

Factors Constraining Labour Productivity: Case Study of Turkmenistan

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Abstract. The aim of this study is to identify the key factors constraining labour productivity of Turkish contractors in Turkmenistan based on the views of project manager consultants, contractors and subcontractors. Qualitative data collected through literature review formed the basis for questionnaire surveys conducted among the target populations. In-depth literature review revealed 28 labour productivity constraint factors, however after the reliability test, corrected scale of the questionnaire merely consisted 24 of the factors. Before the factor analysis factors were ranked according to their mean ratings. Recommendations were provided for improving construction labour productivity of Turkish contractors in the construction industry of Turkmenistan for addressing the labour productivity constraints.

Keywords: Labour Productivity, Turkmenistan, Project Management, Construction

1. Introduction

Productivity is one of the important aspects for the companies in the construction industry, which helps for survival or growth. Improvement in the productivity of the construction industry is therefore of critical importance considering its significant contribution to the GDP.

Furthermore, improvement in the productivity of the construction industry has a positive impact on all other industries, as well as on the national economy [1]. For instance, according to [2], 10% escalation in construction productivity would annually save about £1 billion.

There are various critical problems facing the Turkish contractors in the construction industry of Turkmenistan, but one of the most significant according to the authors points of view, is low productivity [3]. Therefore, as part of the aim of this study, factors constraining construction productivity of Turkish contractors in Turkmenistan are going to be provided. This provision allows Turkish construction companies to focus in order to achieve a remarkable improvement in the construction productivity. On the other hand, resources could be optimally disbursed addressing the few causes responsible for the significant portion of the construction productivity issues. To this end, factors constraining construction productivity were first identified via a review of related literature, and recommendations for enhancing the construction productivity level of the Turkish contractors were provided based on the statistical analyses of the chosen factors.

2. Literature Review

Productivity is an effective utilization of the resources to achieve set objectives. Increase in productivity correlates well with increased profitability, competitiveness, achievement of key stakeholder propositions as well as long-term growth and sustainability of a company, an industry and a nation [4]. This study is not focused on defining productivity, but on the factors constraining labour productivity of Turkish contractors in the construction industry of Turkmenistan. However, to move ahead, the research thrusts need to be anchored on a contextual interpretation of productivity.

European Cooperation defines productivity as “the quotient obtained by dividing output by one of the factors of production”. Or, in another words, “the same as efficiency, which is defined as the ratio output energy divided by input energy”. On the other hand, definition of productivity was made by [5] as “the quantity of work produced per man-hour, equipment-hour, or crew-hour”.

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In overall, productivity can be defined as “quantity of output of a process per unit of resource input”, which aligns with several approaches. This definition is also in accordance with others made by a number of authors [6,7,8].

Based on the above-mentioned review, productivity in the construction industry can be defined as a measure of outputs (i.e. units or dollar) obtained by the inputs (i.e. man-hour, machine-hour, materials or money).

At the level of the individual projects executed by an organisation such as a construction company or consulting firm, emphasis is placed on the achievement of the three key project objectives - time, cost and quality targets. The measure of productivity at this level ought to be how well the targets set for those three objectives are achieved by the deployment of company resources (manpower, machinery, money and materials), using the process or method adopted for the project, while complying with the requirements of the statutory/regulatory environment within which the project is carried out. However, to align this with productivity measures at other levels, the project level measurement may focus on the dollar value of the project per unit cost of the resource inputs.

Construction labour productivity has been the subject of numerous research studies. For instance, type of the procurement system has a remarkable impact on the achievement of time, cost and quality targets for a project [9].

[10] have identified 56 on-site labour productivity constraints to the construction industry of New Zealand under eight broad categories which are project finance, workforce, technology/process, project characteristics, project management, statutory compliance, unforeseen events and other external factors.

In their studies, [11] have identified factors, which have significant impact on construction labour productivity in Kuwait. They have identified 45 factors having impact on construction labour productivity, which are grouped under: 1) management group; 2) technological group; 3) human/labour group and 4) external group.

Depending on circumstances, factors having impact on labour productivity may vary from country to country, from project to project, and possibly within the same project site [12]. Therefore, this paper aims to identify the factors constraining construction labour productivity of Turkish contractors in Turkmenistan.

3. Research Methodology

This paper examines constraints influencing labour productivity of Turkish contractors in Turkmenistan. Therefore, as an appropriate method [3] in collecting data, questionnaire surveys were conducted among the target population to further analyze the factors constraining labour productivity of Turkish contractors. This survey also ranks the factors constraining labour productivity.

Likert-type scale was applied [10] in this study to the questionnaire design, running from 1 (very low) to 5 (very high). To determine the questionnaire structure, a second evaluation was conducted to ensure its effectiveness and suitability to the construction context of Turkmenistan. The original questionnaire consists of 28 factors constraining labour productivity.

Before the distribution of the questionnaire, a pilot test was performed to confirm that the questionnaires were phased appropriately. Twelve construction professionals in Turkmenistan were provided with softcopies of the original questionnaire, respectively. Respondents in pilot testing process were asked to comment on the readability, accuracy and comprehensiveness of the questionnaires.

The Cronbach's alpha coefficient (α) was used to determine the questionnaire reliability, because items which are used to form a scale (Likert scale), construction at the group level and reliability of each item at the individual level has to be evaluated. For the pilot test, Cronbach's α of 0.896 was achieved, and the corrected scale consisted 23 structural survey questions representing 23 factors constraining the construction productivity of Turkish contractors in Turkmenistan.

The survey sampled consultants, contractors and subcontractors in Turkmenistan. For the quantitative surveys, emails were sent to the target population in the database inviting them to participate in the online survey. The survey was hosted on a web-based survey platform. Several reminders were sent at monthly

intervals to the potential respondents, to improve the response rate. Given the anonymous nature of this self-administered online survey, an apology was issued in the emails to those who might have already responded while encouraging those who had not to do so before the cut-off date.

Only 124 usable feedbacks were received by the cut-off date and this represented about 53% of total 235 email invitations that have been sent. The 54 useful responses were from contractors (44%), 48 from project management consultants (39%) and 22 from subcontractors (17%) in the construction industry of Turkmenistan.

4. Research Findings and Discussions

4.1. Ranking of the Constraints to the Construction Productivity

The factors constraining labour productivity of the Turkish contractors were ranked according to their means. The seven factors out of 23 with means of 4 or more were recognized as the most significant to labour productivity. Table 1 ranks these constraints based on mean value.

‘Lack of local experienced labour’ was ranked first among the twenty-four identified, therefore considered as the most significant factor constraining labour productivity of Turkish contractors. This result is justified, as experience improves labour in different ways such as intellectual and physical abilities.

After the Independence of Turkmenistan, a lot of construction companies from Turkey have made an investment to re-build the country. However, the main problem of the Turkish companies was to find experienced local labour, which are mostly migrated to another countries after the breakdown of the Soviet Union. Effect of this factor to the construction productivity is clear and was further recognized among the important factors affecting construction productivity in developing countries such as in the USA, Uganda, Malaysia and Indonesia [3,13,14].

‘Schedule pressure caused by government’ was ranked second. This result is justified because accelerating a project can be rewarding, however the consequences can be troublesome [16,17]. Schedule pressure negatively affects labour performance, which is finally affecting labour productivity in overall [18]. Construction projects in Turkmenistan are directly tendered and controlled by the Government or in the other words lack of privatization. In addition to this, there are three different days (independence day, neutrality day and flag festival) when all construction projects have to be finalised and it makes a schedule pressure on contractors, which is having an impact on the productivity of Turkish contractors.

‘Working overtime’ was ranked third. This factor is directly related with the one which is ranked second, because schedule pressure causes working overtime. This result is justified; because of the nature of the construction industry in Turkmenistan is mostly involving working overtime is unavoidable since there is a pressure on the project schedule and labour shortage, especially in the rural areas of the country. Sometimes in some areas of the country it may cause from the hot weather, where the temperature can be 55°C, which therefore make labours to work after hours. In their studies, [2,7,13] support this result by classifying this factor as one of the most influencing factors having impact on construction productivity in the UK, Thailand, USA, Uganda, and Gaza Strip, respectively.

‘Financially weakness of the contractor’ was ranked fourth. Turkish construction companies, which are investing in Turkmenistan financially, are not so strong, because mostly they consider investing overseas as to survive in the industry or make some money and go back to Turkey. [11] argue that financial weakness of the contractor may cause material shortage or some problems in procurement system, which is very critical to achieve productivity for any country such as Turkmenistan, because mostly materials are exported. On the other hand, Government pays just 20% or 30% in advance, however any contractor has to invest much more money for the resources to be used during the construction phase, such as foreign labours, machine, material and money.

‘Rework’ was ranked fifth among 23 factors constraining labour productivity. This result agrees with the findings of other author [21,22], who argue that the delays and costs associated with rework in construction have profound impact on productivity. In another study [23], it was found that the cost of rework ranged from 2 to 12 percent of the total contract value. Suggestions made by [6] will enhance labour productivity of

Turkish contractors, where he states that the use of quality management systems and improvement in labour skills, particularly for on-site management and the management of multi-projects at the firm level.

‘Inadequate financial policies of the Government’ was ranked sixth. This constraint is very significant in terms of its influence on the labour productivity of Turkish contractors, because the Government tenders almost all construction projects in Turkmenistan. Consequently, the Government makes all payments. Even in some construction projects, it becomes very difficult to find financial support from the Ministries of the related project; therefore it affects productivity of the construction companies, such as Turkish. Implementation of the privatization may help to avoid such kind of financial problems, which is consequently will improve productivity of the construction industry of Turkmenistan.

Table 1: Rankings of the constraints to productivity.

Items	Constraint	Mean	Rank
F1	Working overtime	4.38	3
F2	Rework	4.17	5
F3	Work permit of the local labours	3.74	10
F4	High cost of needed resources: material, money & machinery	3.36	13
F5	Work delay caused by Inspection delays by Local Authority	2.66	15
F6	Cost of the wasted materials on site	2.12	23
F7	Inadequate Financial policies of the Government	4.16	6
F8	Payment Delay	4.11	8
F9	Lack of Experienced Local Project Managers	3.25	14
F10	Lack of labour motivation	3.40	12
F11	Frequent changes in government policies/ legislations impacting on construction	2.29	21
F12	Financial Weakness of the Contractor	4.28	4
F13	Working 7 days/week without taking holiday	4.10	7
F14	High cost of foreign labour	3.99	9
F15	Lack of communication between Government Authority and Contractor	2.46	16
F16	Over influence of the Government on the Construction Process	3.61	11
F17	Material shortage	2.44	17
F18	Schedule Pressure caused by Government	4.45	2
F19	Lack of local experienced labour	4.46	1
F20	Frequency of design changes/ change orders	2.28	22
F21	Poor Estimation	2.41	19
F22	Immigration department policies	2.42	18
F23	Unfamiliarity with current job and conditions	2.41	20

‘Working 7 days/week without taking holiday’ was ranked seventh. This result is tally with the findings of the study done by [7] where it was rated as the first in the time group. [25] has also found that working additional days has a significant impact on the construction productivity. Therefore, this result is justified as working additional days has a negative effect on the labours’ motivation and physical strength. Furthermore, due to the schedule pressure caused by the Government in the construction projects of Turkmenistan, both labours and project managers are working mostly without taking any holiday more than six months. Thus, this can lead to the moral demotivation of the local and foreign labours.

5. Conclusion

As part of its aim, this study identifies and ranks the factors constraining labour productivity of Turkish contractors in Turkmenistan, which are measured based on the views of construction professionals. The findings of the research are generally aligned with the results of previous studies related with labour productivity. The results indicate that the most significant factors affecting labour productivity are, lack of local experienced labour, schedule pressure caused by the Government, working overtime, financial weakness of the contractor, rework, inadequate financial policies of the Government, working 7 days/week without holiday.

In conclusion, it is believed that the outcomes of this paper can assist in achieving high labour productivity by focusing and acting upon the most important factors. Furthermore, by focusing on the significance of the evaluated factors constraining labour productivity, Turkish construction companies could be well guided in their efforts to addressing the factors in a time, cost and quality-effective manner.

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