

THANKS TO ALMIGHTY ALLAH

*Acknowledgments*

The author would like to express his sincere gratitude first of all to Allah almighty then to my parents who didn't and wouldn't spare anything for themselves for the sake of my ambitions and success. And special gratitude to my supervisor Dr. Ahmed Elamin Haroun, for his constant advice and guidance before and during the preparation of this dissertation.

Special appreciation is also extended to anyone who had given me an opinion, advice or helping me on distributing or collecting the questionnaire and whomever contributed directly or indirectly by their inputs on this research.

Special thanks to the contractors, the consultants and the owners who completed the questionnaire, for their generous co-operation ....and contribution

## تجريدة

المشاريع الإنشائية غالباً ما يتخللها قصور في بعض مناحيها يكتشف عند إنتهاء فترة عقد المشروع، مظهره بعض الإنحراف عن العقد المتفق عليه ومسار الخطة الموضوعة قبل البداية الفعلية للمشروع. ان قبول هذا القصور من عدمه يختلف من شخص لآخر ومن دولة وأخرى نسبة إلى مقياس معياري معين مبني على وجهة نظره محددة. ولكن هذا القبول غير المنطقي يعتبر نوعاً من الإهمال، ومع مرور الوقت سيعامل هذا القصور كأصل ثابت في ثقافتهم العامة لصناعة الإنشاءات.

في هذه الدراسة أراد الباحث حصر أبرز مسببات هذا القصور المتداولة وقياس ترددها وإرتداداتها على صناعة التشييد ومقارنتها بين (نموذجين/حالتين) مختلفين هما المملكة العربية السعودية وجمهورية السودان ويطبقان معيارين مختلفين .

دراسات عديدة ومحاولات سابقة شُرعت لتقصي أهم مسببات القصور، ومن الضروري خلق وعي بهذه الأسباب وترددها ومدى تأثيرها العكسي على تقدم المشروع وتكاليفه. وهي مفيدة أيضاً في مقارنتها مع مقاييس ثقافات أو دول أخرى لتبادل الحلول المجربة والعملية.

هذه الدراسة تقدم نتائج المسح الميداني الذي تم لتحديد وقياس مسببات القصور الأكثر تردداً وتأثيراً على مشاريع التشييد في المملكة العربية السعودية وجمهورية السودان كلاً على حده. بنيت الدراسة على إستبيان وزع على شريحة عشوائية من المقاولين، الإستشاريين والمالكين أو ممثليهم. وعليه حلت الأسباب الرئيسية للقصور إستناداً على أثرها و ترددها ، وأثبتت الدراسة أن القصور في صناعة التشييد يختلف تردده وأثره وحتى مسبباته من منطقة لأخرى.

# *Abstract*

Construction projects more often face some discrepancies/failures (in almost all aspects) by the end of their stated completion times.

However, these discrepancies are generally deviations from the contract or/and the project plan, are relatively, acceptable or rejectable, differing from person to person, or country to another, relevant to specific predetermined scale based on specific point of view. Unfortunately, sometimes the non logical acceptance leads to undesired outcomes. Through time these discrepancies become part of the industry culture. In this study the author intends to allocate the most common causes of failures and measure their impact on the progress and completion of a construction project, and comparing them between two different (concepts/cases) applying different standards or environmental settings, i.e., the Kingdom of Saudi Arabia and the Republic of Sudan. Many attempts have been made to identify the causes of failure, and to highlight the most important ones. It is necessary to create awareness about these causes, their frequency and the extent to which failure can adversely affect the project progression, delivery or cost. It is also useful to benchmark these causes of failure in different countries in order to share practical solutions. This study presents the results of a survey undertaken to determine and evaluate the most severe and most frequent factors causing failure in the construction projects in Saudi Arabian and Sudan. A questionnaire was randomly administered to a number of .construction contractors, consultants, and owners The main causes of failure are collected, presented and analyzed according to their frequency of occurrence and severity. The

results of the study show that construction projects suffer everywhere, but with different magnitudes, e.g. construction projects in developing countries suffer failures more than developed countries do, and some countries suffer more than others within the developing countries

## Index

### Part One: Introduction

#### (CHAPTER (1 INTRODUCTION

-GENERAL .....	-2	.1.1
STATEMENT OF THE PROBLEM .....		.1.2
	-.....-3	
OBJECTIVES OF THE RESEARCH .....		.1.3
	-.....-4	
-LIMITATIONS OF THE RESEARCH .....	-4	.1.4
-RESEARCH LAYOUT .....	-5	.1.5

### Part Two: Literature Review

#### (CHAPTER (2

##### CONSTRUCTION PLAN MANAGEMENT AND FAILURE

CONSTRUCTION MANAGEMENT AND FAILURE.....		.2.1
	-.....-7	
CONSTRUCTION PLAN.....	-	.2.2
	-7	
& INTEGRATION BETEWEEN MANAGEMENT FUNCTIONS		.2.3

CONSTRUCTION PLAN.....	-
	-7
PLAN FAILURE.....	.2.4
	-9
ALTERNATIVE PLANS.....	.2.4.1
	-10
CONTINGENCY PLANS AND SCENARIOS....	.2.3.1.1
	.....-11

## (CHAPTER (3

### SUDANESE AND SAUDI CONSTRUCTION INDUSTRIES

INTRODUCTION TO CHAPTER (3) .....	.3.1
	.....-13
THE CONSTRUCTION INDUSTRY IN GENERAL .....	.3.2
	.....-13
THE NATURE OF THE CONSTRUCTION INDUSTRY .....	.3.3
	.....-13
THE PLACE OF CONSTRUCTION IN NATIONAL ECONOMY.....	.3.4
	-14
PROBLEMS FACING THE CONSTRUCTION INDUSTRY IN THE	.3.5
DEVELOPING COUNTRIES.....	-
	-14
THE KINGDOM OF SAUDI ARABIA	.3.6
ECONOMIC OVERVIEW .....	.3.6.1
	-15
THE SAUDI CONSTRUCTION INDUSTRY .....	.3.6.2
	-15
REPUBLIC OF SUDAN.	.3.7
ECONOMIC OVERVIEW .....	.3.7.1
	-17
THE SUDANESE CONSTRUCTION INDUSTRY	.3.7.2
	.....-17

# (CHAPTER (4

## CAUSES OF FAILURE IN CAPITAL CONSTRUCTION PROJECT EXECUTION

INTRODUCTION TO CHAPTER (4) .....	.4.1
	-...-24
CAUSES OF FAILURE IN CONSTRUCTION PROJECTS. ....	.4.2
	-.....-24
CONTRACTOR RELATED FACTORS (5M) .....	.4.2.1
	-...-24
A. MATERIALS .....	-
	-26
B. MACHINERY (EQUIPMENT) .....	-
	-27
C. MANPOWER .....	-
	-28
D. MANAGEMENT .....	-
	-29
E. MONEY (PROJECT FINANCE) .....	-
	-.....-32
CONSULTANT RELATED FACTORS .....	.4.2.2
	-33
OWNER RELATED FACTORS .....	.4.2.3
	-34
GOVERNMENT REGULATIONS. ....	.4.2.4
	-35
-OTHERS EXTERNAL FACTORS. ....	-36 .4.2.5
-SUMMARY OF FAILURE CAUSES IN CONSTRUCTION EXECUTIO..	-38 .4.3

## Part Three: Research Methodology

### (CHAPTER (5

## RESEARCH DESIGN AND METHODOLOGY

-INTRODUCTION TO CHAPTER (5) .....	-43	.5.1
-RESEARCH DESIGN .....	-43	.5.2
-MAKING OF THE LITERATURE REVIEW .....	-44	.5.3
QUESTIONNAIRE .....	-	.5.4
	-44	
QUESTIONNAIRE WRITING DISTRIBUTION AND		.5.5
-COLLECTION.....	-45	
METHODOLOGY.....	-	.5.6
	-46	
THE SURVEY SAMPLE .....	-	.5.7
	-46	
DATA COLLECTION .....	-	.5.8
	-47	
QUESTIONNAIRE DISTRIBUTION METHOD. ....	-	.5.9
	-49	
FAULTS IN THE SURVEY DESIGN .....	-	.5.10
	-50	
METHOD OF ANALYSIS .....	-	.5.11
	-50	

## Part Four: Data Collection, Analysis and Discussion

### (CHAPTER (6 ANALYSIS AND RESULTS

INTRODUCTION TO CHAPTER (6) .....	.6.1	
		....-53
DATA STATISTICS AND ANALYSIS .....	-	.6.2
	-53	
FUNDAMENTAL ANALYSIS .....	-	.6.2.1
	-53	

SECTION ONE .....	.6.2.1.1	-54
SECTION TWO .....	.6.2.1.2	-57
SECTION THREE.....	.6.2.1.3	-61
SECTION FOUR .....	.6.2.1.4	-65
CAUSES OF FAUILURE IN CAPITAL .6.2.1.4.1		
CONSTRUCTION		
PROJECTS.....		-65
ANALYSIS OF FAILURE CAUSES - CATEGORIES .6.2.1.4.2		
AND INDIVIDUALS .....		-65

## Part Five: Conclusion and Recommendation

### (CHAPTER (7 COLCLUTION

INTRODUCTION TO CHAPTER (7) .....	.7.1	-72
FINDINGS SCOPE .....	.7.2	-72
GAP OF DIFFERENES BETWEEN KSA & SD.....	.7.3	-72
FAILURE CANSEQUENCES .....	.7.4	-72
MAJOR FINDINGS .....	.7.5	-73
PARTIES MOST OFTEN RESPONSIBLE OF FAILURE.....	.7.6	-74

RECOMMENDATIONS FOR FUTURE STUDIES .....	.7.7
	-75
References .....	-
	-76
Appendixes.....	-
	-78

# List of Table

	Chapter 3	
1	<i>General Comparison Between Saudi Arabia and Sudan</i>	Table 1
9	.....	
	Chapter 5	
4	<i>Questionnaires Distribution and</i>	Table 2
7	..... <i>Collection</i>	
5	<i>Scale</i>	Table 3
1	..... <i>Indication</i>	
	.....	
12	<i>The 1st Stage of Data Analysis For Both Countries "Number of</i>	Table 4-
1	<i>"Respondents</i>	1
12	<i>The 2nd Stage of Data Analysis For Both Countries</i>	Table 4-
2	<i>"Percentage of..... Respondents</i>	2
12	<i>The 3rd Stage of Data Analysis For Both Countries "Weighted</i>	Table 4-
3	<i>Percentages as per Negative</i>	3
	..... <i>"Impact</i>	
12	<i>The 1st Stage of Data Analysis For SA "Number of</i>	Table 5-
4	<i>....."Respondents</i>	1
12	<i>The 2nd Stage of Data Analysis For SA "Percentage of</i>	Table 5-
5	<i>....."Respondents</i>	2
12	<i>The 3rd Stage of Data Analysis For SA "Weighted Percentages</i>	Table 5-
6	<i>as per Negative</i>	3
	..... <i>"Impact</i>	
12	<i>The 1st Stage of Data Analysis For SD "Number of</i>	Table 6-
7	<i>....."Respondents</i>	1
12	<i>The 2nd Stage of Data Analysis For SD "Percentage of</i>	Table 6-
8	<i>....."Respondents</i>	2
12	<i>The 3rd Stage of Data Analysis For SD "Weighted Percentages</i>	Table 6-
9	<i>as per Negative</i>	3
	..... <i>"Impact</i>	
13	<i>Saudi Arabia</i>	Table 7
0	..... <i>vs.Sudan</i>	
	Chapter 6	
5	<i>Respondents as Per</i>	Table 8
4	..... <i>Professions</i>	
5	<i>Respondents as Per</i>	Table 9
5	..... <i>Sector</i>	
5	<i>Respondents</i>	Table 10
6	..... <i>Classifications</i>	
5	<i>Years of</i>	Table 11
7	..... <i>experience</i>	

5		.....	
9		<i>Project Monetary</i>	Table 2
6	.....	<i>Size</i>	
0	.....	<i>Contract</i>	Table 13
	.....	<i>Duration</i>	
6		<i>Period and</i>	Table 14
2	.....	<i>efficiency</i>	
6		Main criterion of Plan	Table 15
4	.....	success	

## List of Figures

	Chapter 5	
48	<i>Questioners Distribution and</i>	Figure A
49	<i>Respondents Contribution</i>	Figure B
	.....	Weights
	Chapter 7	
55	<i>Respondents as Per</i>	Figure C
56	<i>Profession</i>	Figure D
57	<i>Respondents</i>	Figure E
58	<i>Factor</i>	Figure F
60	<i>Classifications</i>	Figure G
61	<i>Years of</i>	Figure H
63	<i>Experience</i>	Figure I
64	<i>Project Monetary</i>	Figure J
	<i>Size</i>	
	<i>Contract</i>	
	<i>Duration</i>	
	<i>Period and</i>	
	<i>Efficiency</i>	
	<i>Main criterion of Plan</i>	
	success	

# Failure Causes in Capital Construction Projects

