

# Attitudes of Managers towards the Potential Effects of ISO 14001 in Saudi Arabia: Factor Analysis

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Received: April 17, 2013

Accepted: May 6, 2013

Online Published: June 14, 2013

doi:10.5539/ibr.v6n7p91

URL: <http://dx.doi.org/10.5539/ibr.v6n7p91>

## Abstract

This study aims to investigate the attitudes of managers in Saudi Arabia towards the effects of ISO 14001 in Saudi Arabia. The study includes 143 firms in three sectors of activities; private manufacturing, private service and public firms. The study reveals that the five most significant benefits are; safer environment, improvement of image of the certified firms with the international environmental organizations, ensure the safety of workers inside the organizations, improvement of firms image with customers and the reduction of pollution. When using Factor Analysis, it produces five factors; employee morale, efficiency and quality, relations with government, safety of products and relations with environmental organizations. Furthermore, the study shows that the five most difficulties are related to the costs and fees; fees of consultants, costs of changing within organizations, costs of maintain the system, fees of the certification agencies and costs of internal auditing. The Factor Analysis suggests two factors for difficulties namely; preparation and documentation and costs and fees. The study also finds that there is an overwhelming satisfaction about ISO 14001 among managers where the private service firms come first followed by public firms then the private manufacturing firms.

**Keywords:** ISO 14001, standard, environment, attitudes, benefits, difficulties, certification, Saudi Arabia

## 1. Introduction

In 1996, International Organization for Standardization (ISO) issued the first versions of ISO 14001 (Environmental Management Systems). The purpose of those standards was to ensure that the organization is safe for the employees, the customers and the environment. Subsequent versions have been issued since then by the specialized committee within ISO organization; Technical Committee (TC) 207. In 2004, the latest version of the standard has been in place worldwide to be a third-party assessment standard. Interested companies can obtain ISO 14001: 2004 certification by going through certain procedures from the development of quality manual, the necessary modification of the environmental system, the internal auditing until the final assessment. In general, companies that need most ISO 14001 are those manufacture environmentally-dangerous products or materials such as chemicals and petrochemicals, oil products, pharmaceuticals and cement related products. There has been a continuous pressure from governments and environmental organizations on factories to be environmentally-friendly firms. Hence, there are a growing number of companies implementing the standard of ISO 14001 although in a low progression. However, the proportion of firms implementing ISO 14001 in the world is still way smaller than those implementing other standards such as ISO 9001.

Although ISO 14001 is intended for three purposes; the safety and well-being of workers, customers and the environment, it seems to be no decisive answer of whether the standard will achieve such purposes. In Saudi Arabia, firms certified to ISO 14001 are still very limited compared with the quality management systems of ISO 9001. Therefore, this current study will attempt to examine the attitudes of managers in Saudi Arabia regarding the benefits and difficulties of ISO 14001. Respondents of this study will make their judgment of whether the benefits of the certification to ISO 14001 exceed costs and it worth the expenses and efforts, or not.

## 2. Significance and Objectives of the Study

The present study might help Saudi organizations especially those working in the manufacturing sector to assess the potentials from ISO 14001 as this standard is still limited in its implementation in the country. Furthermore,

decision-makers will be enlightened by the findings of this study in their judgments and evaluation of the standard. It is worth noting that, although the first version of ISO 14001 has been published in 1996, the number of firms certified in Saudi Arabia is still limited. This study also will shed the light on the aspects that hinder the certification of the standard.

Furthermore, the findings of this study may help stakeholders such as certification agencies, assessors and lead assessors and ISO 14001 consultants to be more aware of the benefits and difficulties of the standard. Such agencies might consider some adjustments in dealing with the certification process and make appropriate future changes. The auditing and assessing of ISO 14001 go beyond the requirements stated in the standard to other related local and municipal regulations of the environment. Therefore, assessors and auditors may benefit from the outcomes of this study in this regard.

Environmental organizations interested in the environmental standards might find the findings of this current study to be helpful. On that, they can assess the benefits and difficulties of ISO 14001 according to these findings and make their own judgment toward better and more reliable standards. The awareness of the environmental issues has increased and so the pressure on the industry to maintain a clean environment. Hence, this paper may pave the path for better understanding of ISO 14001 as an environmental tool. If this study produces any confusion about the standard, environmental organizations may recommend more reliable one to replace ISO 14001 in the world.

Moreover, members of the Technical Committee (TC) 207, who are in charge of developing and revising ISO 14000 family of standards, will also benefit from the findings of this current research. They might make better assessment and judgment of the standard in order to be able to make appropriate regular revisions of ISO 14001. Therefore, the opportunity for changes and improvements is likely to exist.

The current study is likely to provide a conceptual framework for further research projects in drafting conclusions and potential recommendations. Moreover, Saudi Arabian Standards Organization (SASO) is expected to draw on the findings of the current study to fine tune the standards and specifications field in the country. SASO has to play a significant role on this matter and regulate the certification process in the country. This study may give SASO a clear picture of ISO 14001 benefits and difficulties hence work upon that to achieve the objectives of ISO 14001 regarding the safety and well-being of workers, customers and the environment.

The first objective of this present study is to investigate the attitudes of managers in Saudi Arabia toward the potential benefits and difficulties expected from the certification to ISO 14001 based on the opinions of managers in private manufacturing sector, private services sectors and in public sectors. The second objective is to explore both potential benefits and difficulties using factor analysis mechanism. The third objective of this study is to assess the final judgment of respondents of whether ISO 14001 worth the costs and efforts or not. Finally, this research will attempt to provide useful recommendations to the different parties involved in ISO 14001 development, revisions, certification and implementation.

### **3. ISO 14001: Institutional Framework**

ISO 14001 family first developed in 1996 by Technical Committee (TC) 207 within the International Organization for Standardization (ISO) in Genève. This group includes several standards dealing with the different aspects of the environment. The most important and popular standards are ISO 14001 and ISO 14004. However, ISO 14001: 2004, Environmental management systems – requirements with guidance for use, is the subject of this study (Note 1). ISO 14004: 2004, Environmental management systems - general guidelines on principles, systems and support techniques, is a supporting standard that helps organizations to certify for ISO 14001. The later plays the same role that ISO 9004 in helping the certification of ISO 9001.

ISO 14001 aims at the establishing of the environmental system of the organization to ensure the safety and well-being of employees, customers and the environment. According to the requirements of ISO 14001, workers inside the organization should work in a clean environment and be safe from dangerous situations. Secondly, customers should not be harmed by the consumption or use of the products manufactured by certified firms. Finally, the environment should not be polluted or contaminated by the outputs of the manufacturing process in ISO 14001 certified firms. Those requirements are usually observed by the external auditors working for the certification agency in charge of the certification process. The elements included in ISO 14001 do not have specific and direct requirements such as the case of ISO 9001. Instead, the standard has general demand for the organization to observe the effects of its operations on the environment. The burden in that case to determine firms' compliance will be on the auditors. They have to find out the compliance using industry common practices, local municipal environmental regulations, state's relative laws and regulations and even some

international related environmental regulations.

Implementing and certifying for ISO 14001 starts with the support of top management and the recognition that the standard can help the organization. Furthermore, company need to either hire or contract experts who can develop quality manual and make the necessary adjustment of the organization system to comply with ISO 14001 requirements. In addition, the firm should look for a certification agency that is eligible and capable of conducting the certification process. Eligible certification agencies have to be certified by ISO 17021: 2006 Conformity assessments (requirements for bodies providing audit and certification of management systems). Auditors who work in the certification agencies shall obtain a certificate called IRCA; International Register of Certificated Auditors (IRCA, 2012). ISO 19011: 2011 (Guideline for auditing management systems) is a standard that help both certified agencies and firms in performing external as well as internal auditing procedures. When a company is certified for ISO 9001 and ISO 14001, it can proceed with one documentation process for the shared elements of both standards.

The number of companies certified to ISO 14001 certified rose from 22,000 in 2000 to more than 250,000 companies in 2010, which is considered as a huge jump in just a decade. ISO 9001 certification, on the other hand, made more than one Million companies in 2010. The share of West Asia and Africa in ISO 14001 certification, is still very slim, making 4.3% of the world certification (ISO Survey, 2012). In Saudi Arabia, the number of firms that are certified to ISO 14001 is very small. A country like the United Arab Emirates has 172 companies that are certified to the standard (Peglau, 2012). A part from the Middle East, other leading countries in ISO 14001 certification, are China, Japan and Spain. Those three countries have, approximately, 70,000, 35,000 and 18,000 certified companies, respectively (ISO Survey, 2012). In comparison, Saudi Arabia is still a way far from those leading countries.

#### **4. Previous Studies**

Prior research on ISO 14001 implementation had identified various benefits and difficulties. For example, in a study of Greek industry, Psomas et al. (2011) find that the most significant benefits of ISO 14001 are; improve market position, change from conventional to sustainable practices, improve relations with society and improve waste management. On the other hand, the study reveals that the difficulties facing companies are the requirements of ISO 14001 and the determination of environmental performance although the level of those difficulties is not high. Another study on Turkish construction companies, Turk (2009) finds that ISO 14001 implementation has positive impact on companies in environmental issues as well as in corporate management and marketing. On a review of the literature about ISO 14001, der Vries et al. (2012) find that ISO 14001 can have environmental and business benefits, but also it can show the opposite.

Rockstad (2012) mentions that ISO 14001 helps Dowty Aerospace to overcome the concerns of the European over the environment since the company operate in Europe. In addition, Nee and Wahid (2010) find that ISO 14001 implementation has positive and significant relationship with the performance of industrial firms in Malaysia. Similarly, Haslinda and Fuong (2010) examine Malaysian manufacturing sector, where they find that the most important benefit of ISO 14001 is the contribution to corporate image. However, their study reveals that employees tend to resist the implementation of ISO 14001 because they do not want to change. A third study in Malaysia, Ratnasingam et al. (2009) find positive impact of ISO 14001 in cost competitiveness in wooden furniture manufacturing field. However, they consider the costs of implementation as a hurdle to other companies in the wooden manufacturing sector in Malaysia. In Spain, Segarra-Ona et al. (2012) find positive impact of ISO 14001 on certified hotel's income except for some small rural hotels. Another study examines the effect of quality management and environmental systems which is conducted by Pereira-Moliner et al. (2012). They find that both systems affect several aspects of the hotels performance positively and facilitate the development of skills of environmental system. In Brazil, De Oliveira et al. (2010) show the main benefits of ISO 14001 are developing the environmental preventive action, reducing the use of power, water and gas, and influencing the internal management processes. This study also finds that the main difficulties of the standard are the cost increases and the constant changes of legislations in Brazil.

#### **5. Research Method**

This study target high ranking managers working in different fields in Saudi Arabia; private and public sectors. A total of 174 questionnaires are distributed to managers in a wide range of firms from different sectors of activities. Those firms have been classified into three categories; private manufacturing, private service and public firms. The researcher collected 156 questionnaires (about 89.7% response rate) out of which, 143 found to be usable for analysis which represents 91.7% of collected questionnaires (Table 1). In order to achieve the validity of research instruments, three copies of questionnaires were given to experts in the field of ISO 14001

and quality management systems where they gave their opinions on the matter. Another validity measure has been used by distributing 12 questionnaires as pilot study to Saudi managers and their feedbacks have been observed to ensure validity of questionnaire.

Table 1. Questionnaires management and reliability tests

Questionnaires'	Distributed	Collected	Usable
Management	174	156	143
Reliability Tests	Cronbach's alpha for the 20 statements (Benefits)		0.865
	Cronbach's alpha for the 10 statements (Difficulties)		0.853

We evaluate the reliability of data that have been collected using Cronbach's alpha test that measure the internal consistency of data. Table 1 shows that, the value of Cronbach's alpha for the 20 benefits of ISO 14001 is 0.865 while the value for the 10 difficulties of ISO 14001 is 0.853. Both values of Cronbach's alpha are high since they are close to 1. This means that there is a strong internal consistency among the 20 and the 10 statements. This suggests that respondent who tends to select high scores for one item also tends to select high scores for the others. Therefore, we can safely conclude that the data used in this study are reliable.

Factor Analysis is used in this study in both perceived benefits and difficulties of ISO 14001. The purpose for using factor analysis is to reduce statements of benefits or difficulties of ISO 14001 to fewer, but representing ones. The principal component approach is used with varimax rotation to find a pattern of a large number of factors and see if they can be condensed into smaller sets of components that can be understood by a common label. The basis for factor analysis for the 20 benefits or the 10 difficulties is that components can be correlated because they share one or more common components. Only those components with factor loadings of 0.65 or higher are considered based on the sample size. Factor loadings are "the correlation of a variable with a factor". Each factor has an eigenvalue that represents the amount of variance accounted for by a factor; the higher the eigenvalue the more variance it explains.

## 6. Analysis of Results

### 6.1 Classification of Firms

Table 2 shows that the majority of firms in the study come from the private service industry (48.30%) such as hospitals, Saudi Electric Company, Saudi Arabian Airlines and telecommunication firms. Public and semi-public agencies come second representing about 32% of the sample under study. Some of those respondents in this category are high ranking officers in Saudi military while others working in wide spectrum of public jobs. The private manufacturing plants come third representing approximately 20% of respondents such as petrochemical companies, oil-based products firms, pharmaceutical companies and firms from the food industry. When we classify firms under study by private or public sectors, 68.5% of the respondents in the study come from the private sector while the remaining one third of respondents are government employees representing their agencies.

Table 2. Frequency distribution of firms by sector of activity

No	Types of Firms	Frequency	Percentage
1	Private manufacturing	29	20.30
2	Private service	69	48.30
3	Public sector	45	31.50
Total		143	100%

### 6.2 Attitudes of Managers toward the Perceived Benefits

Table 3 depicts the respondents' attitudes toward ISO 14001 in Saudi Arabia where results are ranked by its significance. The first perceived benefit of the standard is that ISO 14001 will ensure a better safer environment with a mean of 4.45 followed by the improvement of image of the certified firms with the international environmental organizations (mean=4.41). The third most significant benefit is that it ensures the safety of workers inside the organizations with a mean of 4.36 where the improvement of firm's image with customers ranked fourth with 4.18 out of 5 on Likert scale. The fifth most important perceived benefit of ISO 14001 based on the opinions of respondents is that it will help to control the pollution of the firms. From the five most significant benefits that Saudi managers believe in ISO 14001, we notice that three of them are related to the environment either inside or outside the organizations while the other two benefits are associated with the image

of the organization with environmental agencies or customers. Those results related to the environmental benefits are consistent with the previous findings reported by Turk (2009), der Vries et al. (2012) and Pereira-Moliner et al. (2012). Moreover, results of the five most significant positive effects that are associated with the improvement of corporate image support those of Psomas et al. (2011) and Haslinda and Fuong (2010), mentioned earlier.

Table 3. Perceived benefits of ISO 14001

Rank	Benefits of implementing ISO 14001	Mean	Std. Dev.
1	Ensure safe environment inside the organization	4.45	.590
2	Improve firms image with the international organizations dealing with environmental issues	4.41	0.841
3	Ensure safety of workers inside the organization	4.36	0.654
4	Improve firms image with customers	4.18	0.901
5	Firms operations will not pollute the environment	4.16	0.828
6	ISO 14001 helps in competing in the international markets	4.15	0.883
7	Consumption of products will not harm the health of customers	4.07	0.845
8	Improve awareness of employees about the environment	4.06	1.002
9	The use of firms products will not endanger customers	4.00	0.831
10	Improve quality of products	3.90	0.766
11	Improve the image of the firm with the government	3.83	1.000
12	ISO 14001 implementation will reduce defects and wastes	3.64	0.931
13	ISO 14001 will boost the morale of workers in the firm	3.62	0.992
14	ISO 14001 helps firms to compete at local markets	3.54	1.053
15	Will help the company to conserve in the use of materials	3.50	0.903
16	Will increase sales and market share	3.43	1.010
17	Will help to obtain government contracts	3.40	1.015
18	Will help to increase performance and solve problems	3.36	0.923
19	Will improve prices of products	3.24	1.087
20	Will improve internal relations inside the organization	3.22	1.017

Notes: The scale is 5 = Strongly Agree, 4 = Agree, 3 = Neutral, 2 = Disagree, 1 = Strongly Disagree.

Table 3 also shows that quality related factors such as improvement of products' quality and the reduction of defected goods and wastes ranked 10<sup>th</sup> and 12<sup>th</sup> respectively. These results seem to be reasonable since ISO 14001 is neither a product specification standard nor it is a quality system efficiency standard such as ISO 9001. It is merely an environmental management system standard. Furthermore, the five least important perceived benefits that Saudi managers believe in are related to sales, market shares and prices of products and obtaining government contracts. Those results seem to be logical when we know that ISO 14001 has nothing to do with the efficiency of production and operations processes in the organizations. The standard addresses matters related to the environment inside and outside the organization. Finally, we notice from Table 3 that respondents believe that ISO 14001 certification has the least effects on internal relations inside the organizations since this factor is ranked final in the study.

#### 6.2.1 Factor Analysis for Perceived Benefits of ISO 14001 (Note 2)

Table 4 shows the result of factor analysis which produces five factors for the 20 benefits of ISO 14001. The analysis is performed using SPSS statistical packages. Each factor has one or more of the ISO 14001 perceived benefits that has some relations with each other based on some statistical relationships. Those 5 factors are; employees morale, efficiency and quality, relations with government, safety of products and relations with international environmental organizations. The names of the factor are given by the researcher based on the common features of the contents of each factor. The number of benefits that the factor analysis generates has been reduced to 9 elements instead of the 20 elements that represent the perceived benefits.

Table 4. Factor analysis for ISO 14001 perceived benefits

ISO 14001 Benefits	Loadings
<b>Factor 1 Employees morale</b>	
(Eigenvalue = 5.811: % of Variance = 29.053)	
1 ISO 14001 will boost the morale of workers in the firm	.684
<b>Factor 2 Efficiency and quality</b>	
(Eigenvalue = 2.339: % of Variance = 11.694)	
1 Will help the company to conserve in the use of materials	.805
2 Improve quality of products	.770
3 Will help to increase performance and solve problems	.698
<b>Factor 3 Relations with government</b>	
(Eigenvalue = 1.540: % of Variance = 7.698)	
1 Improve the image of the firm with the government	.757
2 Will help to obtain government contracts	.670
<b>Factor 4 Safety of products</b>	
(Eigenvalue = 1.250: % of Variance = 6.249)	
1 Consumption of products will not harm the health of customers	.835
2 The use of firms products will not endanger customers	.670
<b>Factor 5 Relations with international environmental organizations</b>	
(Eigenvalue = 1.085: % of Variance = 5.425)	
1 Improve firms image with the international organizations dealing with environmental issues	.816
<b>Relevant Statistical Tests</b>	
Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO test) = 0.778	
Bartlett's Test of Sphericity: Approximate Chi-square = 1.052E3 df = 190 Sig. = .000	

In order to ensure the validity of the factor analysis, relevant statistical tests are performed for the factor analysis namely KMO and Bartlett's Test. It can be seen from Table 4 that KOM value is 0.778 which is acceptable. KOM value ranges between 0 and 1, but the closer to 1 the better. If KMO value is below .6, then it is unacceptable. The result of Bartlett's Test of sphericity value is significant (.000) since it is below .05. Hence, based on those test results, we conclude that the use of factor analysis is acceptable. Figure 1 presents the Scree plot for factor analysis where the curve starts to flatten at number 5 which is the number of factors produced by the factor analysis mechanism. When the curve starts to flatten, the value of Eigenvalue is smaller than one.

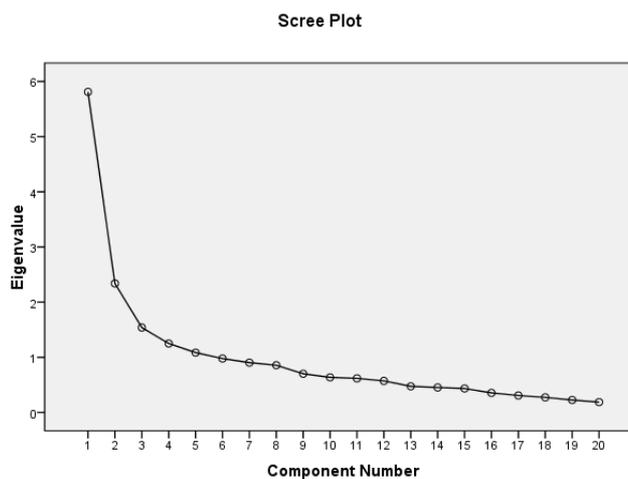


Figure 1. Scree plot for the factor analysis of the 20 statements (benefits)

### 6.3 Attitudes of Managers toward the Perceived Difficulties

Table 5 presents the significance of the difficulties that managers in Saudi Arabia believe when implementing ISO 14001 in their organizations. The first most significant difficulties are related to costs and fees of implementing the standard. The fees of using external house of expertise come first with a mean of 3.97 followed by the required internal changes inside the organization to implement the system with a mean of 3.93.

Maintaining the certification ranked third with a mean of 3.57 and the fees of the certification agencies came fourth. Performing a periodical internal auditing is considered to be the fifth most significant difficulty of implementing ISO 14001. Other difficulties such as the documentation of the system, preparing quality manual and going through the certification process are considered to be other barriers to implement the standard. The findings of this study lend support to Ratnasingam et al. (2009) and De Oliveira et al. (2010) who find costs of implementing ISO 14001 as a hurdle for certification in Malaysia and Brazil, respectively.

Table 5. Perceived difficulties of ISO 14001

Rank	Difficulties of Implementing ISO 14001	Mean	Std. Dev.
1	High fees for using external house of expertise	3.97	0.830
2	High fees and costs of changing within the organization to comply with ISO 14001	3.93	0.893
3	High costs for maintaining ISO 14001 certification	3.57	0.885
4	High fees of the certification agencies	3.53	0.803
5	High costs to perform internal periodical auditing	3.50	0.895
6	Documentation of the system is very high and extensive	3.38	0.941
7	Certification procedures are long	3.34	0.934
8	We need to hire permanent experts to maintain certification	3.27	0.994
9	Preparation and development of quality manual is difficult	3.24	0.906
10	We need special training programs	3.22	0.905

Notes: The scale is 5 = Strongly Agree, 4 = Agree, 3 = Neutral, 2 = Disagree, 1 = Strongly Disagree.

### 6.3.1 Factor Analysis for Perceived Difficulties of ISO 14001

As the case of factor analysis in the benefits of ISO 14001, we use the mechanism for the 10 statements included in the difficulties of implementing the standard. The results of factor analysis are displayed in Table 6.

Table 6. Factor analysis for ISO 14001 perceived difficulties

ISO 14001 Difficulties	Loadings
<b>Factor 1 Preparation and Documentation</b>	
(Eigenvalue = 4.358: % of Variance = 43.578)	
1 Certification procedures are long	.837
2 Preparation and development of quality manual is difficult	.835
3 We need special training programs	.736
4 Documentation of the system is very high and extensive	.675
<b>Factor 2 Costs and Fees</b>	
(Eigenvalue = 1.373: % of Variance = 13.734)	
1 High costs to perform internal periodical auditing	.734
2 High fees and costs of changing within the organization to comply with ISO 14001	.715
3 High fees for using external house of expertise	.698
4 High fees of the certification agencies	.695
<b>Relevant Statistical Tests</b>	
Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO test) = 0.822	
Bartlett's Test of Sphericity: Approximate Chi-square = 544.576 df = 45 Sig. = .000	

Table 6 displayed the results of factor analysis where the mechanism of the analysis groups the difficulties into 2 factors. Factor 1 is called "preparation and documentation" while Factor 2 is labeled "costs and fees". Both names are given because of the common characteristics the contents have. Factor 1 includes four elements; certification procedures are long, preparation and development of quality manual is difficult, we need special training programs and documentation of the system is very high and extensive. On the other hand, Factor 2 includes the followings; high costs to perform internal periodical auditing, high fees and costs of changing within the organization to comply with ISO 14001, high fees for using external house of expertise and high fees of the certification agencies.

Figure 2 includes the scree Plot that represents the movement and formulation of the factors. The curve starts to flatten at number 2 where SPSS mandate only 2 factors grouping 4 elements that share common features because of statistical relationship based on respondents' answers. The relevant statistical tests associated with factor analysis are shown at the bottom of Table 6. KOM value is 0.822 which is acceptable and Test of Sphericity

value is significant (.000).

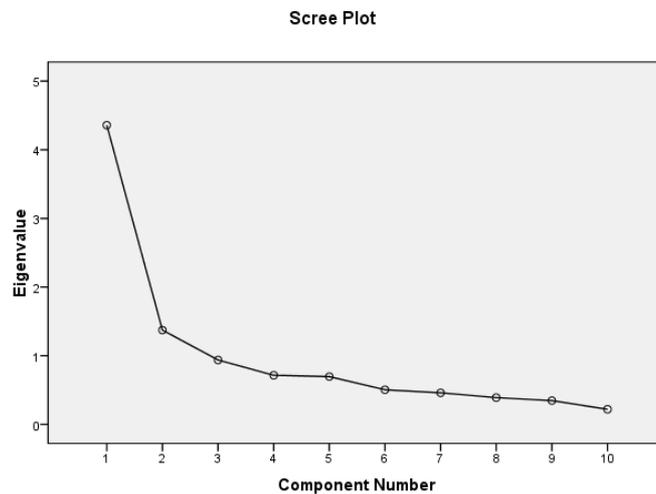


Figure 2. Scree plot for the factor analysis 10 statements (difficulties)

#### 6.4 Is ISO 14001 Worth Certification?

Table 7 shows the opinions of managers in Saudi Arabia towards ISO 14001 worthiness. It appears that there is an overwhelming positive recognition of the worthiness of the standard. The result suggest that about 90% of the respondents either strongly agree (37.8%) or agree (51.7%) on the worthiness of ISO 14001 certification. However, it is worth noting that the firms of those managers are not necessarily certified for ISO 14001. Consequently, their opinions reflect a positive attitude and not an actual confession of the benefits of the standard. Moreover, these findings are inconsistent with Kadasah, 2012, a regarding ISO 9000, who finds that firms certified to ISO 9000 are not that enthusiastic about the standard.

Table 7. Assessment of worthiness of ISO 14001

Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree		Mean	Std. Dev.
Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%		
54	37.8	74	51.7	9	6.3	5	3.5	1	0.7	4.22	.773

##### 6.4.1 Assessment of ISO 14001 by Sector of Activity

In order to compare between the three sectors of activities included in the study, we compare between the means of the sectors. The purpose is to find out the degree of significance; the higher the mean of the group, the higher satisfaction about ISO 14001. Table 8 illustrates the perceived satisfaction of ISO 14001 of the three sectors of activities; private manufacturing, private service and public sector. It seems that managers working in the service private industry are more positive about ISO 14001 with a Mean of 4.26 followed by the public sector (Mean = 4.24). However, the satisfaction of the private manufacturing about ISO 14001 is the lowest among the three groups with a Mean of 4.10.

Table 8. Comparison between the sectors on their assessment of ISO 14001

No	Types of Firms	Mean	Frequencies	Std. Deviation
1	Private Manufacturing	4.10	29	.939
2	Private Service	4.26	69	.798
3	Public Sector	4.24	45	.609

## 7. Summary and Conclusion

The purpose of this study is to examine the attitudes of managers in Saudi Arabia towards the perceived benefits and difficulties of ISO 14001 in the country. We assume that the majority of the firms under study are not certified to the standard. Although, the number of certified firms in the country is still very limited, the findings of this present study show that managers in Saudi Arabia have an overwhelming positive attitude toward ISO 14001. Managers believe that ISO 14001 will contribute in making better environment, safer internal workplace

and safer products to customers. However, managers consider costs and fees of all types to be their main problems with ISO 14001 certification. Those fees and costs are; fees of external house of experts, costs of internal changes and fees of the certification agencies. The Saudi government has not yet pressured companies to implement ISO 14001 concentrating only on the municipal and local environmental laws and legislations. The absence of the environmental groups in the country makes companies not to be serious about implementing ISO 14001 or other related standards. There have been very limited attempts to implement ISO 14001 in Saudi Arabia. Respondents in this study do not give high consideration to government influence or relations regarding ISO 14001. The improvement of image of certified companies with government is ranked 11 while the obtaining of government contracts is ranked 17 out of 20 perceived benefits. Even manufacturing firms who are the main beneficiary of the standard, they are the least satisfied among the three sectors of activities making the future of certification to ISO 14001 in Saudi Arabia to be vague.

Since managers in the country have positive attitudes towards ISO 14001, we may assume that they should seek certification to the standard in more progression rate, especially in companies manufacturing products that pose a threat to the environment. In addition, top management might find these results encouraging them to provide the needed resources to implement ISO 14001 since the respondents consider costs and fees as the main difficulties of implementation. Saudi government might find itself responsible for the promotion of implementing environmental management systems and ISO14001 is probably the most famous one on this regard. Furthermore, the government can provide some privileges in contracts for companies that are certified to the standard.

### **8. Limitations of the Study**

This study is limited to the potential positive and negative effects of ISO 14001, and hence not applies to firms that are certified to ISO 14001. Questionnaire as a mean of data collection is another limitation where other means such as interviews may provide a thorough investigation. In addition, this study is limited to only two elements of ISO 14001; other aspects of implementing ISO 14001 might be included in future studies.

### **9. Recommendations**

Based on the results of this current study, we may suggest some recommendations to the interested parties of ISO 14001 certification in Saudi Arabia.

- 1- Top management in Saudi Arabia may consider the costs and fees of implementing ISO 14001 as prevention ones and seek certification to the standard.
- 2- Saudi Government may consider convincing companies to implement environmental standards such as ISO 14001 especially those companies manufacturing products that pose a threat to the environment such as oil companies, chemicals petrochemicals firms, plastic firms, pharmaceutical companies and cement related products.
- 3- Environmental interests groups can play a significant role in this regard by providing assistance to companies wishing to pursue the certification of any environmental standards especially the well-known ISO 14001.
- 4- Industrial cities, chambers of commerce and industry and the local municipalities may consider providing incentives to companies wishing to implement environmental management systems especially ISO 14001 such incentives as providing expansion opportunities, contract preferences and so forth.
- 5- Educational institutions in the country may play a considerable role in contributing to the certification of environmental standards by providing training programs along with the accreditation certificate such as IRCA and internal training programs.
- 6- The Technical Committee (TC 207), who is responsible for developing ISO 14001, may consider including clauses within the standard to fit the needs of the developing countries such as the case of Saudi Arabia.
- 7- Further researches on ISO 14001 may include the certified firms to the standard in order to pinpoint directly to the actual effects rather than the potential ones. In addition, any future studies may cover other aspects of ISO 14001 certification such as problems with certification agencies, motivations for certification, relations of ISO 14001 to the quality management systems of ISO 9001.

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**Notes**

Note 1. Other ISO 14000 standards such as ISO 14005: 2010 Phased EMS Approach Guidance, ISO 14006: 2011 Incorporating eco-design and ISO 14064-1: 2006 Greenhouse Gases.

Note 2. See Section 5 Research Method and Sample for information on the mechanism and use of factor analysis.

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