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INSTITUTE FOR CONSTRUCTION TRAINING AND DEVELOPMENT

ARCHT. ASITHA PATHIRAGE - CHAIRMAN

'Savsiripaya', 123, Wijerama Mawatha, Colombo 07, Sri Lanka

Telephone : 94 11 2699646 / 2686092 / 2686236

Fax : 94 11 2699738

E-mail ictadch@sltnet.lk Website : www.ictad.lk

IMPROVEMENT OF THE PRODUCTIVITY OF THE CONSTRUCTION INDUSTRY

1. **Executive Summary**

Importance in the improvements in productivity in Construction Industry is felt more worldwide. Sri Lanka has very limited information related to productivity in this sector.

Institute for Construction Training and Development (ICTAD) of Sri Lanka, being main Government body responsible for the development of the industry, with the Ministry and other State Institutions, is taking several measures for improvements in this respect.

Work towards, **Developing professionalism among senior level personnel, Improvements in productivity of middle level technicians and Improvements in productivity of tradesmen**

are three main approaches adopted. to deal with the Human Resource aspect of it, by ICTAD, as well as other statutory bodies. Contracting companies and related associations concentrate more on training of middle level technicians and tradesmen. Professional bodies contribute by conducting programmes for improvements in the quality of services provided by their members.

Technology and Management improvements are other important aspects in the improvement of productivity.

A problem, due to a vacuum created in the human resources supply caused by migration of competent labour, resulting in low productivity and poor quality, has been identified in the industry. The need to produce more professionals, middle level technicians and tradesmen for the industry, is an immediate requirement. Motivation for the youth to join the industry occupations is also an urgent need to be fulfilled.

The establishment of proper **Quality Management Systems** in both consultancy organisations and contracting companies needs to be pursued, for achieving productivity goals.

The proposed new Act, for the regulation and development of the Construction Industry in the country, will provide additional strength to State for its work, by increased authority and wider coverage.

2. **Status Quo of the productivity of the Construction Industry**

Construction Industry has its own difficulties in improving productivity, by its very nature, as against any other industry, where the product or service delivered is standard.

Higher productivity no doubt helps to achieve, objectives of **'Clean Production'** and **'Green Building'** concepts, that are being applied gradually in Sri Lankan Industry as well.

In Sri Lanka, very limited work has been done, to study the productivity in the Construction Industry. Nevertheless, it is felt that much has to be done to improve on it.

A problem, due to a vacuum created in the human resources supply caused by migration of competent labour, resulting in low productivity and poor quality, has been identified in the industry. Contribution by skilled and unskilled labour to the Industry in Sri Lanka, is primarily through informal sector. This has been identified as a factor affecting the labour productivity in the industry. Poor and irregular turnout, shifting and migration, of labour causing disruption of work has been observed. Inadequate or poor quality worker facilities, provided at company or project level, specially by lower grade companies, too have contributed to this unstable condition.

Disruption of work, due to non availability or frequent breakdown, of equipment too has been identified as a contributory factor for low productivity in construction. Only a few contractors have their own equipment of good working order. Equipment Hiring is still handled mostly by the informal sector and hence needs improvement.

Poor management of, and disruption in, cash flow, resulting from payment delays, too have affected the construction productivity. Escalation of prices of inputs in the recent times has aggravated this problem. Frequent interruption of work has been noticed due to this reason.

Lapses on the part of Consultants too have contributed to disruption of work and wastage or idling of resources in projects, leading to low productivity.

2.1 Construction Labour Productivity

In the year 2004 it is observed that the Labour Productivity has come down in almost all the sectors as a result of increased number of employees engaged, without a substantial or no increase in Value Addition. However in 2005 it has reversed. This may have been caused by the volatile nature of employment in the construction industry, where labour migration and shifting takes place, specially in the informal sector.

	V.A.Rs.000s	No.of Emp.	Lb. Prdty.	V.A.Rs.000s	No.of Emp.	Lb. Prdty.	V.A.Rs.000s	No.of Emp.	Lb. Prdty.
	2003			2004			2005		
Building	8,672,540	62,859	138.0	9,420,520	158,409	59.5	11,856,631	89,520	132.4
Highway	1,608,230	17,562	91.6	3,386,845	45,961	73.7	6,326,822	37,360	169.3
Bridge	167,873	4709	35.6	497749	11199	44.4	761,349	4078	186.7
Water sup. & Draing.	2,341,404	20,188	116.0	2082650	36227	57.5	363,638	3783	96.1
Irrig & L. Drainage	402,772	16,771	24.0	407875	13652	29.9	309,973	5017	61.8

Dredging & Reclam.	193,665	2147	90.2	266864	2478	107.7	231,284	334	692.5
Other	308,731	5453	56.6	805346	8929	90.2	607,021	7574	80.1
Total	13,695,215	129,689	105.6	16,867,849	276,855	60.9	20,456,718	147,666	138.5

Source : Department of Census and Statistics

Inadequacy of skills training and knowledge in trades also has resulted in low labour productivity. Volatile nature of the Construction Labour market caused by high demand has created a situation one could identify as exploitation at the lower levels of the industry.

3. Measures to improve the productivity of the Construction Industry

3.1 Role of Institute for Construction Training and Development (ICTAD)

ICTAD has planned to make it mandatory, for all registered contracting companies, to have **ISO Quality Management Systems established** in their organisations. This is a bold step taken by the institution in achieving productivity and quality improvement in the industry and is implemented in a stepped manner, effective from May 2008, to provide for the time required. Starting from the top level contractors of Grade C1, it is planned to be imposed on lower levels gradually. By September 2008, ICTAD has observed a very positive response from the higher level contractors in establishing the system.

15, out of the 29 C1 grade contractors, have already established the system.

In addition to the above, ICTAD also conducts **training programmes, seminars and workshops**, to enhance the knowledge of staff of contracting organisations, on new developments in the industry. The range of programmes are designed to cover the training needs of all personnel engaged in the industry, varying from professionals to tradesmen. In addition to the in-house staff of ICTAD, other experts from the industry as well as from the universities, are engaged as resource persons, in conducting the programmes.

Seminars conducted during 2007 on Standard Bidding Documents

No	Title and Description	Number of times conducted	Duration	Number of Participants
1.	Standard Bidding Document for Procurement of Works (ICTAD/SBD/01,	02	One day	170
	Standard Bidding Document for Minor Contracts (ICTAD/SBD/03,			125

2.	Standard Bidding Document for Major Contracts (ICTAD/SBD/02,	01	One day	180
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Source : ICTAD

Seminars conducted during 2007 on Claims and Dispute Resolution

Name	Course Code	No of Participants	Duration & Venue
Seminar on Construction Claims & Dispute Resolutions	75	230	8.30am to 5.00pm ICTAD Auditorium
Seminar on adjudication of Construction Disputes under ICTAD & FIDIC Conditions of Contract.	80	250	8.30am to 5.00pm Hotel Galadari
ICTAD Price Fluctuation Formula	AS/04	230	8.30am to 5.00pm ICTAD auditorium

Source : ICTAD

JBIC has assisted ICTAD in conducting 37 training programmes for Supervisors and Equipment Operators in Road Construction.

Title and Description	Course Code	Number of times conducted	Duration	Number of participants
Road Construction Supervisors	JBIC 1	1	1 year	24
Const. Equipment Mechanic	JBIC 2	1	1 year	21
Light Cons. Equipment Operator cum Mechanics	JBIC 3	1	3 months	16
Compaction Machine Operator cum Mechanic	JBIC 4	2	3 months	50

Inventory Control & Stores Management	JBIC 5	3	3 months	52
Paving Machine Operator cum Mechanic	JBIC 6	1	3 months	13
Concrete Worker	JBIC 7	1	3 months	6
Hydraulic Excavator Operator	JBIC 8	4	1 month	48
Wheel Loader Operator	JBIC 9	3	1 month	29
Mobile Crane Operator	JBIC 10	3	1 month	24
Crawler Tractor Operator	JBIC 11	3	1 month	24
Dump Truck Operator	JBIC 12	3	1 month	15
Motor Grader Operator	JBIC 13	3	1 month	25
Loader Backhoe Operator	JBIC 14	4	1 month	60
Basic Maintenance of Construction Equipment	BaCEM	4	5 days	248

Source : ICTAD

Short term Training Programmes and Seminars conducted

On Technology	-	15
On Contract Administration and Management	-	35

Training Programmes conducted

On Construction Equipment Operation and Maintenance at Operator Training Centre at Galkulama	-	118
at Construction Equipment Training Centre (CETRAC) in Colombo suburbs(setup with Japanese aid in mid 90s)	-	46
During the Year 2007		

ICTAD also organises programmes in enhancing and updating the knowledge of industry personnel, in collaboration with private sector entities. These are mainly conducted on latest **developments in the industry technology, use of new materials etc.** Correct and proper use of technology and materials are prime concerns in these programmes. Manufacturers and agents of proprietary products mainly assist in this exercise. All these programmes are aimed at increasing the quality and productivity of the industry.

ICTAD has ventured into a new programme to uplift the knowledge of skills of tradesmen and to offer them the '**National Vocational Qualification Levels**' (**NVQ**) through '**Recognition of Prior Learning**' (**RPL**), in collaboration with other relevant State institutions. The most important factor here is that they are being provided with access to the newly set up **University of Vocational Technology**, passing through a series of levels, where they can

earn a degree in the respective field, without having to go through the conventional way of entering a university. It is expected to attract more youngsters to the occupation as well as to gain recognition in the society, for a vocation in the industry.

Construction Excellence Award Scheme conducted annually by **ICTAD** is a well recognized event among the stakeholders of the industry, that motivates all contracting companies for quality and productivity improvement. Awards are presented to projects on the overall performance after regular monitoring. Assessment criteria has been made more elaborate, so that the project monitoring commences from the very beginning. This gives the assessors a better picture of the management of the total project, rather than on the end product only, thereby compelling the contractors to manage their projects well, so that the quality and productivity levels are maintained, at higher levels.

New areas of work for the development of the industry too have been identified by ICTAD in its role.

Work relating to quality and productivity improvement is one such area. **Improvements relating to services rendered by consultants** and the **contractors** are both covered in these aspects.

- ◆ Regulation of activities and promotion of best practices relating to the Construction Industry.
- ◆ Maintaining standards in construction work, including quality of material used and workmanship
- ◆ Promotion and raising of professionalism in the industry
- ◆ Monitoring and Review of the work of consultants
- ◆ Technical Auditing of construction project work
- ◆ Improvements in the Grading and Registration System of Contracting Companies
- ◆ Widening of the scope relevant to specialist contractors
- ◆ Development of skill levels of workers in the industry
- ◆ Improvements in Safety, Welfare and Health aspects of the personnel engaged in the industry
- ◆ Promotion of sustainable and environment friendly construction
- ◆ Prohibition of the use of hazardous material in construction,

are some key aspects that have been specifically identified.

3.2 Private Sector Participation

Similar measures are taken by the **National Construction Association of Sri Lanka (NCASL)** and the **Chamber of Construction Industry (CCI)** as well, in enhancing knowledge of industry staff. Several schools are run by these organisations in giving training in skills. Newly set up **Advanced Construction Training Academy (ACTA)**, ICTAD and NCASL owned company, has ambitious programmes in training and enhancing knowledge of middle level technical personnel of the industry. Training of supervisors, superintendents, draughtsmen and quantity surveying assistants are among them.

Training Programmes conducted by ACTA

Sr No.	Name of Programme
01	Construction Supervisor
02	Quantity Surveying Technician for school leavers(Full Time)
03	Quantity Surveying Technical (Part Time)
04	Human Resource Development Awareness
05	Craft Skills for Supervisors - Plumbing
06	Craft Skills for Supervisors - civil
07	Productivity Improvement and Japanese 5S for supervisors
08	Record keeping at work site for supervisors
09	Labour Management, Regulations and Safety Regulations for Senior Supervisor
10	Craft Skills for Electrical Supervisors
11	Soft skills application for Senior Level Supervisors
12	Leadership Communication and Soft Skills for Supervisors
13	Stores Management
14	Construction Planning
15	Motivation and ISO for Construction Sector
16	ISO-9000 Quality Standards
17	Auto Cad

Source : ACTA

Annual Award Scheme for projects, conducted by the **NCASL** too, gives encouragement and motivation for the contractor members to attain quality end products, in their projects undertaken, giving emphasis to productivity.

3.3 Professional Bodies

Professional Bodies related to construction also conducts regular programmes in updating and enhancing the knowledge of their members, as well as other personnel involved in the industry on various aspects.

Sri Lanka Institute of Architects (SLIA) has its regular quarterly programme '**Continued Professional Development**' on current issues and development in technology, management, materials and other issues. SLIA also conducts seminars and workshops on other industry related issues, and presentations by, local as well as overseas experienced professionals in the industry.

Several Architectural Consultancy Companies have **ISO Standards** established, in their organisations and the number is expected to rise.

Following is a brief account of how other professional bodies conduct their programmes for the development of the knowledge of their members for improved productivity.

Institution of Engineers Sri Lanka -

One or two programmes of varied durations are held monthly, as approved by the Continued Professional Development Committee of the Institution.

Society of Structural Engineers -

Question time programmes of one hour duration are conducted monthly. Seminars on related subjects are held twice a year.

Association of Consulting Engineers -

Lecture programmes are conducted every two months. Courses on FIDIC guidelines are conducted bi-annually.

Institute of Quantity Surveyors, Sri Lanka and Institute of Project Managers are such other bodies of industry professionals that conduct similar programmes.

Improvement of the quality and productivity of the services provided by the members is one of the prime objectives, in conducting the above programmes.

4. Future Development

4.1 Institutional Framework

With the implementation of the new Act establishing '**Construction Industry Development Authority**', there will be provision for wider coverage and legal sanctity for activities of the Authority for the development of the industry.

An important provision in the draft act is the section making, the **non-payment to contractual claims**, within the stipulated times, a violation of the Act. The intension being to minimise the disruption to work, caused by payment delays.

The declaration of “**Prescribed Construction Work**” in the proposed act will provide means of direct state intervention in construction work, for ensuring Quality, Productivity and Safety, in the interest of the industry and the nation.

With the establishment of the **ISO Quality Management System** in the construction companies, it is expected that the productivity and quality of performance of the industry will improve. This concept is being implemented in most consultancy organisations as well.

Assistance for improvements, in the form of **Technology Development, Improved Management Skills and Institutional Establishment** are anticipated from donor countries and agencies.

4.2 Human Resource and Social Issues

A serious problem that has been experienced by the industry during the last few years, is the **dearth of experienced manpower**, in almost all occupational categories. This has been primarily caused by the migration to Middle Eastern and other countries, where construction booms exist and lucrative employment opportunities exist.

A need that has been identified in improving the productivity of skilled personnel in the industry, is to have a **higher level of basic education and literacy** of the persons who intend joining the occupation. Writing and reading skills, both either in Sinhala or Tamil, as national languages, and English, needs to be of a better level than what exists. As the main communication, in Construction Industry in Sri Lanka, in the production of drawings, instructions or other forms of exchange of information, takes place in English, the language or literacy has become an issue. The knowledge of **basic mathematics** and the ability in the **interpretation of drawings**, would no doubt help increase the productivity of these employees.

As such, attempts are being made to attract school leavers, after **G.C.E. (OL)**, who do not qualify to proceed to **Advanced Level**, and the students, who do not qualify to seek further education after Advanced Level, into these areas of occupation.

However, there has also been noticed, **a reluctance** on the part of younger generation/school leavers to seek employment in skilled trades, specially in construction sector. **Lack of social recognition** in the traditional society, despite better financial gains, is believed to be the main cause behind the problem. The Ministry of Construction & Engineering Services, together with ICTAD and other related agencies, carryout number of propaganda work, through mass media, to address this issue. A novel programme ‘**Sisu Nena Pola**’, to raise funds to offer scholarships to prospective needy trainees in these areas of trades, is being conducted by the Ministry of Construction & Engineering Services, jointly with related Ministry organisations. **An**

exhibition, trade fair and a carnival held monthly in various parts of the country for fund raising, awareness buildup and earning of recognition for the occupation, are primary activities of the programme.

4.3 **Expected Investments**

With the liberation of the Eastern part of the country, a boom in infrastructure construction has set in and continued with more investment in construction, expected from both public and private sectors.

Expected liberation of the Northern part of the country, as well, towards the early part of 2009, is also to generate more construction work, primarily in infrastructure. Works in Roads, Power, Telecom, Irrigation, Harbor Construction and Building sectors will be the major stakes. Some road works and power projects have already commenced.

In anticipation of the above, there is a serious need to have the necessary resources ready to take up the challenge, specially in the human resources of competency, for fulfilling the requirements for improved productivity.

5. **Conclusion**

The need for improvements in the productivity of inputs in the Construction Industry is felt more than ever in Sri Lanka. The survival of a contracting organisation is largely dependent on productivity, as it ensures the timely delivery of a cost effective product of quality. This is important both locally and internationally, as some Sri Lankan companies have ventured to undertake projects overseas in Maldives and in countries of Gulf of Oman.

It is believed that the steps taken by the ICTAD in making ISO Standards mandatory for registration of contracting companies, will increase awareness, motivate and encourage them to reach for higher productivity.

Other stakeholders of the industry such as professional bodies and private sector institutions too have identified the need for improvements in this respect. Services provided by consultants also need improvements to improve productivity in construction.

Human resource issues need to be properly addressed.

Provisions in the proposed Act for the 'Construction Development Authority', will give added strength to ICTAD to forge ahead with the task of developing the industry. Joint efforts by the Ministry of Construction & Engineering Services, other State institutions in the Sector, and the private sector is expected to achieve positive results.