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**Implications of Organizational Variables on Waste Management of Stone and Marble Sector in the City of Hebron****Ghadah Neiroukh****Abstract**

The study aimed to explore the implications of organizational variables of waste management of stone and marble sector in the city of Hebron. The study approached the literature as a multi-dimensional phenomenon which addressed both theoretical and applied research. Waste management of stone and marble was evaluated using a 53-item index scale that was administrated to seventy five establishments in stone and marble industry in the city of Hebron that was randomly selected. The data was statistically analyzed using Statistical Package for Social Sciences (SPSS). The findings revealed that the establishments had a high level of reducing waste of stone and marble, and a moderate level of reusing and recycling waste of stone and marble. The implications of the findings for practice were also highlighted.

**Keywords:** Organizational variables, waste management, stone and marble sector.

**Introduction**

Through time, stone and marble industry formed an integral sector. This was followed by forming the Union of Stone and marble in 1996 as a non-profit organization to manage the sector issues, problem solving, and in developing such an industry (Tarawa, 2012).

Normally, any industry produces waste along with products. Obviously, more waste means more consumption of raw material which partially emphasizes the economical problem of scarce resources versus endless needs. Furthermore, such an issue may cause a significant problem to rise up, when the waste is disposed insufficiently, which may lead to a serious problem that threatens our environment (Ibraheem, 2010).

Consequently, the current situation of stone and marble waste management formed a motive to carry out the study. This, however, was an attempt to output some ideas and recommendations for enhancing and developing such an industry.

Since stone and marble waste management is almost ignored, along with its related techniques, or the current used techniques are considered not effective, the idea of applying this study was

suggested. Thus, there is hope for having new, effective, cost saving, and improved techniques in order to output the results and recommendations. In addition, it takes into consideration the fact that the average daily production of stone and marble waste is around 5 cubic meters (Industrial Modernization Center, 2005).

Identifying such matters will help the industrial sector to avoid such problems, or even to eliminate its negative effect. Therefore, such negative effect can be classified as an environmental or a financial one.

### Background and Literature Review

The portfolio of the stone and marble industries in Palestine varies and includes, but not limited to: Raw blocks, Dimension stones, Building stones, Tiles, Slaps, Stone decorative products, Basins and sinks, and Headstones. The stone and marble industry in numbers was as follows: occupies around 15,000 -20,000 direct jobs; composes of 13% of total non-agricultural employment; forms US \$400 million in scales; represents 5% of GDP; represents 20% of GNP; obsesses 20,000 dunums of reserves; and forms US \$30 billion value of reserves (Hebron Chamber of Commerce and Industry, 2007; Palestine Business Focus Magazine, 2012).

According to Sultan (2007), the success of a competitive firm can be measured by both objective and subjective criteria. Objective criteria include return on investment, market share, profit and sales revenue, while subjective criteria include enhanced reputation with customers, suppliers, competitors, and improved quality of delivered services as illustrated by the researcher in Table (1).

**Table (1). Objective and subjective criteria needed for a firm to succeed**

Objective Criteria	Subjective Criteria
<ul style="list-style-type: none"> <li>• Return on investment</li> <li>• Market share</li> <li>• Profit and sales revenue</li> </ul>	<ul style="list-style-type: none"> <li>• Enhanced reputation with customers, suppliers, and competitors</li> <li>• Improve quality of delivered services</li> </ul>

Waste management of stone and marble sector has been a popular topic of debate in the field of business and economics. However, several studies which have been published have researched this topic as a multidimensional phenomenon in both theoretical and applied research. The study of Poveda- Bautista et al. (2012) presented a new approach to find indicators that can be used to measure companies' competitiveness and performance in an efficient and reliable way. The study

represented the following results: growth and creativity were the most contributing indicators to the competitiveness advertising sector, and then came the internal process indicators. Also, there is the need to foster and adopt creativity of employees to help develop such a sector. Additionally, the use of new technologies allows customers to participate actively in services.

In another study, Tarawa (2012) addressed the role of Union of Stone and Marble Industry in developing its industry, whether concerning representation, marketing, training, or even problem solving from the point of view of its members in the West Bank. The study concluded that the majority of the union members were holders of high school certificates or lower, then Bachelor's degree and Diploma, and at last is those of graduate degree certificates holders which formed the minority among members. The percentage of 39.8% of facilities was for sole proprietorship organizational structure, 35.2% for private joint stock, and 25% for the typical public company structure. The findings showed that the degree of evaluation of the representative role of the union was high, while the degree of evaluation for the role of training was moderate. The same moderate degree was for the role of marketing, as well as the role of solving problems. Also, results indicated that there is a statistically significant correlation between the role of the union (in representation, marketing, training and problem solving) and its contribution to the development of the industry in terms of its financial dimension, customers, internal processes, and growth and creativity.

The study of Abu Qamar (2009) evaluated the performance of Bank of Palestine by using the balanced scorecard, and then developing the balanced scorecard by adding a fifth dimension which is the social dimension. The study indicated that the organization has to build a social role that positively impacts the society which will also achieve many benefits to the organization that will improve its competitiveness position.

Moreover, the study of the Industrial Modernization Center (2005) aimed to explain the circumstances surrounding stone and marble sector, and to determine its needs and problems that exist. Findings showed that the stone and marble sector is suffering from several weaknesses; mostly the lack of strategic planners for enterprises, the type of administration of individual, limited usage of information technology, inexistence of incentives, absence of marketing teams, absence of appropriate production management, lack of proper pricing system, and strict rivalry concerning pricing.

### **Purpose and Scope**

The main objective of the study was to identify the extent that the waste management will contribute in enhancing the stone and marble sector in the city of Hebron from establishments' managers' (owners') point of view. Furthermore, the idea of adopting this study emerged so as to

enhance the performance of the Stone and marble sector through its waste management in the city of Hebron.

The objectives of the study involves evaluating the current situation of the stone and marble sector waste management from the following aspects; discussing the nature of waste management techniques used (if exist), and to which extent these techniques are fit or suitable to such a sector; studying any prospected new plans for such waste management techniques; taking the advantage from the cooperation between Academic sector and stone and marble sector as well; concluding financially and socially feedback of applying waste management techniques, in order to contribute in developing such a sector; and enhancing the performance of stone and marble sector through waste management by adopting several management approaches, mostly sales (volume of trade), export, number of employees, market share, and cost minimization and profit maximization.

The significance of the study is derived from applying it to one of the most important industrial sectors, the stone and marble sector, which forms a significant part of our economy, especially in Hebron city. Also, study significance lies in its multi-dimensional aspects such as a scientific, industrial, environmental (ecological), and economical study. Therefore, stone and marble sector lacks and looks for such studies to help in improving performance and circumstances. On the other hand, some technical industrial information and tips may help during the study that was performed since the industrial field is considered as the researcher interest and work field.

### Definition of Terms

**Waste:** Anything that is no longer privately valued by its owner for use or sale and which is, or will be, discarded (Waste Management Report, 2006).

**Stone and Marble Waste:** The powder or "liquid powder" resulting from cutting and polishing stone blocks or marble boards during manufacturing (Sultan, 2007).

**Waste Management:** Management of the collection, recovery, and disposal of wastes, including options for waste reduction (Waste Management Report, 2006).

### Hypothesis

Based on the reviewed literature, the set objectives, questions and variables of the study, the following hypothesis were proposed:

There are no statistical significant differences at  $\alpha \leq 0.05$  in the waste management of the stone and marble sector in the city of Hebron. However, this is considered from the point of view of establishments' managers or owners according to their age, years of experience, establishment year, legal status, and the hold of quality certificate.

### **Methodology and Design**

The study adopted the quantitative research approach. The questionnaire is appropriate for the exploratory nature of the research. The population of the study was limited to the establishments' managers or owners in the city of Hebron during the 201/2012 year. It consisted of (110) establishments specialized in stone and marble industry in the city of Hebron (Palestinian Central Bureau of Statistics, 2008).

The overall sample comprised of seventy five establishments of stone and marble industry in the city of Hebron which was randomly selected. The sample size was calculated using Thompson's Formula.

Waste management of stone and marble was evaluated using a 53-item index scale developed by the researcher. A 5-point Likert scale was used to measure the responses. The participants were requested to complete the questionnaire in the selected establishments of stone and marble industry in the city of Hebron. The sampling survey instrument sought background information such as the participants' age, years of experience, establishment year, legal status, and the hold of quality certificate.

Validation of the tool proceeded in two distinct phases. The initial phase involved a group of referees and expert arbitrators, who provided some comments on the tool. The second phase involved the implementation of a pilot study (N=5) to validate the survey using exploratory factor analysis. Factor loading for all items exceeded 0.50 (0.55 to 0.85). This means that those items are suitable in measuring every item of the implications of organizational variables of waste management of stone and marble sector in the city of Hebron. The reliability was tested using Cronbach's Alpha to ascertain reliability and the consistency of the survey. Cronbach's Alpha for the survey instrument was 0.94, indicating excellent reliability and consistency.

### **Data Analysis and Findings**

Data was analyzed using the Statistical Package for Social Sciences (SPSS). The questionnaire items were rated on a 1–5 Likert scale (1=always, 2=often, 3=neither, 4=rarely and 5=never).

The highest score indicated a high level of reducing the waste of stone and marble. Descriptive statistics gauged the waste management of stone and marble scores among the sampled population. The following statistical techniques were measured: Pearson correlation, T.test, One way analysis of variance, Tukey test, Cronbach's Alpha, Guttman Split-Half Coefficient, and Factor Analysis.

The demographic breakdown of the participants was as follows: age, years of experience, establishment year, legal status, and the hold of quality certificate. In total, the sample comprised of 75 establishments' managers or owners. The respondents' age was between 28 and 68 years of age (M 34.58 SD 10.34). Also, the majority (64%) were having more than ten years of experience. Almost 65.4% of the establishments were founded before the year 2000. 45.3% of the establishments were limited liability, while 34.7% were public, and 20% were individual. Only 13.3% of the establishments hold quality certificate, while the remaining 13.3% were not holding any quality certificate.

The findings revealed that the establishments had a high level of reducing waste of stone and marble, and a moderate level of reusing and recycling waste of stone and marble. The mean scores and standard deviation were (M 4.22 SD 0.20; M 2.38 SD 0.67) respectively.

Moreover, the study investigated demographic breakdown of the waste management of stone and marble in the establishments with the aim of identifying differences. The findings of this study revealed age, years of experience, establishment year, and legal status. However, it was found that the hold of quality certificate were significant variables. The differences favored establishments that hold quality certificate (M 4.62 SD 0.13) compared to (M 4.17 SD 0.20) for establishments that are not holding quality certificate: T.test value was (2.606 P=0.011).

## Discussion

The findings of the study revealed that the establishments had a high level of reducing waste of stone and marble, and a moderate level of reusing and recycling waste of stone and marble, specifically within the sub-scales of both internal business and customers. However, both have sub-issues which are related to different steps occurring inside the establishment. In addition, they can enhance the process of reducing waste or increasing the level of performance. Such steps include enhancing quality of products, granting a good reputation (image) for the establishment, conducting development studies for the establishment, creating new products, adding new production lines, or even using modern technology. All were performed by the establishment in order to have communication channels with their customers. Consequently, it helps in achieving other issues like,

customer satisfaction, attracting new customer, enhancing and increasing advertising campaigns, and improving delivery of products.

The study also revealed that age, years of experience, establishment year, and legal status do not denote any significant difference in the waste management of stone and marble among the participants. This implies that the waste management of stone and marble is not actually influenced by these variables. Also, they are more likely to be affected by other factors other than age, years of experience, establishment year, and legal status.

Furthermore, holding of quality certificate affects positively the waste management of stone and marble in the sampled population. According to the researcher opinion, the reason establishments granted quality certificate were capable of applying waste reduction inside their establishments is that they have a kind of awareness of waste management approach. Also, they have accepted the idea of quality which is attaining customer satisfaction. As a result, they naturally adopt the waste reduce to get the benefit of it. Such benefits are related to financial issues, internal business of the establishment, and also, the growth and creativity issues inside the establishment. Based on the findings of this study, the following recommendations were made:

1. Raising level of education for both managers and workers by holding workshops and lectures, and by participating in international exhibitions in order to introduce the importance of such a sector.
2. Encourage the use of new suitable techniques in production and waste management which positively enhance the stone and marble sector.
3. Further studies to establish a clearer understanding of waste management in the Palestinian stone and marble sector was also recommended.

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