

Factors affecting Construction Labour Productivity in Trinidad and Tobago

Brent G. Hickson^a and Leighton A. Ellis^{b, Ψ}

Department of Civil and Environmental Engineering, The University of the West Indies, St Augustine Campus,
Trinidad and Tobago, West Indies,

^aE-mail: bghickson@hotmail.com

^bE-mail: Leighton.Ellis@sta.uwi.edu

^Ψ - Corresponding Author

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Abstract: Labour productivity is at the forefront of concerns facing professionals in the construction industry worldwide. Despite the breakthroughs made in technology and an ever-expanding labour market much of the advances in construction are being eroded by inherently poor practices on the job site. This study highlights the factors affecting labour productivity of the Construction industry in Trinidad and Tobago (T&T). A questionnaire was used to gather the relevant data from members of the Trinidad and Tobago Contractors Association. It involved ranking 42 predefined factors divided into 4 categories: Management; Technological; Human/Labour and External. The relative importance of indices (RII) was determined and the factors were ranked. The top ten factors affecting construction labour productivity in T&T are: the lack of labour supervision, unrealistic scheduling and expectation of labour performance, shortage of experienced labour, construction manager's lack of leadership skills, skillset of labourers, delay in responding to requests for information (RFI), payment delay, communication problems between site management and labour, rain and late arrival, early quitting, and frequent unscheduled breaks. Recommendations have been made in the study to address these factors. The research has direct benefits to key stakeholders in the construction industry.

Keywords: Productivity, Construction, Labour, Trinidad and Tobago

1. Introduction

A successful construction project has many important components, a major contributor being labour. In fact, construction labour constitutes the largest unit of human resource on any given project. Human resources represent the most variable, uncontrollable, and important element in production (Kazaz and Ulubeyli, 2007) and labour's sheer magnitude is the reason why underlying influences (both positive and negative) significantly determine the outcome of projects.

Although Trinidad and Tobago (T&T) has a sizeable labour force and skilled labour exists, poor workmanship and delays as a result of labour issues plague the construction industry. There is limited research into the construction industry in T&T, thus root issues and trends have not been accurately identified or analysed. This paper addresses this void and adopts the methodology used by Jarkas and Bitar (2012) to identify and rank the factors affecting labour productivity in T&T. Each group of professionals targeted within the construction industry may produce differing perspectives on which factors affect labour productivity and to varying degrees. It is not reasonable to amalgamate these differing opinions into one definitive ranking of factors. While the existence of unproductive labour habits is not challenged, the extent of inefficiency and the sources of underperformance have not been addressed. The paper aims to identify the factors

affecting labour productivity, rank these factors and to propose solutions to these problems in T&T. Given the limited information available, it explores the labour trends, which in turn can be used to improve management techniques, labour relations, project planning and other related aspects of the construction industry in T&T.

In an effort to create a standard ranking system, any additional factors identified but not included in the questionnaire were not scored. Likewise, the integrity of factors used in the survey has not been tested. It is believed that the factors to be ranked are all predefined, undisputed elements that affect productivity.

2. Literature Review

2.1 What is productivity?

Construction labour productivity is a complex variable to measure, its constituents are vague and are difficult to quantify. A comprehensive understanding of the concept of productivity must be achieved to successfully analyse it. Fundamental concepts provided in previous studies include: "dollars of output per person-hour of labour input" (Adrian, 1987), and "the quantity of work produced per man-hour, equipment-hour, or crew-hour" (Finke, 1998).

Similarly, interpretation of the basic output/input expression can be applied to evaluate labour effectiveness by input use efficiency (partial factor productivity) where

output is assessed with respect to a single factor of production.

$$\text{Labour Productivity} = \frac{\text{Output}}{\text{Labour Input}}$$

In this study, as in others, productivity is observed with the work force interpreted as a whole body rather than individual classes of worker (e.g. masons, electricians etc.). Construction projects employ a large number of people, this method does not distinguish productivity among individuals nor does it discern productivity between professions. As a result, the factors documented or recommendations derived may not apply to every class of worker.

2.2 Labour productivity, a global dilemma

The construction sector is a strategic part of every society, it is one of the largest employers and attracts a large amount of investment (both public and private), while being responsible for providing necessary infrastructure to nations. Construction employs more than 7% of Europe's work force and is the largest industrial employer in the continent (Proverbs et al., 1999). Building construction in particular, consumes approximately 70% of construction investment in developing countries (World Bank, 1984).

The battle to complete construction projects on time and within budget is ongoing, being fought when faced with the rising cost of labour and material. Aynur et al. (2008) noted that construction labour accounted for the largest percentage of total project costs in developing countries (i.e., as much as 40% of direct capital cost in large construction projects). Underperformance of this component is detrimental to success.

While improvements have been made in many areas of design and construction technology, addressing the dilemma of productivity has been challenging given the limited data available. Nevertheless, some research has been undertaken to tackle this global problem.

Kuwait, a Middle Eastern territory had undergone a massive state fuelled construction drive initiated in January 2010 but remained plagued by inefficiency and over-budget expenditure. Despite the new technology builders have access to, the excess of construction material, the equipment and financing available, contractors were still faced with rising construction costs, longer project timelines and cost overruns (Jarkas and Bitar, 2012). Much of the leakage had occurred in labour, where weak output had eroded investments made by contractors.

Decreasing productivity has been recognised in the United States (US), witnessed separately in studies by Allen (1985), Business Roundtable (1983) and Stokes (1981) where it was observed that construction output declined between 1968 and 1980 at an annual rate of 2.4 to 2.8%. Teicholtz (2001) showed a continuation of this pattern into the year 1999, with labour productivity measured at an annual compound rate of -0.48%.

The Caribbean is a developing region with impetus provided by a combination of foreign direct investment, state participation and local/regional private sector involvement at varying levels across territories. Construction labour in this region is primarily provided by locals with skills developed either domestically or through information transfer by international firms. In the 2000s a buoyant world economy stimulated investment in new construction within the Caribbean with many territories expanding infrastructure while improving or adding to existing facilities.

While investment may have been positive in the 2000s, publications from the PIOJ (2009) showed Jamaica on a low productivity growth path during this period. It confirmed that overall labour productivity in the region (using international prices) at \$9,080 for Jamaica, Barbados \$28,302, T&T \$33,768, and USA \$67,087 for the period 2000-2003. A further decline of Jamaican labour productivity was witnessed in 2008. Moreover, other Caribbean nations garnered similar reviews: *"In tourism-based economies such as Barbados, employment growth outstripped GDP growth which is a clear indication of falling labour productivity at the level of the total economy"* (ILO 2006).

T&T has an economy based heavily on oil and gas exports, the revenue from which has long fuelled its construction projects. It's much celebrated expertise in engineering and construction however, has not guarded it from negative industry practices. Shortcomings in engineering projects are well documented and span the entire history of this nation (such inadequacies include weak productive output). ECLAC (2005) actually demonstrates a rise in productivity during the early 1990s but after 1996 there was a noticeable decline.

2.3. Outcomes of previous studies

Several labour productivity factors have been identified in research studies. Global productivity trends have been documented and the most popular problems have been identified in the papers. The most prevalent issues include:

- a) Unavailability of material
- b) Unavailability of tools/equipment
- c) Incompetent management
- d) Rework
- e) Poor communication
- f) Lack of incentive program
- g) Motivation of workers
- h) Schedule of work

These issues (not listed in any order) are reoccurring factors gathered wherever relevant research has been undertaken, have consistently been found to be at the forefront of poor productivity. Table 1 shows a list of some of these factors and their rank in previous studies.

Table 1. Factors and their rank in previous studies

Paper, Country	Factor and Rank		
	Lack of Material	Unavailability of Tools/Equipment	Rework
Olomolaiye et al (1987), Nigeria	1st	3rd	2nd
Zakeri et al (1996), Iran	1st	3rd	10th
Makulsawatudom and Emsley (2003), Thailand	1st	4th	10th
Henry et al (2007), Uganda	17th	4th	3rd

This brief overview of the findings of past research not only outlines the similarity of results achieved, but also illustrates just how widespread these problems are. There has been a lack of progress made and by assembling these studies chronologically one can observe that the same problems have remained atop the list for over 15 years (albeit in different countries).

Multiple studies carefully noted that labour productivity factors were not independent of one another and not all can be controlled. Management must therefore direct the conditions that are manageable and provide a positive environment for labour.

2.4 How is this data used?

Understanding labourers is part of the solution to increase efficiency. Construction workers are not machinery and if appraised under identical work conditions different productivity levels might be noticed, furthermore a constant level of productivity is not guaranteed throughout the life of a project (Lam et al., 2001).

Craft workers have been targeted by researchers and their discoveries have offered considerable contribution to management's outlook. Open and lucid communication among personnel cannot be emphasised enough. It is imperative to achieve harmonious operation of human resource on a construction project. Information must not only be disseminated by a top down approach but gathered from site and conveyed upward. As Jiukun et al. (2009) explain, *"a better understanding of the factors influencing labour productivity from the workforce's perspective can enable site management teams to more effectively allocate their limited resources, provide craft workers with better support, increase craft workers' motivation, and enhance craft workers' commitment to productivity improvement."*

Developed countries enjoy much success because they are able to organise production with relatively high levels of productivity. Conversely, low levels of education or poorly trained labour in addition to insufficient infrastructure is prominent in developing countries (Kazaz and Ulubeyli, 2007). This erodes the advantage of cheap labour and leads to over budget and over scheduled projects.

The T&T construction industry embodies this premise, observed in very recent projects during the economic boom as well as past undertakings. A study conducted in T&T by Lewis and Mugishagwe (1997) noted "Construction operations were plagued by low

labour productivity.... in addition to these labour related problems there was also a significant lack of sophistication in the managerial skills employed in the industry".

Despite it comprising a large section of construction cost, the workforce is not seen as important input to a successful project (Kazaz et al., 2008). In T&T, labour always under-performs and management is oblivious of how to change it. Relevant research into the local market must be executed to gather the origins of these deficiencies, so they can be acted upon.

3. Study Methodology

Recognising and grading factors of productivity is subjective hence a survey instrument was best suited for data collection in this study. To achieve standard parameters for quantification and analysis, predetermined factors were used in this investigation. The use of labour productivity factors originates from the research findings advocated by Jarkas and Bitar (2012).

Data acquisition targeted the pool of contractors belonging to the T&T Contractors Association (TTCA.). This organisation was chosen to generate feedback as they had a satisfactorily large sample of qualified professionals and this body comprises reputable companies of sufficient financial strength, experience, technical capability and equipment.

For this study, a probabilistic sampling method (Hogg and Tanis, 2009) was used to determine the minimum size of the contractor pool.

$$n = \frac{m}{1 + \left(\frac{m-1}{N}\right)}$$

where,

N = available population size

m = unlimited population size

n = limited population size

$$m = \frac{z^2 p(1-p)}{\epsilon^2}$$

z = statistic value of confidence level used

p = value of population proportion that is being estimated

ε = sampling error of the point estimate

From the TTCA pool, the calculated unlimited population size was 384. The available population size was sixty-six (66) and using the above formulae the limited population size was calculated to be fifty-seven (57) participants. The survey was able to obtain responses from thirty (30) contractors which represented 52% of the limited population size.

For the purpose of this study, a questionnaire with a combination of close ended and open-ended queries was used as it represents an appropriate tool to draw from the expertise of industry professionals as well as providing timely feedback for the analysis component of this paper. Questionnaires were distributed and each firm was required to score each factor outlined. The factors were derived from previous studies on this subject matter. The questionnaire was administered face-to-face.

Hence, respondents were asked to score each factor using an effect level ranging from 1 to 4 (with 1 representing the least effect and 4, the most effect on productivity). The scores were analysed using the Relative Importance Index (RII).

Relative Importance Index (%)

$$= \frac{5(n_5) + 4(n_4) + 3(n_3) + 2(n_2) + n_1}{5(n_1 + n_2 + n_3 + n_4 + n_5)} \times 100$$

Employee opinion surveys usually end with respondents rating every issue as being important for fear that anything not given high importance ratings would not be addressed (Johnson and LeBreton, 2004).

The RII method is a proven system for analysing employee or customer satisfaction thus making it suitable for this situation. It can expose specific elements that contribute most to management and labour concerns and assist decision makers in allocating organisational resources (Lundby and Fenlason, 2000; Whanger, 2002). The data were compiled and calculations performed utilising spreadsheet software, where the results were ranked and presented in this paper.

4. Results and Discussion

This study examined the factors that affect labour productivity in T&T, and ranked 42 predefined factors divided into four (4) categories, namely 1) Management; 2) Technological; 3) Human/Labour, and 4) External. The RII was used to determine the influence each factor has on construction projects with the highest value attained in the index indicating the highest rank.

4.1 Ranking of Management Factors

Table 2 shows the ranking of the factors and their corresponding RII for the management category. The following is a brief discussion of the top ten factors affecting labour productivity in the management category.

1) *Lack of labour supervision* - Construction workers must be closely monitored to achieve the desired levels of productivity, inadequate supervision as a key reason for idle time on construction projects. Lack of labour supervision was in fact identified as the number one management factor in Jarkas and Bitar (2012), while Soekiman et al. (2011) found that supervision is to be the principal issue affecting productivity.

2) *Unrealistic scheduling and expectation of labour performance* - Practical assessment and scheduling of work is heavily dependent on the skill and experience of

Table 2. Ranking of Management Factors

Rank	Factor	RII (%)
1.	Lack of labour supervision	95.00
2.	Unrealistic scheduling and expectation of labour performance	91.67
3.	Construction manager's lack of leadership	88.33
4.	Payment delay	85.83
4.	Communication problems between site management and labour	85.83
6.	Late arrival, early quit and frequent unscheduled breaks	84.17
7.	Shortage of materials	83.33
7.	Construction method	83.33
7.	Lack of training offered to operatives	83.33
10.	Unavailability of suitable tools	81.67
11.	Lack of periodical meetings with crew leaders	78.33
12.	Lack of incentive scheme	77.50
13.	Crew size and composition	75.83
13.	Sequencing problems	75.83
15.	Inspection delay by site management	74.17
16.	Accidents as a result of poor site safety program	73.33
17.	Labour interference and congestion	72.50
18.	Proportion of work subcontracted	71.67
19.	Lack of recognition program	70.00
20.	Working overtime	66.67
21.	Owner's representative intervention with site management and operatives	60.34
22.	Lack of providing labour with transportation	60.00
23.	Lack of suitable rest area offered to labour on site	59.17
24.	Unsuitability of storage location	57.50

management personnel. Scheduling emerged as a pertinent issue, this weakness can fuel deficiencies in other elements such as poor workmanship and labour discontent.

3) *Construction manager's lack of leadership* - Both Henry et al. (2007) and Makulsawatudom and Emsley (2003) found the incompetence of supervisors to be among the chief contributors to poor productivity. Jiukun et al. (2009) ranked it fifth in its list of productivity categories. This factor is also rooted in the expertise of the individual. One must be able to command the respect of the workforce in order to maximise output as well as be able to diffuse/resolve problems as they arise.

4) *Payment delay* - Delays may occur as a result of cash flow originating from the client, the contractor, or by poor planning/management of funds on the project. Regardless of the source, labour is only concerned with the bottom line and any disputes could severely hamper progress.

5) *Communication problems between site management and labour* - Relaying information from management to labour and vice versa is challenging for both parties but it is essential on the job-site. Communication was seventh in the productivity categories in Jiukun et al. (2009), sixth in the Makulsawatudom and Emsley (2003) list of critical factors, and sixth in Henry et al. (2007). Inaccurate or ambiguous instruction has been identified as a particular concern on for labourers.

6) *Late arrival, early quitting and frequent*

unscheduled breaks - Respondents revealed that this practice was commonplace in some regions of T&T and disciplining workers was not trouble-free. Reprimanding labour often led to workers resigning their positions thereby depleting the workforce resulting in inevitable schedule setbacks. In T&T, managers described the labour force as having poor work ethic and preferring less physically demanding jobs.

7) *Shortage of materials* - This was the most significant factor in Makulsawatudom and Emsley (2003) and the second most important productivity category in Jiukun et al. (2009). Lack of materials is due to delinquent project management or as a result of economic constraints on the contractor, this problem could be solved with better planning.

8) *Construction method* - The construction technique employed is at the discretion of the contractor and depends on the resources available to him. Expertise plays a pivotal role in choosing the construction method and execution of the system. Poor construction methods ranked fifth in the overall importance index found in Henry et al. (2007). Severe disruptions can arise when the workforce is not familiar with the construction technique. Design oversight may provoke this factor as contractor input is not always present in assessing the constructability of a project.

9) *Lack of training offered to operatives* - Poorly trained workers could severely impact output and diminish the quality of work produced. Contractors in T&T offered limited training opportunities to workers hence their capabilities on-site were limited. External training exists but there is a need for better apprenticeship structures and continuous learning initiatives. Contractors also observed that labourers did not always know current professional standards.

10) *Unavailability of suitable tools* - This often arose out of poor procurement of equipment or inadequate maintenance of tools. Lack of tools ranked fourth in recent studies conducted by Henry et al. (2007) and Makulsawatudom and Emsley (2003). Management needs to furnish workers with new equipment whenever possible as obsolete tools curtail progress unnecessarily. Attention must also be paid to the number of workers using a specific tool to reduce the competition for resources.

4.2 Ranking of Technological Factors

Table 3 shows the ranking of the factors and their corresponding RII for the technological category. The following is a brief discussion of the top five factors affecting labour productivity in the technological category. These are:

1) *Responding to requests for information (RFI)* - Workers would regularly ask for instruction/clarification from supervisors and site engineers, responses however are not always prompt. This may lead to idle time thus management must redirect labour whenever possible.

Table 3. Ranking of Technological Factors

Rank	Factor	RII (%)
1.	Delay in responding to requests for information	86.67
2.	Rework	84.17
3.	The extent of variation/change orders during execution	81.67
4.	Clarity of technical specifications	81.03
5.	Coordination level among design disciplines	78.33
6.	Compatibility and consistency among contract documents	75.83
7.	Stringent inspection by the engineer	74.17
8.	Design complexity level	72.50
9.	Site restricted access	71.67
10.	Inspection delay by the engineer	68.33
11.	Confinement of working space	67.50
12.	Site layout	65.00

2) *Rework* - Rework ranked third in Henry et al. (2007) and tenth in Makulsawatudom and Emsley (2003). Rework is the result of poor workmanship or variation to the original design. Respondents emphasised poor methods and inexperienced labour as the main reasons for rework in T&T, they complained of simple tasks that have gone awry. Rework delays the construction schedule and results in undue wastage of materials.

3) *The extent of variation/change orders during execution* - In T&T, it is common for the project construction phase to begin before the design has been completed, this frequently results in variations due to constructability problems owing to the design or existing in-situ conditions. Thomas and Napolitan (1995) calculated an estimated 30% loss in efficiency when alterations are being performed.

4) *Clarity of technical specifications* - This may also occur because construction starts before the design has been completed. Makulsawatudom and Emsley (2003) recorded incomplete drawings as a major concern in the study of Thailand's construction sector, attaining a ranking of the second most critical factor of labour productivity.

5) *Coordination level among design disciplines* - Architecture and engineering disciplines regularly work together. Major changes must be made as early as possible and failure to attain an accord may result in undesirable variations and subsequent project delays.

4.3 Ranking of Human/Labour Factors

Table 4 shows the ranking of the factors and their corresponding RII for the human/labour category. These are:

Table 4. Ranking Human/Labour Factors

Rank	Factor	RII (%)
1.	Shortage of experienced labour	91.67
2.	Skill of labour	87.50
3.	Motivation of labour	82.50
4.	Physical fatigue	71.67

1) *Shortage of experienced labour* - Contractors in T&T employ most workers temporarily (employment typically lasts the duration of the project), thus they are unable to retain experienced labourers. There are no opportunities for vertical mobility within local construction companies. Workers rather offer their services to competing firms then decide which jobs to pursue, thus the experienced workforce becomes divided.

2) *Skill of labour* - Temporary employment with different contractors develops different methodologies and work habits in labour. Besides, contractors do not anticipate an extended association with workers thus they are unwilling to develop labour as they do not want to train workers for competing businesses.

3) *Motivation of labour* - There are many facets to encouraging labour: management relations, adequate and prompt salary payment, job security in addition to job satisfaction. Most labourers lament the lack of employee benefits available to them and their insecure future in the construction industry. Labourers perceive their jobs to be stagnant rather than a rewarding career and this has a negative effect on their output.

4) *Physical fatigue* - Survey participants noted that labourers do not complain of physical fatigue but would target less strenuous occupations once they were accessible, this trend however, can be attributed to negative local customs. Extended work hours have great effect on fatigue during which workmanship and safety practice begin to wane.

4.4 Ranking of External Factors

Table 5 shows the ranking of the factors and their corresponding RII for the external category. These include:

1) *Rain* - T&T is a tropical territory and has a rainy season spanning most of the calendar year. While construction is scheduled to take advantage of the dry season, wet weather is unavoidable and can reduce output on site. Labour usually becomes uncooperative during rainy weather and workers use the occasion to be absent or leave early despite conditions not directly affecting their tasks.

2) *High temperature* - T&T records temperatures in excess of 30°C but locals are accustomed to these conditions and there have been no related injuries or deaths. Complaints of high temperature and their effect on productivity are few.

Table 5. Ranking of External Factors

Rank	Factor	RII (%)
1.	Rain	85.83
2.	High Temperature	64.17

4.5 Overall Ranking of Productivity Factors

Table 6 ranks all productivity factors and shows their

corresponding RII. Survey participants reiterated that these factors are intertwined and their impact must be conceptualised together. For instance, the experience of labour and the skill of labour directly determine the likelihood of rework, the amount of rework necessary and the time to complete such. Likewise, management's leadership, timely salary disbursement and existing incentive schemes affect labour's motivation.

Table 6. Overall Ranking of Productivity Factors

Rank	Factor	RII (%)
1.	Lack of labour supervision	95.00
2.	Unrealistic scheduling and expectation of labour performance	91.67
2.	Shortage of experienced labour	91.67
4.	Construction manager's lack of leadership	88.33
5.	Skill of labour	87.50
6.	Delay in responding to requests for information	86.67
7.	Payment delay	85.83
7.	Communication problems between site management and labour	85.83
7.	Rain	85.83
10.	Late arrival, early quit and frequent unscheduled breaks	84.17
10.	Rework	84.17
12.	Shortage of materials	83.33
12.	Construction method	83.33
12.	Lack of training offered to operatives	83.33
15.	Motivation of labour	82.50
16.	Unavailability of suitable tools	81.67
16.	The extent of variation/change orders during execution	81.67
18.	Clarity of technical specifications	81.03
19.	Lack of periodical meetings with crew leaders	78.33
19.	Coordination level among design disciplines	78.33
21.	Lack of incentive scheme	77.50
22.	Crew size and composition	75.83
22.	Sequencing problems	75.83
22.	Compatibility and consistency among contract documents	75.83
25.	Stringent inspection by the engineer	74.17
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27.	Accidents as a result of poor site safety program	73.33
28.	Labour interference and congestion	72.50
28.	Design complexity level	72.50
30.	Site restricted access	71.67
30.	Physical fatigue	71.67
30.	Proportion of work subcontracted	71.67
33.	Lack of recognition program	70.00
34.	Inspection delay by the engineer	68.33
35.	Confinement of working space	67.50
36.	Working overtime	66.67
37.	Site layout	65.00
38.	High Temperature	64.17
39.	Owner's representative intervention with site management and operatives	60.34
40.	Lack of providing labour with transportation	60.00
41.	Lack of suitable rest area offered to labour on site	59.17
42.	Unsuitability of storage location	57.50

4.6 Overview of Productivity Categories

Table 7 shows the ranking of the productivity categories and their corresponding average RII. The Human/Labour group recorded the highest average RII score of 83.33,

this underlined how important the attributes of workers are to productivity. The common perception is that a more skilled and experienced workforce would require less instruction. Management attained the second highest RII score (i.e., 76.47). Management is needed to coordinate execution of projects and provide leadership. Their ability to extract the best out of labour is vital.

Table 7. Ranking of Productivity Categories

Rank	Group	Average RII (%)
1.	Human/Labour	83.33
2.	Management	76.47
3.	Technological	75.57
4.	External	75.00

5. Conclusion and Recommendations

There are low levels of construction labour productivity in T&T. The investigation into the origins of these deficiencies and assessment of their effect could assist in solving the problem. Moreover, an appreciation of the major factors contributing to the shortfalls gives the construction industry impetus to direct its attention.

Survey instruments used in conjunction with the RII have been proven to reduce bias and simplify data for use in analysis. This survey revealed the ten leading factors affecting construction labour productivity in T&T. These are: 1) the lack of labour supervision, 2) unrealistic scheduling and expectation of labour performance, 3) shortage of experienced labour, 4) construction manager's lack of leadership, 5) skill of labour, 6) delay in responding to requests for information, 7) payment delay, 8) communication problems between site management and labour, 9) rain and late arrival, 10) early quit and frequent unscheduled breaks.

Construction firms must pay closer attention to grooming management personnel in order to develop communication with the workforce and minimise cost leakages. Improvement of workforce motivation is twofold, internal (i.e., human resource management) and external (i.e., standardised labour benefits/job security), a concerted effort is needed to address labour concerns. Besides, the labour force must be held accountable for work done while opportunities must be available to improve the skill of labour.

Several recommendations are made. These are, firstly, to provide training/education opportunities for labour in T&T. The training currently available is inadequate, the state must partner with industry to provide facilities and apprenticeship programmes whereby contractors have direct input in developing the skills required at industry standards. This would reduce rework and build labour experience.

Secondly, this is to improve salary structure, incentives and benefits. Adequate and prompt remuneration in addition to appraisal systems embracing quality, schedule milestones and commensurate rewards

must be used. Contractors and labour unions must agree, so these measures can be meaningfully pursued.

Moreover, overtime work is the common means of schedule acceleration. This practice is not always beneficial as it is known to increase absenteeism, lower morale and decrease safety (Horner and Talhouni, 1995). Scheduled overtime, where permanent extension of the work week is adopted must be disbanded and occasional overtime (random increase in work hours) used. Though overtime is not documented to improve productivity, occasional overtime has a lesser negative effect than scheduled overtime (Rifat, 2007). Kazaz and Ulubeyli (2007) demonstrate the importance of insurance and health benefits to labour as security in retirement gives them serenity to continue with their jobs. Offering vertical mobility and permanent employment with a firm sets individual goals for workers, prompting competition and personal development but it may not be available to immigrant labour.

Thirdly, this is to improve supervision/management. Management frequently complains about labour's inability to operate without instruction and constant monitoring. Conversely, labour is not fond of relentless supervision and begins to loathe observation of their activities. Kazaz and Ulubeyli (2007) explained that delegating duties for specific tasks improves productivity by developing accountability and pride in individuals. Workers and management must be kept abreast of arising issues and involved in the problem solving process one must note however, that too much labour participation has been observed to weaken management's leadership role.

Management should provide a safe and productive environment, provision of amenities such as personal protective equipment (PPE), modern tools, restroom and canteen facilities lift morale. These items should be standard on the job-site with ample upkeep of services. Poor scheduling and material management can hinder the pace of work as labour exploits insufficient supplies of material and slows output in anticipation of a delivery (Kazaz et al., 2008). Similarly, labour efficiency is reduced by deviations from its normal flow (Kazaz et al., 2008) thus leadership on-site must be suitably skilled to handle these problems as they occur.

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Authors' Biographical Notes:

Brent G. Hickson is a recent graduate of the Department of Civil and Environmental Engineering at The University of the West Indies, St. Augustine, Trinidad and Tobago. He holds a BSc. in Civil Engineering.

Leighton A. Ellis is an Assistant Lecturer in the Department of Civil and Environmental Engineering at The University of the West Indies, St. Augustine, Trinidad and Tobago. He is a member of the Association of Professional Engineers of Trinidad and Tobago (APETT). He is also an Incorporated Member of the Chartered Institute of Builders (CIOB). He holds a BSc. and a MSc (Eng), both in Construction Engineering and Management, and is presently pursuing a PhD in Construction Management. Mr. Ellis is also the Graduate and Student Officer in the Institution of Civil Engineers West Indies Local Association (ICEWILA).

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