

The Impact of Environmental Accounting on Compliance with Environmental Legislation and Laws: A Case Study of the Libyan Iron and Steel Company

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Abstract

This research aims to investigate the impact of environmental accounting on compliance with environmental legislation and laws in the Libyan Iron and Steel Company (LISCO). For data collection, a questionnaire was used to collect data from (84) respondents who are employed in this Company (LISCO). The results of the study indicate that there is a significant impact of environmental accounting on the compliance with the environmental legislation and regulations in the LISCO, as well as there is a positive relationship between environmental accounting and compliance with environmental legislation and regulations.

Keywords: *Environmental accounting, Environmental Legislation and regulations, Libya.*

أثر المحاسبة البيئية على الالتزام بالتشريعات والقوانين البيئية

دراسة حالة الشركة الليبية للحديد والصلب

التائب الزروق عبد المجيد

كلية الاقتصاد - جامعة سرت

الملخص

يهدف هذا البحث إلى تقصي أثر المحاسبة البيئية على الالتزام بالتشريعات والقوانين البيئية في الشركة الليبية للحديد والصلب. وقد تم استخدام الاستبانة لجمع البيانات التي أخذت من (84) موظف من العاملين بالشركة الليبية للحديد والصلب. في هذا البحث تم التوصل إلى عدد من النتائج المهمة، من أهمها أن هناك تأثير كبير للمحاسبة البيئية على الالتزام بالتشريعات واللوائح البيئية في الشركة الليبية للحديد والصلب، بالإضافة إلى أن هناك علاقة إيجابية بين المحاسبة البيئية والامتثال للتشريعات واللوائح البيئية.

الكلمات الدالة: *المحاسبة البيئية، التشريعات والأنظمة البيئية، الشركة الليبية للحديد والصلب، ليبيا.*

1. Introduction

In recent years, public concern about the environment has become one of the most important developments in the world (Firoz & Ansari, 2010). More specifically, societies and regulators have become increasingly interested in environmental problems such as pollution and resource consumption (Dunlap, 1997; Athma & Rajyalaxmi 2017; Lu & Taylor, 2018). This interest was because of the concerns about the impact of pollution (air, water and soil) on individuals in society (Hildebrand, 1997). Climate change and ozone depletion are an example of environmental problems that were caused by emissions and air pollution (Hall & Taplin, 2007; Soh, Roddick, & van Leeuwen, 2008). The emissions of greenhouse gases and their impacts on climate change and ozone depletion could be giving rise to harmful consequences on human health and ecosystems (Edino, Nsofor, & Bombom, 2010). Therefore, it is becoming necessary to develop effective environmental laws and legal systems to ensure that economic growth is consistent with environmental sustainability (Firoz & Ansari, 2010; Chinedu & Ogochukwu, 2020).

The relation between the environment and the economy received attention in many conferences, for instance, the United Nations Special Summit on the Environment, held on 22 September 2009, and the London and Pittsburg Summits of the G20 Leaders 2009 (Firoz & Ansari, 2010). These conferences enhanced the importance of the relation between the environment and finance. In response, companies have been seriously trying to take into account the environmental impacts include impacts on air, water and soil caused by their activities (Beer & Friend, 2006; Unerman, Bebbington, & O'Dwyer, 2007). Environmental accounting could play a role in notifying the community about the use of its resources, the burdens and benefits which companies have been obliged to bear in development decisions (Gray, 1992; Maunders & Burritt, 1991; Adebimpe, Ekubiat, & Bokime, 2015; Shuaibu, Muhammad, & Isah, 2019; Oraka, 2021). In addition, through the information provided by the environmental accounting, the government can identify and then make the decisions to reduce and control (Rahahleh, 2011; Steadman, Green, & Zimmerer, 1995) the levels of environmental pollution (air, water and soil), which today have become the worldwide hot topic (Lu & Taylor, 2018).

2. The literature review

Environmental accounting is the "identification, measurement, and allocation of environmental costs, the integration of these environmental costs into business decisions, and the subsequent communication of the information to a company's stakeholders" (Stankoet al, 2006, p. 21), it is a tool of measuring the performance of a company concerning maintain international and environmental standards which are at stake. Therefore, this makes the role of environmental accounting is an important issue in any company (Barman & Saikia, 2016). This has led environmental accounting to become an interesting topic for many academic researchers and has been reflected on the significant increase in environmental accounting studies (Eltaib, 2012). A study was done by Tilt (1997) aimed to investigate the main influences of Australian companies on the Corporate Environmental Policy (CEP). The researcher found out that the environmental law influenced the company's policy development and environmental activities. the results showed the Australian mining and chemical industries were interested in the environment compared with other industries. In addition, Frost (2007) conducted a study on

seventy-one Australian companies listed under utilities, resources (mining, oil and gas), infrastructure, or paper and packaging industries on the Australian Stock Exchange (ASX). The study aimed to explore the influence of the introduction of mandatory reporting guidelines on the environmental disclosures. The findings showed that a substantial increase in the level of environmental disclosure was mainly in the companies that reported breaches of regulations. The study results support that such research is needed as it can study environmental accounting and environmental regulations in one of the environmentally sensitive businesses.

Tsang (1998, p. 625) stated that “legislation on pollution controls, industrial safety, and employee welfare has brought home to companies the importance of CSR”. Similarly, Konar and Cohen (2001) argued that major companies voluntarily over-comply with environmental regulations, and externally portray a positive image. In particular, companies listed under environmentally sensitive industries disclose much environmental information compare with companies listed under non-environmentally-sensitive industries (Deegan and Gordon, 1996; Hackston and Milne, 1996; Moneva and Llana, 1996; Campbell, 2003; Gao, Heravi, & Xiao, 2005; Cho and Patten, 2007; Brammer and Pavelin, 2008; Haddock-Fraser and Fraser, 2008). This is because of the high pollution they cause, which make the environmentally sensitive companies subjected to an extensive range of environmental regulations and they must comply with additional rigorous requirements (Monteiro & Aibar-Guzman, 2010).

In the Asian context, Bagur-Femenías, Perramon, & Amat (2015) stated that in Japan, companies are regularly following the environmental regulation and the results of studies enhanced that environmental sustainability influences income and reduce the risk of Japanese companies. A study was conducted by Dasgupta et al (2006) explored the investors' reaction to the companies that failed to comply with Korean environmental legislation and regulations, published by the Ministry of Environment of the Republic of Korea. The study revealed that there was a significant reaction the investors on the Korean Stock Exchange had toward such news with a high decline in market value. The reason behind that might be the increasing awareness and concern about the environment.

According to Singh, Panackal and Shankar, (2017) in India, environmental awareness has become an essential part of the Indian industry and leading to high environmental quality and growth. Moreover, Athma and Rajyalaxmi (2017) stated that since the early 1970s Public consciousness towards environmental issues such as, environmental preservation, environmental pollution and environmental development, have developed tremendously leading to various policies of legislation for the protection of the environment have been legislated since the mid -1970s. An example of actions toward the environment protection was that the Ministry of Environment and Forest in India has proposed that “Every company shall, in the report of its Board of Directors, disclose briefly the particulars of compliance with environmental laws, steps taken or proposed to be taken towards adoption of clean technologies for prevention of pollution, waste minimization, waste recycling and utilization pollution control measures, investment on environmental protection and impact of these measures on waste reduction, water and other resource conservation” (Athma & Rajyalaxmi, 2017, p. 11).

Furthermore, the environment ministry in India issued guidelines for the companies regarding environmental statements. It includes mainly the following type of information: "(a)- a type of devices installed for controlling pollution; (B)- steps taken for energy conservation; (c)- steps taken for conservation raw material; (d)- a step taken for wastewater and production

process waste; (e)- step taken for improvement of quality of product and services, the process of production" (Moid, 2017, p. 165). However, Moid (2017) concluded that a very small number of Indian companies are willingly disclosing information about the environmental issues in the annual Reports. The reason for this as Moid (2017) stated is the shortage of environmental legislation which compelling the companies to disclose information. In this regard, there is a recommendation by Makori (2013) that tax credit should be given by the Indian government to companies that comply with environmental laws.

In Africa, a study was conducted by Khlif, Guidara, & Souissi, (2015) to examine the relationship between social and environmental disclosure and corporate performance for two African leading countries which are South Africa (common law country) and Morocco (civil law country). They found that social and environmental disclosure has a significant positive impact on corporate performance just in the South African setting. In Libya, according to the literature that the researcher has reviewed, although, environmental laws first existed early in the 1970s, few studies have just been conducted in the area of environmental accounting. For instance, Ahmed's study (2004) explored the corporate environmental disclosure in Libya in the period between 1998 – 2001. Ahmed (2004) concluded that there were no signs of the existence of corporate environmental disclosure. Afterward, Ahmed and Mousa (2010) conducted a study to investigate the corporate environmental disclosure practices in the 18 biggest industrial companies. They found an improvement in the corporate environmental disclosure. More recently, Elgobbi & Elghannai, (2018) explored the impact of quality information on the environmental accounting disclosure in the Arabian Gulf Oil Company. They concluded that the quality of information has a substantial impact on environmental accounting disclosure.

Moreover, Abdalmajeed (2021) studied the reality of the application of environmental accounting in the Libyan Iron and Steel Company. The results included that, despite some obstacles, the (LISC) applies environmental accounting and it is highly aware of the importance of applying environmental accounting for the company. Regarding environmental laws, the First environmental law introduced in Libya was law No.8 in 1973, which has prevented oil from pouring into the sea. Shortly, in 1982 environmental laws witness more consideration leading to the introduction of law No. 2 of 1982, which has included air Pollution, seawater pollution, water source's pollution, soil pollution, imbalance of ecosystem and noise pollution. Law No. 7 of 1982 regarding environmental protection which contained several chapters aimed to protecting (a) airspace from pollution and obligate installations and factories to prevent pollution; (b) seas and marine wealth; (c) surface or groundwater sources; (d) soil and plants; and (e) wildlife.

3. Research problem

The application of environmental accounting can be a hard issue, Ross and Kovachev (2009) stated that the reason behind the application of environmental management accounting as one of the environmental accounting tools is to comply with the environmental legislation and regulations such as carbon footprint, emission trading. However, according to the Chartered Institute of Management Accountants (CIMA) in 2009, only large companies use environmental management accounting because they are required to conform to strict environmental legislation and regulations such as, emission trading schemes and carbon footprint. This supports the view of Noodezh & Moghimi (2015) about the penalty for the violating of environmental regulations and pollution. The researchers argued that there are some

issues such as compilation of regulations about environment protection, severe punishments for environmental pollution and the determination of efficient standards in reporting environmental costs should be considered more than before and companies must protect the environment in a long term.

Even though there is no country without environmental legislation, some industries related to the Iron sector still irregularly comply with the environmental legislation. In Libya, in order to find the reason behind the incompliance with the environmental legislation face by the LISCO, the researcher conducted an exploratory study targeted this company. The questionnaire of the exploratory study was randomly distributed to a sample of population, asking them about the main issues that they may face in the LISCO regarding environmental accounting and the regulations. This exploratory study revealed that several issues can help in improving compliance with environmental legislation and laws in the Iron and Steel industry in Libya. These issues include: (a) there is a shortage of information related to the company's complying with the environmental legislation, and the company's efforts in environmental conservation and environmental performance. (b) absence of awareness linked to the environmental accounting among the employees of the company.

Therefore, this research investigates environmental accounting and its impact on compliance with the environmental legislation and regulations in the LISCO. The research problem is specifically formed to answer the following question:

Is there an impact of the environmental accounting on the compliance with the environmental legislation and regulations in The Libyan Iron and Steel Company (LISCO)?

4. Research aims and objectives

By studying the environmental accounting and its impact on compliance with the environmental legislation and regulations in Libya in the iron and steel industry, the researcher can explore to what extent the company comply with environmental legislation and regulations.

5. Research hypothesis

Based on the research question above, it can be hypothesized that:

there is a significant impact of the environmental accounting on the compliance with the environmental legislation and regulations in the Libyan Iron and Steel Company (LISCO).

6. Research significance

The significance of this research is related to the increasing significance of the environment and environmental accounting. In addition, the research significance can be enhanced by the raw area of research in the Libyan context. Moreover, as far as the researcher's knowledge, similar research has not been carried out on this sector. Therefore, such a sort of research can contribute to the literature and will provide the LISCO with recommendations on the current situation and the need to comply with the environmental legislation and regulations.

7. Research methodology

In this research, the interpretative (descriptive) and positivist approaches were adapted. According to Becket al. (2010, p. 208), the positivist approach is “capture and describe a surrogate assumed to convey meaning and reporting intent”. Therefore, the researcher focused on volume and frequency. The questionnaire, which was designed according to the nature of the elements of the research problem, was used as a method for collecting the data of this

research. A survey questionnaire is considered a suitable method for descriptive and exploratory research. The researcher designed the questionnaire based on the knowledge that the researcher received from the conceptual framework and the Libyan environmental laws including: law No.8 of 1973, law No. 2 of 1982 and law No. 7 of 1982. After collecting the research data, it was reviewed to be analysed. The Statistical Package for Social Sciences (SPSS) is used to analyze and gain specific figures, and transfer the data from verbal to numerical. Therefore, correlation and regression were conducted by using the following statistical tests:

- i. The Mean: is a measure of the central tendency of a probability distribution along median and mode.
- ii. The Standard Deviation: which provides insight into how much variation there is within a group of values, measures the deviation (difference) from the group's mean (average).
- iii. The T-test: which is used to compare the means of two groups. It is used in this research to test hypothesis to determine whether a process or treatment affects the population of interest.
- iv. Cronbach's alpha: which is a measure of internal consistency (reliability).

In this research, five levels of practice score are used to determine the answers of the participants as highlighted in table (1).

$$\begin{aligned} \text{Category Length} &= \frac{\text{maximum score} - \text{minimum score}}{\text{number of levels}} \\ &= \frac{5 - 1}{5} = 0.80 \end{aligned}$$

Table (1): Levels of practice scale

Practice Scale	Very low	Low	Medium	High	Very high
Levels	Less than 1.80	1.80 less than 2.60	2.60 less than 3.40	3.40 less than 4.20	4.20 less than 5

7.1. Reliability of the questionnaire:

The concept of reliability of the questionnaire refers to the stability in the questionnaire's results if the questionnaire is redistributed several times within the same circumstances. In this research, the statistical measurement was used to determine the reliability of the questionnaire. Therefore, a Cronbach's Alpha Coefficient was applied and it was revealed that the value of Cronbach's Alpha Coefficient was very high (88.7 %) as table (2) shows. Consequently, it can be concluded that the questionnaire has a high percentage of reliability for this research and it is considered a high-quality measurement tool.

Table (2): Cronbach's Alpha Coefficient

Cronbach's Alpha	Number of Items
0.887	14

7.2. Research population and sample:

The study was conducted on the LISCO, specifically on four related administrations, which are: (financial affairs, legal affairs, environmental affairs and administrative affairs

departments). These administrations have a total number of employees approximately (169). Thus, the researcher distributed (118) copies of the questionnaire for collecting the data, after reviewing (89) returned, (84) copies were valid for the analysis using the Statistical Package for Social Sciences (SPSS).

7.3. Empirical analysis

7.3.1. Demographic variables of the study sample:

The results of the descriptive analysis of the participants' data were presented in table (3), which include: age, gender, educational qualification, occupation and work experience. According to table (3), it is observed that about (60 %) of the participants are categorized under two categories of age, which are " from 40 to 50 years" with (31 %) and " more than 50 years" with (29.8 %). Regarding gender, the vast majority of the participants is males as they present nearly (81 %) of participants. In addition, the respondents with Bachelor Degree are dominated with the percentage of (35.7 %), in contrast, just one respondent is a PhD Degree holder. Moreover, Regarding the occupation, (65.5 %) of participants are categorized under categories of administrative with (38.1 %) and accountant (27.4 %), they seem to present the occupation of most respondents. Finally, it is clearly evident that more than (80 %) of participants have work experience of more than 10 years and (33.3 %) of participants have work experience from 20 to 30 years.

Table (3): Description of Demographic variables

No	Variable	Category	Frequency	Percent
1	The Age	less than 30 years	15	17.9 %
		From 30 to 40 years	18	21.4 %
		From 40 to 50 years	26	31 %
		More than 50 years	25	29.8 %
Total			84	100 %
2	The gender	Male	68	81 %
		Female	16	19 %
Total			84	100 %
3	The Educational qualification	PhD Degree	1	1.2 %
		Master Degree	10	11.9 %
		Postgraduate Diploma	12	14.3 %
		Bachelor Degree	30	35.7 %
		Higher Diploma	13	15.5 %
		Intermediate Diploma	18	21.4 %
Total			84	100 %
4	The Occupation	Director of Administration	4	4.8 %
		Head of Department	10	11.9 %
		Administrative	32	38.1 %
		Accountant	23	27.4 %
		Supervisor	6	7.1 %
		Technician	9	10.7 %
Total			84	100 %
5	The work experience	Less than 5 years	8	9.5 %
		From 5 to 10 years	8	9.5 %
		From 10 to 20 years	24	28.6 %
		From 20 to 30 years	28	33.3 %
		More than 30 years	16	19 %
Total			84	100 %

7.3.2. The actual application of environmental accounting

This part deals with elements of the independent variable " the application of environmental accounting". Table (4) highlights the statistical distribution of the responses of the participants. The statement " *significant environmental accounting policies and objectives are clearly defined to ensure that they are consistent with the company's objectives*" is important, as it has a weighted mean of about (4.00) and a standard deviation of almost (0.792). Additionally, the statement "*environmental costs arising from environmental protection measures are shown in the financial statements*" is considered to be the least important statement as it has a standard deviation of almost (0.800), and a weighted mean of approximately (3.71). This indicates that the financial statements of the company do not cover the environmental cost. Therefore, action should proceed to avoid the ambiguity and absence of environmental cost and to produce information of high quality. Moreover, the entire independent variable (the application of environmental accounting) has a weighted mean of about (3.7857) with a standard deviation of almost (0.56992). Furthermore, it is evident that the T-test of the entire independent variable is statistically significant, as the T value is (60.880) with a significance level of (0.000). This value is smaller than the level of significance of (5%). Therefore, this is an indication of the existence of application of the environmental accounting in the LISCO.

Table (4): The application of environmental accounting

No.	Statements	Mean	Std. Deviation	T- Value	Sig.
1	Significant environmental accounting policies and objectives are clearly defined to ensure that they are consistent with the Company's objectives.	4.00	0.792	46.317	0.000
2	Environmental accounts are clearly classified in the annual reports.	3.81	0.702	49.706	0.000
3	The period and target range of environmental accounts are determined in the annual reports.	3.74	0.746	45.902	0.000
4	Information about assets, liabilities and environmental costs is disclosed.	3.76	0.887	38.890	0.000
5	Information about procedures to reduce pollution caused by the company's activities is disclosed.	3.74	0.971	35.287	0.000
6	The environment and the concept of social responsibility are taken into account when making expansions in the company's activities.	3.74	0.808	42.382	0.000
7	Environmental costs arising from environmental protection measures are shown in the financial statements	3.71	0.800	42.543	0.000
	Sum	3.7857	0.56992	60.880	0.000

7.3.3. The compliance with the environmental legislation and regulations

In this section, the researcher transacts with the elements of the dependent variable "*the compliance with the environmental legislation and regulations*", and highlights the statistical distribution of the responses of the participants in table (5). As it is showed in the table (5), the statement "*the company takes into account in its activities the mechanisms used to measure and reduce emissions to protect the air from pollution*" is the most important statement

comparing with other statements because it has a weighted mean of approximately (3.86) and a standard deviation of about (0.809). On the other hand, the least important statement is the statement " *the company is rehabilitating and repairing contaminated lands as a result of using it in its activities*", as it comes up with the smallest mean of nearly (3.54) with a standard deviation of almost (0.950). This affirms that the company is neglecting and ignoring the rehabilitating of the work sites. Consequently, more focus on rehabilitating and repairing land should be taken place in the company's priorities.

In conclusion, it is highlighted that the entire dependent variable "*the compliance with the environmental legislation and regulations*" has a weighted mean of almost (3.7602) with a standard deviation of about (0.70272). The T-test of the entire dependent variable is statistically significant because the T value is (49.042) with a significance level of (0.000) which is smaller than the level of significance of (5%). Consequently, this supports that the LISCO compliances with the environmental legislation and regulations.

Table (5): *The compliance with the environmental legislation and regulations*

No.	Statements	Mean	Std. Deviation	T-Value	Sig.
1	The company takes into account in its activities the mechanisms used to measure and reduce emissions to protect the air from pollution.	3.86	0.809	43.712	0.000
2	The company reports in the event of any accidents causing gas leakage in the air.	3.82	0.894	39.181	0.000
3	The company does not use seawater for washing, cooling, burying waste, or for any activity that affects marine life.	3.68	1.055	31.967	0.000
4	The company takes into account the protection of water sources from pollution, whether surface or groundwater.	3.76	0.977	35.287	0.000
5	The company avoids the use of agricultural lands and forests in its expansions.	3.85	0.951	37.077	0.000
6	The company is rehabilitating and repairing contaminated lands as a result of using them in its activities.	3.54	0.950	34.114	0.000
7	The company discloses the location and size of the land it owns or leases and the protected areas and areas of high biodiversity that border it.	3.82	0.894	39.181	0.000
	Sum	3.7602	0.70272	49.042	0.000

7.3.4. Testing the Hypothesis:

For the research purpose, the researcher tested the hypothesis: "*there is a significant impact of the environmental accounting on the compliance with the environmental legislation and regulations in Libya in the iron and steel industry*". Simple linear regression was applied to explore the impact of environmental accounting (independent variable) on compliance with environmental legislation and regulations (dependent variable).

Table (7): Test regression coefficients and correlation results

Variable	T- Value	R	R ²	F	Durbin-Watson	Sig.
the compliance with the environmental legislation and regulations	5.809	0.540	0.292	33.748	1.683	0.000

Table (7) clearly shows that the T value is (5.809) with a significance level of (0.000), which is smaller than the level of significance of (5 %). This means that environmental accounting impacts compliance with the environmental legislation and regulations in (LISCO). In addition, the R-value is (0.540), which means that the relation between environmental accounting and compliance with the environmental legislation and regulations is a positive relationship. According to the R^2 , any change in the environmental accounting will be offset by a change in compliance with the environmental legislation and regulations of (29.2%). Additional support, the Durbin Watson test value is (1.683), which is smaller than 2, and this indicates the environmental accounting impacts the compliance with the environmental legislation and regulations in LISCO. In conclusion, based on the above analysis, the researcher accepts and confirms the hypothesis: “there is a significant impact of the environmental accounting on the compliance with the environmental legislation and regulations in the LISCO. This is consistent with the study conducted by Ross and Kovachev (2009) who stated that environmental accounting is a tool to compliance with the environmental legislation and regulations such as, emission trading, carbon footprint.

8. Finding discussing:

Based on the empirical analysis, several important findings have been revealed. The LISCO complies to a certain extent with the environmental regulation and legislation. This finding conforms with Konar and Cohen (2001) who argued that major companies voluntarily comply with environmental regulations. It is also consistent with Bagur-Femenías, Perramon, & Amat (2015) who stated that some companies are regularly following the environmental regulation. However, this finding is in contrast with Noodezh & Moghimi (2015) who argued that there are some issues regarding the compilation of regulations about environment. In addition, it has been found that there is a significant impact and a positive relationship between environmental accounting and compliance with the environmental legislation and regulations. This is finding aligns with Ross and Kovachev (2009) who stated that the application of environmental accounting enhances compliance with the environmental legislation and regulations.

9. Results

Several significant results have been discovered from the analysis of the data of research. These results include:

- i. There is a significant impact of the environmental accounting on compliance with the environmental legislation and regulations in the LISCO.
- ii. There is a positive relationship between environmental accounting and compliance with environmental legislation and regulations.

10. Recommendations

Based on the revealed results, several recommendations are suggested as follows:

- i. More focus should be given to the environmental cost to ensure the correct accounting treatment and disclose it in the financial reports.
- ii. Additional efforts are required to follow up the environmental legislation and regulations to have complied.

11. Limitations of the research

In this research, the LISCO was selected, so the research findings are limited to the environmental accounting and compliance with environmental legislation and laws of LISCO. Moreover, as stated earlier in the research methodology, the data was collected from participants in 2021, so the research findings are limited to a particular period.

12. Future Research

Despite previous limitations, this study highlights and suggests further areas of research that could be conducted in the future, such as

- i. Comprehensive research on the environmental accounting of extractive industries in Libya.
- ii. The quality of environmental disclosure of environmentally sensitive businesses.
- iii. The impact of environmental accounting on the quality of information.
- iv. Environmental cost is also an attractive area of research.

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