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**Managing Risks and Opportunities and Their Impact on
The Development or Collapse of Institutions
An Applied Study on The National Water Company in the
Kingdom of Saudi Arabia**

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(The Team, 2023)

Abstract:

In this study, some considerations about managing risks and opportunities and their impact on the development or collapse of institutions are mentioned, this study summarizes some findings from previous studies and this study's analytical data. The findings are analyzed together with the literature viewpoints in order to outline a preliminary framework, which describes the study needs in the field of institution's risk and opportunity management importance. On the basis of the synthesis, it is concluded that the risk and opportunity management process in numerous institutions itself might trigger the need for more flexible risk management process.

The overall objective of this study is to improve the process of managing risks and opportunities within an institution, the study focuses on opportunities and the ability and importance of realizing them. Thus, the study questions addressed the following:

- 1. What are the effects of implementing risk and opportunity management strategies on institution's performance (value and profit)?
- 2. What strategies must be followed to manage risks and opportunities in order to achieve the objectives of institutions in general and the objectives of the National Water Company in particular?

الخلاصة:

تم في هذه الدراسة ذكر بعض الاعتبارات المتعلقة بإدارة المخاطر والفرص وأثرها على تطور المؤسسات أو انهيارها، وتلخص هذه الدراسة بعض النتائج التي توصلت إليها الدراسات السابقة بالإضافة إلى البيانات التحليلية لهذه الدراسة، وتم تحليل النتائج من خلال تحليل إجابات أسئلة إستبيان هذه الدراسة من أجل تحديد إطار أولي يصف احتياجات الدراسة في مجال أهمية تأثير إدارة المخاطر والفرص في المؤسسات ، وتم التوصل إلى أن عملية إدارة المخاطر والفرص في العديد من المؤسسات نفسها تؤدي إلى رفع القيمة (الذاتية والمادية) لدى المؤسسات .

الهدف العام من هذه الدراسة هو تحسين عملية إدارة المخاطر والفرص داخل المؤسسة، والتأكيد على أهمية كل من إدارة المخاطر والفرص لدى المؤسسات. وقد تناولت أسئلة الدراسة ما يلي:

1. ما هي آثار تطبيق استراتيجيات إدارة المخاطر والفرص على أداء المؤسسة (القيمة والربح)؟
2. ما هي الاستراتيجيات التي يجب اتباعها لإدارة المخاطر والفرص لتحقيق أهداف المؤسسات بشكل عام وأهداف شركة المياه الوطنية بشكل خاص؟

1. Chapter one

1.1 Introduction:

Risks and uncertainty are two important concepts that address the threats and opportunities provided by humanitarian projects in modern social life. Risks are a fact of life, therefore preparing for risks and developing capabilities to manage them is a way to gain a competitive advantage. Risk management is considered an essential element of management and accountability in institutions.

Paul Hopkin emphasized that benefit comes from the presence of risk, that is, if there is a chance of loss (risk) there is also a chance of profit. (Hopkin, 2012)

All organizations around the world take a global approach to all the risks they face. Integrated risk management is an ongoing process in which potential risks are assessed at all levels of the organization and all results are collected at the business level to improve the decision-making process. (Berg, 2010)

Risk management is more important as organizations become more global and more competitive. The risk management process consists of a series of steps that continuously identify, analyze, evaluate, treat, control, communicate and improve the decision-making process. By implementing risk management, organizations can reduce unexpected and costly incidents and allocate resources more efficiently. Risk management helps in improving communication and improve organizational performance by providing a concise summary of the threats they may face. (Pojasek, 2017)

The importance of risk management lies in enabling institutions and organizations to achieve the desired results and reduce the impact of threats to acceptable levels, in addition to seizing opportunities that keep organizations and institutions within their existential and competitive framework. It can be said that risk management includes: risk management, control management, and opportunity management. (Hopkin, 2012)

Opportunity management is those risks that the organization seeks through risk management to achieve goals and generate new ways of development and revenue growth. Therefore, risks and opportunities can contribute to the development of institutions and the implementation of more realistic and fair prevention and protection rules.

Opportunity management is similar to risk management they both add value to the organization. (Wu,2013)

Many previous researches concerned with studying risk management policies have recommended that institutions take effective measures regarding identifying risks in a timely manner and mitigating or avoiding risks effectively,

as well as the necessity of investing in opportunities that will preserve the institutions' existential and competitive value.

This study examines the impact of risk and opportunity management practices on the performance (value and profit) of institutions in the public and private sectors in general and in the National Water Company (NWC) of the Kingdom of Saudi Arabia in particular.

This study is considered one of the few studies that addressed the impact of risk management practices in general and opportunity management in particular on the performance (value and profit) of institutions that provide water and sanitation services in countries and on the performance (value and profit) of the National Water Company in the Kingdom of Saudi Arabia in particular.

The study model was developed from various sources to raise institutions in the Kingdom of Saudi Arabia's awareness to the importance of managing risks and opportunities.

1.2 Study Problem

Institutions operate mainly within an external and internal environment characterized by a mixture of risks (whether positive - which are called opportunities - or negative), institution's environment requires the integration of risk management policy within institutions in terms of systems, processes and cultures.

According to Stolz, the representation of certain risks enables organizations to enjoy a comparative advantage and thus enables them to improve their financial performance. In general, the risk management suggests that improved risk management practices improve the financial performance of various organizations. (Stolz,1996)

By analyzing this study's data, decision makers will conclude the importance of periodic prediction of risks and opportunities and exploit them to increase the value of their organizations.

The problem of the study stems from understanding what risk and opportunity management is and how risk and opportunities management help institutions improve their performance (value and profit). The problem of this study reveals and understands risk and opportunity management practices in order to provide new insights into dealing with risks and managing opportunities.

1.3 Study Questions

The problem of the study becomes clear when the following research questions are asked:

1. What are the effects of implementing risk and opportunity management strategies on institution's performance (value and profit)?
2. What strategies must be followed to manage risks and opportunities in order to achieve the objectives of institutions in general and the objectives of the National Water Company in particular?

1.4 Objectives of The Study

The objective of this study is to understand what risk and opportunity management are, and to know the impact of their practices on the performance of institutions in the public and private sectors in general and in the National Water Company in particular, in order to provide new insights into dealing with the risks and opportunities faced by institutions in general and the National Company of water in particular.

In this study, a comprehensive framework for managing risks and opportunities will be proposed.

The study focuses on the role of risk and opportunity management practices in terms of commitment, employee empowerment, continuous improvement, and development of work mechanisms in influencing the performance of institutions in the public and private sectors in general and in the National Water Company in particular.

The objectives are focused on the following:

1. Awareness and focus on what organizations may avoid in the future and deal with these risks consciously and what to invest in dealing with opportunities.
2. Measuring organizational performance in institutions.
3. Raising awareness in the importance of studying, evaluating and analyzing risks and opportunities.
4. Providing recommendations to the board of directors within various institutions.

1.5 The Importance of The Study

Economic trends, global events, and changing technology make organizations more vulnerable than ever before.

Since risk management helps reduce sudden risks and identify opportunities which leads to maintaining business sustainability through continuous extrapolation of the future and fabrication of “expecting the worst” events and scenarios.

It is important to point out that risks and opportunities are two inseparable factors despite their differences.

Effective risk management tools help in identifying risks and focus on opportunities - as much as they focus on risks - noting that failure to monitor opportunities is a risk in itself.

The importance of this research lies in studying the effectiveness of risk and opportunity management strategies and procedures on the development or collapse of institutions.

The importance of the study lies in the following main considerations:

- Theoretical importance: This study is considered one of the important references in the scientific fields, as this study is considered one of the few studies that addressed the subject of risk management (including exploiting opportunities) and its impact on the performance of institutions in the Kingdom of Saudi Arabia in general and on the performance of the National Water Company (NWC) in particular. In addition to the possibility of its contribution in providing horizons for other researches.
- Practical importance: This study can effectively help institutions in the Kingdom of Saudi Arabia due to its role in developing organizational performance measurement in institutions.

1.6 Previous Studies and Theoretical Framework

Chapter Two analyzes existing literature and reveals research gaps in the field of risk and opportunity management.

Separate sections also describe and distinguish what are (Risks, Opportunities, Risk Management, Opportunity Management, Risk and Opportunity Management's importance to institutions) with explanations and definitions.

Functional plans and symbolic plans for managing risks and opportunities will be discussed.

Risk and opportunity management is now more important than ever as an indicator of institution's value and performance. Institutions that can efficiently manage their risks and opportunities in order to adapt to the ever-changing, technology-driven business climate are the companies that survive and thrive.

Experience and new information allowed us to think intelligently about the future and plan for potential unexpected outcomes. Many millennia contributed to our growing ability to distill and use information, but the developments since 1900 are more apparent and useful.

Risk management is one of those ideas that a logical, consistent, and disciplined approach to the future's uncertainties will allow us to live more prudently and productively, avoiding unnecessary waste of resources.

Making good decisions in the face of uncertainty and risk probably began during the earliest human existence. Bernstein concludes "The essence of risk management lies in maximizing the areas where we have some control over the outcome while minimizing the areas where we have absolutely no control over the outcome and the linkage between effect and cause is hidden from us". (Bernstein,1996)

According to the study of (Johansen, A. et al., 2020) which showed effective risk and opportunity management as a key to the successful delivery of any major engineering and construction project, the owner and project management team can improve the situation by running a constant hunt for opportunities.

A study of (grundvag & gronhaug, 2006) highlighted that "Exploit opportunities" should be treated with caution, this does not imply that firms should not take risks, but rather that opportunities and their associated threat side(s) should be investigated carefully.

A conclusion in the study of (Mattews, 2015) showed that a firm's recognition needed to perceive for its economic survival and prosperity is due to the

association or responding to opportunities and developing solutions or new products or services or practices, and highlighting the importance of using innovation.

In a study of (Dodgson, Gann & Salter, 2008) which showed that firms which engage in innovative activities compete more successfully in the global marketplace, and achieve company growth.

The findings of (Afridi, F. et al., 2022) revealed that firm size and opportunity to invest had a significant impact on firm value, which means that the greater the investment opportunity set, the higher the firm value, and vice versa.

According to (Pelc, 2015) the implementation of the strategic management process imposes the preparation for changes and initiates a search for new development opportunities, the study also concludes that the company must implement practices associated with modifications of the strategic management process in terms of perception or creation of opportunities, selecting them, as well as including and using them in the strategy, the study also showed that increasing the dynamics of the implementation of the strategic management process in response to development opportunities.

(Boris & Wood, 2015) confirms that the recognition of opportunities includes a set of choices that equates to the execution of corporate's strategy, this set of choices includes deciding the best strategy for exploiting the opportunity given the characteristics of the opportunity and the nature of the environment.

1.7 Theoretical Premises of The Study

Dependent variable	Independent variables
Institution's value (value creation).	➤ Investment in innovation and R&D
	➤ Investment in human resources and motivation
	➤ Continuous risk monitoring and management
	➤ Collaboration with other governmental enterprises
	➤ Community awareness

Table 1. 1: Dependent and independent variables

First Hypothesis (H0):

There is a significant relationship between institution's investment in innovation (R&D department) and institution's increase in value (value creation).

Second Hypothesis (H1):

There is a significant relationship between institution's investment in human resources and motivation and institution's increase in value (value creation).

Third Hypothesis (H2):

There is a significant relationship between institution's continuous risk monitoring & management and institution's increase in value (value creation).

Fourth Hypothesis (H3):

There is a significant relationship between institution's collaboration with other enterprises and institution's increase in value (value creation).

Fourth Hypothesis (H4):

There is a significant relationship between community's awareness and institution's increase in value (value creation).

1.8 Methodology and Research Methods

Research theories are based on a descriptive and systematic study of managing risks and opportunities. Methodology can be defined as a research strategy in which realistic cognitive principles are transformed into rules that explain how to conduct a research. Scientific research is characterized by philosophical and meta-theoretical assumptions related to the nature of reality, knowledge of that reality (epistemology), and methods for knowing that reality (methodology).

The main objectives of this study are to investigate the risk and opportunity management practices adopted to deal with the issue of quality risks, develop a comprehensive framework for managing risks and opportunities, and investigate its impact on the performance of institutions: The context of the current research is the current risk management practices adopted by institutions in the Kingdom of Saudi Arabia. The epistemology of this study can be viewed as knowing what constitutes good risk and opportunity management practice, how to build risk and opportunity management strategies, and what are the best practices for implementing them.

The quantitative research approach will be chosen as the research method in this study to investigate exactly what risk and opportunity management is and its impact on the performance of institutions. Moreover, the objective perspective of the quantitative approach can reflect reality and represent a generalizable result, so the quantitative approach is a more appropriate method of this study.

1.9 Study Tools (Data Collection Tools)

The data for this study's questionnaire was collected from workers in various institutions in the Kingdom of Saudi Arabia, and a descriptive analysis was conducted to show the relationship between the variables of the research.

The questionnaire and sampling used in this study will be designed and the quantitative approach will be adopted to analyze the primary data that will be collected.

Moreover, Excel's data analysis is one of the main tools used to analyze the primary data that was obtained from the questionnaire survey.

1.10 Study Limitation

The limitations of the research are as follows:

- Objective limits: The research topic is limited to risks and opportunity management for institutions in the Kingdom of Saudi Arabia in general: an applied study of its dimensions and its impact on the performance of the National Water Company (NWC).
- Spatial boundaries: The research will be applied to the governmental sectors in the Kingdom of Saudi Arabia, specifically to the National Water Company (NWC).
- Time limits: The research will be applied in the time period of 2023-2024.

1.11 Search Form

➤ Chapter one:	Concerned with studying the case in terms of setting this study goals, defining the study problem, the form of the research and the theories used, in addition to the limits of the research and the form of the research.
➤ Chapter Two:	The theoretical framework and review of literature related to definitions of risk and opportunity management in institutions and in the Saudi National Water Company in particular.
➤ Chapter Three:	Contains a description of the various aspects of the research methodology applied in this research. A questionnaire-based research methodology is used to analyze the primary data collected. This chapter provides an overview of the various methodologies.
➤ Chapter Four:	Contains the analysis of the collected data.
➤ Chapter Five:	Contains a summary of the results and contributions.

Table 1. 2: Study chapters

2. Chapter Two

2.1 Introduction:

Research could be described as the detailed study of a subject, especially in order to discover (new) information or reach a (new) understanding or practical application of such new or revised information or understanding. In this chapter the following points are discussed:

- definition and relation of (risk and opportunity management) and institution's value creation, risk and opportunity management steps.
- Effective opportunity management through continuous research and development (R&D) and Innovation, Employee optimization, and social awareness.
- Kingdom of Saudi Arabia's institutions' interest in risk and opportunity management, and KSA's interest in water risk and opportunity management.
- The national water company's (NWC) profile, revenues, value creation, opportunity and risk management.

2.2 Risk and Opportunity Management

Risk management is the essential element of any competitive strategy, the main policy of risk management within a company is the company's thoughtful bearing of its strategic, operational and financial risks through continuous evaluation and appropriate response to them. Response decisions are taken after a thorough study of the gains and risks associated with them.

As it is important to chase opportunities, it should be realized that seizing an opportunity also involves taking a new risk.

Opportunities are developing dynamically and change along with the occurring changes, therefore in the approach to opportunities it is a challenge to take an active attitude.

Risk and opportunity management steps according to (Jergeas & Lozon, 2015) is as following:

- Appoint the right people to represent and advise risk management strategies; they must be qualified, experienced and able to work well with others.
- Understand the internal and external risks and opportunities involved within the institution, quantify them and make financial provisions for them.
- Clarify the priorities regarding schedule, cost and quality.

- Take into account project costs over its whole life.
- Ensure compliance with legal and regulatory obligations.
- Monitor progress and performance with a focus on emerging opportunities and risks.
-

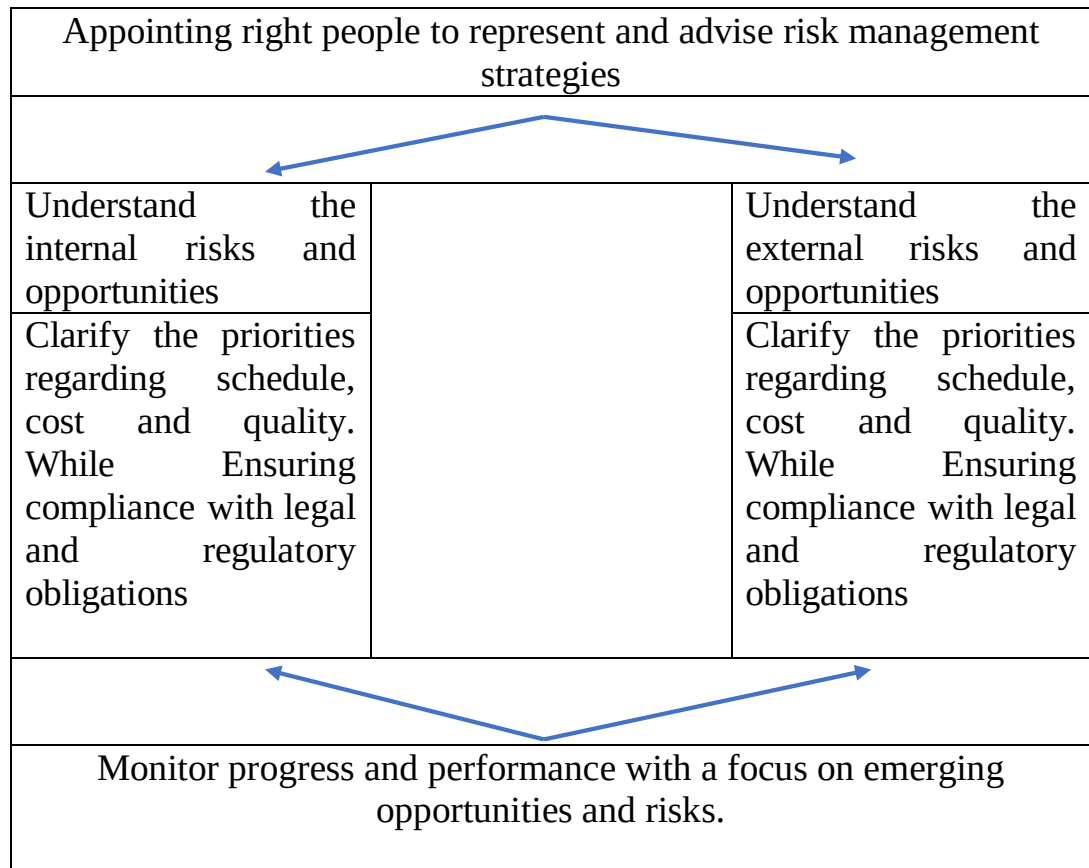


Table 2. 1 : Risk and opportunity management steps according (Jergeas & Lozon, 2015)

The quantitative definition of risk in words is equal to the impact of the event (or its severity) multiplied by the probability of its occurrence. Calculating risks according to Dowling takes into account both the probability of loss and the effect of loss on an event: Risk is calculated as = probability of loss * importance of loss. (Dowling,1986)

Some scholars stated that danger was a manifestation of an inability to control and not just a negative possibility.

(Holman and forriest,2010) defined risk management as a systematic approach to protecting the company's assets and profits by using physical, financial and human capital to achieve certain goals with regard to exposure to net loss. It can be noted that risks cannot be completely eliminated, so some of the current risk management options to protect the company are precautionary aiming to reduce risks.

2.3 Value Creation

The ultimate goal of any corporate is the value creation, value creation is defined as the performance of actions that increase the worth of goods and services. (johansen, 2020)

Value creation can be defined as taking an action where the benefits of the action exceed the costs of the action.

Value creation is dependent on factors such as: (johansen, 2020)

- Product market price, product quality and market demand.
- Operating costs such as labor, materials, energy, services, etc.
- Facilities' uptime and maintenance costs.
- Governmental requirements and conditions.
- Contract conditions and profit margin.
- Work productivity, materials and other resource utilization.
- Customer satisfaction, reputation and market conditions.

In this study profit margin and customer satisfaction are taken as indicators for high institution's performance (value creation).

Value creation procedures in water companies illustrated by WWF's water stewardship ladder as following: (Will Sarni & Hugh Share, 2019)

- Influence governance : governments incentivized and motivation to invest in water basins in a sustainable way.
- Collective action: companies, communities, and public sectors are engaged together in a collective action to address issues.
- Internal action: companies take actions to optimize internal water governance, improve water efficiency and reduce pollution.
- Knowledge of impact : companies have detailed understanding of the impact they and their supplies have.
- Water awareness: companies , their suppliers and customers have (high level) understanding of global water challenges and their dependence on high level of freshwater.

2.4 Value Creation & Risk and Opportunity Management

Risk management adds value by helping companies set themselves up for success in future business ventures.

Ericka Kranitz, director of the Master of Management, Risk and Analytics concentration at Poole College explained that "Risk management helps companies get ahead and seize the right opportunities at the right time, this

includes identifying emerging risks, that could impact their ability to achieve their long-term goals”.

Ericka Kranitz also adds that “Risk management illuminates the greatest threats and the potential opportunities, allowing companies to become resilient, stronger organizations”.

2.5 Risk and Opportunity Management Through Continuous Research and Development (R&D) and Innovations

In the past, researchers have documented a significant positive relationship between Research and development (R&D) and productivity. (Cohen and Klepper 1996, Griliches, 1998, Sutton, 1998)

Research and development is considered one of a number of measures of innovation performance and various studies have shown that investment in Research and development is an important source of productivity growth. (Griliches, 1981)

Research and development investment reduces production costs, as inputs are more effectively transformed into outputs, and it alters output characteristics, thereby providing new products to the marketplace. (Bernstein and Mamuneas, 2004)

Organizations are continually seeking to re-orientate themselves to become strategically innovative where previous literature and empirical findings point to corporate innovation as an important element in organizational renewal and economic development. (Ucbasaran . et al., 2009)

Water management relates to wide areas of research and development (R&D) that can provide useful support for water and environmental engineers and hydrological professionals.

Water Management issues brings together recent progress in the R&D support for water management. This includes water supply to be sustained under climate change; treatment of contaminated water for a better quality of environment; data acquisition device development; and advanced numerical modelling for better conceptual understanding of the fluid dynamics. (yang,2010)

There is a need to accelerate research and development (R&D) activities with near and long-term objectives for evolution of current generation desalination technology along with the creation of revolutionary next-generation advanced desalination and water purification technologies that will offer a promise of 'step reduction' in the cost of producing water. (Srivastava & tewari, 2008)

2.6 Risk and Opportunity Management Through Employee Optimization

Employee optimization is developing and leveraging all available talent to maximize performance and minimize costs, so organizations can more efficiently and effectively move toward achieving their mission and vision.

Optimization can be defined as making something as perfect, functional, or effective as possible.(Hultman,2020)

2.7 Risk and Opportunity Management Through Social Awareness

With the socio-economic change that has taken place over the last years, in addition to an increase in sustainability regulation, stakeholders have gained importance and organizations are more active in relation to generating social impact, but society demands more and better social impact from organizations.

European Commission (2015) showed that social impact is related with social results both in the long-and short-term, adjusted by effects achieved by others (alternative attribution), and effects that would have happened anyway, negative consequences, and effects that diminish with time.

Hared value as mentioned in (Porter & Kramer, 2011) refers to the creation of economic value at the same time as societal value, with a systemic perspective, when approaching society's needs and challenges; social progress and economic growth are interconnected and can be advanced simultaneously.

Companies will come under greater pressure to reduce water use and increase efficiency. the company may need to become involved in supporting better water policy for all users.

2.8 KSA's Interest in Risk and Opportunity Management

There is a growing interest among the leadership and government sectors in the Kingdom of Saudi Arabia to consider a range of issues related to risk management, supported by initiatives emerging from the Kingdom's Vision 2030.

In light of this, and in an effort by the Ministry of Finance to support this trend, a short guide was prepared to meet the need for guidelines of good practices based on sound principles of risk management.

The guideline sets a framework for an integrated risk management system that helps achieve strategic objectives and exploit a range of new opportunities, provided by the technical, environmental, social, political and economic changes that occur in the world in a better way.

2.9 KSA's Interest in Water Risk and Opportunity Management (KSA's Water's National Strategy 2030, 2018)

Water is one of the most important axes of economic and social development, as it is essential for meeting human needs, managing the environment, and ensuring the sustainability of economic development.

The Kingdom of Saudi Arabia faces great challenges summarized to the following:

- Unsustainable use of water resources, as well as the limited non-renewable groundwater reserve that witness rapid depletion.
- The kingdom's arid climatic conditions, which makes renewable water extremely scarce.
- The high demand for water in the agricultural sector that exacerbates the problem of water scarcity in the Kingdom.
- High cost of producing water and sanitation services in the urban sector.
- Service levels which are still below the optimal level.
- The sector also suffers from inappropriate institutional conditions and governance mechanisms.

According to the Kingdom's National Water Strategy - which is a comprehensive water strategy, that integrates trends, policies, legislation, and practices in the water sector at the national level and is developed by the Ministry of Environment, Water, and Agriculture- the kingdom's water facts and risks are mentioned as following:

- The agricultural sector is the largest consumer of water in the Kingdom, with 84% of the total water demand.
- The use of water in the agricultural sector reflects an environmental challenge, as it relies on non-renewable resources, which represent 90% of production.
- Despite the limited water supply, treated wastewater is not being exploited adequately due to limited infrastructure, challenges related to accepting the use of this water in some areas, and limited legislative oversight and pricing incentives.
- Water consumption in the urban sector provides each individual with many opportunities for improvement. This can be achieved by reducing water losses in the network (estimated to be more than 25% indifferent areas), and within buildings, and by setting price indicators and incentives for the governorate on the water.

Therefore, the kingdom has set objectives for water and sanitation sector summarized in five dimensions as following:

- Security of supply which includes storage, transportation and connectivity, distribution and loss reduction, assembly and processing, customers service
- Quality and excellence in customer service.
- Environmental sustainability.
- Economic sustainability.
- Cost management.
- Water system and regulations for water resources management (develop regulations, licenses, and quality standards related to water resources management).
- Water resources management through:
 - a. Restructuring and developing integrated water resources management capabilities.
 - b. Information and digital systems management that contribute to activating the decision.
 - c. Developing and implementing water rights system, and establishing water resources records and monitoring and control mechanisms.
 - d. Integrated water planning.
 - e. Reducing fodder production and improving crop productivity.
 - f. Efficiency of water use in buildings and household appliances.
 - g. Implementing awareness and education campaigns, and changing incorrect behavior and practices.
 - h. Developing renewable groundwater and surface water resources.
 - i. Rehabilitating and developing wastewater treatment plants, and promoting the reuse of treated water.
 - j. Developing sustainable desalination capabilities.
 - k. Developing non-renewable groundwater resources.
 - l. Enhancing the government sector's contribution to the water sector.
 - m. Compliance with environmental regulations and requirements.
 - n. The sector's readiness to manage emergency situations
 - o. Developing and implementing a research and development strategy in the water sector.
 - p. Building and developing national water capabilities.

Risk from water scarcity is often shared between government and business. Likewise, there are common principles for effective management and

mitigation of water scarcity risks that apply to both governments and businesses. (Understanding water risks ,2009)

The United Nations (2003) describes water scarcity as “The point at which the aggregate impact of all users impinges upon the supply or quality of water under prevailing institutional arrangements to the extent that the demand by all sectors, including the environment, cannot be fully satisfied”.

According to regional news and business intelligence service ZAWYA - april,2023- declaring the following:

- The Kingdom of Saudi Arabia announced numerous water projects for desalinization, transmission, strategic reservoir, and wastewater treatment
- The Kingdom continues a vigorous development of water infrastructure deploying public-private partnerships, continuing its position as the largest market for water desalination in the world.
- The kingdom is investing \$14.58 billion in projects planned and underway (owned by the Ministry of Environment, Water & Agriculture).
- The kingdom announced at the 3rd MENA Desalination Projects Forum some 60 water projects worth 35 billion Saudi riyals (9.33 billion US dollars), these projects will increase the desalination capacity from 2.54 cubic meters per day in 2021 to 7.5 million cubic meters of water per day in 2027.
- The kingdom's National Water Company (NWC) announced in 2022 that it would roll out 1,429 projects for tender worth more than SAR108 billion, in the country's largest package of water distribution projects ever.

2.10 The National Water Company's (NWC) Profile, Revenues, Value Creation, Opportunity and Risk Management. (NWC's Official Website)

NWC was established in 2008 as a Saudi joint stock company wholly owned by the public investment fund providing water and wastewater services.

NWC devotes efforts to the following:

- Securing high-quality drinking water for all customers.
- Connecting all households to water and wastewater networks.
- Preserving natural water resources.
- Protecting the environment.
- Utilizing treated wastewater.
- Providing high-end services to customers.
- Developing and training Saudi human resources in accordance with international standards.

NWC's Mission:

- Striving to provide the best water and wastewater services and improving quality across the Kingdom of Saudi Arabia in collaboration with NWC's partners while increasing effectiveness, efficiency and financial sustainability.
- Prioritizing revenue optimization, cost reduction, leakage reduction as well as adding new revenue sources.

Muhammad Al-Mawakli, CEO of the National Water Company, said that the company's revenues during the year 2020, reached 5.4 billion riyals, indicating that these revenues are still very weak and cover 25% of the cost. (Muhammad Al-Mawakli,2021)

Mr.Al-Mowkli also explained in the program "In the Picture" on the "Rotana Khalijiya" channel that the company's annual expenses amount to about 9 billion riyals, including operational expenses and infrastructure development, stressing that to achieve sustainability in the service, financial sustainability must be achieved.

2.11 Water Company Risks (Understanding Water Risks, 2009)

Risk is the recognized possible loss, usually measured as the probability of the unfavorable event.

Water's major risk is scarcity risks which can be classified in terms of insufficient water to meet basic needs.

Water scarcity normally arises due to a complex interaction of social, economic and environmental factors, increasing water scarcity presents physical, financial, regulatory and reputational risks.

Engineering solutions will always be important but management responses to water scarcity that focus on single uses of water often increase risk to a range of stakeholders.

Types of risks that face water companies:

- Price risk: includes mismanagement, industry risks, and price changes.
- Distribution risks: risks that arise from natural disasters such as weather disturbance or man-made disasters.
- Quality risk: the possibility of losses occurring due to quality that fails to meet the quality objectives of beneficiaries.
- Technology risks.
- Economic risks.
- Environmental risks.
- Inventory risk.

2.12 Risks that Face the National Water Company

Risks that face NWC and leads to financial risks, which are created by increased costs or lost revenue as following:

- Physical risks: include the inability to access adequate water supplies or services to effectively manage a company's operations.
This can be caused by:
 - a. Drought or long-term water scarcity (i.e. insufficient and/or unreliable access to water)
 - b. Flooding (causing damage to infrastructure and/or disruptions in supply)
 - c. Pollution (water is rendered unfit for operational use)
 - d. Climate change which exacerbate the problems of water scarcity.
- Regulatory risks: when policymakers and/or water managers change laws or regulations or management practices in ways that alter companies' access to water supplies/ services, increase the costs of operation, or otherwise make corporate water use and management more challenging.
- Reputational: risks which stem from diminished stakeholder perceptions (i.e., consumers, investors, local communities, etc.) due to inefficient or harmful production activities or products that have negative water-related impacts on watersheds, ecosystems, and/or communities.

NWC Risk assessment tools that are used as following:

Water foot printing (WF): is a useful framework for understanding and contextualizing the water usage, and in turn, for identifying related water risk “hotspots” in their products, facilities, and/or supply chain.

Global water tool: is a free online module that helps companies compare their water use, wastewater discharge, and facility information with validated watershed and country-level data.

GEMI’s sustainability water planner and tool: is a tool for identifying and mitigating risks that occur because of issues external to the company operations (e.g., infrastructure, pricing, scarcity, etc.), and is divided into three steps:

- a. Water Use Risk Assessment.
- b. Water Impact Risk Assessment.
- c. Prioritize Water-Related Risks.

2.13 Conclusions

Comparison of previous studies revealed a consensus on the need to rationalize demand on water, especially in the agricultural sector, and studies also stress the importance of adopting an integrated approach to developing, directing and diversifying national and local water supply sources, and improving operations in the sector.

The importance of the need to conduct a comprehensive assessment of the institutional framework and possible governance mechanisms, arising institution’s internal and external community awareness, and considering the possibility of the private sector participating in providing the service and other strategies are all categorized within the risk and opportunity management.

3. Chapter Three

3.1 Introduction:

The ultimate goal of this chapter is covering a description of the research methodology in terms of the following:

- Research method.
- Defining the research population.
- Method of selecting the sample.
- Type of research tool used and the method of determining it.
- Type of scale that was used.

Choosing an appropriate research methodology is extremely important; as it is the basic element of any successful research. The main goal of the methodology is to enable the researcher to plan and study the logic and research method used to evaluate individual research techniques and estimate the likelihood that the research design will make a useful contribution to knowledge.

Thus, the research becomes more understandable by adopting a well-defined research methodology, as the methodology provides a “language” To talk about searches. Each empirical research methodology has a specific method for collecting and analyzing data.

3.2 Research Method

The quantitative approach method was chosen as a research methodology in this study to investigate the nature of risk and opportunity management and its impact on the performance of institutions within the Kingdom of Saudi Arabia and on the Saudi National Water Company (NWC) specifically.

There are several reasons to support the suitability of adopting quantitative methodology in this research, which are:

- By adopting a quantitative approach, hypotheses can be formulated and tested, so the impact of risk and opportunity management can be examined and analyzed through a number of statistical analysis techniques.
- By adopting a quantitative approach, the concepts of risk and opportunity management can be activated so that they can be measured (by collecting samples of practitioners in order to achieve valid and reliable results).
- Classifying and enumerating features, and obtaining statistical models.
- Explaining all the data and processing it to reach the best result.
- Use tables and figures to present values accurately and smoothly.
- Determine the relationships between the independent variable and the dependent variable.

The aim of this chapter is to describe the methodology that was adopted in this research and to cover the details of the analysis, questionnaire design, and sampling used in this study. A quantitative survey-based methodology was adopted to analyze the primary data collected.

3.3 Defining the Research Population

This study's population consists of a group of companies in the Kingdom of Saudi Arabia as a case study. To determine the unit of analysis, employees were identified as managers, technicians, and technicians with different job titles in the KSA's group of companies.

An online questionnaire was distributed via (google form) to the participants, and the questionnaire was examined to indicate its suitability for statistical analysis. 57 (fifty-seven) responses were obtained and the results were extracted and analyzed using Excel data analysis (Regression analysis).

3.4 Questionnaire Development

After completing the questionnaire design, the questionnaire is submitted to practitioners for pilot testing; to adjust the wording, feedback on the questionnaire design that can be obtained from the pilot test. The main purpose is to ensure that practitioners have understanding and the measurement items are clear to respondents.

3.5 Type of Scale That was Used.

A three-point Likert scale gives respondents two options at the farthest points with a neutral option in the middle. For example, Agree, Disagree, and Neutral.

The 3-point Likert scale used in the questionnaire of this study consists of the below points:

- (1) No / I Disagree
- (2) I Don't Have an Idea / Neither Agree nor Disagree
- (3) Yes / I Agree

3.6 Questionnaire Dimensions:

First	Second	Third	Fourth	Fifth	Sixth
(personal questions)	Investment in innovation and R&D Questions	Investment in human resources and motivation Questions	Continuous risk monitoring and management questions	Collaboration with other governmental enterprises	Community awareness
4 Questions	4 Questions	2 Questions	6 Questions	2 Questions	2 Questions

Table 3. 1: questionnaire dimensions

4. Chapter Four

4.1 Introduction

This chapter reviews the results of the statistical analysis of the response of the members of the analysis unit to the variables in which it was adopted through the first statistical indicators of the respondents' answers.

The chapter also deals with testing the study hypotheses, the special statistical significances, and the dimensions of the questionnaire. A three-point Likert scale was adopted.

4.2 Statistical Treatment Used

Excel data analysis (regression) is used to calculate and analyze all the data. Google form is used to display the questionnaire in an electronic way to collect and analyze data electronically and extract percentages of answers and graphs.

4.3 Analysis of Descriptive Study Data:

57 respondents as following:			
Gender	Female	50.9%	
	Male	49.1%	
Job Title	Manager	41.8%	
	Administrator	23.6%	
	Technical	34.5%	
	less than 5 years	69.6%	
	From 5 - 10 years	25%	

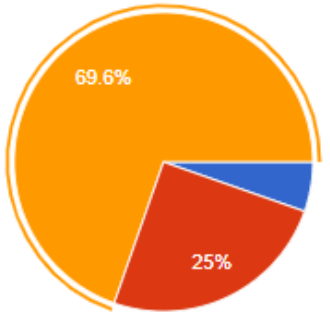
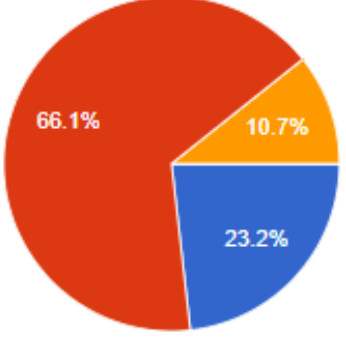
Years of Experience	greater than 10 years	5.4%	
Interviewee's Qualification	Diploma	23.4%	
	BSc	66.1%	
	MSc	10.7%	
	PHD	0%	

Table 4. 1 :respondent's personal information

4.4 Questionnaire Questions Categorized Within Dependent and Independent Variables:

Dependent variable	Independent variables
Institution's value questionnaire indicators (profit and moral value): ➤ Has the company you work for achieved profits within the last two years (2022-2023)? ➤ From your opinion does the company you work for have a value in the national standards?	Investment in innovation and R&D department ➤ does the company you work for have a criteria to evaluate a new product or opportunity? ➤ Is there a research and investment unit in the company you work for? ➤ Does the company you work for constantly embrace innovations? ➤ Do you support that increasing the positive outputs of the research and investment unit is related to increasing profits or value ?
	Investment in human resources and motivation ➤ Does the company you work for adopt development ideas

	continuously among its employees? ➤ Did the encouragement from the management of the company you work for create motivation for employees to perform their tasks exceptionally or creatively ?
	Continuous risk monitoring and management ➤ Does the company you work for use the knowledge management system in the opportunity risk management? ➤ Has the company you work for recently implemented any new or substantially changed systems? ➤ Does the company you work for have a written reporting policy? ➤ Does the company you work for have a written procurement procedures indicating which individuals are authorized to initiate a purchase request, the follow of documents, and the requested levels of approval? ➤ Have administrative decisions affected the value or profits of the company you work for in a positive way? ➤ Have administrative decisions affected the value or profits of the company you work for in a negative way?
	Collaboration with other governmental enterprises ➤ Is there an integrated work plan between the concerned authorities and the company you work for (for example, is there a link between the National Water Company, the Ministry of Environment, and the Corporation? ➤ Is there a partnership between the government and private sectors to invest in external and internal opportunities for the company you work for?
	Community awareness

	➤ Does increasing community's awareness lead to increased value or profits in the company you work for? ➤ Does increasing community's awareness for the necessity of preserving natural resources leads to increased value or profits in your company?
--	---

Table 4. 2 : respondent's questionnaire questions categorized within dependent and independent variables:

Dependent variable (for NWC's employees)	Independent variables
Institution's value questionnaire indicators (profit and moral value): ➤ Has the company you work for achieved profits within the last two years (2022-2023)? ➤ Are you an employee of the National Water Company (NWC)? ➤ From your opinion does the company you work for have a value in the national standards?	Investment in innovation and R&D department ➤ does the company you work for have a criteria to evaluate a new product or opportunity? ➤ Is there a research and investment unit in the company you work for? ➤ Does the company you work for constantly embrace innovations? ➤ Do you support that increasing the positive outputs of the research and investment unit is related to increasing profits or value ?
	Investment in human resources and motivation ➤ Does the company you work for adopt development ideas continuously among its employees? ➤ Did the encouragement from the management of the company you work for create motivation for employees to perform their tasks exceptionally or creatively ?
	Continuous risk monitoring and management ➤ Does the company you work for use the knowledge management system in the opportunity risk management? ➤ Has the company you work for recently implemented any new or substantially changed systems?

	Does the company you work for have a written reporting policy? ➤ Does the company you work for have a written procurement procedures indicating which individuals are authorized to initiate a purchase request, the follow of documents, and the requested levels of approval? ➤ Have administrative decisions affected the value or profits of the company you work for in a positive way? ➤ Have administrative decisions affected the value or profits of the company you work for in a negative way?
	Collaboration with other governmental enterprises ➤ Is there an integrated work plan between the concerned authorities and the company you work for (for example, is there a link between the National Water Company, the Ministry of Environment, and the Corporation? ➤ Is there a partnership between the government and private sectors to invest in external and internal opportunities for the company you work for?
	Community awareness ➤ Does increasing communities' awareness lead to increased value or profits in the company you work for? ➤ Does increasing communities' awareness of the necessity of preserving natural resources leads to increased value or profits in your company?

Table 4. 3: respondent's questionnaire questions categorized within NWC dependent and independent variables:

4.5 Data Analysis Results

- a. The relationship between institution's risk monitoring policies and procedures with institution's profit

Table 4. 4 : respondent's questionnaire questions categorized within the relationship between institution's risk monitoring policies and procedures with institution's profit

Dependent variable	Independent variables
Institution's value questionnaire indicators (profit and moral value): ➤ Has the company you work for achieved profits within the last two years (2022-2023)? ➤ From your opinion does the company you work for have a value in the national standards?	Continuous risk monitoring and management ➤ Q1: Does the company you work for use the knowledge management system in the opportunity risk management? ➤ Q2: Has the company you work for recently implemented any new or substantially changed systems? ➤ Q3: Does the company you work for have a written reporting policy? ➤ Q4: Does the company you work for have a written procurement procedures indicating which individuals are authorized to initiate a purchase request, the follow of documents, and the requested levels of approval? ➤ Q5: Have administrative decisions affected the value or profits of the company you work for in a positive way? ➤ Q6: Have administrative decisions affected the value or profits of the company you work for in a negative way?

1	SUMMARY OUTPUT								
2									
3	Regression Statistics								
4	Multiple R	0.749484							
5	R Square	0.561726							
6	Adjusted R Square	0.50806							
7	Standard Error	0.421248							
8	Observations	56							
9									
10	ANOVA								
11		df	SS	MS	F	Significance F			
12	Regression	6	11.14425	1.857375	10.46705	1.89E-07			
13	Residual	49	8.695034	0.17745					
14	Total	55	19.83929						
15									
16		Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
17	Intercept	1.459351	0.370892	3.934701	0.000263	0.714015	2.204687	0.714015	2.204687
18	X Variable	0.201863	0.100151	2.015576	0.049346	0.000601	0.403125	0.000601	0.403125
19	X Variable	0.246223	0.085888	2.866801	0.006096	0.073625	0.418822	0.073625	0.418822
20	X Variable	-0.25988	0.095935	-2.70888	0.009274	-0.45267	-0.06709	-0.45267	-0.06709
21	X Variable	-0.15536	0.108344	-1.43398	0.157928	-0.37309	0.062362	-0.37309	0.062362
22	X Variable	0.536516	0.098315	5.457104	1.59E-06	0.338945	0.734088	0.338945	0.734088
23	X Variable	-0.13147	0.079831	-1.64685	0.105988	-0.2919	0.028957	-0.2919	0.028957
24									
25									

Figure 4. 1 :
regression analysis
for the relationship
between
institution's risk
monitoring
policies and
procedures with
institution's profit

- Data analysis conclusion: Using the institution's knowledge management system in the opportunity risk management, implementing any new or substantially systems, having written reporting policy and administrative decisions has a significant relation with institution's profit (as shown in the yellow shaded P-value <0.05).
- b. The relationship between institution's risk monitoring policies and procedures with value data analysis.

1	SUMMARY OUTPUT								
2									
3	Regression Statistics								
4	Multiple R	0.552088							
5	R Square	0.304801							
6	Adjusted R Square	0.214123							
7	Standard Error	0.47282							
8	Observations	53							
9									
10	ANOVA								
11		df	SS	MS	F	Significance F			
12	Regression	6	4.508756	0.751459	3.361352	0.007862			
13	Residual	46	10.2837	0.223559					
14	Total	52	14.79245						
15									
16		Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
17	Intercept	1.647878	0.426	3.868259	0.000343	0.790385	2.505372	0.790385	2.505372
18	X Variable	0.118306	0.115537	1.023964	0.311207	-0.11426	0.350871	-0.11426	0.350871
19	X Variable	0.136177	0.10218	1.332717	0.189189	-0.0695	0.341855	-0.0695	0.341855
20	X Variable	-0.08967	0.111074	-0.80729	0.423652	-0.31325	0.133911	-0.31325	0.133911
21	X Variable	0.24329	0.125784	1.934193	0.059255	-0.0099	0.49648	-0.0099	0.49648
22	X Variable	0.104265	0.115769	0.900626	0.372478	-0.12877	0.337297	-0.12877	0.337297
23	X Variable	-0.04202	0.09061	-0.46372	0.645037	-0.22441	0.140371	-0.22441	0.140371
24									
25									

Figure 4. 2 : relationship between institution's risk monitoring policies and procedures with value data analysis.

- Data analysis conclusion: Having a written reporting policy within the institution has a significant relation with institution's value (as shown in the yellow shaded P-value <0.05).

- a. The relationship between institution's profit with institution's investment in innovation and R&D

1	SUMMARY OUTPUT								
2									
3	Regression Statistics								
4	Multiple R	0.498257							
5	R Square	0.24826							
6	Adjusted R	0.171552							
7	Standard Error	0.548866							
8	Observations	55							
9									
10	ANOVA								
11		df	SS	MS	F	Significance F			
12	Regression	5	4.874929	0.974986	3.236427	0.013281			
13	Residual	49	14.76143	0.301254					
14	Total	54	19.63636						
15									
16		Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
17	Intercept	1.520594	0.477938	3.18157	0.002543	0.560141	2.481046	0.560141	2.481046
18	X Variable	0.191088	0.126479	1.510822	0.137256	-0.06308	0.445257	-0.06308	0.445257
19	X Variable	0.124596	0.113139	1.101266	0.276161	-0.10276	0.351957	-0.10276	0.351957
20	X Variable	0.014192	0.108265	0.131088	0.896243	-0.20337	0.231759	-0.20337	0.231759
21	X Variable	-0.02634	0.17202	-0.15312	0.878929	-0.37203	0.319346	-0.37203	0.319346
22	X Variable	0.150327	0.097488	1.542002	0.129507	-0.04558	0.346236	-0.04558	0.346236
23									

Figure 4. 3 : relationship between institution's profit with institution's investment in innovation and R&D

➤ Data analysis

conclusion: There is no significant relation between institution's investment in innovation and R&D and institution's profit (as shown in the P-value > 0.05).

- b. The relationship between institution's value with institution's investment in innovation and R&D.

1	SUMMARY OUTPUT								
2									
3	Regression Statistics								
4	Multiple R	0.510148							
5	R Square	0.260251							
6	Adjusted R	0.179844							
7	Standard Error	0.487351							
8	Observations	52							
9									
10	ANOVA								
11		df	SS	MS	F	Significance F			
12	Regression	5	3.843714	0.768743	3.236659	0.013802			
13	Residual	46	10.92552	0.237511					
14	Total	51	14.76923						
15									
16		Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
17	Intercept	2.301376	0.429463	5.358729	2.61E-06	1.436912	3.16584	1.436912	3.16584
18	X Variable	0.240841	0.119686	2.012266	0.050069	-7.5E-05	0.481757	-7.5E-05	0.481757
19	X Variable	0.073179	0.107573	0.680279	0.499738	-0.14335	0.289712	-0.14335	0.289712
20	X Variable	-0.05678	0.105975	-0.53577	0.594701	-0.2701	0.156539	-0.2701	0.156539
21	X Variable	-0.18312	0.157263	-1.16445	0.250245	-0.49968	0.133429	-0.49968	0.133429
22	X Variable	0.193804	0.094219	2.056944	0.045388	0.00415	0.383458	0.00415	0.383458
23									

Figure 4. 4 : relationship between institution's value with institution's investment in innovation and R&D.

➤ Data analysis conclusion: Increasing the positive outputs of institution's research and investment unit has a significant relationship with institution's value (as shown in the yellow shaded P-value < 0.05).

- a- The relationship between institution's profit with community awareness

1	SUMMARY OUTPUT								
2									
3	Regression Statistics								
4	Multiple R	0.326689							
5	R Square	0.106726							
6	Adjusted R Square	0.073641							
7	Standard Error	0.577204							
8	Observations	57							
9									
10	ANOVA								
11		df	SS	MS	F	Significance F			
12	Regression	2	2.149494	1.074747	3.225879	0.047489			
13	Residual	54	17.99086	0.333164					
14	Total	56	20.14035						
15									
16		Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
17	Intercept	1.713729	0.454236	3.772775	0.000403	0.803041	2.624417	0.803041	2.624417
18	X Variable	0.343975	0.146362	2.350158	0.02245	0.050536	0.637414	0.050536	0.637414
19	X Variable	-0.02743	0.165572	-0.16566	0.869046	-0.35938	0.304524	-0.35938	0.304524

Figure 4. 5 : relationship between institution's profit with community awareness

- **Data analysis conclusion:** The increase in community's awareness has a significant relation with institution's profit (as shown in the yellow shaded P-value <0.05).

b- The relationship between institution's value with community awareness

1	SUMMARY OUTPUT								
2									
3	Regression Statistics								
4	Multiple R	0.331431							
5	R Square	0.109846							
6	Adjusted R Square	0.074939							
7	Standard Error	0.508505							
8	Observations	54							
9									
10	ANOVA								
11		df	SS	MS	F	Significance F			
12	Regression	2	1.627355	0.813678	3.146744	0.051446			
13	Residual	51	13.18746	0.258578					
14	Total	53	14.81481						
15									
16		Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
17	Intercept	2.47141	0.402766	6.136101	1.25E-07	1.662824	3.279996	1.662824	3.279996
18	X Variable	0.325049	0.129702	2.506115	0.015438	0.064661	0.585437	0.064661	0.585437
19	X Variable	-0.17203	0.146148	-1.17708	0.244628	-0.46543	0.121376	-0.46543	0.121376

Figure 4. 6 : relationship between institution's value with community awareness

- **Data analysis conclusion:** The increase in community's awareness of the necessity of preserving natural resources has a significant relation with institution's value (as shown in the yellow shaded P-value <0.05).

a. The relationship between institution's profit with institution's investment in human resources and motivation

1	SUMMARY OUTPUT								
2									
3	Regression Statistics								
4	Multiple R	0.29111							
5	R Square	0.084745							
6	Adjusted R Square	0.067796							
7	Standard Error	0.579879							
8	Observations	56							
9									
10	ANOVA								
11		df	SS	MS	F	Significance F			
12	Regression	1	1.681287	1.681287	4.999971	0.029501			
13	Residual	54	18.158	0.336259					
14	Total	55	19.83929						
15									
16		Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
17	Intercept	2.115125	0.210836	10.03208	6.1E-14	1.692424	2.537826	1.692424	2.537826
18	X Variable	0.193331	0.08646	2.236062	0.029501	0.019988	0.366673	0.019988	0.366673

Figure 4. 7 : relationship between institution's profit with institution's investment in human resources and motivation

- Data analysis conclusion: There is a significant relationship between investment in institution's human resources and motivation with institution's profit (as shown in the yellow shaded P-value <0.05).
- b. The relationship between institution's value with institution's investment in human resources and motivation

1	SUMMARY OUTPUT								
2									
3	Regression Statistics								
4	Multiple R	0.004526							
5	R Square	2.05E-05							
6	Adjusted R Square	-0.01959							
7	Standard Error	0.538556							
8	Observations	53							
9									
10	ANOVA								
11		df	SS	MS	F	Significance F			
12	Regression	1	0.000303	0.000303	0.001045	0.974343			
13	Residual	51	14.79215	0.290042					
14	Total	52	14.79245						
15									
16		Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
17	Intercept	2.842997	0.201548	14.10584	3.09E-19	2.438374	3.247621	2.438374	3.247621
18	X Variable	0.002676	0.082804	0.03232	0.974343	-0.16356	0.168912	-0.16356	0.168912
19									

Figure 4. 8 : relationship between institution's value with institution's investment in human resources and motivation

- Data analysis conclusion: There is a no significant relationship between institution's investment in human resources and motivation with institution's moral value (as shown in the P-value > 0.05).
- a. The relationship between institution's profit with private partnership

1	SUMMARY OUTPUT								
2									
3	Regression Statistics								
4	Multiple R	0.371705							
5	R Square	0.138165							
6	Adjusted R	0.105642							
7	Standard Error	0.569262							
8	Observations	56							
9									
10	ANOVA								
11		df	SS	MS	F	Significance F			
12	Regression	2	2.753421	1.376711	4.248328	0.019442			
13	Residual	53	17.17515	0.324059					
14	Total	55	19.92857						
15									
16		Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
17	Intercept	1.755272	0.284799	6.163191	9.95E-08	1.184037	2.326507	1.184037	2.326507
18	X Variable	0.259998	0.116369	2.234256	0.029707	0.026591	0.493405	0.026591	0.493405
19	X Variable	0.088984	0.108408	0.82082	0.415425	-0.12846	0.306424	-0.12846	0.306424

Figure 4. 9 : relationship between institution's profit with private partnership

- **Data analysis conclusion:** There is a significant relationship between having an integrated work plan between the concerned authorities and the institution you work for (for example, is there a link between the National Water Company, the Ministry of Environment, and the Corporation) and institution's profit (as shown in the yellow shaded P-value <0.05).

b. The relationship between value with private partnership

1	SUMMARY OUTPUT								
2									
3	Regression Statistics								
4	Multiple R	0.460471							
5	R Square	0.212033							
6	Adjusted R	0.180515							
7	Standard Error	0.482824							
8	Observations	53							
9									
10	ANOVA								
11		df	SS	MS	F	Significance F			
12	Regression	2	3.136491	1.568246	6.727226	0.002586			
13	Residual	50	11.65596	0.233119					
14	Total	52	14.79245						
15									
16		Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
17	Intercept	1.923312	0.266588	7.214555	2.77E-09	1.387854	2.458769	1.387854	2.458769
18	X Variable	0.294551	0.101999	2.887775	0.005719	0.08968	0.499423	0.08968	0.499423
19	X Variable	0.11033	0.093723	1.177186	0.244695	-0.07792	0.298578	-0.07792	0.298578
20									

Figure 4. 10 : relationship between value with private partnership

- **Data analysis conclusion:** There is a significant relationship between having an integrated work plan between the concerned authorities and the institution you work for (for example, is there a link between the

National Water Company, the Ministry of Environment, and the Corporation) and institution's value (as shown in the yellow shaded P-value <0.05).

4.6 Data Analysis Conclusion

1. All hypothesis is proven to be true as following:

First Hypothesis (H0):

There is a significant relationship between institution's investment in innovation (R&D department) and institution's increase in value (value creation).

Second Hypothesis (H1):

There is a significant relationship between institution's investment in human resources and motivation and institution's increase in institution's value (value creation).

Third Hypothesis (H2):

There is a significant relationship between institution's continuous risk monitoring & management and institution's increase in value (value creation).

Fourth Hypothesis (H3):

There is a significant relationship between institution's collaboration with other enterprises and institution's increase in value (value creation).

Fourth Hypothesis (H4):

There is a significant relationship between community's awareness and institution's increase in value (value creation).

2. Investing in the institution's internal opportunities (such as investing in the institution's human resources, R&D and empowering risk monitoring policies) and external opportunities (such as institution's collaboration with other enterprises and community's awareness) is proven to be a key to a valuable institution.

5. Chapter Five

5.1 Conclusion and Recommendations

Risk and opportunity management in the Kingdom of Saudi Arabia is one of the most discussed topics that has been addressed recently in both academic and industrial fields. This research aims to develop a systematic approach to dealing with risk and opportunity management. This research made three main contributions:

First: The study expanded the concepts of risk and opportunity management by integrating risk transfer, risk sharing, risk avoidance, and risk treatment.

Second: This study highlights the development of a reliable file and a valid measure for managing risks and opportunities. A comprehensive risk and opportunity management measure has been undertaken.

Third: This study makes further theoretical and theoretical contributions by examining the performance and impact of risk and opportunity management from an individual and integrated concept in light of the risk and opportunity management literature and discussing the impact of risk and opportunity management performance.

The study showed that the integration of the risk and opportunity management system has a strong impact on performance as well as on the individual dimensions of risk.

This research focuses on adopting risk and opportunity management in the Saudi National Water Company

Appendices

Respected Respondent, Greetings, the attached questionnaire is part of the researcher completing the requirements for the master's degree.

I hope you would be kind enough to give some of your valuable time to participate in filling out this questionnaire.

Please note that If the research is published or presented at a scientific conference, the results will be aggregated and not related to a specific person. This questionnaire includes a set of questions related to the professional experience of the respondent and then a set of questions that focus on the extent of the impact of the opportunity and risk management in companies on the company's value or profit. If it is necessary to inquire about anything or in the questionnaire, please do not hesitate to contact the researcher.

Thank you for your kind cooperation

Researcher.

Question 1: Interviewee's gender?	☐ Female ☐ male
Question 2: What's your job title?	☐ Manager ☐ Administrator ☐ Technical
Question 3: What's your years of experience?	☐ Less than 5 years ☐ 5-10 years ☐ Greater than 10 years
Question 4: Interviewee's qualification?	☐ Diploma ☐ BSc ☐ MSc ☐ PHD
Question 5: Has the company you work for achieved profits within the last two years (2022-2023)?	☐ Yes ☐ No ☐ I don't know
Question 6: Are you an employee of the National Water Company (NWC)?	☐ Yes ☐ no
Question 7: From your opinion does the company you work for have a value in the national standards?	☐ Yes ☐ no
Question 8: Does the company you work for use the knowledge management system in the opportunity risk management?	☐ Yes ☐ No ☐ I don't know

Question 9: Does the company you work for have a criteria to evaluate a new product or opportunity?	☐ Yes ☐ No ☐ I don't know
Question 10: Has the company you work for recently implemented any new or substantially changed systems?	☐ Yes ☐ No ☐ I don't know
Question 11: Does the company you work for have a written reporting policy?	☐ Yes ☐ No ☐ I don't know
Question 12: Does the company you work for have a written procurement procedures indicating which individuals are authorized to initiate a purchase request, the follow of documents, and the requested levels of approval?	☐ Yes ☐ No ☐ I don't know
Question 13: Is there a research and investment unit in the company you work for?	☐ Yes ☐ No ☐ I don't know
Question 14: Does the company you work for constantly embrace innovations?	☐ Yes ☐ no
Question 15: Do you support that increasing the positive outputs of the research and investment unit is related to increasing profits?	☐ I agree ☐ I disagree ☐ neither agree nor disagree
Question 16: Does the company you work for adopt development ideas among its employees?	☐ Yes ☐ No ☐ I don't know
Question 17: Have administrative decisions affected the profits of the company you work for in a positive way?	☐ Yes ☐ No ☐ I don't know
Question 18: Have administrative decisions affected the profits of the company you work for in a negative way?	☐ Yes ☐ No ☐ I don't know
Question 19: Did the encouragement from the management of the company you work for create motivation for employees to perform their tasks exceptionally or creatively?	☐ Yes ☐ No ☐ I don't know
Question 20: Is there an integrated work plan between the concerned authorities and the company you work for (for example, is there a link between the National Water Company, the Ministry of Environment, and the Corporation?	☐ Yes ☐ No ☐ I don't know
Question 21: Does increasing communities' awareness lead to increased value or profits in your the company you work for?	☐ I agree ☐ I disagree ☐ neither agree nor disagree
Question 22: Does increasing communities' awareness of the necessity of preserving	☐ I agree ☐ I disagree ☐ neither agree nor disagree

natural resources leads to increased value or profits in your company?	
Question 23: Is there a partnership between the government and private sectors to invest in external and internal opportunities for the company you work for?	☐ Yes ☐ No ☐ I don't know

Summary

The study concludes with a critical review of progress made towards the research questions, objectives, and aims. It also serves to highlight reflections on this study and suggest ideas for its continuation.

The main contribution of this research is that a developed risk and opportunity management process has been verified through implementation and use within global and national institutions. Furthermore, the study has suggested an approach to managing risk. The study has also identified a number of institutional aspects which are important to consider in the management of opportunities. The study has added knowledge to the research paradigm through:

- further development of aspects of existing risk and opportunity management processes for institutions.
- introduction of a methodology for managing risks and opportunities.
- introduction of the effectiveness of risk and opportunity management on institutions performance and value.
- contributed to new insight in the management of opportunities.

The study has examined the wide and vast scope of risk and opportunity management and narrowed it down to the conceptually common area of water institutions risks (NWC risks). A simple conceptual model for handling risks and opportunities in institutions has been validated, and the benefits and implications of viewing uncertainty management (risk management) have been explored.

Recommendations:

Risk management processes have been extensively developed, received great attention from practitioners and researchers. However, despite all the efforts, risk management does not deliver to expectations. By adopting the view that different types of problems and, thereby, uncertainties, exist, additional insight into opportunity management arises.

Results of this study indicate that different prerequisites exist in the ability to manage opportunity within the institution's internal and external environment. Risk management processes are designed to manage analytical and logical uncertainty.

The objectives of this research have been achieved by the development of a methodology and process to ensure how important risk and opportunity management for the value creation (profit and moral value) of any institution. Therefore, after what it is concluded in this study and as following:

- Investing in the institution's internal opportunities (such as investing in the institution's human resources, R&D and empowering risk monitoring policies) and external opportunities (such as institution's collaboration with other enterprises and community's awareness) is proven to be a key to a valuable institution.

It is recommended for the following studies to highlight an effectiveness metric that would measure financial and operational effects of an effective risk management that contains the management of uncertainties and the improvement of opportunity management.

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