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## Corporate Social Responsibility in the Greek Mining and Quarrying companies

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### Abstract

This paper aims to investigate the diffusion of the concept of Corporate Social Responsibility (CSR) and the degree of implementation of CSR practices among the Greek Mining and Quarrying Companies. A research study was conducted through a structured questionnaire among the ISO 9001 certified Greek Mining and Quarrying Companies. CSR appears to be very important for large companies which are able to allocate resources for the required CSR actions. Results show that most of the financial resources available for CSR actions are related to the environment and that respondents expect that through CSR actions they gain better relationships with the local community and the general business environment, they achieve improved employee performance, and they attract and maintain high-potential employees. Participants in the research consider bureaucracy, lack of knowledge, the small size of business and the implementation costs as the main inhibitors for the achievement of the CSR principles. The research of this work was limited to the Greek mining companies that are certified according to ISO 9001. Future research could be conducted on the CSR awareness of the non-certified companies as well. The study may help managers of the mining companies to focus on specific CSR elements when they decide to follow CSR principles. The implementation of the CSR principles in the mining industry has attracted considerable attention in the CSR literature and this study is an attempt to assess the concept and the benefits of CSR within Greek mining sector.

**JEL Classification code:** M14.

**Key words:** Corporate Social Responsibility; CSR; Mining and Quarrying; Greece

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## **1 Introduction**

Corporate Social Responsibility (CSR) is a crucial concept in sustainable development agenda and strongly supports the global shift in the way the role of business is perceived (Hamman, 2003). Nowadays CSR has become an increasingly significant issue for many industries let alone for mining companies. Few industrial activities have the environmental footprint and the influence on the well-being of the local community as mining and quarrying processes (Hilson, 2012). To deal with the consequences of its operations, the global mining industry has embraced the idea of social and environmental responsibility through the adoption of the CSR principles (Jenkins, 2004).

The works of mining and quarrying companies, by their very nature, cause significant changes and destructions in the environment in which they operate (Jones et al, 2007). Slopes of hills or mountains are dug, areas are deforested, and new hills with waste rock are created. Nearby settlements are affected by visual and acoustic pollution and by the vibrations produced by blasting. Water resources are threatened with contamination or even depletion. Wildlife can be disturbed or even become extinct. All these diverse environmental impacts caused by the mining and quarrying procedures along with the economic importance of the extraction industries as well as the social impacts on local communities portray the need for CSR consideration in the mining industry (Jenkins, 2004) (Slack, 2012).

Due to the nature of the extraction functions, the decisions regarding the operations of the companies usually have to balance between legality and irregularity, the respect for the environment and the human beings as well the desire for profit and viability. On the other hand, potential reactions from locals, law restrictions and other factors may lead to the temporary or even permanent pause of their operations. Mining functions may cause serious environmental damages which may end up in devastation or even more, exhaustion of economically valuable resources and any cost-benefit analysis may not be able to adequately support the negative results (Jenkins, 2004). While public policy plays a significant role in arranging the conflict issues for achieving the balance between profits and responsibility, it is the corporate strategy that drives the choices between prevention and disaster (Hamman, 2003).

The negative impact of mining activities on the environment and the complex relationships between the mining companies and local communities stress the need to promote among the industry the idea of adopting an environmentally and socially responsible way of doing business. Therefore, the following question arises: Should these enterprises increase in advance their level of awareness towards the local and wider community and ensure compliance with the national and the European legislation or not? In other words, should they be oriented towards the application of the basic principles of CSR? When a mining and quarrying company follows the CSR philosophy, it has to justify its operations and to

demonstrate positive social and environmental results (Jenkins and Yakovleva, 2006).

By definition, mining enterprises cannot be global and they operate where the mineral resources are located. In addition, due to the long-term nature of their activities, these companies may develop strong interactions with employees from the surrounding area, the trade unions or the government itself. Under the CSR culture, a mining company is set accountable not only to its own shareholders but to all stakeholders affected by its operations i.e., employees, customers, local communities and the general public (Hamman, 2003). The CSR concept may help mining companies to achieve a balance between the demands of the community, the companies' obligations to protect the environment and their need for profitability. By applying CSR principles, a mining company enhances its ability to manage its operations in a sustainable way (Meredith Jones & Mitchell, 2007) and by acting in a responsible manner it can improve its market positioning versus less CSR committed companies (Slack, 2012) and it can also have positive implications in its bottom line profits (Hamman, 2003).

Bearing in mind the significance of CSR activities in the mining sector and taking into consideration the reduced penetration of the CSR concept in Greece and moreover, the lack of studies that investigate the application of the CSR principles among the Greek mining sector (Papacharalampous et al, 2019), this paper seeks to illustrate the degree of awareness of Greek mining companies on CSR issues. The main objectives of the present study are to evaluate the implementation of CSR practices and to highlight their importance in the Greek mining industry.

## **2 Literature review**

### *2.1 What does CSR mean?*

Corporate Social Responsibility (CSR) is a dynamic and constantly evolving concept. The European Commission, through its CSR strategy published in 2011, defines it as "the responsibility of enterprises for their impact on society" (European Commission, 2011). CSR includes the responsibility of an enterprise or an organization towards the parties that it influences or by which it is influenced, in the course of its business activity. (<https://csrhellas.org/>, 2021).

Since 1980, many academic studies on the definition and the characteristics of CSR have been published (Crane & Matten, 2004). Carroll (1991) believes that CSR encompasses four expectations of different areas of activity: economic, legal, ethical, and discretionary (philanthropic). Economic expectations refer to the proper operation of companies, in their effort to have a reasonable profit from their investments and to maintain their position in the business environment. Legal expectations refer to corporate responsibility for compliance

with the law whereas ethical ones refer to everything that society expects from enterprises in addition to economic and legal expectations, i.e., fair and correct choices. Finally, philanthropic expectations refer to activities such as donations, sponsorships, entertainment facilities for employees, support for activities related to education, arts and sports.

Sustainable development, namely that kind of development which mainly concerns about environmental protection and the need to conserve natural resources for future generations, is one of the concepts closely related to the principles of CSR. Several tools and national standards have been developed to facilitate the implementation of CSR in connection with sustainable development, as, for example, the GRI guidelines (GRI, 2002), the UN Global Compact and the standard SA (Social Accountability) 8000. Corporate Social Responsibility has become a keyword for many boards, large investors and other organizations (Peddle & Rosam, 2004) and it has been applied in conjunction with various management theories. For example, experts on quality issues and academics have identified areas where quality management can contribute to the successful implementation of CSR philosophy, indicating synergies between CSR and Quality Management as well as Corporate Governance and Quality Management, and supporting thus the integration of CSR and Corporate Governance in Business Governance and Quality Management systems (Ledgard & Taylor, 2002), (Robbins & Smith, 2000), (Pige, 2002), (Castka et al., 2004). This kind of synergies has led to the development of the ISO 26000 standard, the international standard for CSR (Castka et al., 2007).

## *2.2 Historical development of CSR*

The concept of Corporate Social Responsibility may be detected even throughout the ancient Greece era. In ancient Athens, richest citizens who owned enterprises, whether commercial, construction or manufacturing, were obliged to provide "services" to the rest of the Athenians. Through sponsorships (expenses for theatrical performances), trierarchies (expenses for the equipment of triremes) etc., they took care to cover state and individual needs (Sakellariou, 1999).

Over the past few decades, CSR has evolved from a narrow and often marginalized concept to a complex and multifaceted one, which is becoming increasingly important for most contemporary corporate decisions. Some decades ago, discussions about CSR were only limited to a small group of academics. Among the first who discussed the issue was Adolf A. Berle, Professor at Columbia, and E. Merrick Dodd, Professor at Harvard, in a series of articles published in the magazine *Harvard Law Review*. While Berle tended to argue that business executives were only liable to the shareholders of a company, Dodd (1932) claimed that they had a broader responsibility, that is, they were accountable to the public as a whole and not just to the shareholders. This reasoning became the theoretical basis for the claim that

companies have some kind of social responsibility. During the 1950s and 1960s, the United States experienced the birth of the modern activist movement, of the environmental movement, and of the modern consumer movement. The Vietnam War in the 1960s and early 1970s affected all these social movements, permanently changing the business environment in the USA and the world, and introducing an era of activist groups and NGOs that tried to make the media focus on business practices which they considered immoral or irresponsible. This attention by the media could seriously blacken the corporate reputation, which in turn could lead to reduced sales or discontent among employees. In other words, business executives understood that they had either to embrace Corporate Social Responsibility or risk serious consequences (Cochran, 2007).

As a result, in the 1970s, the focus of the debate changed from CSR to "Corporate Social Responsiveness". In the same decade, Frederick (1978) wrote a much-cited paper entitled "From CSR1 to CSR2: The Maturing of Business –and- Society Thought," in which he noted that enterprises were no longer simply engaged in an academic debate on the ethics of varying degrees of social responsibility but they responded realistically to various social pressures. Thus, as various groups of activists began to apply pressure on enterprises using mainly the media, the enterprises reacted by changing products, policies, etc. The term Corporate Social Responsiveness was first used by Sethi (1975), expanded by Carroll (1979), and took its final form by Wartick and Cochran (1985).

### *2.3 CSR principles*

CSR addresses specific issues related to human rights, business practices, communications and community participation (Para-González, Mascaraque-Ramírez, & Cubillas-Para, 2020).

There are three basic principles which together comprise all CSR activities: sustainability, accountability and transparency. Sustainability depends on the rate at which resources are consumed by an organization in relation to the rate at which resources can be regenerated. In practice, organizations tend to aim towards less unsustainability by increasing efficiency in the way in which resources are utilized, e.g. by implementing an energy efficiency program. Accountability refers to an organization's acknowledgement that its activities affect the external environment and therefore takes responsibility for the consequences these activities may produce. This concept implies the recognition that the organization is part of a wider social network and there it has responsibilities to the network as a whole rather than just to the owners of the organization. Transparency, in principle, means that the impact of the organization's activities, inside and outside of the boundaries of its basic operations, should be apparent to all through the information provided by reporting mechanisms. Therefore, transparency is part of the process of recognizing the responsibility an organization has for the impact of its activities on the external environment (Crowther & Aras, 2008).

Any CSR activity of a company should be in line with the UN Code of, which proclaims the principles that form the four institutional forms of the CSR in the fields of:

- human rights (be immune to human rights violations Support respect for human rights accepted by the international community)
- employment (speak out against child labour, combat all forms of forced labour, oppose any form of discrimination in employment, ensure the right of staff to collective bargaining)
- environment (pay special attention to environmental policy, adhering to the precautionary principle, take initiatives that promote environmental responsibility, promote the expansion and development of environmentally sound technologies)
- fight against corruption (combat bribery and extortion and all forms of corruption) (Urusova, 2019).

#### 2.4 CSR categories

In order for CSR to be accepted by an entrepreneur, it must be implemented in such a way that it embraces all business responsibilities. Carroll (1991) proposes four types of social responsibilities which constitute the overall CSR: economic, legal, ethical and philanthropic responsibility. These four categories of responsibilities or elements of CSR could be represented as a pyramid (Figure 1).



Figure 1: The CSR pyramid (Carroll, 1991)

In summary, the CSR implies the simultaneous fulfilment of economic, legal, ethical and philanthropic responsibilities of an enterprise. In managerial terms, the enterprise that applies

the principles of CSR should at the same time strive to make a profit, obey the law and be an ethical and good social partner (Carroll, 1991).

## 2.5 CSR criteria

CSR principles go beyond the obligation of an enterprise to comply with the law regarding the environment, the human capital and the relations with society, incorporating social and environmental elements that meet the expectations the society has from the enterprise. Nowadays, consumers make buying decisions based on the image and the degree of responsibility of an enterprise, on its respect for the natural environment and on the safety standards it follows.

There are two forms of corporate responsibility: internal and external (Vintro, 2010). Internal responsibility mainly refers to issues related to employees (occupational safety, career) and shareholders (profitability and economic results). External responsibility links the company with suppliers, governments, authorities and the society in general, and includes aspects that demonstrate respect for the natural environment (rational and sustainable exploitation of mineral resources and conservation of ecosystems) and the establishment of productive relationships with the society (integration into relevant social groups and promotion of the local economy).

CSR practices should be based on certain criteria that set out the basic guidelines to apply the CSR principles, such as those proposed by Franc et al (2006) (Table 1).

TABLE 1  
2.5: CSR Criteria (Franc et al, 2006)

<b>A. Economic level</b>
Business code of conduct of the enterprise
Transparency, fight against corruption
Corporate governance, dialogue with shareholders
Behaviour towards customers / consumers
Behaviour towards suppliers and investors
<b>B. Social level</b>
Health and safety of employees
The development of human capital
Observance of labour rules, ban of child labour
Work-life balance of employees
Equal opportunities for men and women, minorities, the elderly, the disabled
Corporate philanthropy, sponsorship and volunteering
Community engagement, mentoring and consultancy



Human Rights
<b>C. Environmental level</b>
Eco-friendly production, products and services (e.g. EMAS certifications, ISO 14001 etc.)
Environmental business policies (recycling, energy savings, utilization of environmentally friendly products, etc.)
Decrease of environmental impact, investment into BAT (Best Available Techniques)
Protection of natural resources

## 2.6 ISO 26000 standard for CSR

The ISO 26000:2010 standard is an international standard that provides guidelines for social responsibility and it is directed to all organizations, regardless of size, type or location, with a view to contribute to sustainable development. It provides guidance to those organizations that recognize that respect for society and the environment is a critical success factor for doing business today. In addition to offering a "good practice" guide, the application of the ISO 26000 requirements is increasingly being regarded as a way to assess an organization's commitment to sustainability and overall performance (www.iso.org, 2021).

ISO 26000 brings together all the key CSR issues, namely environment, work practices, corporate governance, consumer issues, local community development and fair operating practices. From this reason, the ISO 26000 standard is considered as the most advanced, complicated, and regulatory CSR "document" currently available (Castka et al, 2008).

Quality standards, models of excellence and TQM principles can serve as platforms for the implementation of CSR in organizations. Organizations can follow various paths to apply CSR principles. For example, by introducing accountability principles (e.g., SA8000 and AA1000), an organization can move from applying widely used management systems (such as those described by the ISO 9000 and ISO 14000 standards) to building an organization that focuses on stakeholders (as described in the ISO 26000 standard). This does not necessarily mean that organizations should seek standards' certification – the standards can only be used as a point of reference and / or inspiration (Castka et al, 2007).

Since the requirements of the quality standards seem to create the appropriate conditions for applying the principles of CSR, the research of the present study makes a focus on enterprises that are ISO 9001 certified.

## 2.7 CSR in Greece

The adoption of CSR initiatives in Greece is limited and only a few large companies develop and follow a CSR strategy (Skouloudis et al, 2011). The majority of Greek enterprises are very-small, small and medium-sized companies experiencing the tough consequences in the global economy and they are finding it difficult to adapt to new international trends and

changes which has a negative impact on their growth and competitiveness. Skouloudis et al (2011) argue that CSR agenda of Greek enterprises is usually narrowed to charitable contributions and community donations and even these are restricted due to the impact of the financial crisis. In addition, the lack of information on the benefits of CSR does not allow the Greek companies to get acquainted with the concept of CSR and adopt a modern model of responsible entrepreneurship, making them fall behind international trends (Papacharalampous et al, 2019).

A further obstacle which limits the expansion of CSR implementation is the restricted related legislation to support companies on their CSR endeavours (Kavoura and Sahinidis, 2015). The Greek State's initiative to formulate a National CSR Strategy, has promoted the idea to develop synergies between the public and private sectors and the society in a way that creates opportunities for addressing economic, social and environmental challenges, especially in a time of economic crisis (National Plan on CSR, 2014). According to the SWOT analysis, referred to in the National Plan on CSR, the limited establishment of governmental rules and regulations for CSR in Greece (national strategy, administrative support, tools and mechanisms, know-how) is balanced by the existence of relevant know-how in the private sector, the NGOs and the academic sector as well as by the existence (albeit in part) of CSR-related legislation and by the increased autonomy of secondary and tertiary local authorities in strategic decision-making.

The research studies of Metaxas and Tsavdaridou (2010) and Skouloudis et al (2011) which were conducted almost a decade ago with regard to the degree of CSR application in Greece, found that only a few companies were leading the way. However, later studies state that the Greek companies have become more CSR active and that their performance with regard to CSR activities gradually rises and are more efficient (Metaxas and Tsavdaridou, 2013) (Kavoura and Sahinidis, 2015). Although CSR application in Greek territory initially was restricted to multinational enterprises (Metaxas and Tsavdaridou, 2013), the recent study of Papacharalampous et al (2019) indicates that the banking and financial services sectors are the country's leaders of CSR actions followed by the construction and building materials industry. The authors also suggest a relationship between the actions and the general economic and social environment.

While CSR can be the theoretical and practical basis for socially responsible entrepreneurship, with multiple benefits for public organizations and private enterprises (enhancement of export activities, support of international supply chains, adaptation to new consumer trends), in Greece CSR often is used as a promotional tool rather than a means to benefit all stakeholders (Papacharalampous et al, 2019). Marketers may promote the CSR actions executed by their companies (Kavoura and Sahinidis, 2015) however a lot of effort is needed to develop successful and integrated CSR activities among Greek enterprises (Metaxas

and Tsavdaridou, 2013).

It seems that CSR activities are under development in all business areas in Greece and studies that examine the CSR application in specific sectors may provide valuable information to gain a holistic view of the topic. This paper aims at investigating the implementation of CSR issues among the Greek mining companies and portrays the degree of application of the concept within the mining industry. The results of the present study contribute to the broad theme of CSR implementation among Greek enterprises and could provide valuable information and groundwork for further research on the subject of CSR in Greece.

## 2.8 CSR in the mining enterprises

CSR reporting with evidence on environmental and social activities of a company has become a growing trend in global business settings and a means to respond to the pressures of increased social and environmental responsibility (Jenkins, 2004). For mining companies, CSR is an evidence towards sustainability in the industry i.e., the practical implementation of sustainability goals, and also a necessity since their social and environmental impact on the local community is significant and potentially negative (Jenkins, 2004). In their efforts to adopt the principles of Corporate Social Responsibility, the mining enterprises need to identify the interests, concerns and goals of stakeholders (including national, regional governments, local authorities, local communities, employees and competitors) (Jenkins & Obara, 2008).

The CSR criteria for the mining companies are summarized in Table 2 (Vitro, 2010).

TABLE 2  
2.8: CSR Criteria for Mining (Vintro, 2010)

<b><i>A. Sustainability</i></b>
A.1. Rational exploitation of natural resources
A.2. Clean extraction technologies
A.3. Mine closure and recovery programs
A.4. Emergency management
A.5. Quality of production
<b><i>B. Ethics</i></b>
B.1. Promotion of local community economy and social work
B.2. Fair funds administration
B.3. Job security and dignity
<b><i>C. Human resources</i></b>
C.1. Secure working methods
C.2. Training and capability development

C.3. Employee- Manager relations
C.4 Respect for people

The mining industry companies operate in an environment of increased reputational risk (Jones et al, 2007). There are a number of factors that contribute to this situation, such as:

- the finite nature of non-renewable resources,
- the various environmental impacts associated with their extraction,
- the particular economic importance of primary extraction and
- the social impact on local communities related to mining activities.

Additional risks are the limited relocation capacity of the mines and the long-term nature of the operations. While enterprises can generally be global, the mining companies must operate in regions where resources are located (Jones et al, 2007).

Traditionally the mining companies perceive social responsibility activities merely as a business cost but nowadays they must find a balance between profits and social performance. This means that they need to address the matter of responsibility in an holistic manner – covering both their core operations and the CSR activities – taking into account all relevant issues and the way in which these are interconnected and interact (Cesar, 2020). Companies should also keep in mind that when trying to solve a problem, they may find a different problem occurring elsewhere (ISO 26000).

Although it is widely acknowledged that mining enterprises need to be involved in CSR activities, especially in aspects such as the community, the environment and the employees, the way the balance between these activities and stakeholders' interests and consistent profitability is achieved, remains unclear. As minerals continue to decline and prices are likely to remain low for a long time, it is more urgent than ever for mining enterprises to strive to "do well by doing good" by applying CSR principles.

Peng et al (2020) state that in China, although 34% of the listed mining companies have published CSR reports, their CSR levels have still room for improvement. At the same time, although mining companies compared to non-mining ones, are doing more in terms of products, there is no significant difference between them in terms of CSR governance and of relations with the employees and the environment. In addition, the authors note that profitability is more likely to be affected by investing in the multiple dimensions of CSR in a combined way, rather than individually. Sustainability and social responsibility issues in mining industries are now recognized as essential in government policies, industry best practices, civil society involvement and labour relations (Katz, 2020).

With regard to the application of the CSR principles in Greek mining companies, there is no evidence of previously published works on the subject of this specific sector. There are

academic papers regarding the general application of CSR in Greek business setting such as the works of Giannarakis et al. (2009), Kavoura and Sahinidis (2015), Metaxas and Tsavdaridou (2013), Papacharalampous et al (2019), Skouloudis et al (2011) etc and other publications presenting research outcomes of the CSR indicators in specific business sectors such as the research of Metaxas and Tsavdaridou (2012) on energy sector companies, of Polychronidou et al (2014) on banking sector etc. To the authors' knowledge there is no previous published study examining the penetration of CSR principles among the Greek mining companies and the present study is an attempt to fulfil this gap.

## 2.9 Mining companies in Greece

The mining activity in Greece has a long history, lost in the mists of time. They were organized at an institutional level in the 20th century where the Greek Mining Enterprises Association (GMEA) was founded (28th May, 1924) under the name "Union of Metallurgical and Mining Companies in Greece". The main purpose of the union is the strengthening and promotion of the Greek mining industry as a core of regional and national development and international business activity and the establishment of the relationships with the employees and the local communities in the areas where the member companies operate (<http://www.sme.gr>).

The table below shows indicators of sustainable development of the industry between 2013 and 2019 based on economic data, employment, education, consumption of natural resources and energy, restoration of the environment and relations with the local and wider community (<http://www.sme.gr/ektheseis>).

TABLE 3

2.9: Indicators of sustainable development of the Greek mining sector (<http://www.sme.gr/ektheseis>)

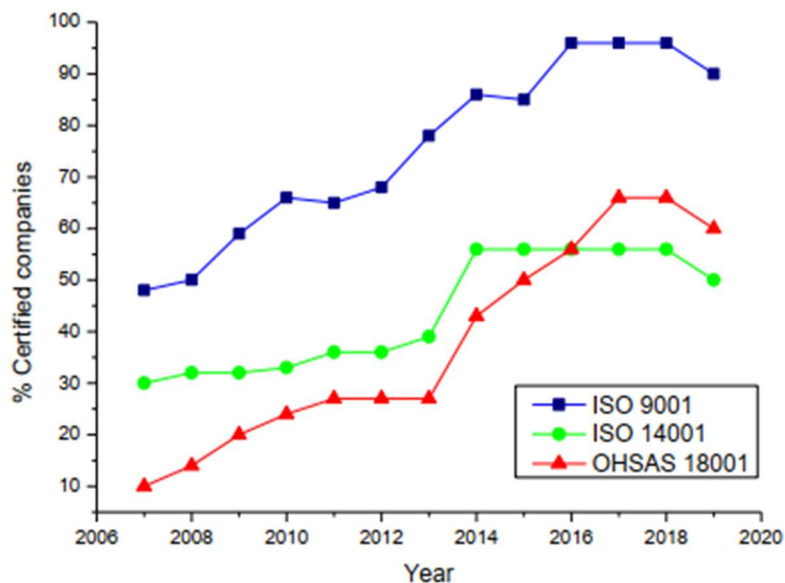
<b>GMEA Sustainable Development Indicators</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
<b>Total turnover (million €)</b>	1,737	1,836	1,933	1,642	1,895	1,831	1,598
<b>Directly employed staff (persons)</b>	9,175	9,804	10,279	9,869	9,328	9,503	8,407
<b>Indirectly employed staff (persons)</b>	4,947	5,126	5,424	4,131	4,870	4,404	3,860
<b>Total number of training hours</b>	227,414	175,171	129,892	193,508	243,142	202,092	148,818
<b>Total energy consumption (TJ)</b>	32,154	47,023	45,760	43,703	43,470	41,952	40,126
<b>Total net water consumption (mm<sup>3</sup>)</b>	12,593	12,529	14,978	15,179	13,814	18,096	16,094

<b>Total land area used for exploitation (acres)</b>	175,183	182,856	181,314	158,169	161,097	161,556	191.193
<b>Number of young trees and bushes planted</b>	159,829	190,755	317,450	293,892	186,677	261,678	159,214

According to the data provided by the GMEA (Annual Reports of GMEA Activities), the application of the ISO 9001 (for quality management systems) and OHSAS 18001 (for health and safety at work) standards shows an increase in the period 2007 – 2019, while the application of the ISO 14001 (for environmental management system) standard shows an increase until 2014, then from 2014 to 2018 is stable and as of 2019 is slightly decreased (Chart 1).

Chart 1.

2.9: Greek certified mining companies, as a percentage of GMEA members (2007 – 2019) (<http://www.sme.gr/ektheseis>)



### 3 Research approach

Literature research reveals that the CSR concept is a key element in the mining industry. The way the mining companies function imposes the need to consider the impact of their disruptive activities on both the environment and the local communities and has contributed to the increased concern about CSR. Although academics stress the importance of CSR initiatives in the mining industry, there is no published evidence focusing on the penetration of the concept among Greek mining enterprises. This paper describes a research conducted within Greek mining industry in order to explore the application of CSR activities. The purpose of the research is to collect data on the penetration and application of CSR principles

by the ISO 9001 certified mining and quarrying companies in Greece. Companies that hold an ISO 9001 certification were selected, as this certification is an indication that these companies are sensitive in quality issues, TQM, sustainable development and excellence, in other words concepts directly related to CSR. Based on the literature findings and in order to address the purpose of the present study, the following research questions are investigated:

*RQ1: Which CSR actions are highly implemented by the Greek ISO 9001 certified mining companies?*

*RQ2: Which CSR actions are less implemented by the Greek ISO 9001 certified mining companies?*

*RQ3: What benefits are attributed to CSR implementation by the Greek ISO 9001 certified mining companies?*

*RQ4: Which are the most statistically significant differences on CSR application among the Greek ISO 9001 certified mining companies based on their demographic profiles?*

### *3.1 Research methodology*

A structured questionnaire was developed, which was sent to 65 companies in the industry. A total of 47 filled-in questionnaires were collected from mining companies operating in various regions of the country. The answers were codified and edited using Microsoft Excel and the data were processed and analysed by descriptive statistical methods using the MINITAB statistical software. The questions were answered by executives of the companies holding one of the following positions of responsibility: General Manager, CSR Manager, ISO System Coordinator, Project Manager, Communication Manager, Marketing & SCR Manager, ISO Manager, Quality Manager, Manager, and Quality Manager.

### *3.2 Development of the Questionnaire*

The questionnaire examines compliance with the basic principles of CSR internationally recognized (Raufflet et al, 2014) and was based on previous relevant researches (Moore et al, 2008). The questionnaire was also included questions contained in the sample survey questionnaire for Corporate Social Responsibility conducted by the Finance – Sector Studies Department of ICAP Group, on the occasion of the Business Edition of the Group, Leading Employers in Greece in 2015 (<http://csrindex.gr/category/erevnes-meletes>).

The final 77 questions of the questionnaire are divided into seven sections. The first six sections include questions related to:

- Ethics and management
- The environment
- Relations with the society
- Health, safety and social issues

- CSR and business benefits
- CSR in Greece

The last section refers to the demographics data of the participating companies.

The questions include single choice and multiple-choice ones, with the use of five-point Likert scale ("not at all" = 1, "slightly" = 2, "moderately" = 3, "a lot" = 4 and "extremely" = 5).

### 3.3 Research results

Charts 2 and 3 present the demographic data of the companies that participated in the research. It is clear evident that medium, small and micro enterprises – based either on the number of their employees (less than 500 employees) or on the basis of their turnover (less than 50 million €) constitute the majority of enterprises that answered the questionnaire (85-86 %).

Chart 2

3.3: Distribution of companies based on the number of their employees

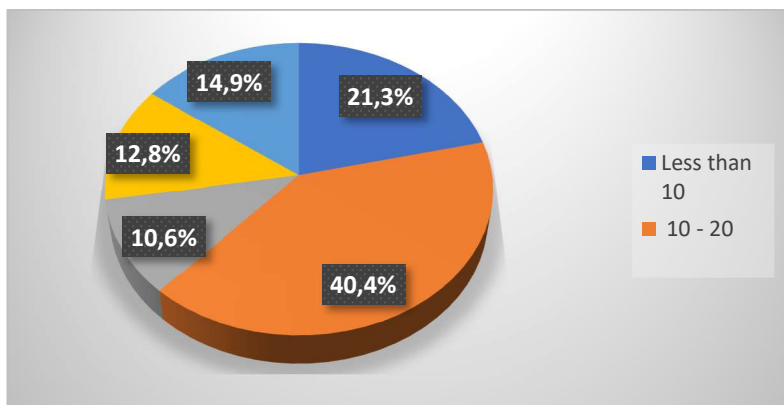
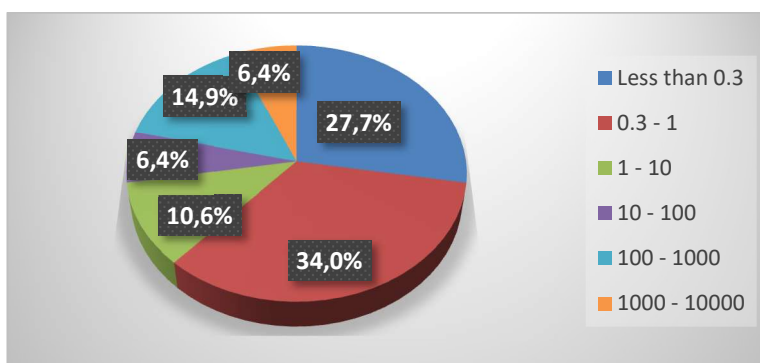


Chart 3

3.3: Distribution of companies based on their turnover



The budget of the mining companies participating in the survey, allocated for CSR activities is shown in Chart 4. It can be seen that activities relating to the environment consume twice the amount of money (more than 40%) that each one of the other groups of activities does: relations with the society, human resources and market ( $\cong 20\%$ ).



Chart 4  
3.3: Budget allocation for CSR actions

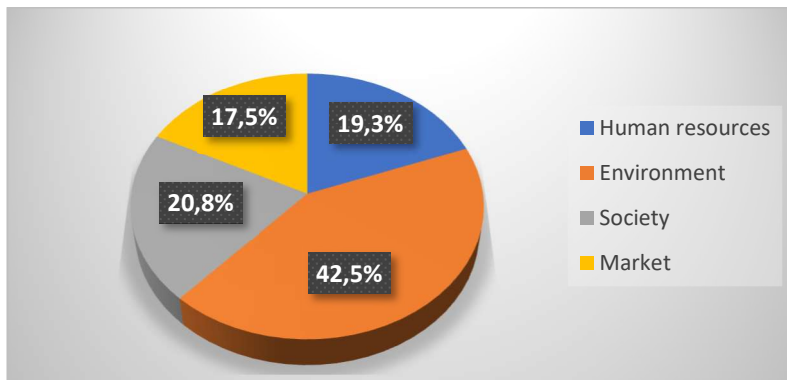


Table 4 presents the results of the Likert scale answers concerning the CSR category “Ethics and Management”. The mean scores indicate that the mining companies in Greece that answered the questionnaire, do not consider the CSR category "Ethics and Management" particularly important, since procedures such as measuring and managing complaints, evaluation of suppliers and selection of subcontractors and suppliers based on the importance they attach to CSR issues, are "somewhat" applied and only "the compliance of the vision, mission and values of the company with the principles of sustainable development" is widely applied. It is worth noting that, although the companies that participated in the research are all ISO 9001 certified, they show limited implementation of complaint management activities.

The answers of the category "Ethics and Management" were tested for internal consistency (reliability) using Cronbach's alpha, one of the most widely used measures of reliability (Bonett et al, 2014). Cronbach's alpha was 0.7239, indicating that the questions have an acceptable level of reliability.

TABLE 4  
3.3: Ethics and Management

CSR CATEGORY	Question	MEAN SCORES
ETHICS AND MANAGEMENT	To what extent are the vision, mission and values of the company in line with the principles of sustainable development?	3.6
	Regarding the selection of subcontractors and suppliers, to what extent are criteria that take into account the company's compliance with CSR principles used?	2.3
	To what extent is their training in CSR issues a criterion for the selection of subcontractors and suppliers?	2.3
	To what extent are suppliers evaluated through specific CSR audits?	1.7
	To what extent does the company implement complaint measurement and management procedures?	1.8

The results of the Likert-scale responses to the CSR category “Environment” are presented in Table 5. Analysing the mean scores of the answers, it can be concluded that more than half of the questions in the category are above medium. These cover issues such as the extent to which enterprises implement waste management programs, whether ecology is part of their development planning, whether they welcome the logic of reciprocity, whether they collaborate with the local community to protect the environment and biodiversity, whether they implement actions to reduce pollution and whether they agree with the logic of compensation and restoration of the environment after they have finished their operations. These findings support the findings of Papacharalampous et al (2019) who state that environmental care is the most prominent thematic aspect of CSR in Greek companies. The answers of the enterprises to questions regarding energy issues, such as planning of energy efficiency measurements, energy management, promotion of energy efficient technologies or renewable energy sources as well as water management programs and monitoring and reporting of leaks, have generally lower scores. Lack of transparency policy and the problem of corruption as obstacles in the adoption of CSR in Greece have been stressed by Metaxas and Tsavdaridou (2013).

The answers to the questions of the "Environment" category were tested as to their internal consistency. Cronbach's alpha was 0.9458, indicating that the questions have an excellent level of reliability.

TABLE 5  
3.3: The environment

CSR CATEGORY	QUESTION	MEAN SCORES
<b>THE ENVIRONMENT</b>	To what extent does the company implement a waste management program through waste reduction, recycling or reuse?	4.1
	To what extent does the company implement planning for energy efficiency measurements?	2.3
	To what extent is energy management part of the process of continuous improvement (energy independence, R&D, eco-design)?	1.6
	To what extent are eco-design approaches part of the company’s development planning for its facilities, products and services?	2.5
	To what extent does it promote energy efficient technologies or renewable energy sources or other alternatives?	2.4

	To what extent does the company have a water management plan? (evaluation of water in all the procedures (use, consumption, leaks), adapting procedures to reduce water use, eliminating sources of pollution, and soil contamination in its area)	2.4
	To what extent does the company welcome the logic of reciprocity?	3.3
	To what extent does the company seek and encourage cooperation with the local community for the protection of the environment and biodiversity?	3,4
	To what extent does the company implement specific actions to minimize the pollution that can be caused during local transport (raw materials, intermediate or final products, wastewater)?	4.2
	To what extent does the company agree with the logic of compensation and restoration of the environment after the end of its operations?	3.5
	To what extent does the company implement a transparency policy in monitoring and reporting cases of leaks? (are they monitored, recorded, made public?)	2.3

Table 6 presents the results of the Likert scaled answers concerning the “Relations with the society” category. The data imply an increased sensitivity on issues that explore the degree of development of a policy that governs the enterprise’s relations with society, the implementation of actions to disseminate information about the practices and industrial activities uses, the preference of local suppliers, the encouragement and facilitation of the physical participation of the enterprise’s employees in the social life of the area, any sponsorships and donations to local services.

The Cronbach's alpha for this category was 0.8274, indicating that the questions have an excellent level of reliability.

TABLE 6  
3.3: Relationships with society

CSR CATEGORY	QUESTION	MEAN SCORES
RELATIONSHIP WITH SOCIETY	To what extent has the company developed a policy that governs its relations with the society?	3.1
	To what extent does the company implement actions to disseminate information about its practices and industrial activities?	3.0

	To what extent does the company implement actions to promote the local cultural heritage (e.g. folklore or industrial exhibitions or similar events)?	2.1
	To what extent does the company prefer local suppliers (where possible)?	4.9
	To what extent does the company encourage and facilitate physical participation of its employees in the social life of the area (cultural and sporting events, etc.)?	2.7
	To what extent does the company regularly make donations or sponsorships to local services?	2.8
	To what extent does the company monitor and control the quality of life and hygiene of the local community (e.g., analysis and monitoring of air or water quality in its area of operation)?	2.9

Data regarding the category of “Health, safety, social issues” are presented in Table 7. The scores are above medium on areas regarding the extent to which the participants have mechanisms for the prevention of accidents or illness, whether they incorporate in their policies health and safety issues of their contractors’ employees, whether they have carried out a risk analysis in industrial processes and their activities, whether they implement programs of staff training, whether their employees were trained on the principles of CSR, whether they have mechanisms to ensure respect of labour rights and industrial relations, whether they provide equal opportunities to all employees (regardless of age, gender, nationality, etc.) and whether they apply a recruitment process transparent and fair, whether wages comply with the collective agreements. Lower scores are detected in matters such as whether the bonuses of managers and directors are linked to the company's CSR performance, whether they provide their staff additional medical coverage and whether there are clear criteria for employee promotion.

With regard to internal consistency, the Cronbach's alpha was 0.9308, indicating that the category has an excellent level of reliability.

TABLE 7  
3.3: Health, safety, social issues

CSR CATEGORY	QUESTION	MEAN SCORES
HEALTH, SAFETY, SOCIAL ISSUES	To what extent does the company have mechanisms to prevent accidents at work or illness (e.g. health and wellness committee, health programs)	3.7
	To what extent does the company incorporate in its policies health and safety issues of its contractors’ employees?	3,4
	To what extent has the company carried out a risk analysis in its industrial processes and activities?	4.2

	To what extent does the company implement staff training programs?	3.5
	To what extent have employees been trained in CSR principles?	2.5
	To what extent are the bonuses of its managers and directors linked to the company's CSR performance?	1.6
	To what extent does the company have mechanisms to ensure respect for labour rights and labour relations?	3,4
	To what extent does the company provide equal opportunities to all employees? (Regardless of age, gender, nationality, etc.)	4.3
	To what extent does the company provide additional medical coverage to its staff?	2.1
	To what extent does the company implement a transparent and fair recruitment process?	4.0
	To what extent do wages comply with collective agreements?	4.2
	To what extent are there clear criteria for employee promotions?	2.3

The extent to which the mining companies participating in the survey were benefited or expect to be benefited from CSR activities is shown in Table 8. Although, not highly scored, the most important gains are the stabilization of the company's market position, the company's contribution to society, the increase in employee performance, the improved relations with the local community, the ability to attract and retain a high level of human resources and the improvement of customer satisfaction. It should be noted that low scores are given in topics such as the protection and improvement of the company's image, the increase of sales, the reduction of production costs and the indirect benefits, such as tax reliefs, programs, subsidies. Although they considered a different set of CSR advantages, the benefit of tax profits is also low ranked in the study of Giannarakis et al (2009) who attribute this to the lack of motivation offered by the Greek State to the companies that strive to implement CSR.

The test of internal consistency indicates a Cronbach's alpha of 0,9080 which implies high reliability of the category.

TABLE 8  
3.3: Business benefits from CSR actions

CSR BENEFITS	TO WHAT EXTENT HAS THE COMPANY BENEFITED FROM CSR ACTIONS?	MEAN SCORES
	Market stabilization	3.3
	Contribution to society as a whole	3.3
	Improvement of relationships with business environment	3.2

	Improvement of employee performance	3.1
	Good relations with the local community	3.1
	Attracting and retaining a high level of human resources	3.0
	Improvement of customer satisfaction	2.6
	Protection and improvement of the company's image	2.3
	Sales increase	2.3
	Reduction of production costs	1,2
	Indirect benefits (e.g. tax reliefs, programs)	1,2

Finally, the participants in the research were asked to assess the importance of CSR activities for their companies and to indicate which are, according to their views, the obstacles that hinder the wider application of CSR principles among the Greek mining companies. The results are presented in Table 9 where CSR is assessed as moderately important, while the factors that may hold back CSR activities are all highly scored ranging from 4.0 (the need for specialized staff to manage the CSR project) to 4.8 (lack of information and bureaucracy). Similar to the high ranking of the difficulty of the lack of information revealed by this study, the work of Giannarakis et al (2009) indicates that the most important obstacle is the definition and understanding of the CSR concept. The authors point out that the concept of the CSR is vague and the appropriate policies and the level of implementation are not easily defined.

Cronbach's alpha for internal consistency of the obstacles statements was 0.774 indicating that this section of the questionnaire has an acceptable level of reliability.

TABLE 9  
3.3: CSR in Greece

<b>IMPORTANCE OF CSR FOR THE COMPANY</b>	<b>MEAN SCORES</b>
How important do you think CSR is?	3.3
<b>TO WHAT EXTENT DO YOU THINK THAT THE FOLLOWING ACTIVITIES HOLD BACK TAKING CSR ACTIONS BY THE GREEK MINING ENTERPRISES?</b>	
The small size of the enterprise	4.7
The cost	4.7
Lack of information	4.8
Bureaucracy	4.8
The need for specialized staff	4.0

### 3.4 Statistical analysis

#### Investigation of the impact of the years of company's ISO 9001 certification on CSR elements

There is an increase in the average value of companies' CSR performance with the increase

of years of ISO 9001 certification in all CSR fields i.e. "Ethics and Management", "Environment", "Relationship with Society" and "Health, Safety and Social Issues". The significance of the variation was confirmed through the application of the non-parametric Kruskal - Wallis test ( $p\text{-value} = 0.001 < 0.05$ ) (Table 10). We can therefore conclude that, as companies "mature" in quality issues, they become more familiar and attach greater importance to the various fields of CSR.

Among the questions that investigate the benefits that companies have gained when they implement CSR, the only correlation that is statistically significant ( $p\text{-value} = 0.048 < 0.05$ ) when the non-parametric Kruskal – Wallis test is applied considering the years of ISO 9001 certification, is traced in the question that investigates the benefits from improving employee satisfaction. The longer the certification period, the greater the employee satisfaction.

Regarding the questions that investigate the Greek mining companies' view about CSR, it seems that companies that are more than 15 years certified show statistically significant variation in their answers' average values, compared to the rest. These companies seem to:

- consider that CSR is important (mean = 3.17,  $p\text{-value} = 0.000$ ),
- believe that the small size of the company does not act as a deterrent to the undertaking of CSR actions (mean = 3.33,  $p\text{-value} = 0.002$ ),
- believe to a lesser extent than the others that both cost (mean = 4.00,  $p\text{-value} = 0.006$ ) and lack of information (mean = 4.00,  $p\text{-value} = 0.001$ ) act as a deterrent to CSR actions

It seems, therefore, that a long-term implementation of quality principles in the way the mining companies operate has a positive effect on their involvement with CSR activities.

TABLE 10  
3.3: *Years of certification of the company according to ISO 9001*

		Years since first certification				Sig.
		1 to 5	6 to 10	11 to 15	More than 15	
		Mean				
CSR Topic	Ethics and management	2.4167	2.3000	2.7455	3.0667	0.001
	The environment	2.7424	2.6263	3.2397	3.6364	0.001
	Relations with the society	2.7857	3.2397	3.3766	4.0000	0.001
	Health, safety and social issues	3.0208	3.6364	3.4924	4.0417	0.001
Business benefits	Improving customer satisfaction	2.4200	2.2800	2.6400	4.000	0.048
CSR	Importance of CSR	3.1700	3.0000	3.1800	4.3300	0.001

	Small size companies and CSRs actions	4.9200	4.9400	4.8200	3.3300	0.002
	High cost and CSRs actions	4.9200	4.8900	4.7300	4.0000	0.006
	Lack of information and CSRs actions	4.8300	5.000	4.8200	4.0000	0.001

*Investigation of the impact of the size of the company (number of employees)*

There is an increase in the mean value of companies' CSR performance with the increase of the number of employees. The highest values traced in the category of "101 to 500 employees" in three fields of CSR: "Ethics and Management", "Relationship with society" and "Health, Safety and Social Issues", as well as in the category of "over 500 employees" in the field of the "Environment". The non-parametric Kruskal - Wallis test reveals a statistical significance ( $p\text{-value} = 0.000 < 0.05$ ) (Table 11) of the differences among the size categories. In particular, as the number of employees increases the company attaches greater importance to the various fields of CSR. A possible explanation for this may be that larger companies usually attract more publicity and experience greater pressures on the implementation of CSR. In addition, a large mining - quarrying company by definition creates greater nuisance to the environment than a small one and therefore it is obliged to present more improved environmental results. As far as actions related to labour as well as health and safety issues are concerned, they are probable more advanced in larger companies due to the existence of a workers' Union, which is, according to national legislation, provided above a certain number of employees. Finally, as the size of the company increases, its financial health is likely to increase and therefore it may be able to invest more in CSR activities.

Among the questions that investigate the benefits that companies have gained from CSR implementation, five questions showed statistically significant variations ( $p\text{-value} = 0.003, 0.001, 0.000, 0.015, 0.025 < 0.05$ ) considering the number of employees. By applying the non-parametric Kruskal – Wallis test, companies with the highest number of employees (more than 500) consider that they have benefited from the implementation of CSR in areas such as “relations with local community”, “protection and improvement of the company's image” and “contribution to society as a whole”. However, in the field of improving customer satisfaction the highest mean value is in the category of “101 - 500 employees”, while in the field of improving relationships with the business environment the highest average price is in the category of “51 - 100 employees”.

With regard to the general views of Greek mining companies about CSR, the mean value on the importance of CSR increases with the rise of the number of employees ( $p\text{-value} = 0.000$  with the application of the non-parametric Kruskal – Wallis test). Factors such as the small



size of the company as well as the cost and the lack of information for the implementation of CSR actions are recognized as inhibitors to a statistically significant lesser extent by companies with a large number of employees (p-value = 0.002, 0.006 and 0.001 respectively). In detail, these results are shown in Table 11.

TABLE 11  
3.3: *Impact of the size of the company (number of employees)*

		Number of employees				Sig.
		Less than 50	51 to 100	101 to 500	More than 500	
		Mean				
CSR Topic	Ethics and management	2,2621	2,6800	3,2000	2,9714	0.000
	The environment	2,5987	3,2182	3,5000	3,5974	0.000
	Relations with the society	2,5862	3,1714	4,2381	4,0204	0.000
	Health, safety and social issues	2,8534	3,4167	4,1806	4,0714	0.000
Business benefits	Good relations with local community	3.0000	3.0000	3.1700	3.4300	0.003
	Protection and improvement of the company's image	2.0000	2.6000	2.3300	3,2900	0.001
	Contribution to society as a whole	3.0300	3.4000	3.6700	3,8600	0.000
	Improving customer satisfaction	2.1000	3.2000	3.8300	3.2900	0.015
	Improving relationships with the business environment	3.0300	3.6000	3.5000	3.5700	0.025
CSR in Greece	Importance of CSR	3.000	3.400	3.6700	3.8600	0.000
	Small companies and CSRs actions	5.000	4.400	4.5000	3.8600	0.002
	High cost and CSRs actions	5.000	4.800	4.5000	3.8600	0.006
	Lack of information and CSRs actions	5.000	4.600	4.5000	4.2900	0.001

*Investigation of the impact of the size of the company (turnover)*

There is an increase in the mean value of companies' CSR attitude with the increase in turnover in all four fields of CSR: "Ethics and Management", "Environment", "Relationship with Society", "Health, Safety and Social Issues". The non-parametric Kruskal – Wallis test

shows that this is a statistically significant variation (p-value = 0.008, 0.000, 0.000, 0.000 < 0.05 respectively) (Table 12). The findings of the impact of the company's size, based on turnover, are in line with those based on the number of employees and the same conclusions may apply.

TABLE 12  
3.3: *Impact of the size of the company (turnover)*

		Turnover of the Company			
		Less than 450.000 €	450.000 € to 350 millions €	More than 350 millions €	Sig.
		Mean			
CSR Topic	Ethics and management	2,2900	2,6421	2,8750	0.008
	The environment	2,6227	2,9952	3,5341	0.000
	Relations with the society	2,5929	3,2406	3,8750	0.000
	Health, safety and social issues	2,8625	3,4254	3,8854	0,000
Business benefits	Contribution to society as a whole	3.0500	3.3700	3.6300	0.005
CSR in Greece	Importance of CSR	3,0000	3,3200	3,7500	0,026
	Small size companies and CSRs actions	5,0000	4,5800	4,2500	0,007
	High cost and CSRs actions	5,0000	4,7400	4,1300	0,004
	Lack of information and CSRs actions	5,0000	4,6800	4,500	0,033
	Bureaucracy and CSRs actions	5,0000	4,7900	4,2500	0,002

Among the questions that aim to investigate whether companies consider that they have gained benefits from the implementation of CSR, the only variation that is statistically significant (p-value = 0.005 < 0.05 with the application of the non-parametric Kruskal– Wallis test) is revealed in the question regarding the contribution to society as a whole. The maximum of the mean value of the answers is found in the category of "medium-sized" companies, with a turnover of 450,000 € to 350 million € and not in the larger ones. With regard to the questions

that try to investigate the views of the Greek mining companies on CSR, the findings are the same with those of the investigation based on the size of the number of employees.

There is an increase in the mean value of companies' responses to the importance of CSR, as turnover increases, which is statistically significant (p-value = 0.026 with the application of the non-parametric Kruskal – Wallis test). Also factors such as the small size of the company, the cost and the lack of information on the implementation of CSR actions as well as the bureaucracy are recognized as inhibiting to a lesser extent by companies with a higher turnover and the differences in this variation are statistically significant (p-value = 0.007, 0.004, 0.033 and 0.002 respectively).

#### **4 Conclusions - Suggestions for future research**

This paper presents the results of a research conducted among ISO 9001 certified Greek mining and quarrying companies with the aim to investigate their perceptions about CSR activities. The percentage of certified mining and quarrying companies in Greece, according to the GMEA data, shows a considerable increase in terms of certification according to the Quality Management System standard (ISO 9001) where it reaches 96% of the GMEA members and a restricted increase for certification according to the of Health and Safety (OHSAS 18001) and Environmental Management (ISO 14001) standards, where it reaches 60 and 50% respectively.

The research reveals that the greatest part of the CSR budget of the companies is spent for environmental activities (42%). This reflects the fact that these companies, due to the nature of their operations, cause significant interventions in the surrounding environment, which in turn may be the source of disputes with the local and wider community.

The CSR actions that are highly implemented by companies are:

- in the field of environment: waste management and actions to minimize pollution caused by local transport
- in the field of public relations: cooperation with the local community for the protection of the environment and preference for local suppliers
- in the field of health, safety and social issues: actions to prevent accidents at work, a transparent and fair recruitment process, equal opportunities for all (regardless of age, gender and nationality), existence of a documented procedure governing working conditions and compliance of wages with the collective agreements.

On the other side, the CSR activities that are less employed by the Greek mining and quarrying companies are the following:

- in the field of environment, they do not promote energy efficient technologies nor

they use renewable energy sources, they do not have a plan for energy efficiency measurements, they do not set targets for reducing greenhouse gas emissions, they do not publish quantified energy or water consumption indicators, they do not implement programs to reduce the use of raw materials or water, while policies of transparency in monitoring and reporting cases of leaks are poorly applied.

- in the field of their relations with the society, they do not monitor nor control the quality of life and hygiene of the local community (except for large companies that do so), they have not developed a policy governing public relations, they have not publicly recorded their commitments to society, nor have they implemented actions to promote local cultural heritage
- in the field of health, safety and social affairs, employees are not trained in CSR principles, managers' bonuses are not linked to the company's CSR performance, and additional medical care is not provided (except for large companies, that do so).

In terms of the benefits that the companies had or expect to have thanks to the implementation of CSR activities, the most important ones are the contribution to society as a whole, relations with the local community, market stabilization, relations with business environment, improvement of employee productivity and attracting and retaining a high level of human resources. On the contrary, they do not believe that indirect benefits (tax reliefs, programs, etc.), reduction of production costs, increase of sales or improvement of the image of the company can result from CSR actions.

Only 13% of companies consider CSR very important, while bureaucracy, lack of information, the small size of enterprises and costs are considered as impediments to the implementation of CSR.

Large companies (with a turnover of more than € 350 million, which constitute 19% of all companies in the sample) almost entirely consider CSR very important and can allocate resources for CSR actions. On the contrary, medium-sized enterprises (with a turnover between € 450,000 and € 350 million, which constitute 38% of the total enterprises of the sample) and small enterprises (with a turnover of less than € 450,000, which constitute 43% of the total enterprises of the sample, in the midst of the financial crisis are trying to control their costs and are not as interested in CSR as they should be. As far as the role of the company's demographic data is concerned, it seems that the company's experience in quality issues in terms of years it is ISO 9001 certified as well as its size in terms of either the number of employees or turnover, they have a statistically significant positive impact on various company's CSR performance aspects.

To the knowledge of the authors, this study is the first attempt to investigate the

implementation of CSR among Greek mining and quarrying companies. By portraying the application of CSR among the participating companies, the research contributes to a better understanding of the concept within the specific industry's background indicating the most and least preferred CSR actions. Moreover, the research reports on the benefits of CSR as well as the different views of the participants according to their demographic data. The present study allows CSR researchers to broaden their views on the various aspects of CSR application and the practitioners to trace areas of attention when CSR principles are adopted by the mining industry.

The results of the research indicate that there is clear room for improvement in the case of CSR application in the Greek mining industry. From a practical point of view, this study may support decision makers of the Greek mining companies when the CSR agenda is considered. The data provided by the study may be utilized by the management of a mining company to develop a CSR approach and to prioritise actions in order to follow or move ahead of the industry's positioning. However, the study reveals that apart from initiatives taken by the companies, the state can also play an important role to promote the idea of CSR by informing companies in a more systematic way and by offering them incentives to implement CSR actions. Initiatives taken by the state regarding the strategic planning, the information and awareness of the business world and of the society as well as the training of business executives and decision makers of the mining sector are critical factors for the adoption and development of the CSR concept by a greater number of companies of that sector.

The present study gives an outline of the application of CSR activities in the Greek mining industry but suffers several limitations. The most important of them is the small sample of the research participants initiated by the authors' choice to address the research questionnaire solely to ISO 9001 certified companies. Another important consideration is the validity of the research questionnaire which although based on questionnaires used by previous studies, has been specially constructed for the purpose of the present study. The limitations of the study can form the basis for future research agenda. Some suggestions for future research are:

- The investigation of the application of CSR principles by companies that are not ISO 9001 certified.
- The investigation of the application of the principles of the ISO 26000 standard.
- A comparative study of the application of CSR principles by companies of another industry or another country.
- A longitudinal research in order to investigate the evolution of the application of CSR principles by mining and quarrying companies.

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