


Analysis of the main labor problems faced by human capital within the marble factories of Tepexi de Rodríguez, Puebla

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ABSTRACT

According to the General Directorate of Mining Development (2015), the antecedents of the exploitation of marble in Mexico date back to the last years of the Porfirista period (1876-1911), particularly in the last two decades of the nineteenth century and in the first years of the twentieth century, there was a growth of the most representative cities around the world. with the consequent dynamism of the demand for construction materials, as well as industrial metals. In this context, some businessmen showed interest in taking advantage of this conjunctural moment, investing resources in our country in the exploitation, not only of traditional minerals such as gold, silver or copper, but also of other minerals that were in growing demand, among which was marble. Valles and Márquez (2004) state that the discovery of the marble in Tepexi de Rodríguez occurred during the construction of the highway in 1963 when General Antonio Nava Castillo was Governor of the State of Puebla. The extraction of marble began around 1964, based on the use of pickaxe, bar, spikes, train ladder jacks, and marro. According to Ros (2016), in the marble sector there are several labor problems that affect human capital. These issues can have a significant impact on worker productivity and well-being. The study carried out was of a mixed type with the purpose of analyzing the main labor problems faced by human capital within the marble factories of Tepexi de Rodríguez, Puebla, in order to define the current factors that affect the human capital in the work that is carried out in the marble industry of this locality, having an exploratory-descriptive scope. through a case study of a company located in that place, which began operations in 1970, taking a sample of 206 employees who worked in it. As identified in the study, the human capital within the analyzed company faces several problems that limit their labor well-being, it was also identified that there are still bad practices in the management of Human Capital, as well as the lack of training that is an important aspect in any industry or company. In addition, it should be noted that three of the main problems faced by human capital according to the mentions made by workers, firstly, are poor salaries and lack of benefits, secondly, health because there are no long-term disease prevention programs, and thirdly, the lack of occupational safety since there are no hygiene and safety programs that allow them to prevent latent risks throughout the country. the processing of marble.

Keywords: Human capital, Marble industry, Problems, Labor.

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INTRODUCTION

According to Abad (2018), the extraction and working of natural stone, in its varieties of marble or marble limestone, has had a long historical trajectory, as attested by the great artistic and architectural works since ancient times. The pyramids of Egypt, built with huge blocks of earthy-brown limestone that can be seen today, were covered with white limestone from Tura, or even marble like that of Cheops. But without a doubt, it was Rome that was the great promoter of marble, which was used to cover and adorn a multitude of rooms such as Agrippa's Pantheon, monuments, temples, triumphal arches or columns such as Trajan's made of the most famous marble of all; Carrara. Although Rome was the first with the technical capacity to have great territorial impacts with open-pit marble mines throughout the empire, as is the case of Macael, in Almeria. The purpose of this study is of a mixed type, which had the purpose of analyzing the main labor problems faced by human capital within the marble factories of Tepexi de Rodríguez, Puebla, in order to define the current factors that affect the human capital in the work carried out in the marble industry of this locality. having an exploratory-descriptive type of scope,

According to the General Directorate of Mining Development (2015), the history of marble exploitation in Mexico dates back to the last years of the Porfirista period (1876-1911). Indeed, particularly in the final two decades of the nineteenth century and during the first years of the twentieth century, there was a growth of the most representative cities throughout the world, with the consequent dynamism of the demand for construction materials, as well as industrial metals. In this context, some businessmen showed interest in taking advantage of this conjunctural moment, investing resources in our country in the exploitation, not only of traditional minerals such as gold, silver or copper, but also of other minerals that at that time presented a growing potential demand, among which, in addition to marble, there were also asbestos, granite, salt, graphite, talcum powder and a few more.

Valles and Márquez (2004) state that the discovery of the marble in Tepexi de Rodríguez occurred during the construction of the road that connects Tepexi de Rodríguez with the federal highway in 1963 when General Antonio Nava Castillo was Governor of the State of Puebla. The extraction of marble began around 1964, based on the use of pickaxe, bar, spikes, train ladder jacks, and marro. This process, despite the fact that in some cases sophisticated techniques and technological advances such as diamond wire and heavy machinery are already used, continued to represent the most common form of extraction, around 80% of the total exploitation of this form in recent years.

The work was generally carried out in crews of 10 to 12 people, although some could be found with only 4 people. There are currently around 40 crews in the municipality's quarries that employ an average of 400 people. On the other hand, in terms of marble processing, we find that the



first factory was installed in 1977, thus initiating a series of installations that, in size and small, are currently approximately 14 factories. On average, the parking factories employ a total of 36 people per day, distributed in three shifts, that is, around 500 people work daily in these rolling mills, highlighting the role of women who participate actively and in large numbers in these factories. The material that is processed in these factories is not only that extracted in the municipality, but also material from other places, the most common: Classic and dark Travertine Tepexi, Travertine Gold or Tepexi, Dorado Tepexi, Crema de Agua de la Luna de Tepexi, Boig Mega de Atlixco, Negro y Haspe de Tepeaca, Blanco Vego de Chiautla, Travertine Marble, Oaxaca Red, Tical Green from Guatemala and Quarry Stone from Hidalgo.

According to Industrias Gromaz (2018), the material is extracted from mountain outcrops and open pits. Initially, a drilling investigation is carried out in search of the ore and to determine if the terrain is suitable. For this, an explosion technique is carried out, which consists of digging a 15 cubic meter pit in the ground and carrying out an inspection of the ore. The second method does not use explosives, but is done by means of diamond wire plows, which is a steel wire with diamond powder, which rubs the rock until a perfect cut is achieved and in this way extract the blocks. Once the marble has been obtained, with the help of a payloader machine, it is moved to an empty space on the ground for storage. According to David (2017), marble is cut on looms or block cutters. This will depend on the dimensions of the block, this means, the large blocks will go to the loom while the irregular and smaller ones will go to the block cutter, this is done in order to make the most of the measurements of the material and achieve less waste. Once the marble bands are obtained, they pass through the polishing machine, through an abrasion system the marble is given one aspect or another. Marble tends to have imperfections (voids), to correct these irregularities the recapping process has to be carried out, which consists of filling the gaps with white cement and special coloring to achieve the shade required by the marble slab achieving a uniform surface. Subsequently, the washing and packaging is carried out, the marble slabs are introduced into the machine, which will be responsible for eliminating residues impregnated in the slab. Subsequently, the plates will be palletized or packaged and stored pending loading.

Throughout its history, the marble industry has witnessed numerous labor problems that have affected the human capital employed. From ancient times to the present day, the quarrying and transformation of marble has been an activity that requires considerable physical exertion and presents a number of unique work challenges. According to Abad (2018), the marble industry has been plagued by hazards and accidents since its inception, whether in the quarry, which works with large tonnage blocks, with cutting and sawing machines, or even in factories. According to Ros (2016), in the marble sector there are several labor problems that affect human capital. These issues can have a significant impact on worker productivity and well-being. On the other hand, Huancahuari



(2019), explains that some of them are: *poor working conditions*: Workers in the marble sector often face difficult working conditions, such as long working hours, lack of workplace safety, and exposure to toxic substances. These conditions can have a negative impact on the health and well-being of workers. *Low wages*: Many workers in the marble sector receive low wages, which can hinder their ability to meet their basic needs and improve their quality of life. Low wages can also contribute to poverty and inequality in the industry. *Lack of training and professional development*: In some cases, workers in the marble sector may face a lack of training and professional development opportunities. This can limit their ability to acquire new skills and advance their careers, which in turn can affect their long-term employability. *Job insecurity*: Workers in the marble sector often face job insecurity, such as temporary or informal contracts, lack of social protection, and lack of job stability. This can lead to stress and anxiety among workers, as well as difficulties in planning for their future and ensuring their economic well-being.

For Niosh (2019), in marble factories, there are several *risk factors* that can affect the health and safety of workers, the most important of which are the following: *Exposure to silica dust*: Exposure to silica dust is a major risk in marble factories. The process of cutting, polishing, and finishing marble can generate dust containing crystalline silica, which can be harmful to workers' respiratory health. Long-term exposure to high levels of silica can cause respiratory diseases, such as silicosis. *Harsh working conditions*: Marble factories can exhibit adverse working conditions, such as high temperatures, intense noise, and vibrations. These conditions can affect the health and well-being of workers in the long run. *Ergonomic hazards*: Repetitive tasks, heavy lifting and awkward postures can lead to ergonomic hazards in marble factories. These risks can cause musculoskeletal injuries, such as back pain and limb injuries. *Chemical hazards*: In addition to silica dust, there are other chemicals used in the marble manufacturing process, such as adhesives and solvents. Exposure to these chemicals can have negative effects on workers' health if proper safety measures are not taken. *Fall hazards*: Marble factories can have slippery surfaces and elevated areas where workers may be exposed to fall hazards. It is important to implement safety measures, such as the use of personal protective equipment and the installation of safety guardrails, to prevent accidents and injuries. *Electrical hazards*: Marble factories use electrical machinery and equipment that can pose electrical hazards to workers. It is essential that regular inspections are conducted, equipment is maintained in good repair, and electrical safety procedures are followed to prevent accidents.

METHOD DESCRIPTION

The purpose of this study is of a mixed type, which had the purpose of analyzing the main labor problems faced by human capital within the marble factories of Tepexi de Rodríguez, Puebla, in order to define the current factors that affect the human capital in the work carried out in the



marble industry of this locality. Having an exploratory-descriptive scope, the research work was carried out through a case study of a company located in the town of Tepexi de Rodríguez, which was established in 1970, for which a sample of 206 employees who worked in it was taken, to whom a survey was applied through a digital form which consisted of ten items. which were divided into three factors, as the first factor were the working conditions with seven items, second factor problematic and risk prevention with two items, third factor technification with one reagent, having a design of closed questions with multiple choice, some with five Likert scale, the questionnaire applied was distributed digitally using the Microsoft Forms platform; Subsequently, the analysis was carried out by concentrating the responses in a Microsoft Excel spreadsheet through which pie charts and histograms were obtained, which served as support in the representation and interpretation of the data.

According to the study carried out, the following results were obtained, in the first factor working conditions, of the surveyed population 60% are full-time workers, this means that they work a full day and one of their main characteristics is that they have a family to support, while the other 40% are part-time workers and these are usually students of upper secondary and higher education, who do it to support themselves in the maintenance of their studies. In question 2 time of experience in the marble industry, 37% answered that they have between 6 to 10 years in this industry, another 26% are workers who have already been working between 1 and 5 years, 21% have more than 10 years working in this industry and who have the characteristic of being mostly adults, and 16% are workers who have just entered the marble sector and have minimal experience, as shown in Figure 1. In the question asked "In what part of the marble production process do you perform your functions?", 54% of respondents are in the transformation process, while 45% are involved in the extraction of marble in quarries, and only 1% participate in sales and marketing.

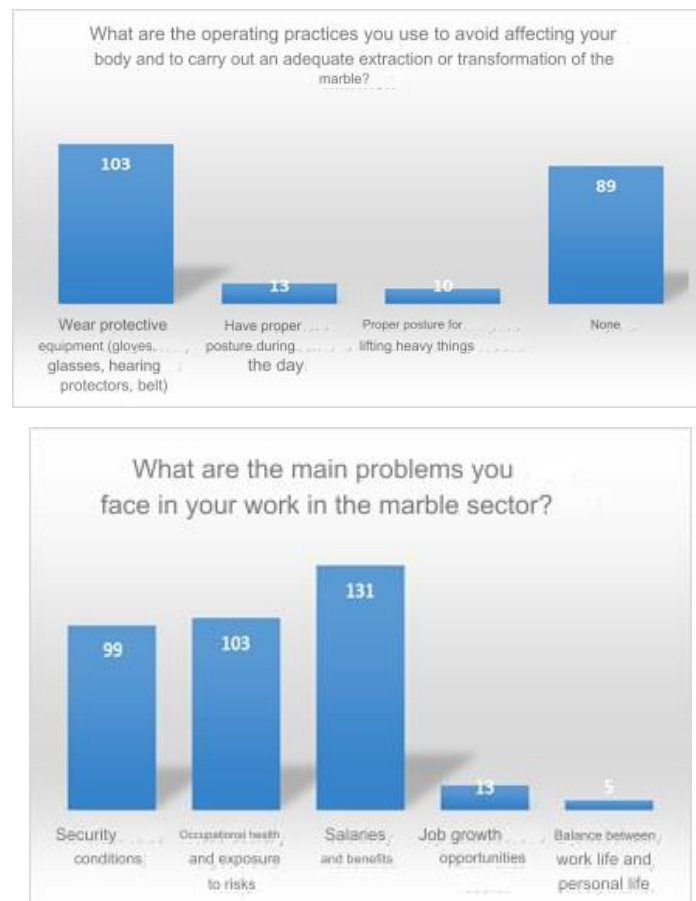
In question five levels of job satisfaction, 45% are dissatisfied with the working conditions they face, while 30% are adapted to the conditions and do not take it seriously, 22% are very dissatisfied with the working conditions and would like to have better conditions, only 2% feel satisfied with the working conditions they have, and only 1% are very satisfied, as shown in Figure 1. In the case of question seven, they receive additional benefits at work, 100% of workers do not receive social security, bonuses or benefits as established by the Federal Labor Law, the only thing they receive is their weekly salary that is granted to them according to the position they have. In question eight, 69.9% consider that their work within the marble sector is not valued or recognized, they consider that they are just another worker within the industry, while the other 30.1% are not clear if they are valued.

Fig. 1 Graphs of results first factor working conditions, years of experience, training, satisfaction with their working condition, own elaboration.



In the second factor, according to the respondents in the main questions they face in their work, 131 of them consider that the low salary they receive due to the high risk they are exposed to in the industrial and mining activities of marble, while 103 of them fear for their long-term health due to exposure to dust or lessons. Only 99 consider that safety conditions are also a work problem, only 13 of the respondents considered job growth as a problem, and only 5 of them consider the balance between their work and their personal life as problematic, since the working hours are long and they cannot enjoy time for family or friends, as shown in Figure 2.

Fig. 2 Graphs of the second factor problems and risk prevention, the first histogram refers to the main problems faced by workers within the company, the second histogram shows the main practices that workers carry out to prevent accidents. Own elaboration.





In the third factor, technification of the workers surveyed considered 37.4% that technification is important, but with the lag that has been going on for years it is a very big challenge for the owners of companies, another 34.5% commented that technification is very important and would be a significant advance for the industry, since it would cause a better quality of production and better conditions for human capital. while 20.4% consider that the marble industry is doing well as it is.

CONCLUSIONS AND RECOMMENDATIONS

As identified in the work carried out, the human capital within the analyzed company faces several problems that limit its labor well-being, as well as the development of the labor market of the marble industry of Tepexi de Rodríguez, since taking this company as a case study and that has more than 50 years of operation, bad practices still persist in the management of Human Capital. giving clear evidence that the working conditions of the employees of this type of companies have unfavorable working conditions, as well as the lack of training was identified, which is an important aspect in every industry and company to develop the skills of the staff and which contributes to improving the labor market, in addition to enabling workers as a fundamental element for the success and efficiency of the processes that are carried out in the marble industry of Tepexi de Rodríguez, because unfortunately for the sample studied, it was identified that employees learn over time with experiences in their work and that their practices are rudimentary, they do not use adequate or professional techniques. It also highlights the need for close collaboration between the marble industry and local educational institutions, in order to establish technical or vocational training programs, so that these institutions can be the key to closing the identified training gaps and preparing the human capital of the marble industry, which is one of the main in the region's economy.

In addition, it should be noted that three of the main problems faced by human capital according to the mentions made by workers, firstly are poor salaries and lack of benefits, secondly, health because there are no long-term disease prevention programmes, because of all the risks they have in the processes that are carried out, and thirdly, the lack of occupational safety, since there are no hygiene and safety programs that allow them to prevent latent risks throughout the processing of marble. Also, the urgent need to modernize operations in the extraction and transformation of marble is evidenced in order to improve productivity and competitiveness in the market and thus offer greater quality, as well as reduce occupational accidents. The technification of the marble sector not only benefits the efficiency and quality of the products offered, but can also have a positive impact on the local economy, the improvement of operations can attract investments, generate employment and contribute to a sustainable development of the municipality of Tepexi de Rodríguez.



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