Determinants of Disaster Risk Reduction procedures implementation: A Case of Egyptian General Petroleum Corporation.

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Abstract:

Purpose – The purpose of the study was to establish the determinants of disaster risk reduction procedures implementation in Egyptian general petroleum corporation. The major obstacle, however, has been inadequate regulatory compliance. The study's objectives were to find out the effect of strategic planning, the role of staff competence, and the effect of top management support on the implementation of DRR procedures.

Design/methodology/approach – The study used a conceptual framework that involves both independent and dependent variables. Independent variables for this study are strategic planning, staff competence, top management support, while the dependent variable is the implementation of DRR procedures. The study used a descriptive survey design and sampled 43 participants. Questionnaires were used to collect data which was analyzed according to the research objectives.

Findings – The study found out that both staff competence and support from top management were a

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significant prediction of implementation of DRR procedures and strategic planning was not a significant predictor of implementation of DRR procedures. The study recommends that management of EGPC to accord staff maximum support to enhance DRR procedures implementation and recommends that top management should decentralization of the decision-making process for DRR; they also should provide incentives to those preparing strategic plans for DRR. Giving incentives and involving workers in important decisions would go a long way in motivating them and thereby enhance the implementation of DDR procedures.
Originality/value – The study represents one of the first attempts in the literature to establish the determinants of disaster risk reduction procedures implementation in the Egyptian petroleum sector.

***Keywords*: Disaster risk reduction; DRR procedures implementation; Strategic planning; Petroleum company.**

Introduction

Egypt recognized the challenges posed by disasters, therefore Egypt established a Crisis Management and Disaster Risk Reduction (NCCMDRR) in 2006, to strengthen and develop its national institutions and policy to meet the tasks of the Hyogo Framework for Action (HFA) on the Crisis Management and Disaster Risk Reduction (DRR). As a result of this, some good signs of progress have been made along with several areas and sectors (UNISDR, 2013).

Industrial accidents can classify as disasters if their causes are rooted in the products or processes of the industry by either accident, negligence, or incompetence, where great damage, injury or loss of life are caused. Catastrophic accidents related to anthropogenic activities that can result in both immediate and chronic impacts on local biota (Gibson et al., 2017). According to the National Emergency Plan for Facing Environmental Crises (eeaa.gov, 2006): Incidents of oil extraction, production and transportation activities represent one of the major sources of environmental disasters. However, there are safety regulations set to reduce the risk of technological failures and human error (Cheung and Zhuang, 2012).

The choice of the petroleum sector is due to the importance of its position within and outside the Egyptian society and its links with other sectors and activities in the country such as economy, investment, and other sectors. Therefore, any imbalance or impact on one of its branches affects other sectors. The sector is also one of the strategic sectors that serve the citizens. In addition, the focus on

petroleum institutions comes from the fact that they operate in a legislative environment that represents the standards and legislations in risk reduction, which in turn emphasizes the importance of risk management planning strategy. And on the basis that taking decisions that concern planning to manage risk reduction in Egypt comes first at the central level in planning and issuing decisions and follow-up implementation, one of the central bodies were chosen in the petroleum sector, which is followed by many companies and thus can be covered by similar organizations.

There are many factors contributing to the unpredictability of the oil spill disaster, such as uncertainty about the situation with the need to take a decision in a limited time, lack of resources, the inability to determine the actual damage to the environment, and pressure and stress involved. Therefore, how to cope and deal with large-scale oil spill disaster effectively is becoming more and more important (Wang et al., 2014).

This study was undertaken to establish determinants of DRR procedures implementation in Egyptian general petroleum corporation (EGPC). The general objective of the study is to find out the determinants of strategic planning for DRR procedures implementation: a case of EGPC.

Specific objectives: the specific objectives of the study are as follows:

a) To find out the effect of strategic planning on the DRR procedures implementation in EGPC. b) To find out the role of staff competence in the DRR procedures implementation

in EGPC. c) To assess the effect of top management support on the DRR procedures implementation in EGPC.

Material and methods

The primary focus of this study was on the factors that influence the implementation of Disaster Risk Reduction procedures. In this way, the study can help raise awareness of nationally relevant factors, as the literature has shown that different environmental cultural assumptions lead to different strategic approaches. The following theories serve as the foundation for this study: Rational Model of Decision Making, Institutional Theory, and System Theory.

(Scott, 2003) defines institutions as having three pillars: regulatory, normative, and cultural cognitive. The regulatory pillar underlines the application of rules, laws, and penalties as a compliance mechanism, providing expediency to comply. Organizations are defined as regulatory, normative, and cultural-cognitive systems which act to create meaning, stability, and order (de la Torre-Castro and Lindström, 2010). Institutional elements move with the aid of carriers from place to place and from time to time. Institutions comprise cultural, cognitive, and regulatory elements which give meaning to life in combination with associated activities and resources. (Scott, 2003).

Systems theory is an interdisciplinary theory on all systems in nature, society, and many scientific fields, and provides a framework for researching conditions of society from a holistic approach. (Cristina, Pels and Pol, 2010) Dynamic, hierarchically structured entities are organizations.

The development of important events on all organization's level reflects this dynamism. (Morgeson, Mitchell and Liu, 2015) Planning, prevention, and response activities for sudden-onset extreme events are challenging (Garrett et al., 2017), due to the unplanned nature of catastrophes. Therefore, the plan must encompass all phases of all types of disaster events using a comprehensive planning approach (Mileski and Honeycutt, 2013). Furthermore, flexibility in the disaster plan and in implementation is a key factor for the response to the disaster. The theory informs the current study by suggesting that the institutions should put measures in place to oversee development and implementation of the public disaster risk reduction policy.

Conceptual Framework

This study's conceptual framework involves both independent and dependent variables. Independent variables for this study are strategic planning, staff competence, top management support, while the dependent variable is the implementation of DRR procedures.

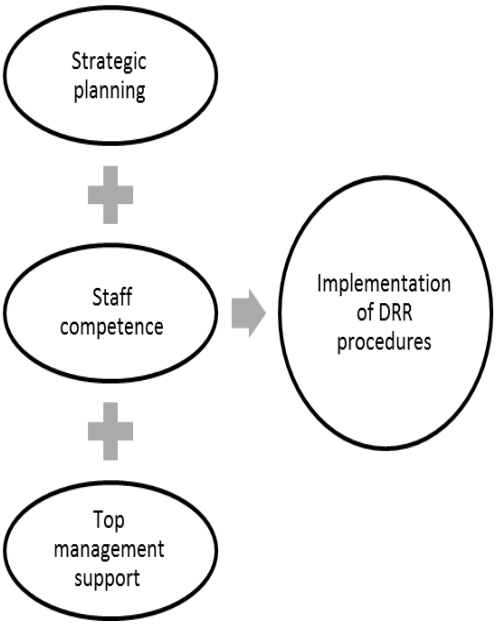

Figure 1. Conceptual framework

Strategic planning

(AlHinai, 2020) claims that disaster planning has become an essential part of all management plans. In institutions that are firmly committed to their plan, the importance of an effective catastrophe plan is regularly demonstrated. The daily management of an institution must include a plan (Radwan and Sakr, 2017) Stresses the importance at the level of Egypt Research Institutions of promoting evidence-based strategic planning. In general, this could increase the dependency of senior managers in the strategy decision-making process and the use of rational techniques. Risk management is a decision-making method which identifies, if possible, objectives and ends for risk reduction, eradication or prevention and tolerance where risks cannot be completely avoided. (Abegunde, 2011)

Therefore, risk management strategy include: risk prevention, measures to reduce the risk in any way; risk mitigation; actions to reduce risk-related damage should it happen; risk coping; measures taken after the fact.

Staff competence

In the implementation of DRR procedures, there are several important staff competence issues. These issues affect the development of training programmers, job plans and management strategies to ensure appropriate emotional adjustment for the ground workers and establish preventive mechanisms and techniques for emergency response. In order to identify weaknesses and take appropriate measures to improve performance, (Cheng-Hua and Hsin-Li, 2012) recommended that organizations review their team's competence on a periodic basis. Identification of the nature of obstacles can contribute to overcoming these differences and the development of appropriate risk reduction processes and instruments. A learning process can enable new knowledge and competences to be introduced at the individual, organizational and social levels. (Barquet, 2016)

Top management support

In Egypt managers are sensitive to personal relations, and prudent especially with superiors (Hickson and Pugh, 2001) Other authors agree that seniority is respected in Egypt. (Elbanna and Child, 2007) (Hofstede, 1991) comparative intercultural research suggests that the Egyptian managers are relatively friendly, fatalist and inclined to act in accordance with their specific relationship, rather than according to general rules or standards. Such respectful

conduct would be linked to the unwillingness of subordinates to risk unknowns in strategically important areas and a tendency towards avoidance of uncertainty. (Elsayed, Hassona and Nageeb, 2021) found an important association between leadership skills and the working environment as well as psychological well-being, which in turn might improve results for their job. (Taabu, 2014) emphasized the need for the Disaster Team to raise awareness and highlight the role of disaster management to top management, to gain the support of the top management.

Different corporate cultures reflect different beliefs and fundamental views and assumptions and decide what is done. (Barquet, 2016) Because of cultural and institutional characteristics, the research reported here may yield some results that are specific to that national context. As a result, the study may serve to raise awareness of nationally relevant factors, as research has shown that different cultural assumptions about the environment result in very different approaches to strategy formulation.

Respondents of the Study:

The target population for this study is the managers working in EGPC. The study used purposive sampling to draw respondents from the managers their work is related to DRR. Fortunately, the respondents were supportive and cooperative.

Material & Instruments

This study prefers to use a self-survey questionnaire to determine the perceived preparedness of the respondents regarding DRRM in the EGPC. The researcher used both structured and open-ended questions and took into consideration the following criteria in the formulation of the questions: the relevance of the items to be answered, their suitability to the research goals and objectives, the number and arrangement of questions, and the suitability of the period allocated to answer the questionnaires.

Data Collection Procedures:

The manager assessment was deemed to be the most accurate and reliable data needed to answer the specific problems raised in this study because they have the direct and personal knowledge on DRR in the EGPC.

The researcher visited the EGPC in person, according to an arranged schedule of the interview to distribute the questionnaires to the respondents and explained to them the mechanics of the conduct of the study in a fifteen to thirty minutes conversation, at the same time to obtain pertinent information from the respondents, if any. For those items included in the questionnaire, verification and validation were done during the interview. At the same time, the researcher requested relevant documents from the respondents to gather firsthand information which he would need to support his assessment of the state of preparedness of the EGPC. The collected questionnaires were then be sorted out ready for data analysis.

Reliability of the Research Instruments:

The Cronbach's aα for the personal self-disclosure items was 0.823 indicating that the questionnaire was reliable as its reliability values exceeded the prescribed threshold (0.7) of acceptable reliability

Data Analysis and Interpretation:

The data was analyzed using SPSS version 21. Descriptive statistics such as mean, standard deviation, frequency distribution, and percentages were used to summarize, and present d Regression analysis was conducted to show the strength of the relationship between the dependent and independent variables. The regression model was: $Y = \beta0 + \beta1X1 + \beta2X2 + \beta3X3 + \varepsilon$ Where: Y = DRR procedures implementation β0 = Constant Term β1, β2, and β3 = Beta coefficients X1= Strategic planning X2= Staff competence X3= Top management support ε = Error term

RESULTS AND DISCUSSION

Distribution of Questionnaires and the Return Rate:

The study targeted 43 respondents out of which 41 questionnaires were filled and returned, giving a response rate of 95 %.

Demographic Information of the Participants:

The study sought to establish the demographic information of the respondents such as gender, age, education, and work experience. This was to enable the study to place the participants in their right perspective.

Table 1 shows that there were 17.1 % female participants while 82.9% were male. This is an indication that male participants outnumbered their female counterparts. Nevertheless, this disparity had no negative effect on the outcome of the study.

Table 1

Gender Distribution.

Gender	Frequency	Percentage
Male	**34**	**82.9**
Female	**7**	**17.1**
Total	**41**	**100**

Table 2

Age Distribution.

Age	Frequency	Percentage
Less than 30	**0**	**0**
30-40	**11**	**26.8**
40-50	**15**	**36.6**
More than 50	**15**	**36.6**
Total	**41**	**100**

Table 2 shows that 26.8% of the participants were in the age bracket of 30-40 years, 36.6% were in the age bracket of 40-50 years, 36.6% were in more than 50 age brackets while 5% were in the age bracket of 45-55. Therefore, the majority of the participants were between ages 40 – 50 and more than 50 years. This implies that most of the respondents were maturity and probably very experienced.

Figure 2 shows that those who had attained bachelor's degrees were the majority at 81% followed by diploma level at 7%, postgraduate at 7% Ph.D. at 3% while those with

other certificate qualifications constituted 2% of the participants. This implies that participants had varying levels of educational qualifications and therefore there was diversification in ideas and views.

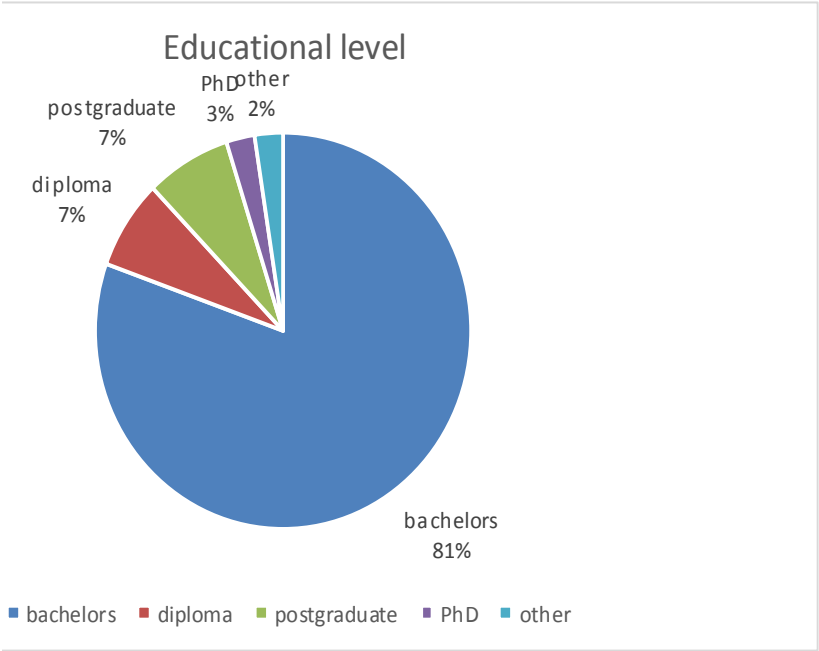

Figure 2.Educational Level of the respondents

Table 3

Work Experience Distribution.

Work experience	Frequency	Percentage
below 10 years	1	2.4
10-20	17	41.5
20-30	17	41.5
Above 30	6	14.6
Total	41	100

Table 3 shows that the participants who had ten years of experience and below were 2.4% of the participants,

41.5% had between 10-20 years of experience, 41.5% had between 20-30 years of experience. While those with 30 and above years of experience were 14.6%. Hence, most of the participants had work experience of at most 10 years. This implies that most of the participants had a high experience, which could have influenced positively on the quality of their work output.

Table 4 shows that the respondents agreed that the strategic planning for disaster risk reduction is an ongoing process, an integrated system, achieves stakeholder objectives, achieves excellence from other bodies, and considers the prospects affecting the performance of the EGPC as expressed by a mean of 4.15, 4.27, 3.98, 3.90 and 3.90 respectively. They also agreed that the strategic plans include standards that measure performance and scientific research is conducted to effectively deal with disasters as expressed by a mean score of 3.78 and 3.73.

Table 4

Response return rate Level of Agreement on Various Statement Based on strategic planning

Statements	Mean	Std deviation
1.Strategic planning for disaster risk reduction is an ongoing process.	4.15	0.882
2.Strategic planning for disaster risk reduction is an integrated system.	4.27	0.593

3.Strategic planning for disaster risk reduction achieves stakeholder objectives.	3.98	.0962
4.Strategic planning for disaster risk reduction achieves excellence from other bodies	3.90	0.735
5.The strategic planning considers the future prospects affecting the performance of the EGPC	3.90	0.735
6.The strategic plans include standards that measure performance	3.78	0.822
7.The staff participate in the formulation of strategic plans	3.24	0.969
8.Scientific research is conducted to effectively deal with disasters	3.73	0.775
9.There are qualified human resources to implement disaster risk reduction plans	3.12	1.288
10.The accuracy of the prediction of the occurrence of certain potential disasters	3.29	1.159

Note: Mean: 3.553 Std. Deviation: 0.473

The respondents moderately agreed that there are qualified human resources to implement disaster risk reduction plans, the staff participate in the formulation of strategic plans, the

accuracy of the prediction of the occurrence of certain potential disasters as expressed by a mean score of 3.24, 3.12 and 3.29 respectively

Table 5

Response return rate Level of Agreement on Various Statement Based on staff competence

Statements	Mean	Std deviation
1.Formulate a future vision for disaster risk reduction	4.05	0.498
2.Formulate a mission to reduce disaster risk	3.85	0.615
3.Ability to conduct SWOT analysis to reduce disaster risk	3.59	0.632
4.Capacity to formulate strategic objectives for disaster risk reduction	3.78	0.759
5.Ability to implement strategic plans for disaster risk reduction	3.83	0.738
6.Ability to monitor the implementation of strategic plans for disaster risk reduction	3.90	0.831

Note: Mean: 3.83 Std. Deviation: 0.523

Table 5 shows that most of the respondents indicated that they had the ability to formulate a future vision, mission, and strategic objectives for DRR. They also agreed that they

can conduct a SWOT analysis to reduce disaster risk and had the ability to implement and to monitor the implementation of strategic plans and for the DRR process as expressed by a mean score of 3.83 respectively.

Table 6

Response return rate Level of Agreement on Various Statement Based on support from the top management

Statements	Mean	Std deviation
1.Top management believes that strategic planning for disaster risk reduction is essential.	3.90	0.735
2.Top management implements strategic plans for disaster risk reduction.	3.78	0.822
3.Management provides incentives to those preparing strategic plans for disaster risk reduction.	3.24	0.969
4.Top management organizes training courses in strategic planning for disaster risk reduction.	3.73	0.775
5.Decentralization of the decision-making process for disaster risk reduction.	3.12	1.288
6.There are effective communication channels between the top management and stakeholders	3.39	1.159

Note: Mean: 3.53 Std. Deviation: 0.699

Table 6 shows that the respondents agreed that the institutions had Top management believes that strategic

planning for DRR is essential and implement strategic plans for it. They also agreed that Top management organizes training courses in strategic planning for DRR.

The respondents moderately agreed that there are effective communication channels between the top management and stakeholders, Decentralization of the decision-making process for DRR; they also moderately agreed that Top Management provides incentives to those preparing strategic plans for DRR.

Table 7

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.717[a]	.514	.475	.46488

Table 8

Summary of One-Way ANOVA results

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	8.457	3	2.819	13.045	.000[b]
	Residual	7.996	37	.216		
	Total	16.454	40			

Table 9

Regression coefficients of the relationship between the implementation of Disaster Risk Reduction procedures and the three predictive variables

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.447	.731		-.613	.544
	Staff competence	.365	.151	.298	2.419	.021
	Top management support	.615	.130	.670	4.723	.000
	Strategic planning	.029	.197	.021	.145	.886

A multiple linear regression was calculated to predict the implementation of DRR procedures based on strategic planning, staff competence, and support from top management. A significant regression equation was found ($F(3,37) = 13.045$,$p < 0.000$), with an R^2 of .514 . Participants implementation of DRR procedures is equal to 0.447 + .025 (strategic planning) +.365 (staff competence) +.615 (support from top management), where strategic planning, staff competence, and support from top management are coded as 1= Strongly Disagree, 2= Disagree, 3= neutral, 4= agree, 5= strongly agree. predict implementation of DRR procedures increased 0.365 for each unit increase in staff competence, 0.615 for each unit increase in support from top management, and 0.029 for a unit increase in strategic planning. both staff competence and support from top management were a significant prediction of implementation of DRR procedures and strategic planning was not a significant prediction of implementation of DRR procedures.

Limitations

Few data and publications described DRR implementation procedures in the industrial sector, especially in Egypt. Moreover, some Egyptian government websites were not updated. Most publications describing DRR are limited to management and logistics issues. The study was confined to EGPC, which may not be representative enough for purposes of generalization. Hence, the researcher suggests applying the study to other sectors in order to enable

the generalization of findings. The study suggests other areas for further research to include Challenges affecting the implementation of DRR procedures in the public sector.

6. Conclusion

Summary of Findings:

The purpose of the study was to establish determinants of DRR procedures implementation in EGPC. The study focused on the effect of staff competence, top management support and the role of strategic planning on DRR procedures implementation in EGPC. A total of 43 questionnaires were distributed to respondents however, only 41 were filled and returned: representing a significant response rate of 95%. Among the respondents, 83% were male while 17% were female. Most of the participants were between ages 40 – 50 and more than 50 years. It also emerged that most of the respondents (81%) had a bachelor's degrees. majority of the participants had work experience of at most 10 years.

Both staff competence and support from top management were a significant prediction of implementation of DRR procedures and strategic planning was not a significant prediction of implementation of DRR procedures.

Conclusion:

The study concludes that the EGPC had strategic plans in place as an ongoing process, an integrated system, achieves stakeholder objectives and includes standards that measure performance. Staff competency comprised of being acquainted with formulating a future vision, mission, and

strategic objectives for DRR. Also, that they can conduct a SWOT analysis to reduce disaster risk and had the ability to implement and to monitor the implementation of strategic plans and for DRR process

Finally, the study concludes that the top management of the EGPC understudy believes that strategic planning for DRR is essential and implement strategic plans for it. They also agreed that Top management organizes training courses in strategic planning for DRR.

Recommendations:

The study recommends that management of EGPC to accord staff maximum support to enhance DRR procedures implementation and recommends that top management should decentralization of the decision-making process for DRR; they also should provide incentives to those preparing strategic plans for DRR. Giving incentives and involving workers in important decisions would go a long way in motivating them and thereby enhance the implementation of DDR procedures. Furthermore, the study recommends that EGPC should establish effective communication channels between the top management and stakeholders.

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