors in the formulation of consortia to win large-scale projects as reported in many BOO/BOT type projects (Tiong, 1992). New technological application will also be tested by expatriate contractors particularly donor assisted and private sector financed projects in the absence of medium sized alternative projects within the capacity of local firms.

Further, technology is the hall-mark needed to bring about a cost effective solution to mass vertical housing construction, which will overcome lateral expansion of housing stock due to land restrictions in urban areas. In this context, the pre-fabrication systems have a vital role to play in the cost effective construction. Trends in prefabrication and standardization will reduce the traditional construction component, thus reduce cost and save time in their construction.

3.2.5 Usage of construction materials

Increasing private investment coupled with favorable economic conditions will result in importing a considerable amount of materials and using a lot of heavy construction equipment. This will lead to technological changes in the construction process particularly in industrial and commercial sectors. Using imported construction materials will be boosted as a result of the global and regional economic co-operation that advocates tariff concessions for certain items of construction materials. There will be a shift of demand from buying fragmented engineering and construction services to packaged services that provide a single source solution. This will be further enhanced by the BOI concession

available for duty-free imports of plant, machinery, raw materials and other project -related goods in Sri Lanka.

Furthermore, standardization of the project delivery process will stimulate an increasing demand for standard ready-built units for mass constructions and large-scale replications. However, pollution and environmental issues will hamper the supply of basic materials such as sand extraction. Production of construction materials such as sand, lime and aggregate will be of increasing concern due to environmental degradation caused by their production. The low-cost pre-fabricated housing industry will therefore be badly affected by the reduction in the amount of raw materials generally generated by cottage industries in Sri-Lanka.

4.0 CONSTRUCTION INDUSTRY DEVELOPMENT TO BENEFIT FROM CURRENT GLOBAL TRENDS

CIB (1999 Cited in Ofori, 2000) defines the construction industry development “as a deliberate and managed process to improve the capacity and effectiveness of the construction industry to meet the national economic demand for building and civil engineering products, and to support sustained national economic and social objectives”. This definition indicates that industrial development goes for beyond corporate levels to the wider industry level in order to accommodate changes within the framework of underdeveloped construction industry in DCs like Sri Lanka. Similarly, Raftery et al, (1998) and Ofori, (2000) assert that current trends in Asian construction sectors have resulted in wider industry development in addition to corporate development. However, the foregoing discussion reveals that the following immediate development measures are necessitated by forces originating from demand and supply trends in the Sri-Lankan construction sector. They have a bearing on other similar construction sectors.

4.1 Corporate development

As the analysis reveals the priority areas of development are the technological and managerial capabilities of the contracting firms. In this regard, joint ventures could facilitate working in large-scale projects with foreign contractors, thereby enhancing technology and management know-how. The formation of joint ventures has been adapted successfully in countries such as China aiming at both a firm’s capacity building and technology transfer (TT) to the country (Ganesan,1999). However, the challenge is to achieve a proper structure for joint ventures in order to advance such objectives. Proper institutional arrangements are vital in overseeing such ventures in the domestic industry, since the contracting sector in Sri Lanka is still not geared to such undertakings.

Domestic contractors in many DCs are in fact often unable to form the preferred joint venture vehicle for TT, and often opt instead for a subcontracting arrangement with the overseas firms. Findings from a survey in Sri Lanka reveal that, where a domestic subcontractor has adequate manpower especially management skills to be able to utilize, absorb and apply the new technologies on other projects, TT in sub- contracting could make a significant contribution in terms of strengthening the firms concerned as well as enhancing the technological capacity in certain selected construction sub-sectors (Devapriya and Ganesan, 2000). Simkoko (1992) asserted further that a TT program built into the project is vital in achieving TT objectives. However, limitations of the effectiveness of such programs are to be seen in potential conflicts involving priorities between delivering construction projects on time, within cost and quality targets the accomplishment of TT objectives (Simkoko, 1992). Long-term TT objectives need therefore to be properly balanced against the short-term project goals.

The slicing of work packages of large-scale projects also requires proper co-ordination and management to achieve their desired objectives. For example, management deficiencies together with

the underperformance of sub-contractors have not achieved the desired objectives of the Seetahwaka Industrial Project (cited in section 3.2.1) in which local contractors experienced shortcomings in terms of project-management (Wijesundara, 1999).

4.2 Institutional reforms and capacity building.

Institutional composition is particularly important in enabling local contractors to participate in projects such as BOO/BOT where the capacity of the local contractor is limited to being a mere agent in the venture. To accomplish such institutional reforms, capacity building and legislative measures to regulate construction industry activities, are needed. The Sri Lankan government is in the process of planning these measures to bring a regulatory network in order to make the construction industry more effective and efficient under the proposed Construction Bill. An authority called Construction Industry Development Authority is to be established once the Act is implemented. The current statutory body, the Institute of Construction Training and Development (ICTAD) will be reformed for this purpose. Under the new proposed Law, participation of overseas designers or contractors in projects such as BOO/BOT will first need to be approved by the new authority. Then the overseas firms involved in the design or construction will be required to form joint ventures with local establishments (Wijeyesekera, 1998).

Such alternative arrangements are necessary, since competition arising from the participation of foreign firms could inhibit the ability of local contractors to compete for projects and so hamper the development of the domestic construction sector (Rafferty et al, 1998). This is particularly important in Sri Lanka since smaller firms still dominate the local construction industry and only 8% of the contractors (numbering 149 in all) are capable of carrying out projects above \$ 130,000 in value (Table-6). This is one of the major reasons why expatriate

contractors are carrying out the greater shares of donor-assisted projects at present. A proper balance is therefore necessary for indigenous capacity to develop. Ofori and Chan (1999 Cited in Ofori, 2000) show that both local contractors and foreign contractors in Singapore have benefited from US counterparts working in the domestic industry. They further assert that once local contractors gain experience in large-scale projects such as BOO/BOT projects, they can promote themselves better in undertaking overseas projects (Ofori, 2000).

However, success of such arrangements is strongly governed by the capacity of institutions to execute projects successfully in the domestic industry. For example, in the Seetahwaka Industrial Project, NCCASL's capacity to oversee the execution of contractual terms has been questioned, as the foreign contractor has not properly honored the retention release terms in the contract. It is therefore necessary to build up the capacity for supporting institutions, and perhaps to give statutory recognition to oversee foreign collaborations in the domestic industry.

In addition, government policy initiatives are necessary to assist the domestic contractors to secure overseas projects and thereby develop their varying capacities. In this respect, the domestic contracting sector needs to seek assistance from its regional associations such as the SAARC Chamber of Commerce and Industry Construction Industry Council (SCCI-CIC) and the International Federation of Asian and Western Pacific Contractors' Associations (IFAWPCA).

4.3 Financial resources development

Absence of a strong financial capacity of local contractors is a constraint in forming joint ventures with the foreign counterparts in international bidding for domestic projects. The availability of low cost capital resources is therefore important.

Table 6. Grading of Sri-Lankan Contractors by 1999

| Grade | Financial term (US \$ 00') | No. of Contractors |
|-------|-------------------------------|-----------------------|
| M1 | 3,896 | 07 |
| M2 | 1,948-3.896 | 13 |
| M3 | 649-1,948 | 25 |
| M4 | 260-649 | 44 |
| M5 | 130-260 | 60 |
| M6 | 65-130 | 178 |
| M7 | } Below 65 | 652 |
| M8 | | 406 |
| M9 | | 518 |
| M10 | | 10 |

(Source: Institute of Construction Training and Development, ICATD)

Nevertheless, it is to be hoped that the recently set up Construction Industry Guarantee Fund in Sri Lanka will boost the local contracting sector, since it will provide assistance to the contractors in furnishing bid bonds and performance guarantees. In addition, the newly established private sector funding arm, Private Sector Infrastructure Development Fund Company (PSIDFC) will provide subordinate loans to strengthen the financial position of developers in the participation of private sector infrastructure development in Sri Lanka. Local contractors can utilize such funds in becoming developers in large-scale projects so that the risk of foreign exchange involvement can be minimized. According to Gray et al (1998), Malaysia and Thailand, which have a high level of local debt financing for private power projects, were able to mitigate the currency depreciation issue in BOO/BOT projects in spite of the recent Asian financial crisis.

4.4 Material and man power development

With the expansion of the industry, training craftsmen and equipment operators is needed to maintain a skilled, competitive and adequate work force to meet the new demand in the industry. This is particularly important with respect to the local contractors, as their workmanship must comply with internationally recognized quality standards. The challenge is therefore to strengthen and develop a strong structural base for the Sri-Lankan construction industry through manpower training and appropriate construction resources.

Material industry development is also necessary, since imported construction services may otherwise grow at the expense of the indigenous sectors in DCs (Raftery et al, 1998). For example in Sri Lanka, the construction sector is overly dependent on imported materials. Furthermore, the percentage imported has rose from 30% in the 1960s to 60% in the 1980s (ICTAD, 1997). When the local building material industry is inadequately

developed in terms of the required quality of materials, the designers often tend to design work with a content of high imported materials. This is a particularly important factor since sourcing good quality materials has been a critical issue in Sri Lanka. The problems need to be overcome shortly to meet the quality standards of new project developments.

5.0 CONCLUSION:

In the present globalise environment, government policies are changing from that of an investor to that of a facilitator and private-sector-led construction demand is predicted to increase in the future. As a result, private sector participation in economic infrastructure, industrial and commercial development is expected to dominate in the industry with an increased involvement of expatriate contractors functioning as service providers rather than traditional contractors.

While forecast economic growth, urbanization trends and foreign aid are well poised for a healthy demand, the increasing costs of construction may well result in fewer prospects in terms of demand. Construction firms will be under pressure to change their business strategies in order to meet the future demand. This necessity for the change will originate primarily from technological changes, the changing nature of the project delivery and new project procurement process. Measures for corporate development are necessitated primarily by means of such changes and, as a result joint venture/sub-contracting arrangements could facilitate the improvement of firms' technology and their managerial capacities.

In terms of wider industry development, capacity building and institutional reforms, the development of financial resources, manpower and material sectors, all could significantly contribute to the development of domestic industry in the context of the changing nature of demand and supply trends. While the necessity for these development measures reflects in part the

underdeveloped state of construction industry's framework in DCs, they could still foster indigenous construction capacity within the context of global trends.

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