

EVALUATION OF WORK ACCIDENTS IN CONSTRUCTION SECTOR ACCORDING TO ECONOMIC ACTIVITY IN NORTHERN CYPRUS

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ABSTRACT

Northern Cyprus is a developing country. Construction sector is one of the most significant sectors in the world and Northern Cyprus. It has a high amount of employability potential and different kinds of subsectors. Furthermore, it is one of the most growing sectors in Northern Cyprus in recent years. Construction sector is one of the riskiest sectors due to its nature. Many accidents happen in construction sites every year and construction site health and safety vulnerability end with loss of lives or injuries at many times. There are so many studies about construction site health and safety. This paper identifies the relationship between economic activity within the number of work accidents, injured and mortal work accidents based on construction industry in Northern Cyprus. There are some different studies for Northern Cyprus about occupational health and safety but none of them includes comparison with economic data. This study takes into account the official data from the year of 2007 to 2017. It concludes the positive impact on construction site health and safety in respect of economic development.

Keywords: Construction sector, construction site, health and safety, economic activity

INTRODUCTION

Northern Cyprus is a country with an increasing population. Therefore, transportation, housing, infrastructure and superstructure works are increasing according to the population. Cyprus Island is in the earthquake zone so this fact also creates another importance for the construction industry. Many studies and researchers conducted on reducing occupational accidents and increasing awareness of occupational safety all around the world. These studies shed a positive light for health and safety improvement in the world. All positive steps to be taken in the construction sector reduces occupational health and safety risk. Construction workers injure or lose their lives as a result of a work accidents every year. One of the main purposes of this study is giving numerical ideas about Northern Cyprus. The construction sector is one of the largest sectors in the world in terms of employment capacity, production and contribution to the economy (Gürcanlı & Müngen, 2013). Construction industry has a high risk of accidents due to its nature and accidents occur frequently in construction sites. Therefore, one of the most important reasons for the frequent occurrence of work accidents in the construction is the high risk of accidents due to the nature of construction works. For this reason, almost all of the construction activities are considered dangerous by experts (Çelik & Tözer, 2014). It is the first responsible reason in terms of death rates in developing countries (Yılmaz & Çelebi, 2015). The high level of occupational accidents in the construction sector is an important issue so the examination of these occupational accidents can be done by classifying them into main groups. This method will ensure that the policies to be taken are in a positive direction. Additionally, the work to be done can be divided into sub-groups after the work accidents that are divided into main groups and can be concluded in detail about the

causes of occupational accidents. On the other hand, same situation is valid for Northern Cyprus as happens in other countries. Construction sector is the sector which most work accidents occur in Northern Cyprus according to the researchers. Approximately 2-3% of the work accidents in construction sites result in deaths every year in Northern Cyprus. On the other hand, Ministry of Labor and Social Security detected 84 fatal working accidents and 41.67% of them occurred in construction sites in the last 20 years in Northern Cyprus (Çelik & Tözer, 2014). 84 fatal accidents occurred in 20 different sectors in Northern Cyprus. The construction sector with 34 workers in the first place, the trade sector with 8 workers in the second place and the industry sector with 5 workers in the third place who lost their lives cause of mortal work accidents. The accidents separated into categories according to different reasons as follows; 18 of them happened cause of falling from height, 6 of them caused by getting electric current, 5 of them caused by jamming, 2 of them caused by traffic accidents, 2 of them caused by crashed by falling objects and 1 of them caused by drowning during port construction. For this reason, construction worker's health and safety situation has been emphasised once again. It was found that 30% of the victims were unskilled workers in the construction accidents in Northern Cyprus according to the study carried out in 2015. Occupational accidents where unskilled workers lost their lives in the northern part of Cyprus constitute 30.95% of total fatal accidents in the construction industry and 15.12% of occupational deaths in the country (Tözer et. al, 2016). One of the most important reasons for accidents in the workplace is the lack of awareness about issues such as potential hazards, occupational safety measures and correct working methods by employees. The lack of awareness of employees who are new to work or who recently change jobs in the new environment is very important. Regulations and protective equipment usage within the framework of occupational safety and health management systems minimize accidents, injuries and similar undesired situations and help to overcome these undesired incidents with minimum damage. It is compulsory to include occupational safety and worker health management system applications in the specifications of private and government projects in Northern Cyprus but these practices are not taken into account due to the lack of control. Literature review reveals that the level of knowledge and awareness of the employees working in the construction industry is quite low compared to the workers working in developed countries in Northern Cyprus. Most of the work accidents in the construction industry are experienced in the first days of the workers, who have started new work or started to work in a new job at the workplace. This is due to lack of awareness and inexperience (Çelik et al., 2012). On the other hand, the Northern Cyprus has been developing from an economic perspective in recent years. There was an increase of 3.7% and 3.9% in 2010, 2011 respectively according to the data obtained. Furthermore, gross domestic product increased by 4.8%, 4.0% and 3.6% respectively in 2014, 2015 and 2016. In 2016, the construction sector was the second largest growing sector with the ratio of 5.7%, while in 2017 the construction industry was the largest growing sector with 10.6% (2017 Yılı Ekonomik ve Sosyal Görünüm, 2018). Considering that the construction sector has an important place in northern Cyprus, it should not be forgotten when there are job losses due to work accidents and occupational diseases. For this reason, job losses can be reduced with occupational health and safety precautions. As a result, the impact of occupational safety education on work accidents and occupational diseases should be given importance. According to the information obtained from the literature review, many accident data and types of accidents belonging to the construction sector have been handled in other studies. As a summary, the importance of occupational safety training for preventing from work accidents and occupational diseases has been emphasised.

FINDINGS

The findings section of this paper includes the statistical data of the literature review. A comprehensive literature review was carried out to collect data and official statistics. Turkish Cypriot Chamber of Commerce’s official gross domestic product (GDP) data was used in this study. On the other hand, total work accidents in all sectors, total number of work accidents in construction sector, number of injured and dead workers data was achieved from the Ministry of Labour and Social Security, Northern Cyprus. The first table includes the gross domestic product amounts in terms of million United States Dollars from 2007 to 2017. It shows the yearly changing trend in economy of Northern Cyprus. Then, number of work accidents, number of injured workers and number of dead workers are presented for all sectors and construction sector respectively. The authors preferred to touch on total number of work accidents in all sectors as well. However, the importance of the construction sector will be found out again. For this reason, a bar chart used to figure out comparison between construction sector and all sectors. It is important to identify the place of construction industry in terms of occupational health and safety assessment. Moreover, it is useful to make comments regarding on the changing in the number of construction work accidents based on work accidents in all sectors. On the other hand, another figure shows the relationship between number of work accidents, injured workers and dead workers. It points out the numerical data based on yearly statistics. Numerical data can also be used to calculate average values of these three factors. Later on, we might detect in which years we exceed the average values. It is important to observe yearly injured and dead workers cause of work accidents in construction sector. However, we will be able to identify if there is a direct proportion between accident numbers with injured and dead worker numbers. Because we cannot mention occupational health and safety improvement while accident numbers decrease with injured and dead workers increases. Finally, another figure indicates the relation between gross domestic product and three cases which are number of work accidents, injured workers and dead workers. This figure summarizes the occupational health and safety of workers in construction sites in respect of economic activity in Northern Cyprus. All these findings encourage us to determine the changing trend in occupational health and safety within the given period. The given data may use to compare Northern Cyprus status with developed countries for different studies in the future. Furthermore, extra statistical data can be added to create another case study as a future work. For instance, yearly construction numbers can also be used to identify the relationship between construction work accidents and economic activity in Northern Cyprus. Yearly construction numbers may be affected by economic improvements and construction work accidents may show direct proportion change depending on construction numbers. In future works, researchers might be done different studies related to the number of workers who are unable to work or became disable due to work accidents in the construction industry.

Table 1. Yearly gross domestic product values
(Economic and Social Indicators 2015, 2017; www.ktto.net)

Year	Gross Domestic Product	Year	Gross Domestic Product
2007	3,547.2x10 ⁶ \$	2013	3,983.6x10 ⁶ \$
2008	3,957.9x10 ⁶ \$	2014	4,040.2x10 ⁶ \$
2009	3,477.3x10 ⁶ \$	2015	3,749x10 ⁶ \$
2010	3,727.1x10 ⁶ \$	2016	3,838x10 ⁶ \$
2011	3,878.6x10 ⁶ \$	2017	3,984x10 ⁶ \$
2012	3,862.6x10 ⁶ \$		

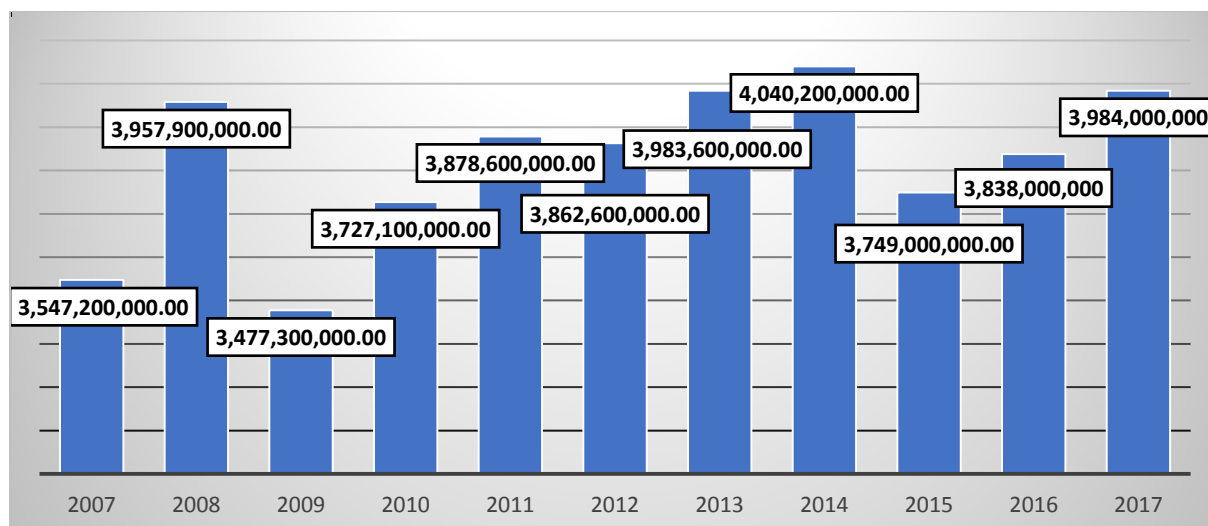


Figure 1. Yearly gross domestic product change

Table 2. Yearly number of work accidents, injured workers and dead workers in all sectors (Çalışma ve Sosyal Güvenlik Bakanlığı Ekim 2016 - Eylül 2017 Yılı Faaliyet Raporu, 2017)

Year	Number of work accidents	Number of injured workers	Number of dead workers
2007	287	278	9
2008	230	237	6
2009	259	253	6
2010	285	283	2
2011	277	270	7
2012	218	214	4
2013	237	230	7
2014	240	238	6
2015	134	127	7
2016	137	129	8
2017	121	117	4

Note: The data 2017 includes the data between 01.01.2017 and 30.09.2017.

Table 3. Yearly number of work accidents, injured workers and dead workers in construction sector (Çalışma ve Sosyal Güvenlik Bakanlığı Ekim 2016 - Eylül 2017 Yılı Faaliyet Raporu, 2017)

Year	Number of work accidents	Number of injured workers	Number of dead workers
2007	106	99	7
2008	66	64	2
2009	68	66	2
2010	56	56	0
2011	56	53	3
2012	56	55	1
2013	59	56	3
2014	45	41	4
2015	26	24	2
2016	25	20	5
2017	27	25	2

Note: The data 2017 includes the data between 01.01.2017 and 30.09.2017.

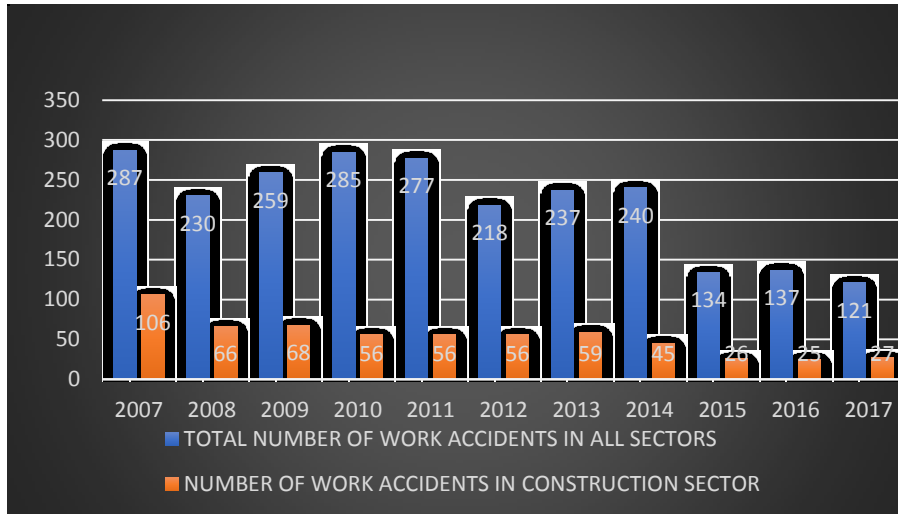


Figure 2. Comparison of total number of work accidents between construction sector and all sectors from 2007 to 2017

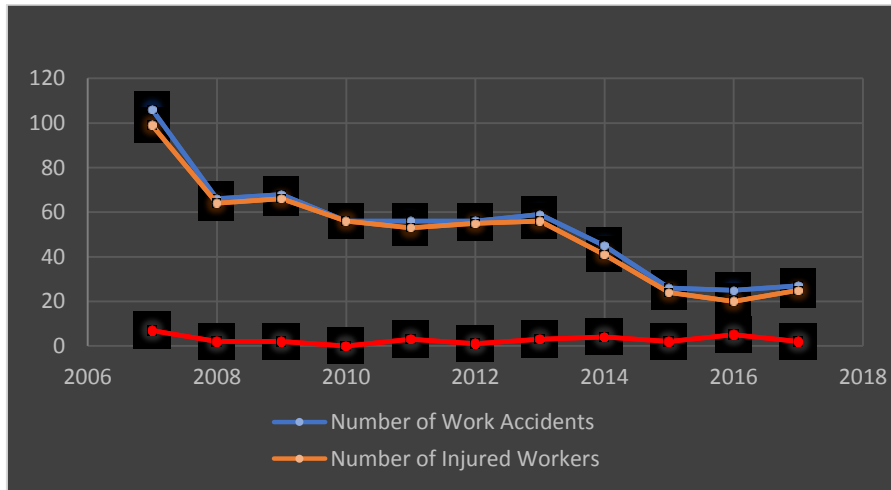


Figure 3. Yearly changing trend in the number of work accidents, injured workers and dead workers

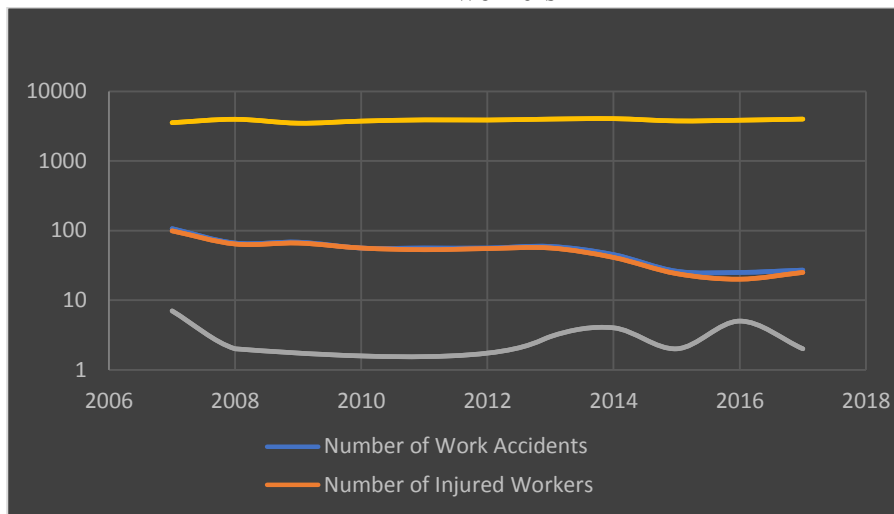


Figure 4. Yearly changing in the number of work accidents, injured workers and dead workers depending on gross domestic product

RESULTS

The amount of gross domestic product is more than 2007, in the years after 2007 except 2009. Although, the economy increased after 2007, it showed decline between some consecutive years. The average yearly gross domestic product amount calculated as $3,822.32 \times 10^6$ United States Dollars (USD). Gross domestic product remained below average in 2007, 2009, 2010 and 2015. Gross domestic product achieved the maximum level in 2014 according to the data from 2007 to 2017. On the other hand, minimum amount of gross domestic product recorded in 2009. The gross domestic product difference between 2007 and 2017 is 437×10^6 USD. Generally, we are able to say that the economy has shown increasing trend after 2007 as it is seen from the figure 1 above. In other words, we can consider Northern Cyprus as a developing country. Therefore, this increasing trend may improve construction industry and all other sectors. On the other hand, the number of work accidents decreased after 2007. This decline continued regularly within the given period excluding 2013. It is good to observe that the difference between 2007 and 2017 is 79. This situation may be considered as a part of economic activity improvement. Although there has not been a regular decrease in the number of injured workers, it is easily seen that there is a decrement coming from 2007 to 2017. Table 2 presents the statistics for all sectors and previous situation is valid for all sectors again. All these findings could be related with positive impact of economy. Furthermore, the most important finding of the study is about mortal work accidents. It is good to observe decrement in the number of mortal work accidents in all sectors. The maximum mortal work accidents were recorded in 2007 according to the achieved statistical data. Moreover, no workers lost their lives in 2010. 1 worker in 2012 and 2 workers in 2008, 2009, 2015 and 2017 lost their lives respectively. Lastly, the average numbers identified for work accidents as 53,64, injured workers as 50,82 and dead workers as 2,82 from 2007 to 2017 in construction industry. The number of workers who injured and lost their lives were above average from 2007 to 2013.

CONCLUSIONS

It is clearly observed that the economy has improved from 2007 to 2017 except 2009 depending on the data we have. There has been a decrease in the number of occupational accidents, injuries and casualties compared to 2007 with the period after 2007 by the help of incremental growth in gross domestic product values. The case study showed the significance of economic development on occupational health and safety policy in Northern Cyprus. However, we can comment that this development increases the importance and investments on worker health and safety in construction industry in Northern Cyprus. The number of occupational accidents, injuries and casualties in the construction industry showed direct proportion with all sectors data compared to 2007. In brief, the data analysed as a result of this study allows us to conclude that important occupational safety measures were taken and the work accidents were decreasing after 2007. In general, the number of work accidents decreased in parallel with the developing economy of Northern Cyprus. Finally, it is good to observe improvement in the awareness of construction health and safety in Northern Cyprus.

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