ASSESSING THE ORGANIZATIONAL RISK MANAGEMENT CULTURE OF ETHIOPIAN CONSTRUCTION WORKS CORPORATION (ECWC)

By:

Fekadu Tolcha Gari

A Project Work Submitted to the Graduate Studies of Addis Ababa University (AAU), School of Commerce Presented in Partial Fulfillment of the Requirements for Masters Degree in Project Management

Advisor:

Abraraw Chane (PhD)

Addis Ababa University, School of Commerce

Addis Ababa, Ethiopia

June, 2023

Statement of Declaration

I, Fekadu Tolcha Gari, hereby declare that this thesis entitled "Assessing The Organizational Risk Management Culture Of Ethiopian Construction Works Corporation (ECWC)" is my own paper work and that it has not been submitted before anywhere either at masters level or undergraduate for any award. Any information used from other works has been acknowledged.

Fekadu Tolcha Gari

Signature _____

Date _____

Confirmed by Advisor:

Name: Abraraw Chane (PhD)

Date: _____

Signature: _____

Approved by Examiner:

Name: Wubishet Bekalu (PhD)

Date: _____

Signature: _____

Name: Getachew. M(PhD)

Date: _____

Signature: _____

June, 2018

Addis Ababa, Ethiopia

ACKNOWLEDGEMENT

‘መቅድመ ኩሉ አቀድም ስብሃተ እግዚአብሄር እንዲሉ’ Am thankful for all grace and mercy of God throughout my entire life! On this paper, I would like to thank my mother Konjit Alemayehu Biru if it makes sense for all her effort to raise me and her unlimited support to date. And dedicated it for remembrance of my humble father Tolcha Garii Wakjira who late without being understood.

I would also like to express my appreciation to Dr. Abraraw Chane (PhD) my advisor, whom I love in his teaching approach and dedication; I would like to thank him for the trust he put on me and his guidance.

I also wish to thank all my instructors who have been incredibly supportive and collaborative over the last three years.

My warm thanks go to the human resource development & Risk and Claim Management directorate of Ethiopian Construction Works Corporation (ECWC), and all the staffs: project managers and engineers who participate in responding their genuine opinion to my questioners.

I am highly indebted to my wife Rahel Moges (Eng.) and her Father Shambel Moges Demilew and Aunty Abeba Belete, who have constantly been encouraging and supporting throughout my academic career and personal life. I really owe you! many thanks! may God bless you!. My lovely Kids Selihom/Soliyana, Mastewal/Kiyu and Alazar I love you! and am indebted to you also as the time of the study is stolen from you.

Last but not least, to those who are member of the telegram channel group “MA in PM class of 2013” and the coordinator Sara Hashim who had contributed assistance with provision of timely and relevant information.

Table of Contents

List of tables:

List of figures:

ACRONYMS

ECWC= Ethiopian Construction works corporation

KPI=Key performance indicator

KRI=Key risk indicator

OB=Organizational Behavior

ORM=Organizational risk management

PMBOK=Project management body of knowledge

ISO=International standard organization

SPSS= Statistical package for social science

SWOT= Strength Weakness Opportunity and threats

ABSTRACT

This study aims to empirically test the existence of risk management culture in Ethiopian Construction Works Corporation (ECWC) an autonomous public body established by virtue of the council of Minsters Regulation No.366/2015. Since construction projects are exposed to risks large companies like ECWC expected to implement organizational risk management and its risk culture expected to develop as an effective means to manage risk holistically. To explore the risk management culture of the corporation quantitative method through questioner survey having ten basic and twenty-seven Likert items is adopted as means of data collection. The data collected from 40 respondents who are all managerial employe of the corporation is analyzed by SPSS version 27 and the result confirms the risk culture of the corporation is in a good level. In other words, the organizational culture of the corporation has influence on the risk management practice of the corporation. A sound risk culture in the corporation will assist risk issues discussed and escalated at all levels within the corporation and employees will not see risk management as compliance issue.

To asses the level of risk culture the six dimensions of risk culture identified by(Ching et al., 2021) are used as independent variables and in conceptual framework. The study will contribute an input to assess correlation between organizational risk management culture and organizational risk management implementation as both are not substitutes but complements.

Keywords: Organizational risk management; Organizational risk management culture; Construction Company.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Defining culture as the way work is done in the organization, if the organization doesn't address risk in the way work is done, risk management will fail. An organization can have an overall positive culture but may lacks a sound risk culture because most of employee see risk management as a compliance issue and not as means of arriving at sound decisions.

Organizational risk management(ORM) culture positively contributes to construction companies in terms of reducing losses, acting as performance indicators, improving decision making and control on projects(Ching et al., 2020).

Building a culture of risk management is primarily a process of developing people in an organization who think and plan projects effectively and who are supported by company systems that encourage them to think and plan effectively. That involves looking constantly at what could go wrong and knowing the difference between theoretical risk and practical risk.

Risk culture can be regarded as the impact of organizational culture on risk management (Kanu, 2020). Properly designed and implemented risk culture establishes cultural context in which risk management processes can flourish, encourage employes in responding to risk proactively within threshold limits and avoid reckless risk taking.(Marshall, 2016)

Robust risk culture integrated effectively and efficiently in an organizations business process and practiced can potentially add value to the business. In addition it can enhance existing processes and ultimately assist organization continue to manage and mitigate the existing and emerging risks that continue to face in changing world.(Baxter and Vermeulen, 2013)

A proper risk culture will reduce the potential for undesirable behaviors that endanger organizations financial wellbeing. (APRA, 2016)

Risk culture's objective is to establish and maintain sound risk culture s that are aligned with the organizational goals, values and risk thresholds. In today's rapidly evolving business landscape, the ability to make risk based decision is paramount to an organizations success. Therefore, the beginning of good risk management is the capacity to know what the organization and its people can do and what they can't do.

It's time for risk managers to rethink traditional risk assessment approach and stop viewing risk management as a monthly, quarterly or even an annual exercise in updating a risk

register. Instead, risk managers should focus on adding value to the business by integrating risk management and specifically quantitative risk analysis into everyday decision-making processes. By making risk analysis an important step in significant decisions, risk managers can greatly influence the development of risk culture. Nothing creates risk culture as inevitability of risk analysis. Risk managers should make quantitative risk analysis as prerequisite for most important and material business decisions. (Sidorenko and Demidenko, 2016).

By embedding risk management into daily operations and decision-making, organizations can create a risk-aware culture where informed risk-taking becomes everyone's responsibility. Transparent risk discussion and informed risk taking should become inevitable.

The purpose of this study is to assess the integration of risk management procedures and processes within organizational culture of Ethiopian Construction Works Corporation (ECWC).

The Ethiopian construction works corporation (ECWC) is an autonomous public body established by virtue of the council of Minsters Regulation No.366/2015 to deliver constructions overseas and domestic construction works in the area of highway, Air filed, dam and irrigation, water supply, buildings and hydropower construction projects.

ECWC is mainly construction project management company and all projects are by nature exposed to risk, because the management processes of all projects dominated by consideration of the future and making decisions about it. Each project potentially has up to four elements (tasks, technologies, resources organization); and usually a great number of differentiated and interdependent sub-elements. The many hundreds of identifiable risks for ECWC are therefore likely to exhibit at different exposure period, and most of these may not be known precisely. This together with the difficulties of obtaining reliable probabilistic data is why the assessment of risk management culture of the organization is important; as the risk process is essentially a thought process, a way or style of management that is ingrained in the way people work and solve project problems.

The corporation is carrying out projects that can be categorized as risky according to the lists of risky projects by (Cooper and Chapman, 1987) such as projects with large capital outlays, unbalanced cash flows, highly complex projects with too many task, technology, resource elements and sub elements with their organization, differentiation and interdependencies,

novel procurement arrangements, severe time constraints, political sensitivity and situational instability and some of its stakeholders are inexperienced.

1.2 Statement of the Problem

Considering uncertainty about anything that matters as a starting point for risk management; project management organizations suffer a lot as they are making project management decisions about the future. And the future can't be known with complete certainty. In project context these uncertainties will come from variability associated with estimates, uncertainty about the basses of estimates, uncertainty about design and logistics, uncertainty about objective and priorities and uncertainty about fundamental relationship between project parties.

To manage such uncertainties project management organizations, need to integrate risk management in to their day-to-day operations and decisions. Which means risk management need to be their way of doing business or part of their organizational culture.

The other pushing factor for the need of risk management to be organizational culture and day today thought process of employees is that, uncertainties not being static. The level of uncertainty in a project change both in nature and degree as time passes and project element and sub-element are completed or changed to suite the new circumstances. This makes the traditional risk management as standalone to fail.

The challenge for building resilient and proactive risk management culture within organizations is teaching and training project leaders and team members to think in terms of risk and internalize the risk management processes in to their daily work. Otherwise, they can't see risks until they are looking for them.

1.3 Research Questions

1.3.1 General Research Question

Exploring the organizational risk management culture of ECWC and ECWC's effort to integrate risk management processes in to its organizational culture.

1.3.2 Specific Research Question

1. Does ECWC's organizational policies and procedures address risk management issues? Or is there any separate policies and procedures for risk management implementation in the organization?

2. Does the organization ECWC have risk threshold limits that can be expressed either quantitatively or qualitatively that help decision makers not to exceed the limit?
3. Does ECWC established key risk indicators for various business units or projects to monitor and evaluate against for top organizations or projects risk exposure?
4. At ECWC is there any means of accountability for poorly attended risks and risk responses as well incentives for outstanding performance in risk management?
5. Does the workers of the ECWC across all levels speak the same language or have common understandings for risk terminologies and linguistic descriptors.
6. Are the workers across all levels are free to express their concern about appearing and future risk? Or in other words does ECWC developed "no-blame" culture?

1.4 Objectives of the Study

1.4.1 General Objective of the Study

Risk Culture denotes the combined set of corporate values, norms, attitudes, competencies and behavior related to risk awareness (perception of risk) and risk taking (active business decisions) that determine a firm's commitment to and style of risk management. Risk culture is the system of values and behaviors present in an organization that shapes risk decisions of management and employees. The general objective of this study is therefore to explore the risk culture dimensions in a large construction company Ethiopian Construction works Corporation (ECWC) to measure risk management implementation through review of its operational processes as a case.

1.4.2 Specific Objectives of the Study

- To assess the risk management policies and procedures of the organization (ECWC).
- To assess the risk threshold of the organization (ECWC).
- To assess key risk indicators of the organization (ECWC)
- To assess the risk language of ECWC Employees.
- To assess the risk accountability and associated incentives of ECWC

1.5 Research Hypothesis

H0=ECWC will not be aware of integrating risk management processes in to its organizational culture to be practiced in its project's day to day activity. In other word organizational culture of ECWC doesn't have influence on risk management.

In today's global economy, inadequate risk management and lack of risk culture can threaten a company's viability. Since construction industry is subjected to uncertainty, public

construction companies like ECWC need to implement organizational risk management as an effective technique in managing risk holistically. Although the importance of organizational risk management is widely accepted, the influence of risk culture in its' implementation is unexplored (Kanu, 2020, Ching et al., 2020).

As culture is an important building block of good governance, risk culture is an essential foundation for risk management architecture (Kanu, 2020, Ching et al., 2020, Wood and Lewis, 2018)

1.6 Significance of the Study

Risk management is against human nature. Building risk culture to counteract will be an important transition from risk management as a stand-alone activity to a quantitative tool built into the key decisions and processes of an organization (Sidorenko and Demidenko, 2016). Although the mandate for risk management comes from the highest level, employees at all levels within the organization are responsible for the success of the risk management initiative too (Ashby et al., 2012, Sax and Torp, 2015). Riskculture forms the foundations for effective risk management underpinning three more tangible pillars of effectiveness: risk identification and assessment, risk quantification/mitigation and risk monitoring/reporting (Wood and Lewis, 2018)

For project management organizations like ECWC for whom risk is inevitable and way of doing their business, instead of dealing risk management as a stand-alone activity better to integrate it with their day-to-day operations; which means making risk management part of their organizational culture. Construction companies like ECWC are initially risk seekers to acquire project. Once they get the project their behavior should be changed to risk averse to minimize the negative effect of risks on project success and maximize opportunities.

Consideration of the future and making decision about it dominates the management process of all projects and as the future can't be known with complete certainty, there will be uncertainty associated with any project. Risk is associated with uncertainty and the uncertainty within project is dynamic its intensity and probability of occurrence varies with project status/phases. As a result, risk management processes need to be day today way of doing businesses or thought process in project management organizations which means need to be culture. Accordingly, this study is significant in measuring level of risk management integration within ECWC organizational culture.

The study of organizational risk management culture is also significant, useful and worthy to be developed well; for both practical applications by embedding risk management processes in organizations culture; as well helpful to develop risk management theory to transform it from dealing it as standalone process in to incorporating to organizational culture.

1.7 Scope of the Study

This study is conducted to measure the level of integration of risk management processes in ECWC organizational culture using the independent variables of risk identification, risk analysis and risk response together with organizational culture. The scop is limited within ECWC and the topic of 'organizational risk management culture'. As ECWC registered in Addis Ababa, Ethiopia and operates majorly within Ethiopia with few projects abroad in the Horn of Africa the study might cover the Ethiopian construction industry organizational risk management culture taking the case of ECWC's organizational risk management culture.

This study expected to participate board members, directors and management staffs the organization both at headquarter and on projects within Ethiopia.

1.8 Limitation of the Study

As this study considers ECWC which is public owned company the outcomes will not fully represent privet owned and share construction companies. Though questionaries are clarified well, participants of the study may manage risk in their way of understanding but may not know them in risk management terminologies, phrases and sentences included in the questionnaire; because of that the questioner addresses only professional and management staffs instead of addressing all employees.

Finance and time also another constraint for traveling to different projects of ECWC and make physical observation of their risk management practices and do some important interviews.

1.9 Definition of Terms

Risk Management: is the process in which the project manager and project team identify project risks, analyse and rank them, and determine what actions, if any, need to be taken to avert these threats (Edition, 2018).

Organizational culture: is the set of values, guiding beliefs, understandings, and ways of thinking that is shared by members of an organization and thought to new members as correct (OB course module). Like that of organizational structure or team lineup it can be used to

achieve competitive advantage and promote stakeholder interests. organizational culture is the pattern of shared values and beliefs that provide individuals the norms for behaviours in the organisation (Rohit and Webster Frederick, 1989). Organisational culture resides in the way people perceive what goes on their organisation environment (Hofstede, 2011). In the context of organisation, culture provides a sense of identity for members, generating of larger commitment and reinforcing standards of behaviour (Greenberg, 2011)

Organizational Risk Management Culture: is the set of encouraged and acceptable behaviours, discussions, decisions, and attitudes toward taking and managing risk within an institution (Ching et al., 2021). Risk culture encompasses the general awareness, attitudes and behaviours of an organization's employee toward risk and how risk is managed within the organization' (Ching et al., 2020). Risk culture is the norms of behaviour for individuals and groups within an organization that determine the collective ability to identify and understand, openly discuss and act on the organization's current and future risks (Levy et al., 2010).

Risk Culture. There is no such thing as risk culture. Instead, there is an organizational culture, in which managing risk should be an obvious, integrated action (Sidorenko and Demidenko, 2016). But for convince literatures used the phrase to replace 'Organizational Risk Management Culture'

1.10 Organization of the Study

This study organized by five chapters that follow the trend and topics research report writing of Addis Ababa University school of commerce post graduate program. Accordingly, the first chapter is an introduction with the research topic, research questions, statement of the problem, objective of the study and research hypothesis with associated relevant information. The second chapter is containing literature reviews about the research topic. The third chapter is methodology of the study that contains the research approach and design, data collection and data analysis procedures and necessary ethical considerations.

The fourth and fifth chapters are based on the collected data, chapter four focuses on analysis and discussion on the collected data. Whereas chapter five is the conclusion and recommendations based on the analysis and discussions as a continuum to chapter four.

2. Organizational Risk Management Culture:

Risk management is largely a leadership and management challenge first, not fundamentally a quantitative process as portrayed in texts on the subject. **Organizational culture drives the approach to risk.** Risk is actually qualitative and intuitive and brings out the most creative juices of project process. It is risk that generates the passion of business achievement. To overcome risk is to overcome a competitive challenge and create opportunity. Overcoming risk equals business success.

A successful risk management practice is one in which risks are continuously identified and analysed for relative importance. Risks are mitigated, tracked, and controlled to effectively use program resources. Problems are prevented before they occur and personnel consciously focus on what could affect product quality and schedules.

Risk is daily irrationality and interpersonal dynamic. It has been narrowly treated in the context of projects and project tasks. but the sources of risk are more appropriately addressed at the business and industry level first. Thus, the roots of project risk lie in the forces acting on the company, and the customer, as a whole. As a consequence, project risk cannot be separated from business planning and control. It is integral to these processes.

The ISO 31000:2018 standard emphasizes the importance of integrating risk management into all aspects of an organization's processes and decision-making. By adopting a systematic, structured, and timely approach, organizations can achieve efficiency and consistency in their risk management practices. It is crucial to ensure that risk management is customized to suit the unique needs, objectives, and context of each organization, fostering an environment of effective risk management tailored to specific circumstances.

Inclusive and dynamic risk management is another essential principle within ISO 31000:2018. Involving all necessary stakeholders with clear roles and responsibilities ensures informed decision-making across the organization. Moreover, organizations should be able to anticipate, identify, and respond to changes in their context, as well as internal changes, fostering adaptability and resilience. The standard also highlights the importance of using the best available information while accounting for human and cultural factors. Risk management should leverage the most relevant and up-to-date information, considering limitations and uncertainties. Recognizing and addressing human and cultural factors, such as individual perceptions and biases, helps create a more comprehensive and effective risk management

approach. Lastly, ISO 31000:2018 encourages organizations to learn from experience and adapt their risk management practices continually, ensuring ongoing improvement in both effectiveness and efficiency.

Therefore, top management and oversight bodies should ensure risk management is integrated into all organizational activities, demonstrating leadership and commitment by aligning risk management with the organization's strategy, objectives, and culture. They should establish a risk management approach, allocate necessary resources, assign authority and responsibility, consider risks when setting objectives, understand and communicate risks, and ensure effective implementation and operation of the risk management framework.

2.1 Risk Management

Risk is an uncertainty that matters; it can affect project objectives negatively or positively. The uncertainty may be about a future event that may or may not happen and the unknown magnitude of the impact on project objectives if it does happen. Thus, a “risk” is characterized by its probability of occurrence and its uncertain impact on project objectives.

The PMI PMBOK Six Edition defines risk management as the "systematic process of identifying, analysing, and responding to project risk." The concept aims at maximizing the probability and consequences of positive events and minimizing the probability and consequences of adverse events to project objectives.

Risk management is ultimately about creating a culture that would facilitate risk discussion when performing business activities or making any strategic, investment or project decision (Sidorenko and Demidenko, 2016).

The ISO 31000:2018 risk management principles and guidelines developed by International Organization of Standardizations (ISO) developed risk management frame work as illustrated in Figure 1 below. The model comprises of six key activities; which are communication and consultation, establishing the context, risk assessment, risk treatment, recording and reporting and monitoring and review (evaluation).

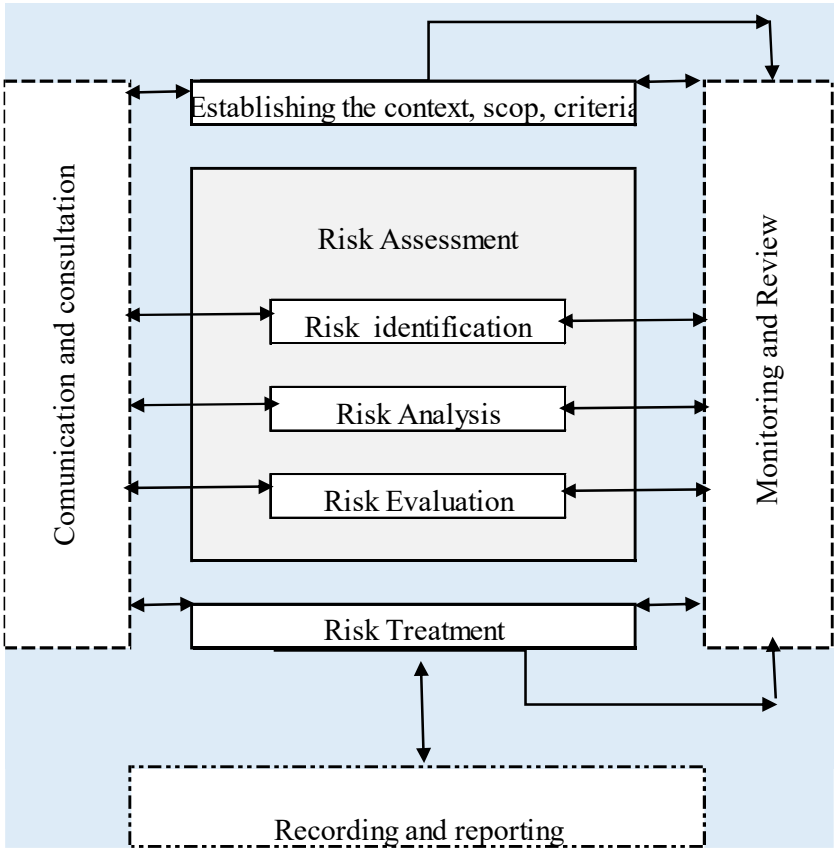

Figure 1: ISO 31000:2018 Risk Management Framework (Adapted from ISO, 2018)

2.1.1 Communication and consultation

Communication and consultation are considered to be integral part of all risk management activities which should be take place at all stages of the risk management process. This entails engaging framework prior to risk management process in order to involve both internal and external stakeholders throughout the risk management process. The framework promotes consultative team approach in order to facilitate good communication with key stakeholders, from the outset (Hutchins, 2018).

This is to ensure that those accountable for implementing the risk management process and stakeholders understand the basis on which decisions are made, and the reason why particular actions are required.

This emphasize the importance of ensuring that adequate opportunity is given to all those who need to be involved to do so in the planning and execution of risk management process.

This emphasise the importance of ensuring that adequate opportunity is given to all those who need to be involved to do so in the planning and execution of the risk management process.

2.1.2 Risk context in construction firms

Naturally, construction companies are exposed to various risks at different stages of project implementation. In projects many decisions are made on the basis of forecasts of outcomes or events occurring at some time in the future and the future can't be known with certainty. Depending on the nature of the forecast this uncertainty may relate to the likely hood of occurrence, timing of occurrence and magnitude of any consequence it brings. Project risk management concentrate on increasing the probability and impact of positive events, and decrease the probability and impact of negative events simultaneously (Edition, 2018). In addition to project risks, construction companies are facing different types of risk with the increased projects size, technology advancement and market competition (Liu et al., 2013). Subsequently, construction companies can manage various type of risks holistically in strategic setting to ensure its survival and growth through organizational risk management (Mohd et al., 2011).

Ethiopian Construction Works Corporation (ECWC) Chief Executive officer Engineer Yonas Ayalewi in his 2022- 2023 budget year nine months report to standing committee disclosed that, 'currently the corporation is constructing 63 projects worth more than 46 Billion birr, all over the country and in Djibouti'. And he added that, for the timely accomplishment of these projects the bottlenecks are construction input material and right of way problems.

The very large projects of ECWC can be risky because of their sheer scale. As mentioned by the CEO they tend to be highly resource dependent and thus vulnerable to turbulence in the supply of these resources. These very large projects can exhaust the capacity of local markets to supply its needs, creating logistical bottlenecks and driving up prices.

And the CEO also mentioned that risks that arise from regulatory environments like right of way or access to construction sites that supposed to dealt with external stakeholders.

(Cooper and Chapman, 1987) have also proposed factors relating to the riskiness of construction projects: those are large capital outlays, unbalanced cashflows, novel or unusual procurement arrangement, severe time constraints, environmental or ecological sensitivity, political and/or cultural sensitivity, situational turbulence especially in developing countries like Ethiopia where there is massive political unrest and the like.

The complexity in construction project environment can also arises from the number of elements, sub-elements their differentiation and interdependency. The decisions associated with these all is vulnerable to risk.

2.1.3 Risk Assessment

Risk assessment comprises of identifying, analyzing and evaluating risk. The first activity that is risk identification establishes the exposure of organization to risk and uncertainty in order to generate a comprehensive list of risks which may affect the attainment of organizations objectives or project objectives. These requires an intimate knowledge of the organization, industry in which the corporate, the market, legal, social, political, cultural environment in which it operates. Risk analysis which is the second activity evaluates possible causes, sources, likelihoods and consequence to establish the inherent risk. The result of risk analysis provides an input to risk evaluation and risk treatment. This result can also be used to prepare a risk profile which indicates rating of significant to each risk and provide a tool for prioritizing risk treatment efforts. The third activity that is risk evaluation, evaluate the level of risk in order to decide about further risk treatment accordingly. These involves comparing the level of risk, determined during risk analysis and risk evaluation, with defined risk criteria to prioritize the implementation of adequate measures for treatment and mitigation of the risk (ISO 3100:2018).

2.1.3.1 Risk Identification

Several risk identification techniques exist. The ingredient common to virtually all of them is brainstorming. Risk identification brainstorming could be used on its own in a completely unstructured manner. In fact, brainstorming is easier, and usually more successful, when it is guided in some way, i.e., applied within more structured identification techniques. some of the inputs that help to structure brainstorming and facilitate risk identification are:

i. Checklists are often advocated as a technique to stimulate brainstorming in risk identification.
ii. tracking project decision points with a more highly organised framework of where, when, how, and about what the decisions are made.
iii. to identify risk arises from project decision making.
iv. Risk source categorization; a way of classifying risks. This alternative form of list can provide a more structured basis for brainstorming questions along the lines: what risks of this type could arise on this project?

v. Two-dimensional project sub-element/risk source category matrix mapping technique combined with an organisational project risk register.

In addition, risks can also be identified from documents used to record or reflect the myriad of decisions made in projects. Typical among these documents are work breakdown structures (WBS), Gantt charts, activity networks, schedules, estimates, cost plans, detailed budgets, plans, drawings, specifications, performance standards and contract agreement clauses.

Some of the risk categories in construction industry identified by previous researcher are technical, financial, and safety risks. Under the topic of typical construction risks ((Reddy, 2015)) Created the following categories; The risks that may have adverse effect on the project cost and time schedule can be divided as (i) site-based risks, (ii) design/ construction related risk due to lack of coordination between team and the client, (iii) human resource and materials-based risk, and (iv) few other external factors.

Risk applied to a business framework produces SWOT (strengths, weaknesses, opportunities, and threats) analysis and other outputs that support identification of project risks.

And the following are risks categories some of them what I have been identified in my project management carrier and from teaching materials which are helpful risk categories in risk identification for construction industries: Poor productivity; Excessive wastage by workers; In adequate product quality; Sabotage; Occupational health and safety risks (injury, property damage, sickness and the like; In adequate staffing; Inappropriate Staffing **;** Inflation; Cashflow problem/ delayed payment; The action of lobby and protest group; Weather system like rain , snow, wind, temperature **;** Geological system like landslide.

2.1.3.2 Risk Analysis:

Before embarking on the risk analysis process, a stakeholder organization should investigate what prior risk allocation arrangements already exist for the project. There is little point in analyzing a risk further if it has already been allocated to another party or insured through a mechanism such as a special clause in a contract agreement.

The risk statements that are the outcome of the risk identification process form the input to the risk analysis. Risk analysis is an evaluative process that serves the purpose of establishing some understanding of the magnitude of the risks faced by an organization in undertaking a project. The analytical process decomposes each risk into its constituent components and subjects them to some form of assessment. PMBOK separates the risk analysis process into

two parts: (1) qualitative and (2) qualitative. Qualitative connotes a better description of the risk, its dimensions and its characteristics; quantitative involves getting a finer cut on risk by applying mathematical and other quantitative tools. In practice, companies rarely split the two. The point of risk analysis is to drill down on potentially high-risk tasks to get a more detailed picture of their impacts.

Risk analysis inevitably involves making estimates of variables that may lie far ahead in the future. And the future can't be known with certainty, uncertainty enters the scene. Risks are potentially analyzed for its likelihood of occurrence, its consequence and duration of exposure.

2.1.3.3 Risk Evaluation:

Once identified risks have been analyzed and scored in some way, they can be ranked in terms of relative severity. This is useful way of focusing stakeholder organizations attention on the most serious risk it faces on a project.

While a straight ranking of risks according to their severity scores is useful, an org could adopt a more strategic approach by aligning these scores to a set of predetermined risk severity categories and risk thresholds.

2.1.4 Risk treatment

Is about selecting the most appropriate risk treatment option(s); and designing risk treatment plans specifying how the treatment options will be implemented. There are four basic responses to risk: avoidance; transfer; reduce and retain residual; and retain. The first option is exclusive, since if a risk is avoided, it cannot be transferred, reduced or retained. The remaining options, however, are frequently encountered in combination. It is necessary that risk treatment techniques should provide efficient and effective internal control, as risk treatment itself can introduce new risks such as the failure or ineffectiveness of risk treatment techniques (Fadun, 2013)

The activities at this stage centers on development and implementation of specific cost-effective strategies and action plans for increasing potential benefits. Risk treatment focuses on determination of what will be done in response to the identified risks. The purpose of risk treatment is to reduce the level of unacceptable risk to acceptable level. Potential treatment options are developed based on the chosen treatment strategy. The treatment strategies will be directed towards:

- Avoiding the risk by discontinuing the activity that generates the risk or taking another course of action that avoid the probability of occurrence and consequence of a risk.
- Reducing the likelihood of the occurrence and/or reducing the consequence of the risk.
- Transferring the risk to insurance company or relevant experts. And the last but not the list is
- Retaining the risk.

The selection of the preferred treatment options must consider the financial implications and its effectiveness. Likewise, the implementation details (e.g responsibilities, time table for implementation and monitoring requirements) of the proffered strategy should be adequately documented for effective monitoring and review purposes (ISO 31000: 2018).

2.1.5 Monitoring and review

Monitoring and review ensure that the organization monitors risk performance and learn from experience. Planned regular monitoring and review of risk and organizational risk management frame work is crucial in order to keep the risk management framework relevant to changing needs of the organization and external influence. It is also necessary to monitor the effectiveness of all steps involved in the risk management process. This is to insure that changing circumstances do not alter priorities; and to facilitate easy identification and treatment of new risks as they arise. It is therefore, paramount to maintain adequate records for monitoring and review (ISO 31000:2018)

It includes:

- Improving the quality and effectiveness of process design, implementation and outcomes.
- Monitoring the risk management process and its outcomes, with responsibility clearly defend.
- Planning gathering and analyzing information, recording results and providing feedback.
- Incorporating the result in performance management measurement and reporting activities.

2.1.6 Recording and reporting:

The capturing of project risk knowledge is important for an organisation. It must be able to learn from its experiences. Without some formal means of collecting information, processing

it and placing it somehow into organisational memory, experiential risk knowledge will be left to reside in individual people in the organisation. It is the means to capture the risk 'stories' of the people involved in the project. In most cases, post-project debriefing is an appropriate method of collecting risk information.

It includes:

- Communicating risk management activities and outcomes across the organization.
- Providing information for decision-making.
- Improving risk management activities and;
- Providing risk information and interacting with stakeholders.

2.2 Risk Culture

In the context of organizations, culture provides a sense of identity for members, generating of larger commitment and reinforcing standards of behavior (Greenberg, 2011). Rohit & Webster (1989) define organizational culture as the pattern of shared values and beliefs that provide individuals the norms of behaviors in the organization. Organization culture reside in the way people perceive what goes on their organization environment (Hofstede, 2011). As a subset of organization culture, how an organization manages risk has implications not only to the dynamic system but also the members is risk culture.

Risk culture is the norms of behavior for individuals and groups within an organization that determines the collective ability to identify and understand openly discuss and act on the organizations current and future risks (Levy et al., 2010). (Ching et al., 2021)also defined risk culture as the set of encouraged and acceptable behaviors, discussions, decisions and attitudes toward taking and managing risk within an institution.

Risk culture comprises of the attitude and behaviors of individuals and groups within an organization related to risk awareness, risk taking and risk management. And risk culture encompasses the general awareness, attitudes and behaviors of an organization's employee toward risk and how risk is managed within the organization (Ching et al., 2020).

Essentially the popularized view of culture focuses on the relations among the people in the organization (Madu, 2012). Thus, the organizational risk management frame work places importance on the involvement of all level employee in organization and not only top management in implementation of organizational risk management (Ching et al., 2020).

Although the mandate for risk management comes from the highest level, employees at all levels within the organization are responsible for the success of the risk management initiative too,(Sax and Torp, 2015, Ashby et al., 2012). Organizational risk management involves participation not only from top management but also with all level of employe with a systematic approach integrating process holistically.

Organizational risk management culture positively contributes to construction companies in term of reducing losses, acting as performance indicators, improving decision making and control on projects (Liu et al., 2013).

2.2.1 Importance of risk culture in risk management implementation

Traditional risk managers used to create risk management frameworks or procedure documents to outline roles, responsibilities, and processes. While these documents became commonplace, they were typically only read by risk managers and internal auditors, failing to provide decision makers with needed risk awareness. To address this issue, we propose a more integrated approach to documenting risk management practices that fosters a robust risk culture and reinforces informed risk-taking(Sidorenko and Demidenko, 2016).

By integrating risk management elements into various business processes, companies can establish a robust risk culture in which informed risk-taking becomes a shared responsibility. This approach also emphasizes the importance of developing tailored risk management tools and methodologies for different business functions, ensuring that risk management remains relevant and practical across the organization.

Risk culture is impact of corporate culture on risk management, so if organizational culture significantly explains or deters risk management implementation implicitly risk culture either positively or negatively affects organizational risk management (Kleffner et al., 2003). Therefore, the organizational culture is critical in its decision to adopt risk management and the effectiveness of its implementation (Viscelli et al., 2016).

Risk culture is a fundamental tool for effective risk management, and organizations that consider their culture understands the dynamics and efficiency of risk management practice better than those without (Kanu, 2020)

There is a natural tendency to study risks as separate problems, to see risk as one-shot points-in time; when risks are systematically identified, assessed qualitatively and quantitatively using sophisticated mathematical models, and controlled through conceived contingency

plans. But real-world experience teaches us *that risk is, in truth, an inseparable aspect of the whole project life cycle* and its daily irrationality and interpersonal dynamic.

In a way, risk events are a result of bad planning; risk can be seen as a continuous series of individual and collective decisions in planning and managing a project. The process is not mystical and quantitative; it is organic and intuitive. Many decisions add up to a successful management of risk. The tyranny of small decisions adds up to success or failure.

The traditional risk management system which is process oriented is useful for ensuring quality and discipline, but has limitations in practical work settings. The tendency to breakdown the project planning and control process into components misses the actual dynamic in real organizations where everything goes on all the time. *Risk management has not proven to be useful as a separate process*, but rather effective only if integrated.

The risk process is essentially a thought process, a way or style of management that is ingrained in the way people work and solve project problems. Overemphasis on methods and undervaluing of the human element limit the application of the traditional separate and standalone risk management.

The current PMBOK describes contingency planning as a separate process, but in order to be effective contingency actions need to be incorporated into baseline schedules and budgets. The project manager ensures that the schedule has buffers and contingency tasks built in.

2.2.2 Risk culture dimensions

The following are discussions on risk culture dimensions namely risk policy and risk appetite; key risk indicators; accountability; incentives, risk language and internal relationships.

2.2.2.1 Risk Policy and Risk Appetite

Identifying the core mission and goals are usually part of an organization's strategy process. When consensus core mission and goals provide solutions that work repeatedly, they can be perceived as potential cultural elements(Madu, 2012). (Muralidhar, 2010) points out that by declaring the organizational risk management initiative in the organization's vision and mission statements is a way to link risk into strategy.

Subsequently, the critical linkage between strategy execution and risk management is through the determination of risk threshold (Coso, 2004). Risk threshold is an essential part of risk governance by making explicit the amount of risk that an organization is willing to take in

strategic decision ((Ching et al., 2021, McGing and Brown, 2014). The persistent challenge is to ensure consideration of risk threshold truly embedded in organizations daily operations where core objectives are understood and driving behaviors at all levels of employee (EY, 2014b)

2.2.2.2 Key Risk Indicators

A key risk Indicator (KRI) is a metric for measuring the likelihood that the combined probability of an event and its consequences will exceed the organization's risk threshold and have a profoundly negative impact on an organization's ability to be successful. Consensus on the criteria for information gathering of an organization performance can become central element of its culture (Madu, 2012). Similarly senior management can identify key risk indicators for monitoring purposes as they execute the chosen strategic initiatives. Key risk indicators are also developed in consent with strategic plans for individual business units and incorporate acceptable deviations from plans for individual business units and incorporate acceptable deviations from plan that fall within the overall risk threshold of the organization (Beasley et al., 2010). Risk owners are required to update the key risk indicators related to the organization's top risk exposures.

Benefits of KRIs include the following: advance notice of potential risks that could damage the organization; insight into possible weaknesses in an organization's monitoring and control tools; and ongoing risk monitoring between risk assessments.

2.2.2.3 Accountability

Risk is owned by the ones closest to its occurrence usually through bottom-up steps that build on existing functional capabilities (Muralidhar, 2010). However, it should not be seen replacing the top-down approach but acting in parallel and reinforcing manner. Regardless of the top-down or bottom-up approach, everyone in the organization is responsible for managing risk (McGing and Brown, 2014). Risk threshold coupled with key risk indictors not only contribute to monitoring the achievement of the organization's objective but also improving accountability ((Aureli and Salvatori, 2012) (White et al., 2015)).

2.2.2.4 Incentives

Risk-taking incentives are rewards given to individuals or organizations that encourage them to take risks. These incentives can be financial or non-financial and are designed to motivate people to take risks that they might not otherwise take. Employees understand their roles in organizational risk management implementation and feels involved in creating a common

risk culture when accountability is well defined coupled with incentives. In this manner, key risk indicators as well as accountability can be linked to risk-based incentives, defined for risk owners of all hierarchical levels (Aureli and Salvatori, 2012). The linkage between incentives and risk management to the achievement of organization's objectives also can generate a greater responsibility of top and middle managers in their decision making. When incentives are in the picture, employees are also more active in risk assessment and response (FSB,2014; Mcging & Brown, 2014). Thus, employees' contribution in discussion can result in greater efficiency of risk management and create a risk culture ((Aureli and Salvatori, 2012)

2.2.2.5 Risk Language

Communicating in common language and conceptual categories are critical for people of an organization to agree on what to do, what is important and so on (Madu, 2012). An organizational risk management mind-set and common risk language create a natural risk habitat and together dictate everyone's organization wide involvement (Althonayan et al., 2011). It is important organizations communicate through common risk language (Althonayan et al., 2011) (Boultwood and Dominus, 2014, Muralidhar, 2010) to ensure everyone is "on the same page". Besides creating pressure free atmosphere, continual performance improvement with consistent risk information can be shared across business units(Hallowell et al., 2013). Risk information such as risk threshold or response can be openly expressed in common risk language so every one can take action in order to achieve organization's goals.

2.2.2.6 Internal Relationships

Delivering consistency between leadership, employee behavior and alignment with other process are important for organizations in developing risk culture (Ching et al., 2020). relationships between management and employees with coordination can develop risk culture in organizations (Gupta, 2011). Clear and open communication with participation in implementing organizational risk management create a transparent environment, which eventually developed risk culture in the organization (Kenwood and Rafferty, 2017).

(Lloyd-Walker et al., 2014) and (Mikes and Kaplan, 2014) found that top management support in creating no-blame culture can encourage employees to speak up and discuss risk issues they were worried about. Employees at different levels can communicate with their immediate supervisor about current and emerging risks that is critical to the organization. As

a way to gain employees' commitment by involvement, building risk culture can be complemented with more social and opinion sharing meeting (Dafikpaku et al., 2011)

2.2.3 The weak-end continuums of risk culture

(Levy et al., 2010)conducted research on the strong and weak end continuums of risk culture dimensions as summarized with the following diagram figure 2. With regard to the null hypothesis chosen for the purpose of this study the weak end continuums definitions are tabulated under four groups namely: transparency of risk, acknowledgment of risk, responsiveness to risk and respect for risk.

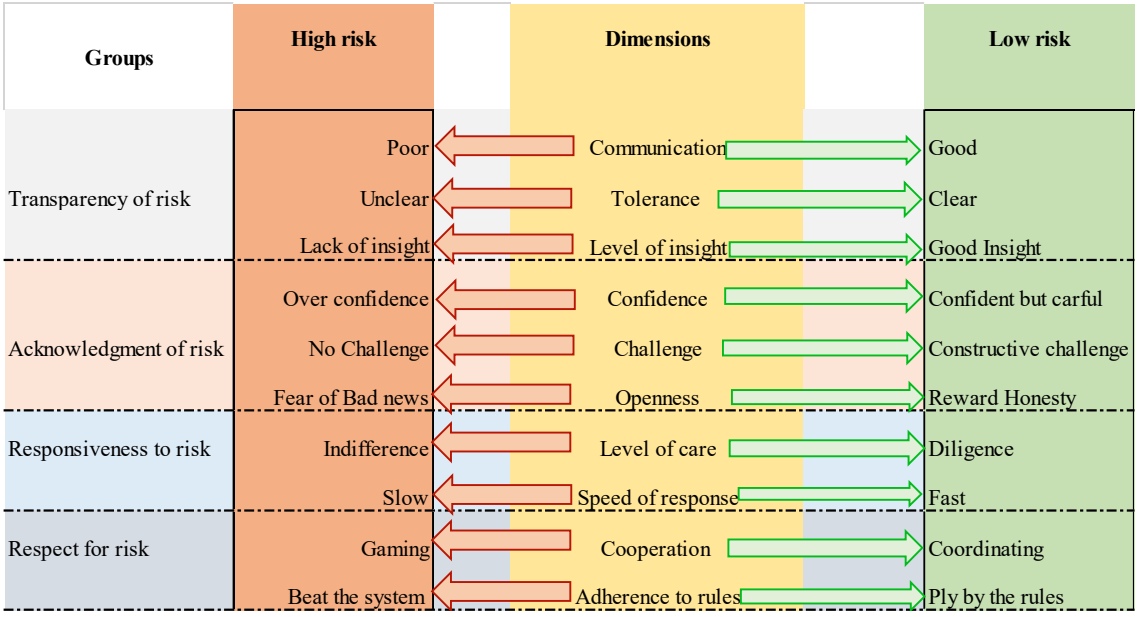

Figure 2: Risk culture frame work adopted from Twining et al. 2010

1. Transparency of risk

1.1 Poor Communication: a culture where warning signs of both internal and external risk are not shared.

1.2 Unclear tolerance: A culture where leadership doesn't communicate a clear risk appetite or fails to present a coherent approach or strategy.

1.3 Lack of insight: a culture where organization fails to understand the risks it is running or believes that such an understanding is the preserve of risk specialists.

2. Acknowledgment of risk

2.1 Over confidence: A culture where people believe that their organization is insulated or even immune from risk because of its superior position or people.

2.2 No challenge: A culture where individuals don't challenge each other's attitudes, ideas and action.

2.3 Fear of bad news: A culture where management and employees feel inhibited about passing on bad news or learning from past mistakes.

3. Responsiveness to risk:

3.1 Indifference: A culture which discourages responding to situations or fosters apathy about the outcome, either due to bad faith or incompetence.

3.2 Slow response: A culture where the organization perceives external change but reacts too slowly or is in denial about innovation and the likely impact of change.

4. Respect for risk:

4.1 Beat the system: A culture where risk appetites are misaligned with the organizations risk profile, leaving room for the conception and implementation of inappropriate activities.

4.2 Gaming: A culture where individual units take risks or embrace projects which could benefit the unit but are out of line with organizations risk appetite.

2.5 Empirical Literature Review

Risk culture is one of the constructs that are not easily quantified, creating challenges in its measurement and management. Academics and practitioners of organizational risk management and risk culture have argued without empirical evidence that there is an inherent relationship between risk culture and risk management in organizations. And they continue promoting implementation of risk management to be culture to overcome the dynamic and competitive business environment. But lack of empirical evidence to reinforce these relationships comparatively contribute to fragmented implementation and lack of proper attention to risk culture in organizational risk management implementation.

The finding of empirical research conducted by (Kanu, 2020) on 141 firms from Nigeria, Ghana and Kenya regarding the association of risk culture with organizational risk management; acknowledged that there is significant positive relationship between risk culture and organizational risk management. (Kanu, 2020) also conclude that when a sound risk culture exists in an organization risk issue are discussed and escalated at all levels within the organization. Employees can easily endorse any risk management program and will not see risk management as a compliance issue.

(Ching et al., 2021)In their empirical test on the relationship between risk culture and organizational risk management on Malysian public listed construction companies they found risk culture have direct effect and significant influence in organizational risk management. Their finding reinforces the proposition of(Wood and Lewis, 2018) risk culture influences and influenced by organizational risk management. (Ching et al., 2021) from their analysis of annual reports of Malysian construction companies and interviews they found that monitoring key risks, accountability, internal relationships, rewards & recognitions and risk policy & tolerance limit are dimension of risk culture.

2.6 Conceptual Framework

The conceptual framework determines the way a researcher formulates research problem, investigating the problem and attaches the meaning to data accruing from the investigation. It is self-designed, formed from literature review to explore risk culture in ECWC organizational risk management. As showed in Figure 3 below, the dependent variable is the main variable that lends itself as a viable factor for research (Sekaran and Bougie, 2016). They are the outcomes or results of the influence of the independent variables (Creswell, 2014). The independent variable is one that influence the dependent variable either a positive or negative way (Sekaran and Bougie, 2016). The dependent variable for this study is organizational risk management implementation which is measured by the six risk management frameworks adopted from ISO31000,2018 which are communication and consultation, establishing the context, risk assessment, risk treatment, recording and reporting and monitoring and review (evaluation). Based on literatures the independent variable under risk culture are risk policy and risk threshold, key risk indicators, accountability, incentives, risk language and internal relationships.

In Summary, this paper proposes the conceptual framework to test the organizational risk management culture of ECWC with the following diagram.

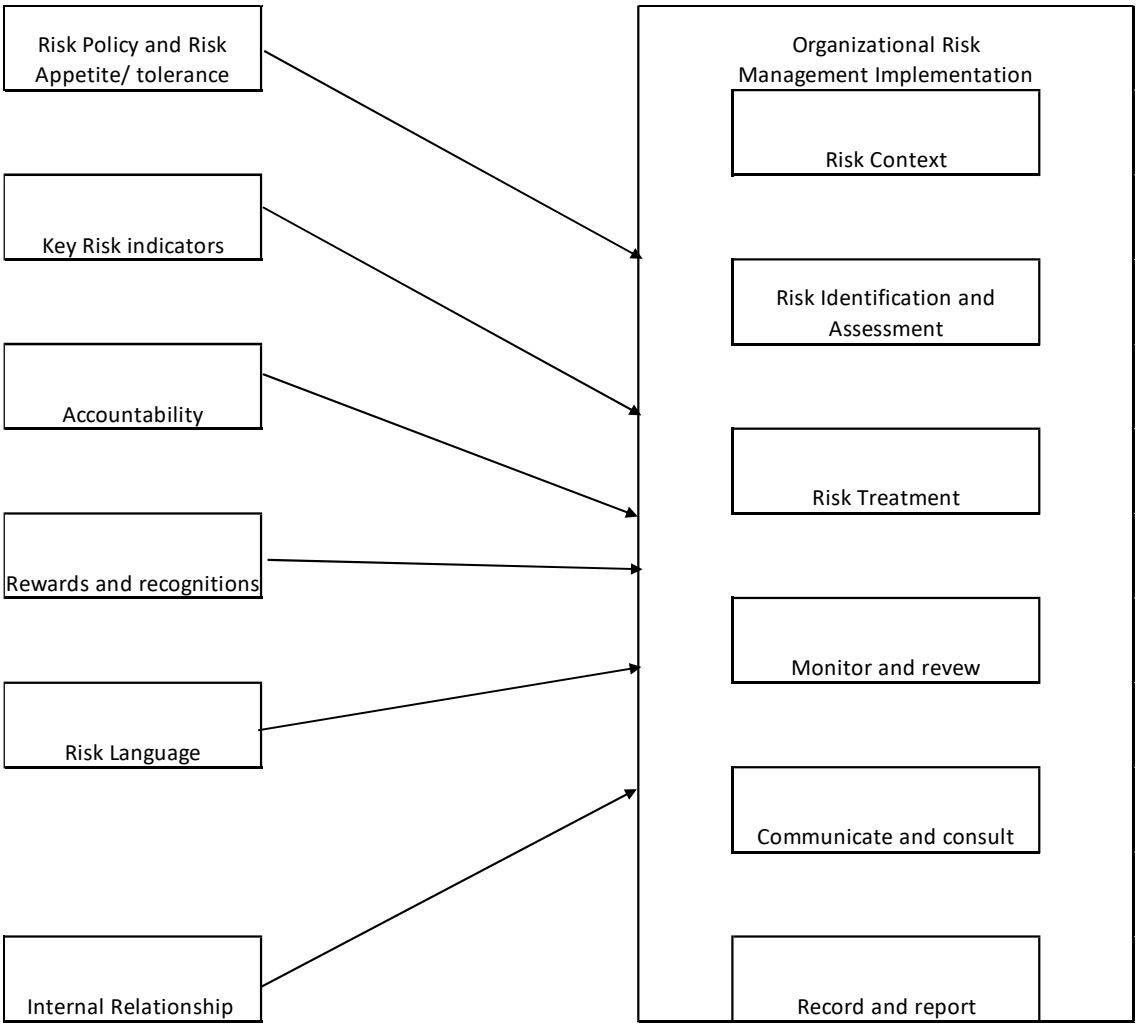

Figure 3: The proposed conceptual frame work.

CHAPTER THREE: METHODOLOGY OF THE STUDY

3.1 Research Approach

The appropriate research approach chosen to explore the presence or absence of risk management culture at Ethiopian Construction Works Corporation (ECWC) is exploratory study. I chose this approach due to the level of uncertainty in integrating risk management process with organizational culture is high. And I assume the construction industries within Ethiopia not aware of or ignorant to integrate risk management process with organizational culture.

Though it has been an emerging approach of integrating risk management process with organizational culture for effectiveness of risk management; I have doubt that this benefit understood by construction firms of Ethiopia.

3.2 Research Design

The design in terms of control method is non-experimental or prospective observational design waiting for the results of questionaries in assessing presence or absence of risk management process in ECWC organizational structure.

And based on the type of data, I chose quantitative research means for testing objectives of analyzing the presence absence of risk management process (the dependent variable) in the organizational culture of ECWC that is the independent variable together with the moderating variables such as risk identification, risk analysis, and risk response.

It is data-based research/ empirical research relies on observation alone without due regard for system and theory coming up with conclusion. Which makes it capable of being verified by prospective observation.

In terms of time period of data collection this research can be categorized under cross-section/One-tome research as I am gathering the information within short duration of not more than two weeks' time period and only once.

Based on depth of research this can be categorized as case study. Due to the scope, time and financial constraints it doesn't deeply investigate the risk management culture of Ethiopian construction industry rather it asses the risk management culture of a single construction firm ECWC as a case study to represent the country level construction industries risk management culture.

And this research is designed as conclusion oriented based on the feedback acquired from the respondents of ECWC.

3.3 Population, Sample Size and Sampling Techniques

3.3.1 Population of the Study

As we are studying cultural elements of a construction company it is expected to cover all employes of the organization but regarding our topic risk management culture of ECWC our population would be those at least aware of the topic risk management and in managerial positions whose decision have risk consequence on projects objectives. Accordingly, our desired target population will become management staffs of ECWC both at head office and projects.

For inclusion purpose the study will consider project departments, hierarchical categories such as head office, regional office and project office. And based on functions it will try to address functional managers with standard project element categories like task manager, resource manager, technical manager and coordinators.

The sampling unit for this study is individual employees of ECWC with the above desired criteria and the source list for our sampling is acquired from human resource management department of the ECWC.

3.3.2 Sample Size

The population chosen for the study are those employes of ECWC and at managerial position. Generally, from the CEO level to the team leader level those in managerial positions are 621 employes. Out of that for the study 44 peoples are chosen from five clusters. The clusters are made by projects and head office. From head office nine employes at managerial position was selected and eight replied. From four projects 35 people was selected randomly and thirty-two responded which means eight on average from each project. However, the study was not experimental, to determine the sample size I used table of required sample sizes for hypothesis testing by Cohen's d and power.

3.3.3 Sampling Techniques

The technique applied for sampling is Deliberate or Purposive Sampling to address those decision makers whose decision have risk consequence and somehow familiar with risk management terminologies and geographically those located at Addis Ababa.

3.4 Data Types and Data Sources

Mainly this study is based on quantitative method of primary data collection through questionnaire survey. The questions have three parts, the first one is general information about respondents to find the data that will be factor for our study. The second one is basic question that are helpful for testing the null hypothesis formulated. And the last or third portion of the questioner designed to collect data for measuring level of risk management culture of the corporation.

As secondary data it was planned to investigate available and accessible ECWC policies and procedures, description of employee's roles and responsibilities, induction and training manuals for new hires if any and risk related training manuals, quarterly and annual reports of the organization as well monthly, quarterly and annual reports of projects to explore risk related contents but due to lengthy bureaucratic process and the time constraint couldn't able to accesses the documents.

3.5 Data Collection Procedures

For data collection purpose structured questioners are prepared with three parts. The first four questions were about general information of respondents that are expected to be factor for the study. The second 10 questions were basic information required for assessing presence or absence of risk management culture at the corporation and the last twenty-seven questions were prepared under six categories to assess the level of risk management culture through the six risk culture dimensions. After getting permission from the corporation' human resource development office questionnaires were distributed to head office and project volunteer staffs with due explanation of the objectives of the study and necessary ethical considerations. Though all of the questions were close ended basic questions were given choice of 'Yes' or 'No' and each of the 27 main questions and statements in the third part were measured based on five-point Likert scale. Likert items were used to measure respondents, attitudes to particular questions or statement. The valid questioners returned for analysis in time was included in the report.

3.6 Data Analysis

Collected data from forty respondents initially checked for completeness and missing values then feed and analyzed by IBM SPSS Statistic software version 27. For the first 10 basic questions descriptive statics analysis required to generate frequency table of responses for each question that are helpful to test the hypothesis. Since the tables are clear and descriptive

graphs and charts was not found necessary to include. The outputs of those ten questions are interpreted and discussed just next to the respective frequency tables. For Likert item part in addition to generating frequency table of responses, ordinal mean and standard deviations are generated for each item and the discussion and interpretation of out put is done for groups under the six dimensions of risk management culture.

3.7 Ethical consideration

(Saunders et al., 2009)Noted that ethical issues in research refers to the appropriateness of one's behavior in relation to the rights of those who become the subject of one's work, or affected by it. On this study participants are ensured concerning confidentiality. Also strived to maintain truthfulness in reporting data results by ensuring that there is no fabrication, falsehood or any misrepresentation of data. The study also ensured respondents remain anonymous and data gathered will not be shared or used for other purpose.

CHAPTER FOUR: DATA PRESENTATION AND ANALYSIS

4.1 Introduction:

This chapter presents the type and analysis of data that are collected from forty respondents of Ethiopian Construction Works Corporation (ECWC) management staff for close ended questions provided to them in a questioner booklet having three categories. As indicated above in chapter three under methodology the questionaries were prepared with three parts namely general information; basic questions and main questions. And the respondents are selected randomly from the management staffs of ECWC who are working at headquarters and on four building projects located within Addis Ababa namely Kality 5000 prefabricated houses project 1 & project 2 located at Akaki-kality sub city; Addis Ababa Teachers Association Multi-Purpose nine-story building located at Yeka Sub City and 4B+G+21 Head quarter building for federal document registration agency (DARS) at Lideta Sub city.

For the descriptive analysis of the responses collected from 40 respondents for forty questions IBM SPSS version 27 is used and the results of the statistical analysis and frequency responses are presented in terms of mean, standard deviation, frequency and percentage respectively. For some relevant information bar charts are also included for easy of understanding and observation.

4.2 Response Rate

As the domain for the questioner was to address management staffs who are actively engaged in projects and at headquarter within Addis Ababa generally 50 questioner documents were prepared out of which able to distribute 44 and 39 collected physically one returned through a social medial called ‘telegram’. Total 40 out of 44 were responded which means 91% of the distributed questioners are responded without missing value.

4.3 General information of respondents

The general information of respondents required to know the age, gender, education and experience level because it matters or affects the response and are factors of understanding the questions. The descriptive statistics analysis outputs of the software SPSS version 27 are shown below from table 1 up to 4.

- ✓ From table 1 below we can observe 67.5% or 27 out of 40 respondents are above thirty-one years, accordingly better organizational culture awareness is expected from them as they might not be direct from school.

Table 1: Age of Respondents

Age of respondents		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20-30	13	32.5	32.5	32.5
	31-40	10	25.0	25.0	57.5
	41-50	13	32.5	32.5	90.0
	>50	4	10.0	10.0	100.0
	Total	40	100.0	100.0	

Source: Own survey analysis output, June 2023

Table 2: Gender of respondents

Gender of respondents		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	33	82.5	82.5	82.5
	Female	7	17.5	17.5	100.0
	Total	40	100.0	100.0	

Source: Own survey analysis output, June 2023

- ✓ From table 2 above, the percentage of female respondents are less than expected, only 17.5%. Most of the employees at managerial position within the assessed projects are male. By nature, women are attentive to things that could go wrong than men but, on this study, we might not see their sufficient representation.

Table 3: Educational level of respondent

Educational Level		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Diploma	2	5.0	5.0	5.0
	Degree	28	70.0	70.0	75.0
	Masters	10	25.0	25.0	100.0
	Total	40	100.0	100.0	

Source: Own survey analysis output, June 2023

- ✓ Majority (95%) of our respondents as we can see from table 3 above are bachelor degree holders and above this will give us confidence in clearly understanding the questioners and provide us their genuine opinion.

Table 4: Years of experience at ECWC

Years of experience		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0-5	14	35.0	35.0	35.0
	6-10	14	35.0	35.0	70.0
	11-16	4	10.0	10.0	80.0
	>16	8	20.0	20.0	100.0
	Total	40	100.0	100.0	

Source: Own survey analysis output, June 2023

- ✓ As the corporation reestablished and merger of former different sector government construction organizations 70 % of my respondents are less than 11 years of experience with the corporation and out of them 35% almost half are less than 6 years' experience with the corporation.

4.4 Response analysis for basic information questions about risk management culture of ECWC.

The basic information questions are organized to assess the presence of basic elements that are important and pre requisite for building risk management culture. The questions with their respective response frequency table and its analysis are shown below in the same order.

Q1. Does your company have policies and procedures for risk management?

Table 5: Responses frequency for availability of policy and procedure.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	34	85.0	85.0	85.0
	No	3	7.5	7.5	92.5
	I don't know	3	7.5	7.5	100.0
	Total	40	100.0	100.0	

Source: Own survey analysis output, June 2023

- ✓ As we can see from the response frequency table 5 the majority 85% of respondents acknowledged that the corporation has policies and procedures for risk management. The presence of these policies and procedures by themselves will reinforce informed risk takings and foster robust risk culture.

Q2. Does your company have active training and development programs that address risk identification, assessment and response that can help to build professional competence in handling risk issue?

Table 6: Responses frequency for active training and development programs.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	27	67.5	67.5	67.5
	No	9	22.5	22.5	90.0
	I don't know	4	10.0	10.0	100.0
	Total	40	100.0	100.0	

Source: Own survey analysis output, June 2023

- ✓ Risk-based decision-making is essential for fostering a robust risk culture and making informed risk-taking everyone's responsibility. However, not all employees have the necessary skills and competencies to apply it effectively. Employee training and development are key components in driving this change. The frequency table 6 above shows that 67.5% of respondents agree that ECWC has active training and development program that will help them in risk identification, assessment and responses. You can't see risk unless you are looking for them.

Q3. Does your company have active reporting and feedback system regarding things that could go wrong and affect either completion time, project cost or quality of product?

Table 7: Responses frequency for active reporting and feedback system.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	34	85.0	85.0	85.0
	No	3	7.5	7.5	92.5
	I don't know	3	7.5	7.5	100.0
	Total	40	100.0	100.0	

Source: Own survey analysis output, June 2023

- ✓ 85% of respondents sown above in frequency table 7 confirm that ECWC has active reporting and feedback system for things that could go wrong, this will nullify our null hypothesis "H0=ECWC will not be aware of integrating risk management processes in to

its organizational culture to be practiced in its project's day to day activity. In other word organizational culture of ECWC doesn't have influence on risk management."

Q4. Does your company have information technology capacity or use information technologies to communicate risk information quickly?

Table 8: Responses frequency IT capacity of the organization.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	22	55.0	55.0	55.0
	No	11	27.5	27.5	82.5
	I don't know	7	17.5	17.5	100.0
	Total	40	100.0	100.0	

Source: Own survey analysis output, June 2023

✓ Slightly above average only 22 out of 40 respondents say yes to the statement described above in frequency table 8. An IT platform is important mainly within business units or projects in strengthening risk management culture by creating awareness among team members.

Table 9: Response frequency for allowance of contingency budget.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	16	40.0	40.0	40.0
	No	13	32.5	32.5	72.5
	I don't know	11	27.5	27.5	100.0
	Total	40	100.0	100.0	

✓ Less than 50% acknowledges that top management allowance for contingency budget. The real-world experience teaches us that risk is in truth an inseparable aspect of the whole project life cycle and its daily irrationality and interpersonal dynamics. for proactive and panic free management of these daily irrationalities contingency plan and budget are important.

Q5. During estimating duration of your project or task, does your schedule has buffers and contingency tasks built in.

Table 10: Responses frequency for schedule buffers and contingency tasks.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	20	50.0	50.0	50.0
	No	14	35.0	35.0	85.0
	I don't know	6	15.0	15.0	100.0
	Total	40	100.0	100.0	

✓ Exactly 50% acknowledges that the corporation allows contingency tasks and buffers in scheduling tasks. The remaining 50% don't accept that the management allows contingency task and schedule buffer.

Q6. Does your company include risk awareness and risk management competencies in job descriptions or in induction trainings of new hires?

Table 11: Responses frequency for risk related job description and induction training.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	20	50.0	50.0	50.0
	No	12	30.0	30.0	80.0
	I don't know	8	20.0	20.0	100.0
	Total	40	100.0	100.0	

✓ Including risk awareness and risk managing competencies in new hires induction training and integrating risk management roles and responsibilities in job description strengthen robust risk management culture but the response frequency shown above in table 11 indicates only 50% of respondents acknowledges that there is risk awareness and risk management competencies in their job description or induction training.

Table 12: Responses frequency for likely hood of risks in ECWC.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Rare	7	17.5	17.5	17.5
	Occasionally	25	62.5	62.5	80.0
	Always	8	20.0	20.0	100.0
	Total	40	100.0	100.0	

✓ 82.5% responses show that the likely hood is occasional.

Table 13: Responses frequency for severity of risk impact in ECWC.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Insignificant	7	17.5	17.5	17.5
	Moderate	31	77.5	77.5	95.0
	Catastrophic	2	5.0	5.0	100.0
	Total	40	100.0	100.0	

✓ The severities of risk impact also moderate according to 77.5% of respondents.

Table 14: Responses frequency for risk appetite ECWC.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Zero tolerance	4	10.0	10.0	10.0
	Acceptance within qualitative limits	11	27.5	27.5	37.5
	acceptance within qualitative limits	4	10.0	10.0	47.5
	Both within quantitative and qualitative limits	12	30.0	30.0	77.5
	Don't know	9	22.5	22.5	100.0
	Total	40	100.0	100.0	

✓ The response shows that there is known level of risk tolerance that can be qualitative or quantitative.

Generally, from the basic question frequency of responses we can conclude that ECWC has policy and procedures for risk management. Its training and development program together with the reporting and feedback system also acknowledged by majority of the respondents. Whereas the presence of IT platform and IT capacity for quick reporting of risks and allowance of schedule buffer the respondents who acknowledged and not are 50:50.

Regarding incentives towards risk management in terms of allowing contingency budget for uncertain circumstances only 40% answered yes, the remaining 32.5% says no and 27.5% don’t know weather allowed or not.

Table 12 & 13 gives us the information that risks are certain to happen occasionally to the corporation and its impact is moderate. And the corporation has risk threshold in both qualitative and quantitative limits.

4.5 Response analysis to main questions about risk management cultural dimensions.

The main questions of ECWC's organizational risk management culture assessment are organized under the six dimensions of risk management culture namely: Risk related polices and appetite; Key risk indicators; Accountability; Incentives; Risk Language and Internal relationship (no blame culture). Accordingly, the analysis also summarized under this six risk culture dimensions. As the questions are close ended with answering options of Strongly Disagree=1 ; Disagree= 2 ;Uuncertain= 3, Agree=4 and Strongly Agree=5 with corresponding ordinal value from 1 up to 5 the respective statistical mean and standard deviation gives sense and used for the analysis.

4.5.1 Response analysis for the variable policy and procedures related to risk management.

Table 15: Statistical analysis of ECWC's policy and procedure related to risk management.

		At ECWC risk analysis is an important step and prerequisite in significant decisions.	ECWC improve risk awareness through risk-based decision-making training	ECWC has system of capturing and reporting risks on completed task or project and communicate it back	ECWC has policies and procedures that require its workforce to go through disciplined risk planning, identification, assessment and risk response
N	Valid	40	40	40	40
	Missing	0	0	0	0
Mean		3.90	3.58	3.30	3.73
Std. Deviation		.744	1.083	.966	.816

For those questions whose ordinal mean of responses greater than 3.5 tells majority of the respondent is in agreement with the respective statement. Accordingly, the risk management culture of ECWC in terms of making risk analysis prerequisite in significant positions; improving risk awareness through risk-based decision-making training and having polices and procedures for disciplined risk planning, identification, assessment and response are acknowledged by 80%, 65% and 70% of respondents as we can see below from the response's frequency table 16, 17 & 19 respectively. Look at tables in Appendix B.

Whereas only 42.5% in agreement with the statement ECWC capturing and reporting risks on completed tasks or projects and communicate it back so that individuals will not re-invent the same risk again and again. From the table 18 and its respective graph we do understand that ECWC has some lacings in its risk repository.

Table 16: Responses frequency for capturing and reporting risks and communicate it back.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	2.5	2.5	2.5
	disagree	7	17.5	17.5	20.0
	uncertain	15	37.5	37.5	57.5
	Agree	13	32.5	32.5	90.0
	Strongly Agree	4	10.0	10.0	100.0
	Total	40	100.0	100.0	

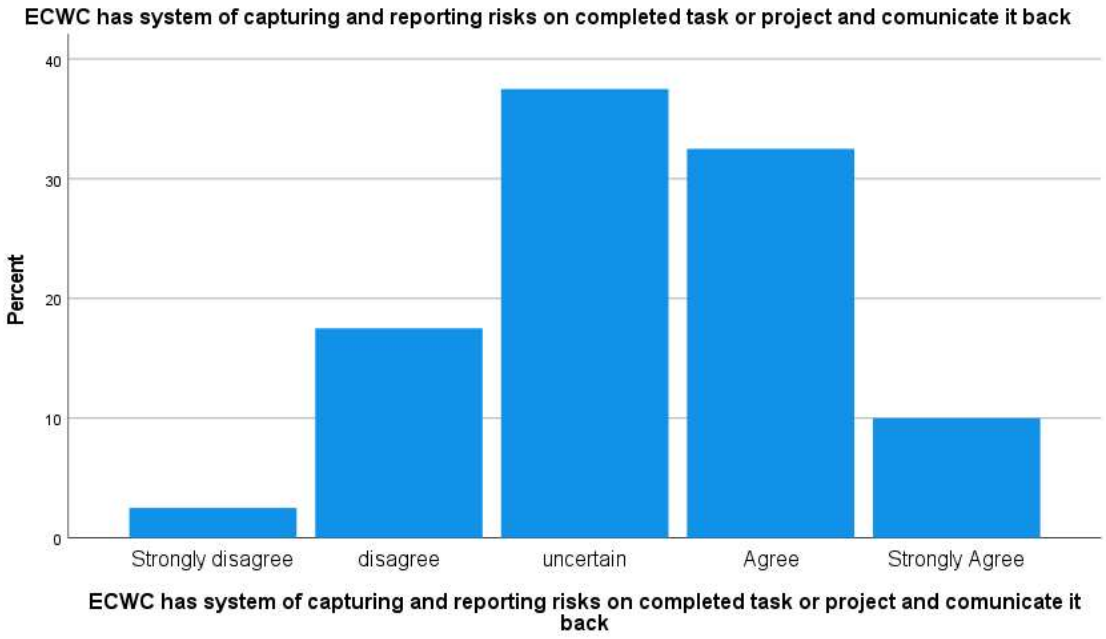

Figure 4: frequency of responses for risk capturing and reporting on completed tasks.

4.5.2 Response analysis for the variable key risk indicators

Table 17: Statistical analysis for identified key risk indicators.

		Design errors and omissions	Unexperienced, inappropriate staffing or inadequate staffing	Failure to comply with contractual quality requirement	Delays in accessing construction sites and/or expired temporary construction permits	Property cost overrun.
N	Valid	40	40	40	40	40
	Missing	0	0	0	0	0
Mean		3.80	3.60	3.63	4.03	3.80
Std. Deviation		.883	.955	.952	.832	.992

		Unpredicted weather; landslide and/or other geological risks like foundation failure
N	Valid	40
	Missing	0
Mean		3.75
Std. Deviation		.707

Source: own survey analysis output, June 2023.

The mean value of the responses to identified key risk indicators is greater than 3.5 for all the six questions and the average number of respondents in agreement with all identified key risk indicators are more than 70%. This also another remarkable point in nullifying our null hypothesis regarding the risk management culture of ECWC. Frequency tables of the responses for the respective key risk indicator are attached as table 21-26 in appendix B.

Those who agreed that design error and omission are risk indicators account 29 out of 40 respondents in percent 72.5. Those in agreement with inappropriate and inadequate staffing and failure to meet contractual quality risk are both 27 out of 40 respondents in present 67.5. Those in agreement with right of way risk are 31 out of forty respondents in percent 77.5. And those in agreement with property cost overrun risk and unpredicted weather risk are 75% and 70% respectively.

4.5.3 Response analysis for the variable 'accountability.'

Table 18: Statistical analysis of accountability

		In Decision-making do you check and take measures for things that could go wrong	ECWC integrate risk information throughout the annual report and discussing relevant risks in sections like annual turnover	ECWC have roles and responsibilities related to risk management	Project managers are accountable for delays
N	Valid	40	40	40	40
	Missing	0	0	0	0
Mean		3.58	3.45	3.23	3.45
Std. Deviation		1.010	.932	1.250	1.108

Slightly above average number of respondents are in agreement with statements related to risk management accountability.

4.5.4 Response analysis for the variable 'incentives:'

Table 19: Statistical analysis for Incentives.

		top management support in acquiring additional resources	ECWC have financial and non-financial incentives like promotions for those taking risks	Risks are allocated to whom who can best manage ECWC
N	Valid	40	40	40
	Missing	0	0	0
Mean		3.20	3.15	3.33
Std. Deviation		1.067	.949	1.023

Compared to the above three cultural dimensions less respondents are in agreement with incentives provided for risk management. Only risk allocation to whom best mange it got exactly 50% agreement others like top management support in acquiring additional resource for uncertain circumstance and financial and non-financial incentives for managing risk have got 45% and 40% scores in agreement.

Table 20: Responses frequency for top management support in acquiring additional resources.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	3	7.5	7.5	7.5
	disagree	7	17.5	17.5	25.0
	uncertain	12	30.0	30.0	55.0
	Agree	15	37.5	37.5	92.5

	Strongly Agree	3	7.5	7.5	100.0
	Total	40	100.0	100.0	

Table 21: Responses frequency for financial and non-financial incentives.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	3	7.5	7.5	7.5
	disagree	5	12.5	12.5	20.0
	uncertain	16	40.0	40.0	60.0
	Agree	15	37.5	37.5	97.5
	Strongly Agree	1	2.5	2.5	100.0
	Total	40	100.0	100.0	

Table 22:Responses frequency for 'risks are allocated to whom who can best manage it. '

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	3	7.5	7.5	7.5
	disagree	4	10.0	10.0	17.5
	uncertain	13	32.5	32.5	50.0
	Agree	17	42.5	42.5	92.5
	Strongly Agree	3	7.5	7.5	100.0
	Total	40	100.0	100.0	

4.5.5 Response analysis for the variable risk language:

Table 23: Statistical analysis of responses related to risk language

		Construction projects are exposed to various risks at different stages of project implementation	ECWC conduct SWOT analysis as a corporation and include outcomes such as opportunity and treats in its project planning and implementation	Work breakdown structure (WBS) or bill items are inputs for risk identification	Technical specifications/ designs/drawings are inputs for risk identification.	Cost estimate and resource plan are used as inputs for risk identification
N	Valid	40	40	40	40	40
	Missing	0	0	0	0	0
Mean		4.08	3.43	3.73	3.73	3.75

Std. Deviation	.797	.874	.816	.679	.670

		Discussions supported by different guidelines applied to identify risk
N	Valid	40
	Missing	0
Mean		3.88
Std. Deviation		.791

Here the mean value and standard deviation have significant meaning in measuring similarities of respondents' response as it leads to conclusion of having similar risk language. According both the standard deviation and mean value shows above average of respondents have common understanding regarding risk management. Those in agreement with 'construction projects are exposed to varies risks' are 85%. Those in agreement with ECWC conduct SWOT analysis and use it as input for risk management are 57.5%. Those in agreement with the idea of using WBS and technical specification as source of risk identification are 70% and 75% respectively. Those in agreement with other risk identification inputs mentioned in table 41 & 42 are 72.5% and 80% respectively. The frequency tables of the variables starting from 37 up to 42 are attached in Appendix B.

4.5.6 Response analysis for the variable 'no-blame' culture

Table 24: Statistical analysis of responses for' no-blame culture' variables

		At ECWC there is transparent risk discussion among stakeholders	ECWC employees don't hesitate to communicate mistakes	ECWC encourage business units and projects to report risks	ECWC advice its workers to avoid risk often at the expense of the opportunity.
N	Valid	40	40	40	40
	Missing	0	0	0	0
Mean		3.33	3.08	3.60	3.55
Std. Deviation		.917	.997	.955	.932

The respondents in agreement with transparent risk discussion with stakeholders are only 45% less than half. And also, the respondents in agreement with the statement employees don't hesitate to communicate mistakes are only 37.5% which implies ECWC need to work more in internal communication and transparent discussion. The response for encouraging business units and projects to report their own risks are relatively better in agreement with 60%.

Table 25: Responses frequency for transparent risk discussion among stakeholders.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	2.5	2.5	2.5
	disagree	6	15.0	15.0	17.5
	uncertain	15	37.5	37.5	55.0
	Agree	15	37.5	37.5	92.5
	Strongly Agree	3	7.5	7.5	100.0
	Total	40	100.0	100.0	

Table 26: Responses frequency for don't hesitate to communicate mistakes.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	4	10.0	10.0	10.0
	disagree	5	12.5	12.5	22.5
	uncertain	16	40.0	40.0	62.5
	Agree	14	35.0	35.0	97.5
	Strongly Agree	1	2.5	2.5	100.0
	Total	40	100.0	100.0	

Table 27: Responses frequency for encouraging business units and projects to report risks.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	2.5	2.5	2.5
	disagree	4	10.0	10.0	12.5
	uncertain	11	27.5	27.5	40.0
	Agree	18	45.0	45.0	85.0
	Strongly Agree	6	15.0	15.0	100.0
	Total	40	100.0	100.0	

. CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Summary of findings

The study for risk management culture of Ethiopian Construction Works Corporation (ECWC) made by close ended ten basic questions and twenty-seven main questions summarized as shown below framed with the six-risk management cultural dimensions. As mentioned above in chapter four the respondents of this study were selected by their managerial position and the response is collected from head office and four building projects management staff of ECWC.

- To assess the risk management policy and risk appetite of the corporation four basic questions and four main questions were forwarded to respondents. As observed from the frequency response tables, table 5 to7, and 14 to 18 about 85% of respondents acknowledged that the corporation has risk management policies and active reporting and feedback system for risk events. Out of the same respondents 67.5% agreed that the corporation has risk management related active training and development program as well it has either quantitative or qualitative threshold limits for risks. Most importantly 80% of the respondents acknowledged that risk analysis is an important step and prerequisite in significant decisions. However, less than 50% only 17 out of 40 respondents in agreement with the statement ECWC has risk repository.
- To assess the risk management culture of the corporation in identifying key risk indicators (KRI) six common key risk indicators of construction projects have been forwarded to respondents' weather they are also identified as risk indicators or not in the corporation. As we can see from the frequency table of response table 21 up to 26, on average more than 70% of respondents agreed on all of the six risk indicators have been also identified by the corporation as KRI.
- To measure culture of accountability related to risk management one basic questions and four main questions were forwarded to respondents. Those in agreement with there is roles and responsibilities of risk management in their job description and those not agreed are fifty-fifty in percent. Those in agreement with accountability for delays of delivery and those in agreement with accountability related to risk management being included in new hire induction training are both less than 50%.
- The assessment of cultural dimensions related to incentives, rewards and recognitions for risk management were measured by two basic questions and three main questions. The frequency of responses summarized in table 9 and 10 above shows that contingency plan

and budget for uncertain circumstance not allowed. And the response frequency in table 29-31 indicates that on average more than 50% of respondents doesn't agree on presence of top management support and incentives for risk management.

- The frequency of responses for two basic and six main questions raised for assessing similarities of risk language across the corporation, above average of respondents respond in agreement with all statements.
- To assess the 'no-blame' culture and internal relationships totally one basic and four main questions were forwarded to the 40 respondents only less than average agrees on development of no-blame culture. Frequency of the response in agreement with availability of transparent risk discussion among stockholders is 45% and those in agreement with 'employees don't hesitate to communicate mistakes' is 37.5%.

5.2 Conclusion on study findings.

- The presence of risk management police and procedure by themselves reinforce informed risk taking and it is an important step in creating risk management culture. The active reporting and feedback system of the corporation will assist in maintaining the culture. However, not all employees have the necessary skills and competencies to implement the policy and exercise the reporting and feedback system; in solving this problem the acknowledged active training and development program of the corporation will assist. Making risk analysis an important step in significant decisions can greatly influence the development of risk culture.
- The similarity in responses about identified key risk indicators of the corporation will inform us the level of risk management culture in the corporation above presence and in a better position.
- We are observing from response frequency tables of 11, 30 & 31 the risk management culture of the corporation towards accountability has some lacking in terms of including risk management roles and responsibilities in job description and in induction trainings for new hires.
- One of the cultural dimensions that will strengthen risk management is allowance of contingency budget and buffer time for uncertain circumstance. But it doesn't seem getting much attention by the top management of the corporation. Only less than half of respondents are in agreement with incentives and top management supports for risk management.
- The common understanding of different risk factors key risk indicators and the similarity of responses for inputs of risk identification under risk language assessment provides to conclude an essential basis created for effective knowledge transfer, within the corporation and from one project to another.
- While there is no acknowledged transparent risk discussion among stakeholders and there is hesitation in communicating mistakes among employees difficult to conclude that 'no-blame' culture is developed and internal relationship is in good position.

The results of the quantitative measure made to asses the level of risk management culture of ECWC with respect to six risk management cultural dimensions in overall nullifies the null hypothesis "H0=ECWC will not be aware of integrating risk management processes in to its organizational culture to be practiced in its project's day to day activity. In other word

organizational culture of ECWC doesn't have influence on risk management" drafted before the assessment.

From the response rate/frequency table 12 & 13 above in chapter four the likely hood of risk to appear occasionally and above is 82.5% and its impact to be moderate and above is 82.5% which shows risk is certain for ECWC business. And

80% of respondents agree that risk analysis is an important step and pre requisite in significant decisions; And nothing that create risk culture than this. Which helps to conclude the presence of risk management culture at ECWC. In addition, more than 70% of respondents on average agree on the six key risk indicators provided in the questioner that shows in similarity of their risk language that also proofs the presence of risk management culture.

However, to strength the risk management culture of the corporation the following recommendations have been given on observed week points.

5.3 Recommendation

- While maintaining the good practices in fostering robust risk management culture through organizational policies and procedures acknowledged by respondents; it is also advisable to maintain a convenient capacity by looking backwards to the wisdom gathered from previous project risk experience. This can be done by establishing risk registry structured as a repository of organizational knowledge of project risk and it will assist the corporation doesn't reinvent the wheel each time it plans and implements a project. In other words, the lesson learned from real project experiences are recommended to be incorporated in documentation and embedded in training programs so that project managers learn from it. Communication also needs to be open to handed down project risk experiences to next generation project teams.
- One of the more practical steps in reinforcing risk culture is documenting and communicating risk management roles and responsibilities. While it's common to describe these roles and responsibilities in risk management policies, this approach may not be very effective as business units and individuals often don't feel ownership. A more effective method is to integrate risk management roles and responsibilities into existing job descriptions. As well include risk awareness and risk management competencies in new hires induction training and job descriptions. Once risk management roles and responsibilities are documented in job descriptions it's essential to establish relevant and measurable Key Performance Indicators (KPIs) that align with the overall theme of creating a robust risk culture where informed risk-taking is encouraged and rewarded. Risk management KPIs shall be integrated into the existing performance management system, or better yet, existing KPIs should be made risk-based instead of creating separate risk management KPIs (Hutchins, 2018)
- Organizations building risk management culture recommended to provide incentives for integrating risk in to the project planning and control process. The incentives for handling risk are top management support and resource. The tone of top management is important for developing a risk culture. Although many have a basic understanding of risk management, it is essential for risk managers to lead in shaping their views on the subject by providing risk awareness sessions and relevant information. For panic free and proactive risk management it is recommended that top management allows contingency plan and budget together with the baseline plan and budget. Project managers to be effective in in risk management they need to have resource backup ready to use when risk occurs. The corporation shall also remind it's employes that the purpose of risk

management is not to avoid risks but to make informed decisions and provide appropriate tradeoffs between risks and rewards. Recognition and rewards also advised for decision quality and decision-making under uncertainty. (Module page 34)

- Risk managers might also consider implementing a rewards program for active participation in risk management activities. Encouraging a "no blame" culture and communicating this throughout the company is crucial in promoting an environment where employees feel comfortable discussing risk-related issues. Instead of solely relying on risk managers to report risks to executives or boards, consider the following approach:
  - Encourage business units to report on their own risks as part of regular performance reporting and when making significant decisions. Risk managers should report risks when they hold alternative or contradictory opinions to business units or have additional information that should be considered during decision-making.
  - Risk information should flow continuously within the organization, not just during periodic risk assessments.
- Establishing a robust risk culture involves fostering effective two-way communication about risks within an organization. To improve internal risk management communication, consider these strategies:
  - Incorporate risk information sharing and escalation mechanisms into the policies and procedures.
  - Modify performance or management reporting templates to include risk analysis results.
  - Collaborate with the decision makers in report and document preparation to ensure risks are adequately addressed.
  - Develop communication channels, such as newsletters, intranet sites, or email alerts and other social medias.
  - By promoting constant and open communication about risks, risk managers can help make informed risk-taking everyone's responsibility and strengthen the organization's risk culture.

Finally, I believe and recommend this study to be useful input for assessment of correlation between risk management culture and organizational risk management processes of the corporation.

I. Appendix A: Questionnaire

Addis Ababa University

College of Business and Economics

School of Commerce

Project Management Post Graduate Program

Dear Participant,

My name is Fekadu Tolcha Gari, I am Post graduate student of Project Management at Addis Ababa University college of Business and Economics, School of Commerce. As part and Partial Fulfillment of the award of Masters Degree in Project Management am assessing the organizational risk management culture of Ethiopian Construction Works Corporation (ECWC).

I kindly request you to participate in this study by patiently completing the questionaries. And I hereby assure you that all the information will remain confidential and don't include your name in the questionaries.

I sincerely request you to respond the questions as per the actual corporation's/ project's perspective; not as per general perspective and as honestly as possible.

Needless to say, that your time is irreplaceable, please take few minutes of your precious time to complete the questionaries.

For any hesitation or inquires please use fekadu0880@yahoo.com or ✆+251 912 033018.

I thank you in advance for your valuable answers and cooperation with due regards!

Questionnaires:

General instruction and information:

Dear Participant, this questionnaire booklet has three parts: Part I -includes questions about general information of the respondent, Part II has multiple choice questions regarding basic information about risk management and part III comprises close-ended questions about the risk management culture survey.

Part I: General information of respondent: mark '✓' in the respective box '□'

1. Age: years from 20 to 30 □ from 31 to 40 □ from 41to 50 □ above 51 years □
2. Sex: Male □ Female □
3. Level of Education: Diploma □ Degree □ Masters □ PHD □ Others □
4. Total years of experience within the corporation: years from 1 to 5 □ years from 5 to 10 □ from 10 to 15 □ above 15 years □

Part II: Basic information questions regarding organizational risk management culture: mark '✓' in the respective box '□'

1. Does your company have policies and procedures for risk management? Yes □ No □ don't know □
2. Does your company have active training and development programs that address risk identification, assessment and response that can help to build professional competence in handling risk issue? Yes □ No □ don't know □
3. Does your company have active reporting and feedback system regarding things that could go wrong and affect either completion time, project cost or quality of product? Yes □ No □ don't know □
4. Does your company have information technology capacity or use information technologies to communicate risk information quickly? Yes □ No □ don't know □
5. Does the company allow you to add contingency budget for uncertain circumstances in your cost plan? Yes □ No □ don't know □

6. During estimating duration of your project or task, does your schedule has buffers and contingency tasks built in. Yes □, No □ Don't Know □
7. Does your company include risk awareness and risk management competencies in job descriptions or in induction trainings of new hires? Yes □ No □ don't know □
8. What is the likely hood of risk in your company? Risks are causes of: time overrun, cost overrun, poor quality of work, injuries and property damages and the like. Rare □ Occasionally □ Always □
9. What is the severity of risk impact in your company? Risks impacts are: time overrun, cost overrun, poor quality of work, injuries and property damages and the like. Insignificant □ Moderate □ Catastrophic □
10. What is the risk appetite/tolerance/ threshold limits of your company?

    "Zero tolerance" □ Acceptable within quantitative limits □ Acceptable within qualitative limits □ Both within quantitative and qualitative limits □ Don't know □

Part III: Main questions regarding organizational risk management culture: indicate your opinion by marking '✓' in the respective grid box corresponding to the number against the following five-point linguistic scale that best describes your perception about risk management practice of your company. (1)=Strongly Disagree, (2)= Disagree (3)=uncertain, (4)=Agree and (5)= Strongly Agree

No	Question/Statements	Strongly Disagree	Disagree	Uncertain	Agree	Strongly agree
	I. Risk related polices and procedures of ECWC	(1)	(2)	(3)	(4)	(5)
1	At ECWC risk analysis is an important step and prerequisite in significant decisions that may affect time, cost, quality, customer satisfaction or combination of them.					
2	ECWC improve risk awareness through risk-based decision-making training and making informed risk-taking everyone's responsibility.					
3	ECWC has system of capturing and reporting risks on completed task or project and communicate back to its employees so that they will not reinvent the same risk each time they plan and implement a project or task.					
4	ECWC has policies and procedures that require its workforce to go through disciplined risk planning, identification, assessment and risk response.					

	II. ECWC identified the following key risk indicators:	(1)	(2)	(3)	(4)	(5)
1	**Design risks such as:** design errors and omissions; the design process takes longer than anticipated; stakeholders request late changes; failure to carry out works in accordance with the contract due to difficulty of the design for implementation.					
2	**Organizational risks such as:** unexperienced, inappropriate staffing or inadequate work force and staff turnover; delayed deliveries and/or lack of protection on a construction site.					
3	**Project management risks such as:** failure to comply with contractual quality requirement; Scheduling errors subcontractor delays; project team conflicts and the like.					
4	**Right of way risks such as**: delays in accessing construction sites and/or expired temporary construction permits and the like.					
5	**Construction risks such as:** property cost overrun.					
6	Environmental risks such as: unpredicted weather; landslide and/or other geological risks like foundation failure.					
	III. Accountability	(1)	(2)	(3)	(4)	(5)
1	In your daily operations and decision-making do you check and take measures for things that could go wrong?					
2	ECWC integrate risk information throughout the annual report, discussing relevant risks in sections like annual turnover and/or corporation profitability.					
3	Does your job description at ECWC have roles and responsibilities related to risk management?					
4	Project managers are accountable for delays, cost overruns and or property damages and poor quality of products.					
	IV. Incentives	(1)	(2)	(3)	(4)	(5)
1	ECWC professionals have top management support in acquiring additional resources as backup and contingency plans ready to use when risk occur.					
2	ECWC have financial and non-financial incentives like promotions for those taking risks, manage it and maximize corporation's benefit.					
3	Risks are allocated to whom who can best manage it.					
	V. Risk Language	(1)	(2)	(3)	(4)	(5)
1	Naturally, construction projects are exposed to various risks at different stages of project implementation.					
2	ECWC conduct SWOT analysis as a corporation and include outcomes opportunity and treats in its project planning and implementation.					

3	Work breakdown structure (WBS) or bill items are inputs for risk identification.					
4	Product description/ Technical specifications/ designs/ drawings are inputs for risk identification.					
5	Schedule/Gant chart, cost estimate and resource plan used as inputs for risk identification to show bottlenecks.					
6	Brainstorming/ informal meetings and discussions supported by different guidelines applied to identify risk.					
	VI. Internal Relationship/ "No blame culture"	(1)	(2)	(3)	(4)	(5)
1	At ECWC do you make transparent risk discussion with your team members, supervisors or stakeholders for informed risk taking?					
2	At ECWC employees don't hesitate to communicate mistakes and there is sufficient sharing of and learning from mistakes.					
3	ECWC encourage business units and projects to report on their own risks as part of regular performance reporting and when making significant decisions.					
4	ECWC advice its workers to avoid risk often at the expense of the opportunity.					

Once again, Thanks very much for your valuable time and responses.

With Regards!!

II. Appendix B. response analysis frequency tables.

Table 28: Responses frequency for risk analysis being prerequisite in significant decisions.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	2.5	2.5	2.5
	uncertain	7	17.5	17.5	20.0
	Agree	26	65.0	65.0	85.0
	Strongly Agree	6	15.0	15.0	100.0
	Total	40	100.0	100.0	

Source: Own survey response analysis output, June 2023

Table 29: Responses frequency for availability of risk-based decision-making training.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	3	7.5	7.5	7.5
	disagree	3	7.5	7.5	15.0
	uncertain	8	20.0	20.0	35.0
	Agree	20	50.0	50.0	85.0
	Strongly Agree	6	15.0	15.0	100.0
	Total	40	100.0	100.0	

Source: Own survey response analysis output, June 2023

Table 30: Responses frequency for policies and procedures to go through disciplined risk planning, identification, assessment and risk response.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	disagree	4	10.0	10.0	10.0
	uncertain	8	20.0	20.0	30.0
	Agree	23	57.5	57.5	87.5
	Strongly Agree	5	12.5	12.5	100.0
	Total	40	100.0	100.0	

Source: Own survey response analysis output, June 2023

Table 31: Responses frequency for design errors and omissions.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	2.5	2.5	2.5
	disagree	2	5.0	5.0	7.5
	uncertain	8	20.0	20.0	27.5
	Agree	22	55.0	55.0	82.5
	Strongly Agree	7	17.5	17.5	100.0
	Total	40	100.0	100.0	

Source: Own survey response analysis output, June 2023

Table 32: Responses frequency for unexperienced, inappropriate staffing or inadequate staffing.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	2	5.0	5.0	5.0
	disagree	3	7.5	7.5	12.5
	uncertain	8	20.0	20.0	32.5
	Agree	23	57.5	57.5	90.0
	Strongly Agree	4	10.0	10.0	100.0
	Total	40	100.0	100.0	

Source: Own survey response analysis output, June 2023

Table 33: Responses frequency for failure to comply with contractual quality requirement.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	2.5	2.5	2.5
	disagree	5	12.5	12.5	15.0
	uncertain	7	17.5	17.5	32.5
	Agree	22	55.0	55.0	87.5

	Strongly Agree	5	12.5	12.5	100.0
	Total	40	100.0	100.0	

Source: Own survey response analysis output, June 2023

Table 34: Responses frequency for delays in accessing construction sites.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	disagree	2	5.0	5.0	5.0
	uncertain	7	17.5	17.5	22.5
	Agree	19	47.5	47.5	70.0
	Strongly Agree	12	30.0	30.0	100.0
	Total	40	100.0	100.0	

Source: Own survey response analysis output, June 2023

Table 35: Responses frequency for property cost overrun.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	2	5.0	5.0	5.0
	disagree	2	5.0	5.0	10.0
	uncertain	6	15.0	15.0	25.0
	Agree	22	55.0	55.0	80.0
	Strongly Agree	8	20.0	20.0	100.0
	Total	40	100.0	100.0	

Source: Own survey response analysis output, June 2023

Table 36: Responses frequency for unpredicted weather; landslide and/or foundation failure.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	disagree	2	5.0	5.0	5.0
	uncertain	10	25.0	25.0	30.0
	Agree	24	60.0	60.0	90.0

	Strongly Agree	4	10.0	10.0	100.0
	Total	40	100.0	100.0	

Source: Own survey response analysis output, June 2023

Table 37: Responses frequency for checking things that could go wrong in decision making.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	2.5	2.5	2.5
	disagree	5	12.5	12.5	15.0
	uncertain	11	27.5	27.5	42.5
	Agree	16	40.0	40.0	82.5
	Strongly Agree	7	17.5	17.5	100.0
	Total	40	100.0	100.0	

Source: Own survey response analysis output, June 2023

Table 38: Responses frequency for integrating risk information through the annual report.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	2	5.0	5.0	5.0
	disagree	3	7.5	7.5	12.5
	uncertain	13	32.5	32.5	45.0
	Agree	19	47.5	47.5	92.5
	Strongly Agree	3	7.5	7.5	100.0
	Total	40	100.0	100.0	

Source: Own survey response analysis output, June 2023

Table 39: Responses frequency for job description having roles and responsibilities related to risk management.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	5	12.5	12.5	12.5
	disagree	7	17.5	17.5	30.0
	uncertain	7	17.5	17.5	47.5

	Agree	16	40.0	40.0	87.5
	Strongly Agree	5	12.5	12.5	100.0
	Total	40	100.0	100.0	

Source: Own survey response analysis output, June 2023

Table 40: Responses frequency for accountability of project manager in delays.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	3	7.5	7.5	7.5
	disagree	5	12.5	12.5	20.0
	uncertain	8	20.0	20.0	40.0
	Agree	19	47.5	47.5	87.5
	Strongly Agree	5	12.5	12.5	100.0
	Total	40	100.0	100.0	

Source: Own survey response analysis output, June 2023

Table 41: Responses frequency for construction projects are exposed to various risks.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	2.5	2.5	2.5
	uncertain	5	12.5	12.5	15.0
	Agree	23	57.5	57.5	72.5
	Strongly Agree	11	27.5	27.5	100.0
	Total	40	100.0	100.0	

Source: Own survey response analysis output, June 2023

Table 42: Responses frequency for ECWC conduct SWOT analysis to be input for risk management.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	2	5.0	5.0	5.0
	disagree	3	7.5	7.5	12.5
	uncertain	12	30.0	30.0	42.5
	Agree	22	55.0	55.0	97.5
	Strongly Agree	1	2.5	2.5	100.0
	Total	40	100.0	100.0	

Source: Own survey response analysis output, June 2023

Table 43: Responses frequency for WBS or bill items are inputs for risk identification.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	disagree	5	12.5	12.5	12.5
	uncertain	5	12.5	12.5	25.0
	Agree	26	65.0	65.0	90.0
	Strongly Agree	4	10.0	10.0	100.0
	Total	40	100.0	100.0	

Source: Own survey response analysis output, June 2023

Table 44: Responses frequency for ttechnical specifications are inputs for risk identification.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	disagree	2	5.0	5.0	5.0
	uncertain	10	25.0	25.0	30.0
	Agree	25	62.5	62.5	92.5
	Strongly Agree	3	7.5	7.5	100.0
	Total	40	100.0	100.0	

Source: Own survey response analysis output, June 2023

Table 45: Responses frequency cost estimate and resource plan are inputs for risk identification.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	disagree	2	5.0	5.0	5.0
	uncertain	9	22.5	22.5	27.5
	Agree	26	65.0	65.0	92.5
	Strongly Agree	3	7.5	7.5	100.0
	Total	40	100.0	100.0	

Source: Own survey response analysis output, June 2023

Table 46 Responses frequency for the statement Discussions supported by different guidelines applied to identify risk'

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	2.5	2.5	2.5
	disagree	1	2.5	2.5	5.0
	uncertain	6	15.0	15.0	20.0
	Agree	26	65.0	65.0	85.0
	Strongly Agree	6	15.0	15.0	100.0
	Total	40	100.0	100.0	

Source: Own survey response analysis output, June 2023

REFERENCES

ALTHONAYAN, A., KEITH, J. & MISIURA, A. 2011. Aligning enterprise risk management with business strategy and information systems.

ASHBY, S., PALERMO, T. & POWER, M. 2012. Risk culture in financial organisations: An interim report.

AURELI, S. & SALVATORI, F. 2012. An investigation on possible links between risk management, performance measurement and reward schemes. *Accounting and Management Information Systems,* 11**,** 306.

BAXTER, D. & VERMEULEN, P. 2013. Intelligent ERM: evolving risk management. *Journal of Financial Perspectives,* 1.

BEASLEY, M. S., BRANSON, B. C. & HANCOCK, B. V. 2010. COSO's 2010 Report on ERM. *Current State of Enterprise Risk Oversight and Market Perceptions of COSO's ERM Framework, Research commissioned by COSO*.

BOULTWOOD, B. & DOMINUS, M. 2014. Developing an effective risk culture. *Electric Perspectives,* 39**,** 57-60.

CHING, W. C., MOHD-RAHIM, F., CHUING, L. S., ZAINON, N. & AZIZ, N. 2020. Conceptualising risk culture on Enterprise Risk Management (ERM) implementation in construction companies. *Built Environment,* 17**,** 58-69.

CHING, W. C., RAHIM, F. A. M. & CHUING, L. S. 2021. Enterprise risk management and risk culture in construction public listed companies. *Journal of construction in developing countries,* 26**,** 17-36.

COOPER, D. & CHAPMAN, C. 1987. *Risk analysis for large projects: models, methods, and cases*, Wiley.

COSO, I. 2004. Enterprise risk management-integrated framework. *Committee of Sponsoring Organizations of the Treadway Commission,* 2.

CRESWELL, J. W. 2014. *A concise introduction to mixed methods research*, SAGE publications.

DAFIKPAKU, E., ENG, M. & MCMI, M. The strategic implications of enterprise risk management: A framework. ERM Symposium, 2011.

EDITION, P. S. 2018. A guide to the project management body of knowledge. *Project Management Institute. Pensylvania*.

FADUN, O. S. 2013. Promoting 'enterprise risk management'adoption in business enterprises: Implications and challenges. *International journal of Business and management invention,* 2**,** 69-78.

GUPTA, R. 2011. *Insurance and risk management*, Alfa Publ.

HALLOWELL, M. R., MOLENAAR, K. R. & FORTUNATO III, B. R. 2013. Enterprise risk management strategies for state departments of transportation. *Journal of Management in Engineering,* 29**,** 114-121.

HOFSTEDE, G. 2011. Dimensionalizing Cultures: T he Hofstede Model in Context. *Online readings in psychology and culture,* 2**,** 2307-0919.1014.

HUTCHINS, G. 2018. *ISO 31000: 2018 enterprise risk management*, Greg Hutchins.

KANU, M. S. 2020. The Role of Risk Culture in Enterprise Risk Management Implementation. *International Journal of Business and Management,* 15**,** 13.

KENWOOD, P. A. & RAFFERTY, P. D. 2017. Exploring the culture of risk-awareness among the professoriate: the implementation of enterprise risk management in higher education. *Journal of Higher Education Management,* 32**,** 243-256.

KLEFFNER, A. E., LEE, R. B. & MCGANNON, B. 2003. The effect of corporate governance on the use of enterprise risk management: Evidence from Canada. *Risk Management and Insurance Review,* 6**,** 53-73.

LEVY, C., LAMARRE, E. & TWINING, J. 2010. Taking control of organizational risk culture. *McKinsey & Company*.

LIU, J. Y., ZOU, P. X. & GONG, W. 2013. Managing project risk at the enterprise level: Exploratory case studies in China. *Journal of Construction Engineering and Management,* 139**,** 1268-1274.

LLOYD-WALKER, B. M., MILLS, A. J. & WALKER, D. H. 2014. Enabling construction innovation: the role of a no-blame culture as a collaboration behavioural driver in project alliances. *Construction management and economics,* 32**,** 229-245.

MADU, B. C. 2012. Organization culture as driver of competitive advantage. *Journal of academic and business ethics,* 5**,** 1.

MARSHALL, A. 2016. Why risk cultures need prudence.

MCGING, S. & BROWN, A. Risk Culture Leadership, Measurement & Management–A Comparison across Industries. Actuaries Institute Financial Service Forum, 2014. 5-6.

MIKES, A. & KAPLAN, R. S. Towards a contingency theory of enterprise risk management. 2014. AAA.

MOHD, A. B. K., ASMAH, A. & ISAHAK, K. 2011. Enterprise Risk Management in Malaysia: A Study of the Status of Implementation, the Role of Internal Audit and The Impact on Organisational Performance. Germany: LAP LAMBERT Academic Publishing GmbH & Co. KG.

MURALIDHAR, K. 2010. Enterprise risk management in the Middle East oil industry: an empirical investigation across GCC countries. *International Journal of Energy Sector Management*.

REDDY, A. S. 2015. Risk management in construction industry-a case study. *International Journal of Innovative Research in Science, Engineering and Technology,* 4.

ROHIT, D. & WEBSTER FREDERICK, E. 1989. Organizational culture and marketing: defining the research agenda. *Journal of Marketing,* 53**,** 3-15.

SAUNDERS, M., LEWIS, P. & THORNHILL, A. 2009. *Research methods for business students*, Pearson education.

SAX, J. & TORP, S. S. 2015. Speak up! Enhancing risk performance with enterprise risk management, leadership style and employee voice. *Management Decision*.

SEKARAN, U. & BOUGIE, R. 2016. *Research methods for business: A skill building approach*, john wiley & sons.

SIDORENKO, A. & DEMIDENKO, E. 2016. *Guide to effective risk management 3.0*, RISK-ACADEMY.

VISCELLI, T. R., BEASLEY, M. S. & HERMANSON, D. R. 2016. Research insights about risk governance: Implications from a review of ERM research. *Sage Open,* 6**,** 2158244016680230.

WHITE, D. E., JACKSON, K., BESNER, J. & NORRIS, J. M. 2015. The examination of nursing work through a role accountability framework. *Journal of nursing management,* 23**,** 604-612.

WOOD, A. & LEWIS, A. 2018. Risk culture development and its impact: the case of the Caribbean Development Bank. *International Journal of Business and Economic Development (IJBED),* 6.