THESIS

Approaches to risk management in international projects:

A comparative case study

BY

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PREFACE

In my earlier career in international development and through past academic endeavors, I have come to learn about and experience firsthand that many international projects fail or do not deliver on intended outcomes and goals. I commenced work and studies in the field of risk management in 2015. Then I came to appreciate that many of the projects I had been involved with lacked attention to risks and risk management as part of project management. In fact, the UN agency I worked with in Sierra Leone had a delivery record of only 60 percent. At times, I had to pay out of my own pocket to ensure project delivery and implementation. Had I known then what I currently know about managing risks, I would have been better able to mitigate rsks and, where not possible, explain the underperformance of the projects. In hindsight, I have a deeper understanding of the reasons why projects fail or underperform, in particular in an international setting. I do believe, though, that there is a large discrepancy in failure rates between international development projects and privately implemented projects. The former types of projects rely on public (donor) funds and the outcome is usually not to make a profit. Privately funded and implemented projects, on the other hand, have greater expectations of profit and success. Hence, in privately funded projects it is in the interest of project managers to manage risks related to cost, quality and time.

When starting a new position as a risk adviser at Multiconsult in June 2019, I already had an idea of what I would like to explore – approaches to risk management in Multiconsult's international projects. Given my experiences with the complete lack of risk management in the international project management field while at the UN and other non-governmental organizations, I wanted to unearth formal and informal risk management practices within the private sector. As one of Norway's most established engineering and advising consultancy firm, Multiconsult has considerable experience implementing large projects at home and abroad. Two of the recently completed international projects, the Mt. Coffee hydropower plant in Liberia and the Jurong Rock Caverns subsea oil storage facility in Singapore, represent unique engineering projects implemented in highly diverse settings. The common denominator in these two projects is Multiconsult.

I would like to thank the interviewees for sharing information, stories and opinions on risk management within the two projects. Particularly, I would like to thank Ove Rusten and Finn Fagervik for meeting with me on several occasions to give me insight into the minute details, the history and inner workings of the Mt. Coffee and the Jurong Rock Caverns projects. Their information and contacts to other informants have been indispensable.

ABSTRACT

This paper seeks to examine how and whether approaches to risk management in international projects within one company vary. More specifically, this paper compares and contrasts approaches to risk management in Multiconsult's Mt. Coffee hydropower plant project in Liberia and Jurong Rock Caverns subsea oil storage project in Singapore. Through qualitative conversational interviews with key personnel involved in the two projects, this paper examines differences and similarities in contexts and risk profiles, risk management practices, and cultural and risk perspectives. We find that, despite the differences in contexts, risk profiles and project specifics, there were insignificant variations in approaches to risk management in Multiconsult's Mt. Coffee and Jurong Rock Caverns projects.

CONTENTS

LIST OF ABBREVIATIONS AND TABLES

EIB	European Investment Bank
GOL	Government of Liberia
HPP	Hydropower plant
ISO	International Standards Organization
JRC	Jurong Rock Caverns
JTC	Jurong Town Corporation
KfW	Kreditanstalt für Wiederaufbau/
LEC	Liberia Electricity Corporation
MCC	Millennium Challenge Corporation
MCHPP	Mount Coffee hydropower plant
Norad	Norwegian Agency for Development Cooperation
PIU	Project Implementation Unit
PRM	Project risk management

1 Introduction

How often do we hear about project delays or project budgets that have doubled or tripled from the original estimate? It seems as though projects are prone to mishaps and failure, regardless of where the projects are implemented. Frequently, infrastructure development or construction projects create newspaper headlines with information about yet another delay or cost increase. This begs the question: are delays and cost overruns in large projects ubiquitous? Not necessarily. Delays, cost overruns or other negative incidents could be identified and mitigated through risk management processes. When a company or organization decides to implement large and complex projects – be it infrastructure, engineering, construction or development projects – one of the key ingredients of project management should be risk management. Risk implies the possibility of loss or gain due to uncertainties (Munier, 2014, p. 2). Uncertainties could jeopardize project implementation by negatively affecting the cost, quality and the timely delivery of a project.

Risk management as a field of study and practice has evolved in order to deal with and reduce the potential impact of uncertainties. Risk management consists of methods, techniques, processes and measures that attempt to control the uncertainty in a project (Munier, 2014, p. 1). Even though managing risks is one of many tasks when implementing projects internationally, it is a recent phenomenon to do so in a conscious and process-oriented manner that rely on international standards and methods. Moreover, the expansion of international and national standards on how to conduct risk and security management has led to the professionalization of the field of risk management. Nonetheless, the path to rigorous risk management has been rocky- and managing risks is still less common than managing crises. It is against this backdrop that this paper seeks to examine how and whether approaches to risk management in international projects within one company vary. More specifically, this thesis looks at how and whether standardized Multiconsult risk management practices have been consistently implemented in the Mt. Coffee hydropower plant project in Liberia and the Jurong Rock Caverns subsea oil storage project in Singapore.

1.1 Research questions

Several research questions have guided data collection and the answer to the central thesis question, which is whether and how standardized Multiconsult risk management practices have been implemented in the Mt. Coffee and Jurong Rock Caverns projects. For

one, it is necessary to find out in what way approaches to risk management differ in Multiconsult's overseas projects and whether risk management is tailored to the specific project and context. Has Multiconsult adopted standardized practices and apply a 'one-size-fits-all' approach to its national and international projects? What factors contribute to differences and similarities in risk management approaches in Multiconsult projects? Has the political, socio-economic and infrastructural contexts of Liberia and Singapore had a bearing on the ways in which risk management has been conducted in the two projects? Will a standardized approach to risk management in all Multiconsult projects, regardless of context and complexity, suffice? Have cultural differences and variations in risk perspectives and practices affected the execution and implementation of risk mitigation strategies? These are just some of the underlying questions that have guided the data collection for this thesis.

Some of the expectations at the onset of conducting this study were that a large and a well-established consultancy firm will have standardized approaches to risk management in all its projects, regardless of where the project is implemented. Nonetheless, while approaches to project risk management might be similar, it is expected that risk management as pertains to operating in a high-uncertainty country like Liberia will have a different focus than a project in a stable country like Singapore. Liberia, a post-war nation, struggles with unstable and poor infrastructure, political turmoil and mass poverty. Singapore, on the other hand, is a prosperous and highly organized island-state, albeit authoritarian. As will be further discussed in Chapters 4 and 5, implementing projects in these two countries offer widely different risk spectrums and context-specific risks (risks pertaining to operating in a country). Moreover, it is expected that risks related to expatriate personnel and context-specific risks (therein political and health risks) have had a much larger impact on project risk management and project planning and implementation in Liberia, given the country's challenges. In Singapore, assumedly personnel risks and context-specific risks have potentially played a smaller role within project planning and implementation. Finally, the projects in Liberia and Singapore commenced at different times, which could imply that Multiconsult's standards and approaches were not the same at the start-up of these two projects. Risk management practices and standards evolve over time and with experiences and lessons learned.

1.2 Thesis statement

Multiconsult's standardized management systems have evolved over time, based on experiences, lessons learnt, developments in various fields of expertise, and in order to

comply with new laws, regulations and industry standards. Yet, data collected through interviews show that there were insignificant variations in approaches to risk management in Multiconsult's Mt. Coffee and Jurong Rock Caverns projects. After analyzing all the influencing factors, Multiconsult shows a consistency in the way they deliver their projects – effected through well-developed management systems, including risk management practices. The risk management system is comprehensive and holistic enough to be used in various settings. In fact, the project risk management system is not dependent upon contexts (high vs low risk), environmental and cultural factors, labour skills, industry, project specifics, staff personalities or underlying agendas, time lapses or project role. Instead, it allows for variations in risk focus over time while providing the overall framework for managing both external and internal project risks.

1.3 Structure

This thesis consists of seven chapters. Following an introduction to the topic, research questions and hypotheses in this chapter, Chapter 2 will lay the theoretical foundation for the analysis. Chapter 2 looks into risk management standards and approaches, including risk management in international projects, before attempting to define risk and discuss a constructivist approach to risk. Chapter 3 provides information about research design and chosen research methods. In chapter 4, the two cases are presented, providing both contextual and project related information on the Mt. Coffee hydropower plant project and the Jurong Roc Caverns subsea oil storage project. The main empirical findings are presented in Chapter 5. This Chapter reveals how the data collected answers the research questions and hypotheses presented. Chapter 6 discusses the empirical findings in light of the theoretical foundation outlined in Chapter 2. The concluding chapter summarizes the findings and thesis statement.

1.4 Objective

This thesis will compare and contrast Multiconsult's risk management practices in two large overseas projects: the Mt. Coffee hydropower plant project in Liberia and the Jurong Rock Cavern subsea oil storage facility project in Singapore. Exploring approaches to risk management in two very dissimilar projects allows us to discern whether standardized risk management practices should and could become company policy and practice or whether

contextual differences disallow a 'one-size-fits-all' template. If a standardized risk management approach proves adequate, this will lighten and streamline the risk management load for project management teams at home and abroad as they have recognizable risk tools across projects.

The scope of this paper does not allow for a thorough investigation or evaluation of the quality of each risk assessment or risk tools employed in the two projects or an examination of how risks were identified and mitigated.

1.5 Background and context

Since its establishment in 1908 as a small engineering firm, Multiconsult has since grown to encompass nearly 3000 employees with several acquisitions through the years and daughter companies abroad. Multiconsult remain one of Norway's largest and oldest engineering and advising consultancy companies. Multiconsult delivers consultancy services within seven business areas, including Buildings & Properties, Industry, Oil & Gas, Transportation, Renewable Energy, Water & Environment and Cities & Society (Multiconsult, 2020). Although Multiconsult primarily operates in Norway, the company has implemented projects in over hundred countries around the world in the last forty years and continues its international presence with sales and project offices in Europe, Africa and Asia (Multiconsult [3], n.d.). The two main business areas for Multiconsult's international projects are within renewable energy and the oil and gas industry. The two projects chosen for this study, the Mt. Coffee hydropower plan in Liberia and the subsea oil storage caverns in Singapore, fall within these two specialized business areas, respectively.

Multiconsult embraces a standardized approach to project management through its enterprise management model and an internal quality management system. The Multiconsult management system safeguards compliance with laws, regulations and standards, describes work processes and systematic management and control at all levels, and ensures company results and yields (Multiconsult, 2020). Within the management system, there are three project execution processes: simplified management for projects under 1000 billable hours; standard management for medium sized projects over 1000 billable hours; and adapted management for large integrated and complex projects over 1000 billable hours (Multiconsult, 2020). Adapted management is used as management system for projects that involve several companies (joint ventures), entail geographical cooperation and scope, has high complexity

and risk, has growth potential, and projects that might receive media exposure. Both the Mt. Coffee and Jurong Rock Caverns projects were managed through the adapted management system. The adapted management system demands more attention to risk management and requires the use of risk register, risk identification (through the Ishikawa method/diagram) and business ethics evaluations (Multiconsult [2], n.d.). The Multiconsult enterprise model and the three project execution processes have evolved over time. There are continuous improvements and changes to the management system, including the risk management components. Today's tools and are not necessarily the same as the ones implemented in the JRC project in 2006 or the Mt. Coffee project in 2013. The system evolves based on experiences and best practice, as well as developments in the field of risk and project management.

This comparative case study seeks to discern differences and similarities in approaches to risk management in two of Multiconsult's projects abroad. The projects are widely dissimilar in scope, field and contexts but have Multiconsult's enterprise management in common. The following section will provide a brief overview of the Mt. Coffee and Jurong Rock Caverns projects. A more detailed description of the contexts and projects will be offered in Chapter 4.

The Mt. Coffee hydropower plant project is a rehabilitation project aimed at providing Liberia and the Liberian population with clean and affordable energy. Multiconsult (under the international brand name Norplan), together with the German company Fichtner, won the Owner's Engineer contract for the rehabilitation of Mt. Coffee hydropower plant. The role of the Owner's Engineer is to ensure, on behalf of the client or owner, that the technical and build contractors are complying with project and design specifications. The client is the Government of Liberia, represented by the Ministry of Lands, Mines and Energy and the Liberia Electricity Corporation (LEC). The project commenced in 2013. As of spring 2020, there are three contracts still running (Ullyett, date). The funders are the European Investment Bank (EIB), the German Government through its Reconstruction Credit Institute (KfW), the Norwegian Government through the Ministry of Foreign Affairs and the Norwegian Agency for Development Cooperation (Norad), the Millennium Challenge Corporation (MCC) and the Government of Liberia (Multiconsult [1], n.d.). The rehabilitation project was technically challenging given that the only remaining structure were a concrete skeleton overgrown by jungle (Multiconsult [1], n.d.). In addition to Owner's Engineers and several donors, there were the Project Implementation Unit (PIU) which oversaw project management onsite and were a semi-autonomous part of the Liberian Electricity Corporation (LEC). There were also

a number of contractors responsible for site works and construction, camp services and manufacturers of parts.

Multiconsult won the project management contract for the Jurong Rock Caverns project in Singapore in 2006. Multiconsult served as the project manager on behalf of the client, the Singapore Government represented by the Government Agency Jurong Town Corporation (JTC Corporation). The project was managed by a consortium of Multiconsult, Sintef and the Singaporean company Tritech (Multiconsult, 2014). There were several contractors involved in the construction of the caverns and shaft, the biggest one being Hyundai. The JRC project consisted of construction large underground storage caverns for liquid hydrocarbons, tunnels and shafts.

Both projects were large and complex in terms of budgets/costs, design and technical complexity, and with multiple partners and stakeholders involved. Furthermore, these projects spanned across various fields of expertise, geographical locations and entailed years of involvement. Before embarking on a more thorough and in-depth study of the Mt. Coffee and Jurong Rock Caverns projects, it is useful to look into and discuss the theoretical framework for this thesis. The following chapter will look into approaches to risk management, the meaning of risk and risk as a social construct, which provides the explanation for potential cultural differences and perspectives on risk management and mitigation.

2 Theoretical discussions and framework

This chapter delves into risk management standards in general, and project risk management in particular. Thereafter, there is a discussion on how organizations have been slow at adopting risk management strategies and the failure rates of (international) projects. Some argue that there is a link between poor or deficient risk management and project failures. The underlying assumption is that good risk management will aid project success, or at the very least, reduce risks and failures. Conversely, a lack of attention to risk and risk mitigation will result in a greater failure rate and negative consequences for project implementation. Lastly, we will discuss the meaning of risk, whether and how risk is inherently objective or a social construct, and how risk perception varies across cultures, time and contexts. Cultural and human factors shape risk management practices and approaches, or the lack thereof. This might explain variations in approaches to risk management and mitigation, despite the implementation of a standardized framework. Yet, with the advent of what Ulrich Beck terms the 'risk society', standardized risk management practices have evolved and been adopted by organizations worldwide.

2.1 Approaches to risk management

The whole premise of risk management is that we are able to prevent, reduce, eliminate or transfer risks. Risk management practices have grown out of our desire to stem uncertainties, prevent harm and avoid losses. Risk management arguably also stems from society's increased focus on risk. There exist a plethora of knowledge about, and approaches to, risk management in general and project risk management in particular. Risk management involves the various activities and measures undertaken in order to control and manage risks and uncertainties (Aven T. , 2007, p. 13; International Standards Organization, 2018, p. 1). Risk mitigation activities might be undertaken as part of concerted risk management efforts or as an unconscious ad hoc measure based on needs. Managing risks entails using methods, processes and strategies in order to identify risks, evaluate the effectiveness of risk reduction measures, and gain insight into the degree with which risks could be controlled or managed (Aven T. , 2007, p. 13).

The International Standards Organization (ISO) is crucial for the international standardization of practices within risk management. The ISO standard titled "*Risk management – Guidelines"* highlights how risk management is vital for the improvement of

organizational management in general, and for leadership in particular (International Standards Organization, 2018, p. v). More specifically, integrating risk management methods and tools helps an organization with strategies, decision-making processes and reaching goals (International Standards Organization, 2018, p. v). Most risk management literature claims risk management should become an integral part of project management- at all levels and in all phases. It is not easy, though, to know which tools, methods and processes to adopt and how to tailor these to a specific organization, project or case.

2.1.1 Risk management processes and tools

During the last few years, a plethora of risk management tools and standards have been developed and utilized. The Project Management Institute has developed standards such as the *Practice Standard for Project Risk Management* (2009), *The Standard for Risk Management in Portfolios, Programs, and Projects* (2019), and *A Guide to the Project Management Body of Knowledge* (6th ed, 2017). The Association for project management (APM) has issued the *APM Body of Knowledge* and the *Project Risk Analysis and Management Guide*, and the Global Association of Risk Professionals (GARP) also have their own standards, guides and course materials catered to risk professionals. In addition, there is a the well-known British project management certification scheme, PRINCE2, which includes risk management as part of project management. Finally, there is the already-mentioned Risk Management Guidelines ISO 31000 standard, which was first published in 2009. These are just a few of the internationally used and known standards and associations related to project risk management.

A common trait of the various risk management standards and tools is that the risk management process generally consists of three main activities: establish situational awareness and knowledge, then assess, analyze and evaluate risks, and finally manage risks. These processes will lead us to an overview of risks and hazards for an organization or a project. How do we then deal with the identified risks? Aven and Renn propose three possible outcomes of risk management: risks could present an intolerable situation (risk elimination or reduction is necessary), a tolerable situation (risk reduction is within reasonable limits) or an acceptable situation (the risk is negligible so risk reduction is usually not necessary or is voluntary) (2010, p. 121). One achieves these risk management outcomes through reducing, avoiding, eliminating, optimizing, transferring or retaining risk (Aven T. , 2007, p. 16). Risk avoidance involves removing the risk, either by not conducting the risk inducing activity or by

changing the activity in such a way that risk is avoided (Yornu & Ackah, 2019, p. 33). Risk can be transferred through insurance or contractual arrangements, or reduced through measures that decrease the likelihood or impact of risk, or both. Retaining risks implies accepting the risks or develop contingency and preparedness plans for risks that might materialize. Finally, optimizing risk implies minimizing the negative consequences and maximizing the positive consequences of a risk, or turning the potential risk to an advantage.

Risk management is about making decisions in situations that might have a high degree of uncertainty (Aven T. , 2007, p. 17). Project risk management for development projects in fragile, failed or post-conflict states involves a higher-than-average degree of uncertainty. In fact, uncertainty is the norm rather than the exception. Using standard and modified methods and processes for risk management could help reduce uncertainties and increase preparedness. ISO 31000:2018 proposes principles, a framework and a process for risk management but simultaneously encourages individual adaptations to each organization in order to achieve effective risk management (International Standards Organization, 2018, p. v).

The Risk Management - Guidelines ISO 31000 outlines the following eight principles of risk management (International Standards Organization, 2018, pp. 3-4): The first principle states that risk management should be an integral part of the activities of an organization. The second principle calls for a structured and comprehensive approach to risk management. This in turn, leads to consistent and comparable results across the organization or across projects. Adapting risk management processes, frameworks and methods to the organization's objectives is the third principle. The risk management practices should be customized and proportionate to the internal and external circumstances. The fourth principle for risk management in ISO 3100 involves including all partners and stakeholders in risk management, which will better situational and risk awareness. The next principles highlight how risks management has to be dynamic and adaptable to changes in risks and take into account current and best available information. The last two principles look at how human and cultural factors affect risk management at all levels and how risk management requires continual learning and improvement.

A risk management framework, such as the one espoused in ISO 31000:2018, provides organizations with the tools to integrate risk management in activities, decision-making, functions and project and program management. Integrating risk management implies that risk management is a part of "… the organizational purpose, governance, leadership and

commitment, strategy, objectives and operations" of an organization (International Standards Organization, 2018, p. 5). Ideally, risk management is mainstreamed throughout the organization, at all levels. This is because everyone is, to some degree, responsible for managing, reducing and treating risks. In order to integrate risk management in an organization, it is important to understand the structure and underlying context of the organization (International Standards Organization, 2018, p. 5).

Since every organization is different and, to a certain extent, unique, risk management must be adapted to the specific internal, external and cultural dynamic of the organization. What works for one organization might not be ideal for another organization. The underlying idea is still the same, though, whereby risk management forms part of the overall management of an organization. Methods, processes and products might differ and should be tailored to suit the needs of the particular organization, project or context. Moreover, the multi-faceted nature of risks for an organization: both internal and external contexts should be considered, as well as cultural and human aspects (International Standards Organization, 2018, p. v).

Managing risks at all levels and in all areas of an organization could become a highly complex venture. It is therefore useful to have a systematic approach and standardized tools and methods that aid in risk identification, analysis and management. Yet, these standards tools and methods also have to be tailored to the specific situation. Designing a risk management framework that is suitable for an organization could become a daunting task when considering the number of factors that should or could be examined from a risk perspective. Several external factors could negatively affect an organization or project. The ISO 31000 guidelines refers to the following non-exhaustive list of external contexts that should be examined for risks (International Standards Organization, 2018, p. 6):

- The social, cultural, political, legal, regulatory, financial, technological, economic and environmental factors, whether international, national, regional or local;
- Key drivers and trends affecting the objectives of the organization;
- External stakeholders' relationships, perceptions, values, needs and expectations;
- Contractual relationships and commitments; and
- The complexity of networks and dependencies.

In addition to the external context, there is a wide range of internal factors where risks may arise, including organizational culture, capability, and structure; the policies, standards and guidelines adhered to in the organization; internal and contractual relationships; data and the way information is handled and flows; and roles, accountability and interdependencies (International Standards Organization, 2018, p. 6). An organization or a project should try to establish the inner and outer boundaries of risk management. This would aid in, and delineate, where the organization's or project's risk appetite goes and where and how to implement risk mitigation measures, depending on resources, capacities and strategy (Derenyielo & Joseph, 2018, p. 36). Managing risks in projects is a limited venture, due to the temporary nature of projects. The following sections are devoted to discussions on project risk management and international project implementation.

2.1.2 Project risk management

Projects are inherently risky business, Yornu and Ackah ascertain "… and modern approaches to managing projects recognize the central need to manage the risk as an integral part of the project management discipline" (2019, p. 32). Furthermore, these modern approaches to project management recognize the importance of managing risks in all types of projects, industries and countries (Yornu & Ackah, 2019, p. 32). Implementing and integrating risk management in projects could actually be viewed "… as a project in its own right, as part of a multiproject environment concerned with all other aspects of project management…" (Chapman & Ward, 2003, s. xii). As long as projects are inherently risky undertakings, so is risk management an inherent necessity. Charles Perrow, the author of *Normal Accidents: Living with High-Risk Technologies*, claims that the inevitability of system failures and risks have brought about the need for risk management (1999, p. 43). Failures and the potential for failures form part of the inherent risks of organizations or projects. Shortcomings and failures could come from within – due to an organization's inadequacy, human error, design flaws and the like – or from "…the unpredictable and often hostile environment the organizations have to work in" (Perrow, 1999, p. 291). Implementing projects overseas in unstable and unpredictable environments presents many and often unique challenges for project implementation.

Project risk management (PRM) has evolved into a separate subfield within risk management. Managing project implementation implies managing the potential and real risks

associated with project implementation. What are the sources of risks? And how do we treat or mitigate these risks? Project risk management usually concerns itself with risks related to time (not delivering on time), cost (not delivering on budget) and quality (not delivering with expected quality).

Before embarking on a discussion about project risk management, it is essential to look into definitions and terminology within the project management literature. The Project Management Institute (PMI), an international association of project, program and portfolio managers, describes project as "… any temporary endeavour with the aim to create unique service or product" (referenced in Yornu & Ackah, 2019, p. 30). The project's purpose is to fulfill an objective or reach a goal, a defined end state, either through a completed product or service, or through a process. One person or a team of specialist functions usually manage and implement projects (Yornu & Ackah, 2019, p. 30). Moreover, a project has to have a timeframe and an end in sight rather than being a continuous activity. A project usually has a (project) life cycle that consists of timeframes, stages or phases and a description of how the project starts and ends (Yornu & Ackah, 2019, p. 33). Even though non-permanence and predefined objectives are important features of a project, other characteristics are also important, including limited budgets and set performance criteria (Yornu & Ackah, 2019, p. 33). Hence, project management is about managing limited resources (time allotted, budgeted costs) to ensure the execution of a set of tasks and activities in order to achieve or complete the main objectives.

Unsurprisingly then, project risk management identifies and measures risk on time, budget/cost and quality. Project management and risk management in projects are two sides of the same coin: In project management, we use "…skills, tools and techniques to accomplish project objectives aimed at meeting or exceeding the expectation of stakeholders. Risk management is an important part of the process to identify potential project risks and respond to such risks" (Yornu & Ackah, 2019, p. 28). The larger and more complex a project is, the greater the need for project and risk management skills and tools. Projects vary greatly in size and complexity, budget and time constraints. Infrastructure, heavy construction and industrial construction projects are often technically sophisticated and therefore carry greater risks. Construction projects, such as the hydropower plant project in Liberia and the subsea storage facility in Singapore, are defined by the physical structures that are built. Once the drawings and designs have emerged as fully functional infrastructure, the project is completed. Notwithstanding the size or scope of the project, successful project management

characterizes a successful project. This, in turn, implies achieving the main objectives and goals within the resource constraints imposed on the project.

In order to ensure a successful project delivery, managing risks or hindrances to a successful project is essential. Project risks and project outcome risks are two very different risks that are owned and handled by different stakeholders. The project owner, or the client, determines whether consultants or contractors manage project execution and contracts determine the division and distribution of risks. However, there is a distinct difference between the risks of not completing the project versus the risk of not delivering on project goals. A project could deliver according to agreed-upon time, budget and quality – yet fall short on delivering on the project goals or expected outcomes. In the case of the Mt. Coffee hydropower plant in Liberia, project risks were related to time, cost and quality. The ultimate project outcome, though, involves delivering clean and affordable electricity to the Liberian populace. This is a policy-oriented goal of improving critical infrastructure in a poor and war-torn country – and arguably more important than budget and schedule concerns. The next section takes a closer look at risk management in international projects.

2.1.3 Risk management in international projects

Organizations are increasingly integrating risk management into project management. Yet, the number of projects with cost overruns, delays and design flaws attest to the lack of risk management strategies and execution. Failures are common in domestic projects but endemic in international projects. This is because implementing a project internationally – in a country or context in which an organization and the project managers are not familiar with, presents a few extra challenges, or risks. Extensive research has been conducted on the failings of international development projects. International development projects receive a lot more attention, in research and the media, because these are usually implemented using public funds. There is far greater scrutiny of the use of public funds for projects that fail to achieve the intended objectives than for projects implemented with and by private actors. Most often, international development projects are intended to help poor people and communities – better their lives and improve livelihoods. The failings of such projects have usually larger impact than the failings of projects paid for by private enterprises.

Why are international (development) projects infamous for failing or underperforming? Building infrastructure in developing countries and fragile states torn apart from civil war present many unique challenges and risks. Ika refers to a number of surveys that demonstrate the high rate of failure among development projects: Surveys conducted by the International Finance Corporation (IFC) estimates that only about half of the World Bank's development projects in Africa are successful (Ika, 2013, p. 109). A McKinsey-Devex survey suggests that donor-funded projects fail at a rate of 64 percent (Ika, 2013, p. 109). A survey by the U.S. Meltzer Commission proposed that over 50 percent of World Bank projects failed whereas a 2010 evaluation by the Independent Evaluation Group (IEG) deemed 39 percent of World Bank projects unsuccessful (Ika, 2013, p. 108). What's more, African development projects fail at a higher rate than development projects implemented in other regions of the world. The World Bank's project failure rate exceeds 50 percent in Africa versus a 40 percent failure rate in other poor regions (Ika, 2013, p. 108). Why do so many international (development) projects fail?

The frequency with which international development projects fail, has led to a number of studies and surveys that look into causes of failure. Failures are often attributed to external causes, such as the lack of qualified workers in many developing countries and fragile states or that Africa is the toughest continent to conduct business and implement projects (Ika, 2013, p. 109). Although Ika contends that there have been general improvements in international development project management (utilizing logical frameworks, feasibility studies, needs assessments and monitoring and evaluation), there is a distinct lack of risk management in international development projects (2013, p. 100).Ika suggests that international development project management suffers from a range of problems and traps. Based on previous research, Ika has grouped project management problems in international development into three areas: 1) structural/contextual problems, 2) institutional/sustainability problems, and 3) managerial/organizational problems (Ika, 2013, pp. 109-110). A risk manager would most likely label these as risk areas rather than problem areas.

The structural/contextual risks (problem areas) could also be labelled external risks since there are factors that are not part of the project but could still affect project implementation and success. Structural/contextual risks may be sub-divided into several groups, including political, economic, physical, geographic, socio-cultural, historic, demographic and/or environmental risks (Ika, 2013, p. 112). Political risks that may impede or affect project implementation and success could be differing political agendas, power play,

political tension and turmoil, lack of accountable political institutions and, consequently, corruption and favoritism. Some of the main external economic and financial risks include macroeconomic policy issues, including currency volatility, domestic price regulations, budgetary restrictions, corruption and misuse, and for development projects, the drying up of donor funds. A number of physical and geographic risks may affect project implementation: Difficult terrain and a lack of natural resources, a harsh or volatile climate, inaccessible location, flora and fauna that suffer from project implementation, i.e. habitat loss or endangered species or flora/fauna that could make project implementation more difficult due to conservation or more dangerous. There are sociocultural factors that could present risks to project implementation, such as religious beliefs and rites, language barriers and misunderstandings, gender roles, distinct cultural traditions and beliefs. Historic risks include ethnic differences and grievances, collective action patterns (i.e. mob culture), colonialism and past experiences with (Western) development efforts and projects. Demographic challenges and environmental problems could also impede project implementation and success. Ika holds that the first step to solve these structural and contextual problems lie in awareness (2013, p. 112).

Managing risks entails assessing risks and raising awareness on how to reduce and deal with risks. Awareness of internal risks are just as important, though. Sols attests to the high failure rate of projects due to problems related to performance, cost and completing on schedule (Sols, 2018, p. 128). Although there might be a number of reasons why projects fail, inadequate risk management is usually one of them. Sols cite inadequate early phase risk identification and assessments, lack of follow-up of risk mitigation and lack of continuous attention to risks during the execution phase as some of the inadequacies (Sols, 2018, p. 128). Additionally, both successful project implementation and successful risk management for international and development projects depend on tailoring tools and approaches to the specific (African) context (Ika, 2013, p. 122). Harnessing and managing the many uncertainties of project implementation in a failed state is instrumental for successful project implementation. "Although there are few written resources for the African project manager, cross-cultural project management issues as they apply to Africa are common" (Ika, 2013, p. 122).

Ambitions and hopes have resulted in thousands of well-intentioned development projects on the African continent. Many of them have been implemented; many of them have been abandoned or have failed to reach their goals and fulfil their purpose. Although the

blame is usually dealt to structural and contextual problems, it could be argued that the reason so many projects have failed is because of poor and inadequate project management. Ika contends that "… development practitioners need to enhance project management if they would like to make this promise [of development] a reality" (2013, p. 126). Drawing from standard project management theory and practice, Ika proposes an agenda for action that addresses project management traps in international development. Ika suggests that the methodical approach to conventional project management used in i.e. construction, could inform and improve international development project management and implementation (2013, p. 126). Moreover, Derenyielo and Joseph's research on enterprise risk management in Nigeria demonstrate that large and complex organizations and projects are able to conduct risk management processes in order to maximize opportunities and reduce risks in developed as well as developing economies (2018, p. 35).

International development projects might be infamous for their failure rate. However, privately run construction projects also underperform (Yornu & Ackah, 2019, p. 27). The construction industry is vital for the infrastructural and economic development of developing nations. Yornu and Ackah, exploring risk management in the construction industry in Ghana, found that risk management in construction projects relied on previous experience rather than the use of standardized risk management methods and tools (2019). Yornu and Ackah unearth how the construction industry in Ghana and elsewhere has been troubled with low performance, despite the industry's significance to the developing economies (Yornu & Ackah, 2019, p. 27). Even in privately owned, run and financed projects, we see inadequate or flawed project and risk management. This is perhaps due to the inherent risks of construction and infrastructure projects and because many of the projects have complex systems, designs and structures.

All projects have to contend with risks, regardless of size and complexity. However, Yornu and Ackah find that the level of "…risk associated to a project is directly proportional to the size and complexity of a project" (2019, p. 28). The more complex projects become, the harder it is for CEOs, directors and managers to anticipate problems and risks across the delivery and execution chains. These projects would benefit from employing risk managers that systematically assess potential problems and challenges in wait and reduce the potential for loss or damage (Yornu & Ackah, 2019, p. 28). In larger and more complex projects, risk avoidance is not really an option. Risks could be reduced or transferred but not eliminated. This is where risk management processes and tools come in handy.

Risk management processes and tools are indeed handy in complex projects. How do we separate differentiate one project's risk profile from another? What makes a project complex and high-risk? Do we differentiate risk management depending on whether the complexity of the project or whether the context is high-risk? Yornu and Ackah find that "proposals involving research, development or immature technologies tend to be of higher risk than projects in more mature areas such as civil engineering" (Yornu & Ackah, 2019, p. 31). Nnew and pioneering civil engineering projects also carry great risks, especially related to cost variation. Yornu and Ackah point out three dimensions of project risk: firstly, the size of the project influences its risk level. Larger projects are usually more complex in terms of management, administration and communication. Secondly, the level of technological maturity is a risk factor. A project would potentially have greater risks with new, untried or innovative methods, procedures, techniques, designs or technologies. Lastly, a high structural complexity – meaning the structure of, and relationship between, teams, stakeholders and management as well as the structure of the project into smaller components, involves greater project risk (Yornu & Ackah, 2019, p. 31). These risk-enhancing factors apply to both domestic and international projects, though complexity increases with layers of governance and stakeholders across countries, legal systems and cultures. Context risks were not part of the list, but is arguably a fourth risk-enhancing factor to project implementation. The preceding sections have risk and risk management. The following section attempts to define risk and deconstruct the meaning and importance of risk by looking at risk as a social construct and the risk society theory.

2.2 What are risks and threats?

Both the practical and the academic fields of risk management have gained traction in the last couple of decades. With that, a number of researchers and institutions have attempted to define the concept of risk. Hence, there are numerous definitions and interpretations of risk. Although we generally view risks as something negative, risk can also connote opportunities, chance, progress and serendipity. Literature on risk, though, heavily focuses on risk as something negative. Aven defines risk associated with an activity as the possible consequences of that activity and the uncertainty/probability attached to the consequences (Aven T. , 2007, p. 13). Risk is in ISO 31000:2018 defined as the "effect of uncertainty on objectives" (International Standards Organization, 2018). An effect can be something that

deviates from normal and it could be either positive or negative. For instance, a deviation from the expected result or outcome of a project could be completing it before time (positive) or being delayed (usually seen as a negative effect), or according to/under budget due to i.e. beneficial exchange rates (positive) or over budget (negative). The effect of uncertainty could create or result in either opportunities or threats/risks (International Standards Organization, 2018, p. 1). Usually we refer to risk as the likelihood or probability of unintended events that bring about negative consequences (International Standards Organization, 2018, p. 1). Renn sees risk "…as the *possibility that an undesirable state of reality (adverse effects) may occur as a result of natural events or human activities*…" (2008, p. 98). This undesirable state of reality equates to dangers, hazards and threats to something we value, such as life/health, the environment, finances, material goods and property or reputation.

Renn distinguishes between risks caused by natural events or human activities (2008). Whether a wildfire or a landslide is a natural event or caused by human activity, the effect of such an event could be the same – loss of lives, livelihood, and property. As long as our values are negatively affected, it does not matter whether the risk itself is a natural event or due to human activity. We would want to reduce risks regardless of the cause. The difference is in whether and how we can prevent such events. It is arguably easier to prevent or control man-made risks. It would be hard to prevent earthquakes or tsunamis from occurring. Instead, we would have to reduce the potential consequences of these types of events. Even though natural disasters – such as earthquakes, wildfires or landslides – could be deemed objective risks, they constitute risks only insofar as these events have consequences for humans. A wildfire or landslide in a pocket of the world where humans or societies are not affected is a natural phenomenon – not a natural disaster. Some risks occur naturally, while other risks and threats are man-made due to technological advances, or as a result of human progress and activities.

In fact, the underlying premise of Beck's risk society thesis discussed below is that human activity and progress – modernity – creates more risks. In that regard, risks could be seen as the negative or unwanted consequences of initiating an activity, such as large infrastructure or construction projects (Bjelland, 2013, p. 24).Without human activity, we would not develop, evolve or prosper. Incurring (new) risks through human activity could therefore be deemed inevitable. Or perhaps the increased level of risk in today's society as a result of human activity are socially constructed and a result of people's imagination? The idea that risks are socially constructed emanates from a constructivist approach to risk. It is

worthwhile discussing constructivist theories of risk in order to gain a better understanding of how and why approaches to risk management might vary between and within organizations, projects and people.

2.3 Constructivist approach to risk

We seek to understand and gain insight into the differences and similarities in approaches to risk management in Multiconsult's international projects. Implicit in the proposed research questions is the notion that risk is socially constructed. When looking at risk as a social construct rather than an objective truth, it is important to reveal the underlying theoretical assumptions and foundation of this study: constructivism. Constructivism has its roots in the works of Max Weber, Emile Durkheim and Anthony Giddens who saw the world – systems, structures, states and the way humans organize societies – as socially constructed (Barnett, 2018, p. 86). Constructivism and social theories seek to explain the world we live in and help us "…conceptualize the relationship between agents and structures" (Barnett, 2018, p. 87).

These same theories help us understand how approaches to risk vary across time, cultures and organizations and how the variations in approaches are borne out of and embedded within a socially constructed world order. Social theories do not call into question objective truths or facts, such as the natural world, which exists independently of human agreement. Instead, social theories concern themselves with constructed realities that often mask as objective facts. These constructed realities, or social facts as Barnett calls them, "…are often treated as part of the 'natural order of things' when, in fact, their existence is dependent on human agreement" (Barnett, 2018, pp. 88-89). Risk, then, is shaped through knowledge, values and culture and does not exist independently of human perception (Engen, et al., 2016, p. 90).There are a number of social constructs that we today treat as facts, such as money, the value of gold, stocks and property, international treaties, democracy and the international system of sovereign states. These social constructs depend on agreement among groups of people – and when that agreement collapses, this particular social construct will cease to exist or decline in importance. Currency fluctuations and the rise and decline in property and stock prices are good examples of social constructs. The values of these do not exist outside of human imagination and agreement. Likewise, many of today's risks and threats are social facts that rely on human agreement for their existence. The war on drugs and

the war on terror rely on an agreement among people and politicians that drugs and terrorism pose such a threat that we need to launch 'wars' against these threats – to eliminate them. Similarly, our collective angst for nuclear power plants – and the risk these might pose – have led to an abandonment of nuclear power sources. The ever-changing and evolving focus on what poses a danger or threat to our country, our children, our health and our communities is a testament to risk as a social construct.

Constructivism helps us understand how risk is perceived, experienced and constructed by and amongst individuals, groups, organizations and institutions (Engen, et al., 2016, pp. 78-79). Risk is not only about what unintended events might occur but also about what individuals, groups, organizations and institutions value and would like to protect. Determining the value of something – for instance money, objects, employees, and reputation – is a social construct. Hence, risks that affect what we value and want to protect are also social constructs. How are risks socially constructed? Which processes and factors enable the mental construction of risks?

The anthropologist Mary Douglas contends that cultural and social processes shape how individuals and groups of people perceive risk (Engen, et al., 2016, p. 99). This contention supports the risk as a social construct thesis. How we view risk is contingent upon our background and the context in which we live and how our values are shaped and formed. Yet, and perhaps consequently, there are great variations in risk perception within the same culture. Furthermore, Douglas delves into discussions about the cultural relativity of risk perception and judgement – looking into how differences of risk perception and acceptance between people or groups in the same culture. The distinction between 'Self' and 'Other' is important in Mary Douglas' discussions on risk. When defining and viewing risk as something external, foreign or 'Other' – a deviation from the known or a lack of social order – it serves to maintain and fortify borders and protect oneself from the 'risks out there'. Otherness poses a danger. The increased focus on risks in the Western part of the world is seen as a strategy to deal with Otherness and danger (Lupton, 2013, p. 54). The aversion to non-European immigration to Europe, the focus on Jihadism and terrorist groups in other countries, the general fear of people practicing other religions and cultures are all part of the risk perception of Europeans and a way of controlling or eliminating the 'Other'.

Renn's view of risk matches Mary Douglas' weak constructionist approach: real dangers and risks exist, though our approaches and responses to risks are socially constructed. Renn agrees that risk is a mental construct: "The invention of risk as a mental construct is

contingent upon the belief that human action can prevent harm in advance" (2008, p. 2). The mental model of risk, though, is forged through observations and lived experience of deaths, health impacts, material or environmental damage, and financial losses (Renn, 2008, p. 2). Usually, some risks or dangers receive more attention than others do. Which risks achieve attention in particular cultures depend on these cultures' values and concerns. In individualistic cultures where individual human lives are highly valued, potential dangers that claim human lives, especially children's lives, receive more attention. Consequently, these cultures typically have stricter laws, regulations and more mitigation measures in place to reduce risks and dangers that could involve loss of life or health. Both Renn and Douglas believe dangers are real and objectively exist. However, the way risk is socially constructed is through the interpretation of these dangers and the belief that human action can prevent or reduce the impact of dangers (Lupton, 2013, p. 56; Renn, 2008, p. 2).

If we agree that risks are socially constructed, how do we then measure risks with the aim of mitigating risks? The emergence of risk management standards, methods and tools – and professional risk managers – raises the issue of whether risk could be objectively assessed or quantified. Can professional risk estimates and analyses assess actual or 'objective' probabilities of harm or danger, or do the assessments reflect an elite view of risk that is no more valid that any other view of risk (Renn, 2008, p. 2)? The positivist stance that science is objective and provide the 'truth' has been dismissed by social science research (Bjelland, 2013, p. 4). The methods, models and experiences of risk professionals are all value laden and represent social constructs based on a set of values and norms. Risk managers and engineers should not claim to present the truth about risks. Instead, they present "…descriptions of uncertainty or knowledge that are dependent on the analyst's or engineer's background experience and knowledge" (Bjelland, 2013, p. 5). The gathering of accident and incident data and statistics allow us to discern between dangerous and less dangerous activities, and whether risk reduction has an effect. Yet, the lay public or even other stakeholders might not always agree with or condone the results presented by risk professionals. Differences in risk perception between groups of people is not about the lack of knowledge or education as much as it is about conflicting political, moral or aesthetic views on risk (Lupton, 2013, pp. 54-55).

Attempts to communicate or educate the lay public or affected groups about risks may fall short of settling risk disputes insofar as the premise of these attempts is that the lay public is only uninformed or uneducated (Lupton, 2013, pp. 54-55). In fact, "[t]he modus operandi of risk perception will vary according to circumstance" (Mythen, 2004, p. 144). The lay public

or affected groups have their own view of how they will be affected by potential risks. The lay public's risk perceptions are no less valid than the risk professionals' systematic analyses of risk based on information about prior events, statistics and context. Through both processes, it is possible to construct or amplify or negate risks. Mythen asserts that "[i]n negotiating risk, various coping strategies will be operationalized. We need to retain the idea of lay actors as rational subjects, whilst remaining receptive to the emotional, habitual and fatalistic influences that steer individual interpretations of risk" (2004, p. 144). Given the attention paid to risk by both the lay public and the increasingly professional risk field, some go as far as to claim we live in a risk society. Ulrich Beck, a known German sociologist, coined the term risk society. In the following section, we will discuss whether and how we live in risk society.

2.4 Risk society

Ulrich Beck's *Risk Society: Towards a New Modernity* (first published in German in 1986 and in English in 1992) has become one of the twentieth century's most influential texts on social theory. Beck's risk society thesis delineates historical periods through perspectives on hazards and risks. Society has increasingly moved away from understanding the world through fate and religion in the pre-industrial to industrial ages to secular and rational worldviews in modernity. The risk society phase thus becomes a part of a culture's maturation and moving away from tradition (Mythen, 2004, p. 142). Beck differentiates 'modern' risk from 'older dangers'. Risk, he claims, is a "… *systematic way of dealing with hazards and insecurities induced and introduced by modernization itself"* (1992, p. 21). Beck states that today's risks are different from older dangers, insofar as today's risks are consequences of the forces of modernization, and technological and societal progress (1992, p. 21). Risk, in this view, is a byproduct of human progress and activities. This view is shared by Taleb, the author of *The Black Swan: The Impact of the Highly Improbable,* who asserts that previously unknown and unthinkable events with extreme consequences will occur more frequently in the future due to increasingly complex societies, technologies and systems (2007). In other words, successful civilization, technological advancement and societal progress carry added and greater risks or dangers.

The same year as Taleb's *The Black Swan* reached the New York Times best-seller list, Beck published *World at Risk* (in German in 2007 and English translation in 2009). This

increased attention to risks reflect dominant Western discourse. Actually, Foucauldian discourse theorists' perspectives on risk claim that risks exist due "discourses, strategies, practices and institution… [I]t is only through these discourses, strategies, practices and institutions that we come to know 'risk'. They produce 'truths' on risk that are then the basis for action" (Lupton, 2013, pp. 113-114). Indeed, in a risk society, we see that hitherto non-existing, constructed, and fictional risks determine our current experiences and actions. Today, we proactively prevent, reduce, and limit tomorrow's potential problems and crises (Beck, 1992, p. 44). This is part of society's inclination to control future uncertainties. In a secular world, humans – not God – control the future. Risk embodies the "… openness, uncertainties and obstructions of a self-created future [that] is no longer defined by religion, tradition or the superior power of nature…" (Beck, World at Risk, 2009, p. 4). Risk management, not religion, becomes the recipe for dealing with risks and uncertainties. According to Mythen, there are several voices critical of the dominant Western risk discourse:

> Looking across the board, we can concur that the rising cultural presence of risk within the media, politics and the economy has engendered a relative growth in public concern. It is fair to assume that people are more cognizant of risks as a generic category than in previous ages. However, although such general statements may chime with the risk society perspective, they also camouflage significant contradictions and anomalies. While risk consciousness may be in the ascendant, the composition and quality of public understandings of risk remains disputable (2004, p. 142).

Critiques of Beck's risk society thesis hold that there is no empirical evidence for a widespread perception and existence of greater risks and threats (Mythen, 2004, p. 113). There are too many cultural variations to herald the coming of a risk age or society (Mythen, 2004, p. 113). It seems as though Beck espouses a predominantly Western mindset, one that glosses over different perceptions and attitudes to risk (Mythen, 2004, p. 114). Claiming we live in a risk society fronts an objective model of risk cognition instead of a world in which risk perception is constantly re-evaluated, redefined and culturally diverse. Morever, Mythen holds that Beck's rigid historical framework compacts risk perception and different attitudes towards risk between and within time periods and that Beck ignores how people are shaped by different cultural, historical and emotional views on risk (2004, pp. 142-143).

In fact, researchers have found that several factors determine what an individual or a society perceive as a risk or a threat. Psychological, cultural, and political variables – as well

as social and traditional media – shape, define and create risk and threats. Risk perception as Renn writes, is derived from "… people's judgements about events, situations or activities that could lead to negative consequences…" (2008, p. 98). Risks are shaped through experiences, information, knowledge and fear. Hence, the sense of risk or threat can be invariable personal – as individuals each have a unique mental image, psychological framework, cultural background and political views that affect how they perceive risks or threats. Simultaneously, though, risk perception is influenced by peers and other members of the community; by media's information about risk, and through government agencies, experts or other channels. Lupton asserts that ordinary people's perception of risk changes and develops based on daily life observations and conversations, and interactions with other people (Lupton, 2013, p. 152). It is clear that risk perception does not form in a vacuum. Rather, peoples' perceptions of risks and threats are constantly recreated and altered – and based on cultural backgrounds and perspectives. The following section will look into how risk perception and risk management vary across cultures and religions.

2.4.1 Risk perception – cultural and religious differences

When implementing projects in other countries and cultures, it is important to exercise cultural awareness and gain insight into the cultural affinities and beliefs that are dominant in the area. Perception of risk varies depending on the social and cultural context (Aven T. , 2007, p. 56). This has implications for how people deal with and manage risks. In many cultures, there is a belief that humans cannot influence their futures and therefore, there is no need to manage risks and uncertainties: "Risks are created and selected by human actors. What counts as a risk to someone may be an act of God to someone else or even an opportunity for a third party" (Renn, 2008, p. 2). Beck also points out that God-fearing people do not view risks as risks but rather ascribe risks to God's or the devil's intentions. Evil (danger, accidents, or incidents with serious consequences) occur because of God's wrath or the devil's malice (Beck, 2009, pp. 72-73). Whatever happens is the result of some higher power, fate or God, Thus, human activity cannot prevent the predestined outcome. In times of major crises, people and communities might place their future into the hands of a God or some other supernatural power. Left with nothing else to do, "… it is quite possible that the psychic absolution sanctioned by superstitions and rituals can act as a valve for risk anxieties" (Mythen, 2004, p. 144).

People with these convictions will not necessarily attempt to manage risks based on cause and effect relationships. Instead, they will seek to abide by God's scripture in order to avoid harm. This is an example of how cultural and social processes shape risk acceptance and risk treatment. In certain cultures and religions, there is a belief that risk mitigation is best done through prayers or living according to scripture ('God willing…') rather than exercise caution or implement physical, technological or organizational risk mitigation measures. Similarly, an ambivalent relationship to risk management can also be witnessed in areas of high uncertainty and where ordinary people have little or no control over their lives, fates or outcomes. In disaster and worn-prone societies, managing risks in the long-term is less important than staying alive in the short-run.

Conversely, in predominantly Western cultures we have witnessed increased intolerance to accidents and injuries. This has resulted in zero tolerance policies for injuries and accidents – and subsequently risk amplification and a whole host of risk mitigation measures. Hence, there is a clash between religious determinism and secular rationalism over risk. Beck believes the most important cleavages and conflicts in risk society are between cultural understandings of risk: "… [I]t is not traditional, religiously founded 'civilizations' that are at the heart of the global cultural conflicts over values but conflicting 'religions' of risk faith or risk belief and of faith in God. We are confronted with a *clash of risk cultures and risk religions*", Beck asserts (2009, p. 73). Beck goes as far as claiming that secularism and religiosity are inverse in regards to views on risk. He proposes that "… religious cultures are characterized by a 'risk secularism' … [and that] … [t]hose who believe in God are risk atheists" (2009, p. 73). At the other end of the spectrum are the highly secularized societies filled with risk 'fanatics'. The overwhelming attention to risk has brought about standardized approaches to risk thinking and risk management and professionalized a whole new risk industry. Rather than placing a clash of cultures at the heart of the risk society thesis, it would be helpful to look at how culture helps people understand and interpret risk. For instance, a communal interpretation of risks could create support among the populace for drastic measures aimed at containing or mitigating risks. These measures form part of our social contract and are possible to implement due to our cultural perceptions of risk and communal acceptance of mutual expectations and obligations (Lupton, 2013, p. 54).

An individualistic notion of risk, though, would prevent common responses to risk or leave risk mitigation measures ineffective. For instance, countries and communities across the world have displayed great variations in risk discourse and risk mitigation strategies when

dealing with the current Coronavirus pandemic. During a crisis we see how "[a] variety of factors, such as class, ethnicity, gender and age have been found to affect public understandings of risk" (Mythen, 2004, p. 13). Indeed, risk perception is shaped by how risk is communicated and managed. It is also important to discern how actors or stakeholders are affected differently by the same risks and how those who carry the risks and those who benefit from risk-taking perceive risk differently. Mythen criticizes Beck for postulating an objective model of understanding risk that "… neglects the structuring force of power relations in the formulation of risk knowledge (2004, p. 114). Those with the most to gain from risk-taking often steer discourses on risk, while people and groups with the least resources and power are usually disproportionately affected by risks (Mythen, 2004, p. 114).

Risk perception, acceptance and tolerance are embedded within cultures, yet are constantly redefined, renegotiated and reimagined. One group of people might perceive a risk that another group will not recognize as a risk. Even Europeans and Americans, who have strong cultural ties and similarities, experience and view risk differently (Beck, 2009, p. 73). A current example is the disparate views of climate change: while some perceive an urgent climate emergency due to human behavior and actions, others seem to reject any notion of a climate change as a threat to our planet. The views of climate risks have evolved over time for the first group – with more knowledge and information as well as the lived experience of climate change or ecosystem collapse. Climate change deniers, on the other hand, see climate change as natural events and not due to human activity. Their risk perception and discourse is a future in which production and material gains and prosperity decreases due to what they deem are unnecessary environmental regulations. This disagreement boils down to what one culture, subculture or community values more: the environment or continued progress, and what constitutes the greater risk to those values: climate change or regulation halting continued growth.

Human activity, as previously mentioned, generate new risks. Societies, companies and individuals must be willing to accept and tolerate some risk in order to make gains. The motivations may differ: for a society, it might mean engaging in risky endeavors in order to serve or improve the public good; companies take risks in order to improve their profits and bottom line; and individuals take risks for personal or altruistic benefits. Complete risk aversion would spell a quick end to the aid industry, to research, development and exploration. In the case of post-war Liberia, necessary risks were taken in order to ensure peace and redevelop the country's infrastructure, including the Mount Coffee hydropower

plant. Risk holds a negative connotation. However, taking risks could be an important step towards greater affluence and development of infrastructure and technology (Aven T. , 2007, p. 37). This, in turn, will benefit societies or large groups of people. The purpose of risk management is to balance development and value creation with risk avoidance (Aven T. , 2007, p. 15). How can an individual, a society or a company develop, evolve and prosper – embark on new adventures and ventures, while simultaneously minimizing accidents, damages and loss? Risk management seeks to balance these, sometimes, diverging considerations.

We also find various risk perceptions and value differences within organizations. Even though organizational culture and attitude towards risk management often varies, both between and within organizations, risk management performance is often mandated by rules and regulations. Stricter rules and regulations for environmental impact of human activity and for worker's health and safety have contributed to increased attention to risk management. However, risk management or risk avoidance are not always in the interest of the executives. For them, taking risks could turn into higher profits. Risk management and a safety culture, on the other hand, "… might interfere with or threaten income-generating activities or executives' plans (Perrow, 1999, p. 293). When accidents do occur, these are often blamed on human error or a lack of safety culture within the organization.

Perrow's research into accidents in high-risk technologies demonstrate that "[c]hanging the culture of an organization to correct its ways has become a mantra in the industry that sells organizational-change techniques, and also in the academic field of organizational behavior, where concerns with culture, rather than structure and power, dominate" (1999, p. 293). Even in places where executives have been resistant to risk management and high safety standards, is it rare to credit the executives with failures, accidents and poor crisis management. Executives might value profitability over environment, health and safety (EHS) concerns. Likewise, workers might prioritize getting the job done quickly over complying with health and safety measures that might slow them down. These groups' input into risk assessments, in particular the elite's or resourceful people's input into risk assessments, might steer the risk manager away from risks and risk mitigation measures that are time consuming or costly for the owner or executive. Hence, risk assessments, and subsequently risk management, might be manipulated in such a way that accidents, design flaws, building structure failures and so on are not prevented. Risks can also be attenuated or amplified depending on who benefits

from risk mitigation or risk negation. The theory on the social amplification of risk is useful to explain differences in risk perception and how we come to live in risk society.

2.5 Social amplification of risk

Socially constructed risks, whether real or not, and the advent of the risk society could potentially be explained by the theories of risk amplification. In 1988, Renn and colleagues proposed a novel approach to study the social experience of risk. They developed the concept *social amplification of risk,* which is "… based on the thesis that events pertaining to hazards interact with psychological, social, institutional, and cultural processes in ways that can heighten or attenuate individual and social perceptions of risk and shape risk behavior" (1992, pp. 139-140). By looking at various factors, such as physiological, social, institutional and cultural processes, we can uncover how risk perception intensifies or diminishes (Renn et al., 1992, pp. 139-140). In theory, when risks are amplified, we become more preoccupied about these risks.

The media has a central role in amplifying risks, often by over-communicating risks and threats. Renn accentuates that "stimulated by media reporting, the public's perception of the risk is often amplified in ways that are difficult to explain if one focuses on the standard elements of any technical risk assessment: probability and direct losses" (2008, p. 95). The media, then, becomes an amplifying station for risks and threats. Renn et al. further contend that individuals, groups or institutions also serve as amplification stations (1992, p. 140). Arguably, risk management will be higher on the agenda and conceived as more important in projects where risks have been amplified. In projects, there might be efforts to both downplay and amplify specific risks. Examples of this for the two case study project are provided in Chapters 5 and 6. The next chapter, though, will lay out the methodological framework for this thesis.

3 Methodological approach

This chapter will explain how data was collected and which methods from the basis for this scientific enquiry.

3.1 Research design

Good research design entails a well thought out plan for how to organize one's scientific investigation. A plan should provide guidance on how to collect and analyze data used in the study. Even with an initial plan for how to conduct research, these plans may change throughout the course of study or scientific inquiry. Moreover, although the research design should be tailored to the specific scientific enquiry, it is often chosen out of convenience or based on what is actually achievable given the restraints and limitations of the researcher (Gerring, 2011, p. 632). Gerring points out lack of language skills, political and cultural barriers, scarcity of evidence or inability to collect evidence and data, and the lack of funding and time as barriers to research (2011, p. 632). Although these barriers are more practical than methodological, they do influence research design. This, in turn, could have an impact on the quality of data and analysis, and thus, affect the validity and reliability of the thesis.

A major obstacle for this research has been access to information and internal documents. Particularly as the projects subject to case study and comparative analysis have been ongoing for a number of years. Furthermore, project documentation is mainly stored in project-specific communication and web-based systems, to which access have proved difficult. It is not easy to gain access to information about projects that have run for a number of years, with a rotation of international staff. Interviews have been conducted with some of the Multiconsult employees that worked on the two projects and a few of the partners. Moreover, the author has managed to access relevant internal documents from the Liberia project but has been unsuccessful acquiring internal documents from the Singapore project.

This study relies on a thorough review of risk management literature and country-specific contexts, a document review of accessed internal Multiconsult project documents and semi-structured qualitative interviews with key Multiconsult employees and partners involved with the projects.

3.2 Methodology

This thesis is concerned with whether and how risk management varies across cases. A comparative case study allows for the study of two different international projects within the same company. By choosing this method – investigating two cases – we are able to compare and contrast approaches to risk management in two unique Multiconsult projects. Moreover, case studies allow for a more in-depth view and understanding of the unfolding of events, progression over time, and couplings and causalities that might not otherwise be revealed in quantitative studies. Data collected through the interviews will be used as the basis for comparing the two projects within the areas of risk management frameworks, risk tools and methods, what risks were identified and how these were dealt with, and whether there were cultural or stakeholder differences.

This thesis explores differences and similarities in risk management approaches in the Liberia hydropower plant project and the subsea oil storage project in Singapore. In order to discuss differences and similarities in project risk management, key literature and theories on risk management, risk perception and risk construction, as well as international standards for risk management have been consulted. Data for this study has been collected through a review of relevant publications and sources, in-depth interviews with a select number of staff involved in the projects, and contents analyses of accessed project specific documents.

The following sections will describe the different research methods used and ethical considerations surrounding data collection. Primary data was collected through interviews with key personnel in the two projects surveyed.

3.3 Interviews

Why was interview-based research chosen as a method for research? It is possible to gain new insight and knowledge into practices, attitudes and behaviours through qualitative conversational interviews. The aim of the qualitative research interview is to produce knowledge and insight through the interaction between the interviewer and the interviewee (Kvale & Brinkmann, 2015, p. 99). Qualitative interviews, also called conversational interviews, have a longstanding tradition in political science and remain central to case studies (Andersen, 2006, p. 279). Conversational interviews help the researcher uncover mechanisms, processes and practices within organizations and structures that are not necessarily on paper. Moreover, conversational interviews are often characterized by open-ended questions where

the informant steers the conversation while the interviewer takes a passive listening role (Andersen, 2006, p. 279).

Key informants are normally resourceful people who can shed light on a phenomenon or procedures, informal practices and cultures within an organization or in a case. There are two types of open conversational interviews. One form focuses on the unique private experiences, opinions and feelings of the interviewee, while the other type of interviews attempts to extract knowledge about cases, situations, relations and contexts that is not easily attained elsewhere (Andersen, 2006, p. 281). The latter type of interviews describes the interviews conducted for this thesis. The chosen informants possess knowledge, insights and experiences about processes, practices and procedures within the two projects examined in this thesis. The informants act as gatekeepers to valuable information and insight and their subjective opinions and experiences often become the focus of the interviews (Andersen, 2006, p. 282).

The objective with the interviews was to: learn whether standardized (company) risk management practices or approaches were implemented in the projects, how risks were identified and handled, whether risk management was a key feature of project management and whether cultural differences had a bearing on risk management practices. Data collected from the interviews will help answer the central research questions in this thesis.

3.3.1 Interviews – preparation and structure

In preparation for the interviews, an interview guideline outlining the scope and purpose of the research and including a list of questions on several topics relevant for the initial research questions was produced. This was emailed to the informants beforehand. The purpose of the thesis and the purpose of the interview were reiterated at the start of each interview. The informant was then asked about his/her role and duration in the project before asked a number of questions related to risk management. The interview questions were adjusted to the informant at hand. The interviews lasted between one and two hours. The informants were asked the predetermined interview questions but spoke freely on the topic at hand. If the questions had already been answered, the interviewer repeated these questions, adding that this was a topic already discussed while opening up for further discussion around the topic.

All of the interviews were transcribed directly during the interview process. The interviews were conducted in person or via skype during the period January – February 2020. One final interview was conducted in May 2020. Meetings with the two project directors at Multiconsult were held in the summer of 2019 and again in early 2020 in order to gain insight into the two projects and receive information about potential source and informants.

3.3.2 Informants

Stakeholders/personnel deemed to have relevant knowledge and information to share were selected for interviews. There were five informants from the Liberia project, three of which work for Multiconsult while two informants represent partners. These all have insight into the risk management performance of the Mt. Coffee hydropower plant project. Ove Rusten served as the project director for the Mt. Coffee project at Multiconsult head office. Bente Brunes served as senior mechanical engineer on the Mt. Coffee project and was also located at the Multiconsult office in Oslo. Gordon Ullyett is the current project manager in Liberia. He is contracted by Multiconsult on a temporary contract. Knut Gakkestad works for Norad and represents the Norwegian Government as funder of the Mt. Coffee project. He also provided professional advice to the Government and the project. Dr. Trifkovic served as the project director for Fichtner, the other Owners Engineer in the Mt. Coffee project.

The author interviewed three Multiconsult employees involved with the Jurong Rock Caverns project in Singapore, all of whom have intimate knowledge of risk management at various intervals of project implementation. Finn Fagervik served as the project director on behalf of Multiconsult for the duration of the project. He was essential in setting the standard for risk management in the JRC project and wrote the risk management requirements for the contracts. His zero accident philosophy became an important aspect of the project. Fagervik has been part of the JRC project since 2006 and for a while held the role as project manager in Singapore during a time of transition between project managers. Tom Mølltorp served as the project manager onsite in Singapore from 2016 to 2019. Thor Ørjan Holt held different roles within the JRC project. The formal role was as planning manager, herein responsible for the approval process for basic design and as project manager on behalf of the client for the completed product. Holt worked as project manager in Singapore form 2006-2008 but was also involved in the project from the head office in Oslo. The table below provides and

overview over informants, their role in their projects, affiliation and the format and duration of the interviews. The dates for each interview or meeting are specified in the reference list.

Table 1: Overview over interviews and meetings with informants

Name of informant	Role in project	Format and duration	Affiliation
Ove Rusten	Project Director MCHPP	Meetings (2) Approx. 1 hour each	Multiconsult
Dr. Alexander Trifkovic	Project Director MCHPP	Semi-structured qualitative interview on skype. Approx. 1.5 hrs	Fichtner
Bente Brunes	Senior mechanical engineer MCHPP	Semi-structured qualitative interview Approx. 1.5 hrs	Multiconsult
Gordon Ullyett	Project Manager onsite MCHPP	Semi-structured qualitative interview on skype. Approx. 1.5 hrs	Multiconsult (contracted)
Knut Gakkestad	Adviser, donor representative MCHPP	Semi-structured qualitative interview Approx. 1.5 hrs.	Norad
Finn Fagervik	Project Director JRC	Meetings (2). Approx. 1 hour each	Multiconsult
Tom Mølltorp	Project Manager onsite JRC	Semi-structured qualitative interview Approx. 1 hour	Multiconsult
John Ørjan Holt	Project Manager onsite JRC	Semi-structured qualitative interview on skype. Approx. 1 hour	Multiconsult

3.3.3 Ethical considerations and dilemmas with interviews

When conducting semi-structured interviews with professionals in their field or stakeholders who have a special interest in the subject at hand ('their' project), it becomes important for the interviewer to separate anecdotes and personal narratives from facts. Qualitative interviews are not necessarily the best data collection method to arrive at the 'truth' but rather a tool that provides various perceptions, experiences and opinions of what has transpired. Information derived from the interviews cannot be treated as objective or as unbiased account of events. The informants' backgrounds, experiences and roles in the projects influence their thoughts and opinions. The information provided by the informant during an interview might consist of facts, time lines, and written documents, on the one side, and opinions and anecdotes, on the other side. When data collection to a large degree consists

of information from verbal rather than written (and peer-reviewed) sources, it is important to highlight and discuss the validity of the data collected. By interviewing several informants working on the same project, it is possible to verify information, or at least unearth shared or common beliefs and perspectives on issues.

3.4 Document research

In addition to relying on information attained through conversational qualitative interviews, unpublished, published and publicly available scholarly and non-scholarly sources on applicable theories and on project and international risk management have been consulted. Scholarly sources on risk and risk management as well as literature on project management form the backbone of the theoretical chapter. Some project documents for the Mt. Coffee project were made available. It was not possible to access project documents for the JRC project in Singapore because the digital project platform has been closed to Multiconsult. The nature of this research, though, has not necessitated a thorough investigation into project documents as the intention was to look at differences and similarities in approaches too risk management, not verify or compare risk management tools.

Having outlined the research design and methodological framework for this study, it is time to get a more in-depth look at the two projects and contexts of the comparative case study.

4 Case studies and contexts

The aim of this paper is to compare and contrast risk management approaches in two highly diverse Multiconsult projects implemented in two dissimilar countries, Liberia and Singapore. This chapter will provide information that shed light on potential challenges or risks associated with project implementation in the respective environments – so called contextual risks. Additionally, this chapter will provide an overview of the projects as well as stakeholders involved in or benefitting from the projects.

Charles Perrow writes about accidents related to movements of large quantities of earth and water, such as in the mining and dam industries. He finds that "[d]ams have catastrophic potential … [and]… m]ining is a death-dealing activity" (1999, p. 232). Perrow further believes that accidents in these two systems – dams and mines – could be easily reduced (1999, p. 232). One of the solutions for dam and mining work is to implement risk management systems that help prevent or reduce accidents and system failures. There have been vast improvements in risk management and environment, health and safety (EHS) standards since Perrow studied accidents in these systems in the 1990s. However, risk management approaches might differ extensively, both between similar projects, between industries and sectors and depending on the context. The following sections will provide background information on Liberia and Singapore in order to demonstrate the dissimilar contexts in which the Mt. Coffee and the Jurong Rock Caverns projects were implemented.

4.1 Liberia – emerging from longstanding civil wars

This brief introduction to Liberia will set the stage for a broader understanding of potential contextual risks facing Multiconsult project managers and engineers when they took on the Mt. Coffee hydropower plant project. What's more, the background information provided will also provide insight into the project's many stakeholders.

Liberia is a small state situated on the west coast of Africa. Liberia shares borders with Sierra Leone, Guinea and Côte d'Ivoire in an unstable sub-region. These four neighboring states have all been through periods of civil war. In fact, some of these civil wars were sparked by cross-border meddling and support for dissidents or rebel groups. The Liberian warlord Charles Taylor sparked a brutal civil war in Sierra Leone (1999-2002). Attacks against Guinea were launched from Liberia and Sierra Leone, while the Guinean government supported rebel groups against the Liberian government. Côte d'Ivoire underwent two civil

wars in the period 2002 – 2011, in which Liberian mercenaries fought for Ivorian President Laurent Gbagbo. Liberia also conjures up images of brutal and lengthy civil wars. In the period 1989 until 2003, Liberia underwent two devastating civil wars. The wars left over a quarter of a million dead, half of the population displaced and over 80 percent below the poverty line (Center on International Cooperation, 2007, s. 74).

After nearly fourteen years of armed conflict in Liberia, the warring factions signed a comprehensive peace agreement in August 2003. A United Nations peacekeeping force (UNMIL) deployed to oversee the implementation of the peace agreement and the consolidation of peace (Center on International Cooperation, 2007, s. 74). A comprehensive peace agreement, international presence and democratic elections in 2005 set Liberia on a path of recovery and reconstruction. The new President, and former World Bank employee, Ellen Johnson-Sirleaf, admitted that access to electricity was a prerequisite for development. At a national energy stakeholders' forum in the fall of 2006, the new President called upon international donors, the private sector and government agencies to cooperate to rebuild the Liberian energy sector and get Liberians back on the grid (Government of Liberia, 2007, p. i). The government's goal was to provide sustainable, modern and affordable energy to the vast majority of the population through public-private partnerships and private sector participation (Government of Liberia, 2007, p. 1).

At the time of the national energy stakeholders' forum, Liberia was not even ranked among the 177 countries on the UNDP Human Development Index (United Nations Development Programme (UNDP), 2006, p. 286). According to the United Nations *Human Development Report 2006*, Liberia was one out of seventeen UN member states that it was not possible to compute the human development aggregates for (2006, p. 413). There was simply not enough information or statistics about Liberia to compute the human development index. Instead, some basic statistics were listed for Liberia. Emerging from a long period of civil war, Liberians had a life expectancy of 42.5 years, an under five-child mortality rate of nearly 25 percent and a gross combined school enrolment ratio of less than sixty percent (United Nations Development Programme (UNDP), 2006, p. 287). Liberian society suffered from poverty, malnourishment and a complete disintegration of public and private infrastructure, in addition to a fragile peace and political tensions. This was the setting in which the new President encouraged private investment to rebuild the country's electricity infrastructure, including the Mt. Coffee hydropower plant.

The following year, the new Liberian Government published a national energy sector white paper that confirmed that "[a]ccess to energy services is indispensable to national development, poverty reduction and achieving the Millennium Development Goals (MDGs)" (Government of Liberia, 2007, p. i). The Government White Paper (2007, p. 3) addressed investor perceptions of significant political risk as one of the main obstacles to attain much-needed private investment.

This obstacle – the perception of Liberia as a high-risk country to invest in – falls in a long line of external contextual risks that would have to be considered if investing or implementing projects in Liberia. In fact, it is the political volatility of the sub-region, combined with the devastating effects of a lengthy civil war, which makes Liberia a high-risk country for investments and projects. In order to abet infrastructure investments in the energy sector, the Government sought donor funds (Government of Liberia, 2007, p. 2). The refurbishment of the damaged and looted Mt. Coffee hydropower plant was one of the first, and most important, investments made in the energy sector. Donors provided the funds for private engineering and consultancy companies to venture into risky business in Liberia.

4.2 The Mt. Coffee hydropower plant

Energy, not least access to electricity, is a critical societal infrastructure. In order to rebuild and run a country, public and private organizations and institutions, such as government agencies, private corporations, schools and hospitals, are all to some degree reliant on electricity consumption. The "[r]ehabilitation of the Mt. Coffee hydropower plant (HPP) was identified as a major priority of the Sirleaf administration for its potential to harness the country's ample riverine resources for a low-cost, reliable, and environmentally friendly source of power" (Mt. Coffee hydropower rehabilitation project, 2019, pp. A-13). Its rehabilitation and possible expansion was on the long-term agenda (Government of Liberia, 2007, p. 6). Liberians had to wait for a number of years still before gaining access to clean, modern and affordable electricity. The Mt. Coffee hydropower plant project (MCHPP) did not commence until 2013.

The goal of the project was to restore and rebuild "the hydropower plant, spillway, and dam" as well as "the construction of a 66 kilovolt (kV) substation at Mount Coffee; construction of two 66 kV transmission lines between Mount Coffee and Monrovia; and the expansion of the two receiving substations in Monrovia" (Mt. Coffee hydropower

rehabilitation project, 2019, pp. A-13). The project aimed to produce commercial power by the end of 2015, thus making it a fast-track project implementation process (Mt. Coffee hydropower rehabilitation project, 2019, pp. A-13).

4.2.1 Stakeholders

The Mount Coffee Hydropower Rehabilitation Project has many stakeholders. The owner of this project is the Government of Liberia, represented by the Ministry of Lands, Mines and Energy and the Liberia Electricity Corporation's (LEC). Other stakeholders include the donors. At the end of 2011, the Liberian Government requested the Norwegian Government (through Norad), the German Government (through the German Development Bank, KfW) and the European Investment Bank (EIB) for funding for and assistance to rehabilitate the Mt. Coffee hydropower plant. Towards the end of the project period, the Millennium Challenge Corporation (MCC) also provided funding. The stakeholders more directly involved with project implementation and execution were the Owners' Engineers Multiconsult and Fichtner, the Project Implementation Unit (PIU) and contractors.

Project implementation was managed by the PIU from the LEC headquarters in the Liberian capital Monrovia and at site from late 2016 when the site office was completed (Mt. Coffee hydropower rehabilitation project, 2019, pp. A-21). The other case in the comparative case study, the Jurong Rock Cavern subsea oil storage project in Singapore, also had a number of stakeholders involved in the project but had a completely different context.

4.3 Singapore – a stable city-state

Singapore is a politically and economically stable small island city-state situated in Southeast Asia. While Liberia was not even listed on the 2006 UN Human Development Index, Singapore ranked number 25 out of the 177 countries listed, attesting to its prosperity and high development levels (United Nations Development Programme (UNDP), 2006, p. 283). Additionally, the Globalization Index has ranked Singapore the most globalized economy for a number of years (Bellows, 2009; Statista, 2019).

Singapore, a former British Colony, achieved autonomy and self-rule in 1959. Since then, Singapore has had a strict one-party meritocracy. Singapore's landmass is only about

720 m^2 hosting a population of 5.7 million people, many of whom are foreign nationals (Department of Statitsics Singapore, n.d.). Singapore has prospered to become a highly developed economy and one of the countries with the highest GDP per capita (Bellows, 2009). The economy is based on high-skill labour, innovative technology and serving as a hub for maritime trade routes. Bellows attributes Singapore's success to two factors: Firstly, Singapore is located on a highly advantageous spot between South and East Asia. With its deep-water topography, Singapore has one of the best ports in the world and the best in Southeast Asia (Bellows, 2009). Secondly, a non-oppressive one-party meritocracy has ruled Singapore for decades, espousing efficiency and effectiveness while also vigilantly denouncing corruption (Bellows, 2009).

Singapore is ethnically, culturally and linguistically diverse yet a highly Westernized society (Tan & Tan, 2012, p. 506). The city-state has a large Chinese population, with Indonesian, Malay and Indian minorities, as well as Europeans and Eurasians (Bellows, 2009;Tan & Tan, 2012, s. 505). In other words, Singapore is a geographically small and stable melting pot with multiracial harmony, interfaith coexistence and strict order (Tan & Tan, 2012, p. 505). Bellows hails Singapore as one of the "most stable and successful political systems in the world today" due to its social and economic advances, evolving pluralism, and meritocracy (2009). Singapore is a safe and reliable country to invest and conduct business in; it is stable, boasts first-class infrastructure, high-skilled labour and policies conducive to foreign investments and private enterprise (Tan & Tan, 2012, p. 500). Singapore relies on foreign direct investments from multinational corporations, which are mostly "…skill-intensive, high-technology industries such as chemicals, oil, shipbuilding and repairing, precision engineering, and electronics" (Tan & Tan, 2012, p. 501). This could make Singapore vulnerable to swings the international economy.

Another issue facing Singapore is a small island and city-state is scarcity of land. In Singapore, about half of the land has been dedicated to residential, industrial and commercial use (Tan & Tan, 2012, p. 504). Land is precious and efforts to attract businesses and industries will therefore go hand in hand with land use and the availability of land. Oil exports have been a mainstay of Singapore's trade (Tan & Tan, 2012, p. 495). Oil storage is land-intensive, and for a small city-state, very costly when considering the price and value of land. The need to rethink and redistribute land utilization from low-value to high-value industries stimulated the idea of storing oil underground.

4.3.1 Jurong Rock Caverns

The Jurong Rock Caverns (JRC) is a highly innovative initiative in order to free up land and simultaneously improve Singapore's liquid hydrocarbon storage capacity. JRC is the first commercial and hitherto deepest known, subterranean rock cavern facility. The JRC is the first subterranean oil storage facility in the sub-region, but not the first underground storage facility in Singapore. An underground ammunition storage facility for the Singapore armed forces opened in 2008.

The Jurong Rock Caverns project commenced in 2006, The first caverns were operational from 2014 and the project closed in 2019. The caverns are located 130 meters beneath the Banyan Basin seabed (Engineer What's Next, n.d.), are nine stories high and consist of 9 kilometers of tunnels in addition to shafts and piping. During the construction, 3.5 million cubic meters of rocks were dug out and removed from site (Engineer What's Next, n.d.). Phase 1 of the project was to build storage for 1.47 million cubic meters of liquid hydrocarbons, such as crude oil, gas oil, condensate and naphtha (Multiconsult, n.d.). Given the scarcity of land in Singapore, these subterranean storage facilities free up valuable land for high-value manufacturing. In fact, the JRC storage facility translates to land savings of about sixty hectares, which could be used for higher value activities (Engineer What's Next, n.d.).

Building such an innovative structure 130 meters under the seabed does not come without risks. Engineer What's Next, a Singapore Government Agency website, informs that "One of the major challenges is the unpredictability of geological conditions resulting in potential poor ground conditions as well as significant water seepages encountered during excavation works. Extensive mitigating measures to address this risk have been implemented" (Engineer What's Next, n.d.). However, once in use, the subterranean storage of petrochemicals enhances safety and security and reduces the impact of industrial accidents on surrounding areas on Jurong Island. The Jurong Rock Cavern project is conceived of as an engineering feat and has received numerous awards and accolades (JTC Corporation, n.d.).

4.3.2 Stakeholders

Jurong Town Corporation (JTC) is the main stakeholder, and the client, in the highly complex JRC project. JTC Corporation is a Singapore Government Agency established in

1968 to spearhead, pioneer, plan, promote and develop Jurong Island for industrial infrastructure (JTC Corporation, n.d.).

In 2006. Multiconsult won the Project Manager contract for the JRC project, together with SINTEF and Tritech, a Singaporean company. This trio was hired to provide project management onsite, as well as administrative and technical supervisory teams, represent the client JTC Corporation onsite, at site investigations, basic engineering and follow up of the various contracts for storage caverns, access shafts, jetties, process areas and pipe routings (Multiconsult, n.d.). Moreover, Multiconsult performed the following roles and responsibilities: as project manager, planning manager, contract manager, technical review, project management, and geotechnical, mechanical and piping engineering (Multiconsult, n.d.). There also a number of contractors involved who built the caverns and shaft. The biggest contractor was Hyundai.

Now that the contexts and projects have been presented, it is possible to examine the data collected through the interviews. The following chapter will explore the project risk profiles, risk management approaches, risk tools and methods used, and varying approaches to risk.

5 Empirical findings

The following section will provide insight into the risk profiles for the two projects and how risks were managed. Moreover, this chapter will compare and contrast risk management practices and unearth to what extent stakeholder and cultural perspectives have played in risk management and mitigation.

5.1 Project risk profiles

The Mt. Coffee hydropower plant project in Liberia and the Jurong Rock Caverns subsea oil storage project in Singapore seem, from the outset, to have widely dissimilar risk profiles. As outlined more thoroughly in Chapter 4, Liberia is a poor country that has emerged from a lengthy and brutal civil war. The lack of critical and basic infrastructure posed many challenges, and risks, to rehabilitating the Mt. Coffee hydropower plant. The contextual risks of such a project are significant whereas the project itself – engineering and rehabilitating an existing hydropower plant does not present unusual or previously unknown risks. Hydropower plant construction and rehabilitation are familiar, tried and tested projects.

Singapore, on the other hand, is a Westernized, prosperous, stable and technologically advanced city-state. There were few contextual risks in Singapore as there is access to good healthcare, water and electricity and other basic and critical infrastructure and the country is stable. The major risks in the JRC project were project-related. Building shafts and caverns 130 meters below the seabed is complex and pioneering engineering. This, in turn, involves more uncertainties and potentially greater risks for project completion and for workers' safety. From the outset, it looks like the project risk profiles for these two projects are dissimilar. This section will exemplify some of the contextual and project related risks and challenges that were dealt with in the two projects, and thus display how dissimilar projects are concerned with many of the same risks. Moreover, the attention to various risks, risk perception and the risk picture of a project will evolve over time, which results in different answers on risk from staff working in the same project.

When asked about what they thought posed the greatest risks to the project during implementation, the informants on the JRC project provided different answers and perspectives. Holt believes a cave-in of the caverns presented the biggest risk from a project perspective: When exploding large caverns under the seabed, there is a risk that the rock is

porous and that can lead to rockslide into the caverns or that the ocean water pressure leads to cave-ins (2020). This is the biggest risk when there are people working 100-150 meters below sea-level. The geological conditions were the biggest design risk (Holt, 2020). There was a continuous focus on safety in design in order to avoid cave-ins of the caverns and safety measures when handling explosives (Holt, 2020). According to Holt, there were three risk factors that were continuously followed up throughout the JRC project: EHS at the building site, cave-ins and explosives (2020).

From Mølltorp's perspective as a project manager, the biggest risk was that he could not deliver on time: "If you operate under a system that does not allow you to deliver on time, then scheduling becomes a huge risk and factor" (2020). The JRC project was nearly five years overdue, making it easy to conclude that time was the biggest risk factor. The contractor could not be trusted to deliver on time. Mølltorp concedes that the project management team had meetings and discussions every day and took actions to fill the gaps in order to reduce the scheduling risks (2020). The contractor had enough staff and was eventually losing money on this project due to the delays. In order to reduce their losses, the contractor reduced and changed personnel on the project. This calamity, Mølltorp believes, is due to the contractor's poor project risk management skills, lack of people working on contractual issues and lack of planning (2020). Moreover, there is a cultural barrier there, whereby is it not within their culture to raise issues with a client (Mølltorp, 2020). Furthermore, the client JTC Corporation was well aware of the contractor's reputation and accepted this risk because the contractor had the lowest price (Mølltorp, 2020).

For the Mt. Coffee project, Brunes categorically stated schedule and quality as areas with continuous risk focus (2020). Dr. Trifkovic mentioned contextual risks, such as security and political risks, as key permanent risk factors (2020). Ebola became a risk factor for the remainder of project implementation after the initial outbreak. Other risks were important at various stages but were closed: costs and running out of money was a big risk but reduced when the project secured more donor funding (Trifkovic, 2020). Gakkestad mentioned cost overruns, Liberia's inability to pay for its share of the rehabilitation project according to a pre-arranged cost-sharing model, and delays as risks that were present throughout the project (2020). Though the risk of delays was not unexpected, as "most projects are delayed" (Gakkestad, 2020). Holt is the only Multiconsult employee who was involved with both the Mt. Coffee and the JRC projects. Holt considers both projects as high risk. Hence, risk management had to be part of both and precise (Holt, 2020). According to Holt, both the

projects had significant technical and execution risks. The most important project risk in Singapore was a cave-in. For Mt. Coffee, the greatest risk is the dam bursting (Holt, 2020).

In terms of staff safety and security, there is no doubt that the EHS concern for Multiconsult employees were greater in Liberia. Liberia posed a greater risk to the health and wellbeing of staff. Life in Singapore is easier, Holt said, "but one has to remember that the city-state has a form of dictatorship where someone will be executed if caught with narcotics" (2020). To live and work in Singapore has its risks. The risks of living and working in Liberia are more severe, particularly health risks such as malaria, Ebola and the lack of quality health care (Holt, 2020). There were also greater risks in terms of potential injuries related to construction because of the lack of proper healthcare and hospitals in Liberia, in addition to the distance from the work site to health facilities on poor roads (Holt, 2020). There were also contextual risks and uncertainties in Liberia, such as sudden riots. The site was far away and became a logistical nightmare in terms of speedy evacuation out of the country or transportation to reliable and safe hospitals.

The following sections will look further into the contextual, project-related and EHS risks for the Mt. Coffee hydropower project in Liberia and the Jurong Rock Caverns subsea oil storage project in Singapore.

5.2 Contextual risks

What differentiates Singapore from Liberia in terms of contextual risks? Liberia is a small low-income developing country at the West coast of Africa while Singapore is a small prosperous and highly organized island state in South –East Asia. From the outset, it looks as though Liberia is a high-risk country and Singapore a low-risk country. However, implementing a particular project in Singapore could be high-risk while implementing a project in Liberia involves fewer risks. Implementing projects in a country associated with high risks does not always equate to a high-risk project, and vice-versa.

In risk management practices, it is crucial to look at how the outside world – the context in which you operate – affects your projects or actions. Conversely, it is also crucial to evaluate how your actions or projects affect the surrounds. This paper has already provided some of the country contexts for the projects, but it is also necessary to look closer to the nearby communities and the vicinities of where the projects were implemented. In order to

discern whether, and if, project risk management looked into risks to and in nearby communities, the author asked the informants whether risks were identified for nearby communities and how these risks were treated. Conversely, how did nearby communities and surroundings pose risks to the project.

Ullyett, one of the project managers for the Mt. Coffee project, agrees that managing contextual risks is crucial. Contextual risks affect personnel. He believes many project staff did not fully understand what it is like to operate within a context such as Liberia. The colleagues working on compliance at Multiconsult in Oslo did not have the contextual understanding (Ullyett, 2020). Likewise, many of the newcomers battled to adjust, not expecting the conditions that met them in Liberia. "I could see stress levels going through the roof and they became unproductive and inefficient. You have to manage risks with personnel – projects are implemented by humans" who react to their environment (Ullyett, 2020).

Dr. Trifkovic recognized that a project such as the MCHPP may pose risks to local communities: "you affect the way the people live by changing the environment where they live. We were creating a reservoir, putting up fences and constructing roads" (Trifkovic, 2020). The hydropower plant construction and refilling the reservoir impacted nearby communities. There were 27 rural communities within a radius of 5 kilometers of the reservoir. An assessment found that seventeen communities would be affected by the Mt. Coffee project (Mt. Coffee hydropower rehabilitation project, 2019, pp. A-17). However, this project posed limited and temporary risks given that the project was rebuilding a past construction. The reservoir was the same size as the previous reservoir and in the same location. From the 1990s until 2013 the previous reservoir had dried out and people had occupied the area. That meant a small community of 4-8 houses had to relocate and a new village created for them elsewhere (Trifkovic, 2020). The settlement action plan was done very well, Dr. Trifkovic claims, stating that there is extensive documentation of this (2020). There were also put in place measures that provided locals continuous access to their land by bridges, roads, organizing transport buses from one side to another during construction phase- so locals would be less affected.

It was made sure that the local communities would benefit from the Mt. Coffee rehabilitation project. The project design was intentionally labour intensive in order to employ more locals and thereby contribute with income generation for the local communities. It is not easily organized, though, and there were dedicated social agents employed to ensure a fair

distribution of jobs to the nearby local communities. When construction was completed, employment decreased. Local dissatisfaction, complaints and demands then increased. This is one of the contextual risks the project manager had to contend with (Trifkovic, 2020). It was the PIU that was responsible for local community outreach. The PIU had a person assigned to this, a community outreach officer. It was the role of the project management to make sure locals were treated well and respected (Ullyett, 2020). There were situations where contractors did not pay their local workers. Project management had to mitigate risks associated with that and identified key personnel, often leaders of teams, as go-to-people when problems arose. The project policy was to hire locally (Ullyett, 2020).

In contrast to the high impact of the Mt. Coffee project on nearby communities and extensive mitigation efforts, the JRC project was implemented on an industrial island with heavy petrochemical industries. There were therefore few risks from and affecting nearby communities. There were other industries and businesses nearby, though. Once, there was a fire in one of the neighbouring industries and everyone had to halt their work (Mølltorp, 2020). The project itself posed risks with the transportation and use of explosives, especially the transportation of thousands of tons of explosives through a giant city like Singapore (Holt, 2020). Nearby businesses could also be affected by a damaged pipe or a large uncontrolled explosion. The challenges and risks here, though, were not more extensive than in other industrial projects of this magnitude (Holt, 2020).

5.3 Project risks – schedule, cost and quality

Project risk management usually concerns itself with risks related to time (not delivering on time), cost (not delivering on budget) and quality (not delivering with expected quality). Projects are temporary and meant to achieve a goal or objective within a set time frame, budget and expected or agreed upon quality. Hence, project management is about managing limited resources (time allotted, budgeted costs) to ensure the execution of a set of tasks and activities in order to achieve or complete the main objectives. Unsurprisingly then, project risk management identifies and measures risk on time, budget/cost and quality. The following sections will look into some of the identified risks to schedule, costs and quality in the two projects – and how these risks were managed.

5.3.1 Managing schedule risks

Both the Mt. Coffee and the Jurong Rock Caverns projects were delayed. While the JRC project was five years behind original schedule, the Mt. Coffee hydropower plant started operations and delivered electricity about a year after original schedule, in December 2016. Yet, the Mt. Coffee project manager is still onsite closing the project with three contracts still running (Ullyett, 2020). It seems as though project delays are commonplace – you rarely hear of projects that completed on or before time. Yornu and Ackah agree that "frequent delays and cost overruns on a lot of projects are some of the challenges of the construction industry" (2019, p. 30).

One of the reasons Mt. Coffee project was delayed was that the project had a very short schedule to begin with. The Owner's Engineers informed the client that it was not possible to deliver on the requested schedule, cost and quality. However, the President was riding on a campaign of providing electricity to the populace and electricity was necessary in order to rebuild the country. Time was of essence. Brunes informed that manufacturing time for some of the components was one year, yet the time schedule for the whole project – until the date for delivering electric from the Mt. Coffee hydropower plant, was only a year and a half from its inception (2020). The tight schedule was one of the main risks and influenced many decisions throughout the project. There was very little time scheduled for electromechanical work within the project. "We started procuring one contract but had to revise the documents to get the quality we wanted. In parallel, we started up another contract. We had a strong team who worked long hours and overtime to reach the project milestones. Our efforts were recognized", Brunes says (2020). Luckily, the Owner's Engineers made such great progress with the electromechanical part of the project and were therefore able to secure the rest of the contract. The stakeholders were satisfied (Brunes, 2020).

Ullyett confirms that one of the biggest risks in the project was time— the project was rushed. Time was always a challenge. The funders assisted on fast-tracking contracts while President Sirleaf's ambition was to commission the first machine in December 2015. Due to the Ebola-outbreak, project completion was delayed by one year (Ullyett, 2020). An increase in the scope of the project and contractor delays extended the project through the fall of 2018 (Mt. Coffee hydropower rehabilitation project, 2019, pp. A-28).

The JRC project was five years overdue. The project was initially scheduled for completion in 2014 but finished in 2019, nearly five years later. Undoubtedly, there were many risks related to schedule and time line. Part of the project was executed on time but the

rest of the project was delayed (Mølltorp, 2020). Mølltorp assessed the old schedule when he first arrived at the project site in Singapore. Then he held meetings about the schedule delays with the main contractor Hyundai. Project management implemented many actions throughout the project to avoid delays. The project management team requested risk meetings every second week in order to deal with the risk of delays from the contractor. The main source of delay, though, was the performance of Hyundai and their lack of planning skills (Mølltorp, 2020). The client, JTC Corporation, was aware of Hyundai's scheduling problems and had accepted this risk when hiring Hyundai as one of the main contractors (Mølltorp, 2020). Holt confirms that both of the largest contracts were delayed but this was a delay Multiconsult was not responsible for (Holt, 2020).

The last two project managers onsite in Liberia and Singapore both had their contracts extended considerably. Ullyett's original contract was for 18 months but after four years, he is still working in Liberia trying to manage the closure and completion of the project (Ullyett, 2020). Tom Mølltorp served as the project manager in Singapore from 2016-2019. His main assignment was to complete and close the project. It was supposed to take 6-7 months but it took three years (Mølltorp, 2020). In both projects, there have been attempts to manage and communicate risks to the schedule. The delays were caused by factors manly outside the control of Multiconsult as the project manager and the Owner's Engineer. While the delay caused by the Ebola-outbreak was an external and largely unforeseen emergency, delays caused by contractors should be managed as an internal risk.

5.3.2 Managing risks related to finances, cost and budgets

One of the most important aspects of project management is the financing. Unforeseen or hidden costs or poor pricing of a project could lead to cost overruns and, potentially, project failure. Holt believes the financial risk for Multiconsult was larger with the Singapore contract than with the Mt. Coffee project (2020). This is because the Liberia project was financed by donors who paid for Multiconsult's work (Holt, 2020). Holt did not experience financial risk as very important. Sure, Multiconsult was concerned about the risk of not getting paid due to the delays and be held accountable for the delays in project completion. The project manager in Singapore and the project director at the head office in Multiconsult Oslo thus spent time making sure contractual obligations and delays were handled (Holt, 2020). Nevertheless, by the time Mølltorp started the role as project manager in 2016, there

were many charges that had not been cleared (2020). This posed a huge financial risk. Multiconsult had outstanding claims of around 345 million NOK. Claims had been made by the contractors but not paid. Before Møltorp closed the contract, the amount Multiconsult paid was small in relation to the claims (Mølltorp, 2020).

For the Mt. Coffee project, the client was not deemed financially sound or a safe customer (Trifkovic, 2020). Even though the money was paid directly by the donors, it was the Liberian Government that had to approve of payments for services provided. There have not been problems with payments until now, Dr. Trifkovic states (2020). The risk in Liberia was about pricing correctly. Pricing what it costs to keep staff in Liberia was difficult, Holt contends, as well as pricing of construction (2020). This is confirmed in the Draft completion report for the Mt. Coffee project: "As the detailed design and procurement of each of the construction contracts got underway, the budget continually increased, due to market response of higher costs than expected, optimization of design, and in 2014, the suspensions required by the unforeseen West Africa Ebola crisis" (Mt. Coffee hydropower rehabilitation project, 2019, pp. A-28).

According to Ullyett, the partners and stakeholders were preoccupied with the financial risks of the project (2020). As project manager, Ullyett made sure the budget was balanced. The budget was managed and budgetary risks included in the risk management plan. There was a risk to the budget because the project did not have a bottomless pit of money. The funders made sure to communicate that. Ullyett's weekly, monthly and quarterly reports would reflect budget risks. Hence, there were no headaches or shocks to the funders. Still, additional funding was needed. More funding was granted but funds dried up and a no-cost extension for the PIUI was accepted (Mt. Coffee hydropower rehabilitation project, 2019, pp. A-28). This no-cost extension is not necessarily positive. Ullyett asserts that one of the biggest risk is money: funding has run out and the budget is depleted but the project is not completed yet (2020). "If the Owner's Engineers leave without finishing, this will pose a risk to their reputation" (Ullyett, 2020).

Norad was not so concerned about cost in the beginning: "We had cost estimates and a contingency, but later on our cost estimates proved to be too optimistic", Gakkestad recounts (2020). It became an issue later on how to finance the Mt. Coffee project because Norway had limited funds after funds were absorbed into handling the refugee crises in the fall of 2015. Money for international development projects dried up and the Government of Liberia did not come up with money they initially planned to use: they had promised 45 million but came up

with 10 million (Gakkestad, 2020). The Millennium Challenge Corporation in the US came in as a major financer. They rescued the continuation of the project (Gakkestad, 2020). Both projects faced cost overruns that had to be dealt with as risks to the project.

5.3.3 Risks related to quality

The third common project risk factor is quality. Quality was not conveyed as posing a big risk to the JRC project. It was the responsibility of the project management and superintendent teams to follow up the quality of components and parts used by the contractors – so as to ensure that they complied with the technical specifications and quality of the design. There were systems put in place to check if the contractors had bought the components, equipment and materials that the management teams had asked them to do. If an issue or discrepancy popped up repeatedly, this was added to the risk register (Mølltorp, 2020).

In the Mt. Coffee project, on the other hand, the Owner's Engineers were very preoccupied with risks related to the quality of design and manufactured parts. "Quality has always been a factor. That is why we went in with a strong team", Brunes exclaims (2020). Strict quality control was part of the progress review. The Multiconsult team adopted a risk-based approach to quality controls, where teams travelled to inspect equipment (conducted factory acceptance test, FAT) for the most important equipment and equipment that was not possible to modify (Brunes, 2020). Even though this was an explicit approach for quality control, Brunes says she is not sure Multiconsult has documents to support or testify to risk-based testing and inspections (2020).

A huge risk to quality was the lack of drawings and documentation for the original power station and the second expansion with added units. Manufacturing the turbines and other parts had to be based on measurements of the concrete skeleton and the tender documents from the 1960s (Brunes, 2020). Moreover, the existing construction in concrete posed a few problems for fitting the new turbines and constructing the machine-hole crane (Brunes, 2020). In addition to a squint concrete power station, the manufactured parts had to be done properly. "Hydropower requires a high level of quality from the supplier because we work with such fine tolerances: a 15-meter high construction rotating on its own axis- like a big watch, must be done properly- on the millimeter" (Brunes, 2020).

The Owner's Engineers were vigilant with the control measures, checks and independent controls of calculations, equipment and drawings. "Sometimes we found things

that had to be fixed", Brunes reminisces, "if we did not find the errors early enough, it meant equipment had to be shipped [to Liberia] and back, which would lead to severe delays" (2020). The equipment could not be modified onsite, only at the manufacturers. Hence, the team sent people to Brazil four times to check on equipment manufacturing (Brunes, 2020). There were also inspections and test plans for site works and the Owner's Engineers had people present onsite the whole time. What's more, contractors had to make sure they had additional equipment onsite to handle contingencies, as it is not possible to find tools and parts in Liberia. "We had 2-3 containers filled with everything imaginable that could be needed, including ordinary bolts and screws that you would find nearly anywhere, but not in Liberia" (Brunes, 2020). There were concerns about risks to cost and schedule in both projects, whereas quality seemed more of a concern for the Mt. Coffee project. How were these concerns and risks captured and processed? The next section will look into risk management practices within the two projects.

5.4 Project risk management practices

This section will examine data collected in risk management practices, frameworks, tools and forums within the Mt. Coffee and Jurong Rock Cavrens projects. From the data collected, and based on overarching Multiconsult standardized project management system, both the Liberia and Singapore projects had integrated risk management practices.

5.4.1 Risk management framework and plan

Multiconsult has a standardized risk management framework for its projects. Both the Mt. Coffee and Jurong Rock Caverns projects had adapted management, which entails risk assessments as part of project management. However, given that the projects started about seven years apart, the risk management framework might have been different at various times. The JRC project contributed to the improvements of risk management tools and processes in large Multiconsult projects. Since the projects ran simultaneously in the period 2013-2019, the standardized Multiconsult approach to risk management in adapted management processes would apply to both projects in this comparative case study.

In 2006 when the JRC project started, there were no general international standards for risk management (ISO 31000 was published in 2009). However, risk management had gained

considerable traction in the oil and gas industry. Fagervik brought risk management and the zero accident philosophy from the oil and gas and transportation sectors into the JRC project (Fagervik F. , 2019). The risk management strategy for the JRC project was built up from the start in 2006, reflecting practices in the Norwegian oil and gas industry (Mølltorp, 2020). Fagervik was the one who worked on and integrated risk and security management requirements and standard as part of the tender documents. His risk management requirements were based on the zero accident vision and his experience working with the Norwegian National Transportation Plan in 2002 (Fagervik F. , 2020). Fagervik holds that much of the risk management in the JRC project was based on Multiconsult's approach and Fagervik's idealism. The zero accident philosophy became a success criterion for the project and for Multiconsult being awarded the project management contract from JTC Corporation (Fagervik F. , 2020). "When you read the [risk management] document today, there are many things that are still valid and many things that are commonsense today but which, retrospectively, were novel at the time" (Fagervik F. , 2020).

Multiconsult used internal resources and project management systems when setting up management of the Mt. Coffee project. Out of the three project execution practices, the Mt. Coffee project had adapted management (Brunes, 2020). This entailed more extensive risk management practices and requirements to project staff in Multiconsult, especially the project director and manager.

Neither of the projects had dedicated risk managers onsite (Holt, 2020). The task of risk management was added to the project managers' portfolio in both projects. However, the whole project management team was responsible for risk identification, assessments and mitigation. There were, though, dedicated staff who handled risk in the contract [between Multiconsult and the client] (Holt, 2020). Multiconsult, as one of the Owner's Engineer for the Mt. Coffee project, involved a risk manager at the head office in Oslo. The risk manager, though, could not be aware of everything going on in Liberia or the project. Furthermore, there was an Environment, Health and Safety (EHS) manager from New Zealand attached to the Mt. Coffee project.

5.4.2 Risk tools and methods

A number of tools and methods are available within risk management practices. Some of the tools and methods available include different risk assessment methods, risk mitigation

strategies or measures, emergency preparedness and contingency plans, and transfer of risk through insurance or contractual arrangements. Risk management usually consists of three main activities: establish situational awareness and identify risks, then assess, analyze and evaluate the identified risks, and finally manage risks through risk avoidance, mitigation, acceptance, transfer or optimization (Aven T. , 2007, p. 16). The first two activities will provide the stakeholders with knowledge of potential risks and hazards for project implementation. This knowledge will then form the basis for decision-making and action. Within both projects, there were processes to identify and manage risks. The main tools used to identify, describe, track and treat risks were risk matrixes and risk registers. The adapted management system in Multiconsult uses the Ishikawa risk identification method and provides a risk register template in Excel. The Excel format has been used in both projects.

Fagervik informed that risk management methods and templates had to be adapted to the circumstances of the JRC project (2020). The first risk identification session within the JRC project was held at a workshop in 2006. The Ishikawa method for risk identification was utilized. Even though the format has evolved and improved over time, the Ishikawa method is still part of the risk management procedures in the adapted project management system of Multiconsult (Fagervik F. , 2020). At the workshop, risk categories and risks were identified and then gathered in a risk register. The same risk register has continued to project closure in May 2019. It has been a living document and served as a management document (Fagervik F. , 2019). In the Jurong Rock Caverns project the risk register was updated after the biweekly risk meetings with the contractors and the monthly meetings with the superintendent team. The risk register included risks in design, the project structure and technical risks and uncertainties (Holt, 2020). The risks were classified according to the traffic lights (red, amber, green) colour scheme. The risks were then followed up with an action list (Mølltorp, 2020). When the contractors were present, they had to provide explanations on improvements and actions related to mitigating risks. The risk register has had many risks throughout the 13-year project duration (Mølltorp, 2020).

In the JRC project, there was also a risk register for the basic design approval process, which was a year or two before construction started. An extensive communication structure was established, which had predefined formats on how to handle uncertainties and risk in design. There was an extensive verification program with the involvement of specialists, Multiconsult, Sintef Norway, the French Geostock environment and the processing environment in Kuala Lumpur and Singapore (Holt, 2020). There was a systematic risk

process in design and this process was much more extensive and more professional than normal risk management in Multiconsult projects. Holt believes this is due to Multiconsult's unusual role in the project, as the client's professional project management group (2020). Hence, Multiconsult did not have a normal contract but had to treat and handle the client's total risk, from the perspective of the project, management and construction. It is rare for Multiconsult to have this responsibility. Having such a demanding role in a project implemented on the other side of the world where Multiconsult had no prior experience added an extra dimension of gravity, Holt holds (2020). "Multiconsult established a system that is beyond what we would have done in 'safer' environments" (Holt, 2020).

Fagervik has worked to standardize this type of risk register across Multiconsult projects. All risk elements in a project should be coordinated and gathered in one document or tool. Further, Fagervik believes this tools and methods should be recognizable across subsystems and projects and structured according to project phases and project structure (Fagervik F. , 2019). Mølltorp agrees that the risk management in this project is recognizable from other projects (Mølltorp, 2020). When Mølltorp arrived in Singapore, he recognized the risk management procedures from other places he had worked. He would have used a more updated software than Excel, though, as Excel files are cumbersome to send around for updates and input (2020). "Had this project started today, we would have used a software where several users can update the risk register at the same time and on a common digital platform", Mølltorp says (2020). Still, the JRC project lifted the standards of risk management in projects in Singapore and it was at a much higher level than how risk management is normally conducted in the city-state (Mølltorp, 2020). The client, JTC Corporation, was satisfied with how risk management was conducted and how safety standards improved considerably (Mølltorp, 2020). A common risk register for the whole project was also novel to Multiconsult at the same and has since been implemented in other large projects where Multiconsult is one of the actors (Fagervik F. , 2020).

In the Mt. Coffee project, it was the PIU which was responsible for the daily management of the project, as well as risk management. The project manager at the PIU and contract managers have been directly responsible for risk management (Trifkovic, 2020). The role of the Owner's Engineer was supervisory – making sure services were delivered on time and with quality according to the contract. The Owner's Engineers made sure deadlines were respected and provided necessary resources. The Owner's Engineers Multiconsult and Fichtner contributed, as technical advisers, with assessments and templates (Trifkovic, 2020).

Fichtner, like Multiconsult, has a quality management system that includes risk management as part of project execution and as part of procedures and routines in projects (Trifkovic, 2020). The risk assessment tool used in the first half of the project was a risk matrix. Here, risks and potential consequences were identified and mitigation strategies prepared. Another risk assessment tools used in the Mt. Coffee project was a risk register that was established and regularly updated by the PIU. This risk register was also shared with other stakeholders. The key elements of risk assessments focused on schedule, quality, cost or EHS (Brunes, 2020). The project manager asserted he managed risks for the whole project on a daily basis: "We had a project-wide risk matrix and I had my own risk matrix at a lower level where I looked at low to high risks within the remaining contract and of not completing the project on time" (Ullyett, 2020). There was a risk matrix designed at the beginning of the project. A risk matrix needs continuously updating, especially when issues or changes arise. Ullyett cross-reference the matrix with his weekly and monthly reports, using a red, amber, green index (2020). He reported on key factors of project delivery. It was always a discussion about risks, whether to change, modify or drop risks when parts of the project was completed.

For the project manager Ullyett, risk management was part of project management. Ullyett believes the risk matrix used in this project is an outdated form of registering and managing risk (2020). He also believes not enough forethought went into this project and, as far as he knows, no HAZOP was conducted (2020). If a risk management plan had been developed earlier, the Owner's Engineers would have realized that this project was not as easy as they first thought. He further states that Multiconsult had many inexperienced people at the beginning and that it was a risk to the project that a project manager was not hired from early on (Ullyett, 2020).

Given the many contextual risks of working in Liberia, there were various risk identification, mitigation and management tools in place, including fire drills, community outreach and risk identification for the nearby community followed up with mitigation, EHS training, driving courses, safety induction, job safety analyses, emergency plans and evacuation plans. There was an emergency plan for the elections and the re-election run-up and evacuation plans.

Over the course of the project periods, there were changes in risk management and the tools and methods used. In short, management adjusted to the phases of the project. In the beginning, using the risk matrix was more appropriate but later on as the number of unknowns were reduced, the project manager used a risk register instead, says Dr. Trifkovic (2020).

Decisions on what tools to use were not necessarily based on analyses but what people in charge found more useful. "No one noticed that the risk matrix [for the Mt. Coffee project] was not updated for months and no one talked about it anymore (Trifkovic, 2020). Ullyett confirms this, saying that "the project director and myself pretty much agreed that the risk matrix done initially was not really worth to write home about. We did not follow up on it. Instead, we put our own risk register together which we followed up and communicated to stakeholders and funders" (2020). The reason why they created their own risk register was that the original architect and author did not follow up the initial risk matrix. This led to an outdated, and thus a useless, risk matrix (Ullyett, 2020).

Fagervik also attest to changes and an evolution within both Multiconsult and the JRC project on risk management tools and practices: When Multiconsult was awarded the JRC management contract in 2006, Multiconsult had 500 employees. When the project was completed in 2019, Multiconsult had 3000 employees (Fagervik F. , 2020). Throughout the thirteen years Multiconsult was involved with the JRC project, there have been developments in Multiconsult, within the field of risk management, and technological advances. What is standard now, would be a novelty or pioneering work at the start of the project. For instance, in 2006 it was unique for a project to have its own website. It is therefore important to keep in mind historical developments and the time in which risk management tools and methods were implemented. There has been a progression over time: "what we conceived as new and cutting edge in 2006 might not meet today's standards or expectations. That means we have to take a historical perspective on approaches to risk management" (Fagervik F. , 2020).

5.4.3 Risk forums

In both projects, risk was on the agenda every day (Brunes, 2020; Holt, 2020; Mølltorp, 2020; Ullyett, 2020). Within the JRC project, risk was on the agenda continuously: both in meetings with the client and the entrepreneurs (Holt, 2020). Risk was on the daily meeting agenda and there were regular risk meetings. They had weekly meetings where risk was on the agenda. In addition, there were risk meetings every two weeks initially, then monthly (Fagervik F. , 2020).

The project management team's duty was to look after risk and follow up. However, it was the responsibility of the superintendent team that followed up with contractors on a daily basis. The contractors were doing the physical jobs whereas the superintendent team and

management team were responsible for the technical solutions and followed up all disciplines with the contractors. We managed and followed up the superintendent team who then followed up contractors. This did not always happen. Møltorp made sure he or someone else from the project management team sat in on all meeting in order to follow up risks (2020).

The steering committee from Norway, SINTEF and the Singaporean partner company Tritech asked for information on risks. The risk picture was always on the agenda in the steering committee meetings. Mølltorp as the project manager had to prepare reports and present the risks in meetings and how the project management team panned to follow up on major risks (2020). There were risks from Multiconsult's point of view, in terms of the contract and Multiconsult's cooperation with the client and partners. Contractual risks for Multiconsult were treated from the level of the project manager sitting in Singapore up to the project director in Multiconsult in Oslo. This is another type of risk than what the project manager normally was concerned with, such as risks related to the execution of the project (Mølltorp, 2020).

In the Mt. Coffee project, there were various forums for discussing project and other risks with the stakeholders: there were daily morning meetings onsite, regular stakeholders meetings, discussions with contractors before start-up (design and interfaces and quality), and community outreach (Brunes, 2020). There was good and close interaction between the two Owner's Engineers, Multiconsult and Fichtner. Both companies were affected by the same risks, such as not being paid for services (Trifkovic, 2020). The PIU and Owner's Engineers had a risk assessment presentation at every meeting (Gakkestad, 2020). "As the project manager [for Mt. Coffee], I had risk on the agenda every day. Discussions on risk were at the forefront of execution, control and monitoring. We are closing up [the project] and still concerned with risks", project manager for Mt. Coffee, Ullyett, asserts (2020). Every morning started with risk assessments, EHS assessments, emergency preparedness plan, traffic plans, fire safety on the camp site, identifying who onsite that day had first aid training and who and how to contact medical staff. Job safety assessments were conducted every day on the different site locations. This enabled the contractors to align their planning and scheduling and stay alert of one another. If one contractor's personnel did something, it could be reported anonymously (Brunes, 2020).

5.4.4 Environment, health and safety (EHS) risk management

Environment, health and safety (EHS) for staff was a concern for both the Jurong Rock Caverns and the Mt. Coffee projects. Even though EHS was a concern, plans and procedures in place to ensure the safety and wellbeing of personnel were not always implemented. Safety was always a concern in the JRC project. Multiconsult's zero vision for accidents was very important, and there were few accidents. This vision was inspired by the Norwegian oil industry and the same procedures were followed as when platforms and big projects in Norway are built. It was not easy to implement these strict safety and security standards. The client, JTC Corporation, supported these standards and procedures.

At the beginning, there were some misunderstandings with the contractors and some of the stakeholders paid lip service to the importance of EHS. Mølltorp pointed out that Hyundai is one of the world's biggest contractors but was not aware how to implement a zero accident philosophy when work on the Jurong Rock Caverns commenced. Hence, workshops and meetings were held in order to understand the philosophy and find ways to implement it. It took time (Mølltorp, 2020). Even though Hyundai stated in meetings that safety was their biggest priority, onsite this was not the case. Mølltorp claims Hyundai did not met expectations of risk management and safety (Mølltorp, 2020).

Management site walks were conducted in order to ensure compliance with risk and safety standards and requirements. First, this was conducted weekly, then later once every two weeks. Initially, findings from these walks were not reported. Fagervik requested reports. In one walk, Fagervik noted forty discrepancies. For a lot of these workers, protective clothing, shoes and glasses, the fencing in of shafts were unheard of" (Fagervik F. , 2020). Tunneling and mining are some of the most dangerous jobs and there are many risks to personnel safety, such as gases, water, falling from heights and falling objects. Fagervik had to mandate the use of harnesses when working at heights. The shaft was 120 meters deep and 20 meters wide. Eventually workers put on harnesses but did not always use them correctly. Securing the perimeter around the shafts was also important. At 24 meters deep, there were no safety measures in place in or around the shaft or for the workers (Fagervik F. , 2020).

One of the most important contracts – the construction contract for the shafts – was already in place by the time Multiconsult was involved in the project. This contract did not have risk management requirements. The work done under this contract had a risk factor of 4.3 deaths/injuries per 1 million working hours. The subsequent construction contract had a risk factor of 0.45 deaths/injuries per 1 million working hours (after 35 million hours had

been billed) (Fagervik F. , 2020). The Singapore Government noticed this and were satisfied with the risk management aspect of our work. "In 2007-09 we started a job safety awareness campaign targeting foreign workers in Singapore. The [Singapore] Government noticed what we did and sought more of this" (Fagervik F. , 2020). Additionally, safe job analyses were conducted for all work operations and regular toolbox meetings were held on what to do and who were responsible for what in terms of safety and security. This was something Mølltorp and Fagervik brought with them from the Norwegian oil and gas industry and that was new to the contractors (Mølltorp, 2020).

Multiconsult had a good EHS plan and regularly checked that regulations and standards were followed in the Mt. Coffee rehabilitation project. There still were a few accidents. A couple of them were not directly related to work tasks, like two people drowning in the river and another one drowning while using the work canoe. Canoes and bridges were in place as mitigation measures. After the drowning accident, Multiconsult required handrails on the canoes (Gakkestad, 2020). Gakkestad mentioned that EHS is a concern because work accidents damage the reputation of international companies. Hence, it was important that EHS standards were implemented at the construction site. However, strict (Western) EHS standards are not easily implemented when there are local workers and companies with different traditions and standards (or lack thereof) (Gakkestad, 2020). Both projects had environmental, health and safety standards and plans. However, these were difficult to enforce, as the contractors were ultimately responsible for their workers. That could potentially be explained by varying approaches to risk and risk mitigation. The next section will explore varying approaches to risk within and between the two projects.

5.5 Varying approaches to risk:

Despite a common and standardized risk management practice within Multiconsult, there were some variations in approaches to risk management within the two projects. The following sections explore potential variations in approaches to risk management and risk mitigation among stakeholders and due to cultural differences that influence how risk is perceived, managed and mitigated.

5.5.1 Stakeholder risks and perspectives

Risks are constructed and shaped through a constant battle between participating actors in society – all of whom front their own perception of risk (Engen, et al., 2016, p. 100). In a project, typically there is a hierarchy where the project manager and project director will shape and make decisions regarding the risks to the project. Nevertheless, when there are various stakeholders – contractors, project managers, donors/funder, the local or national government – they all have their own perception of risk. Risk perception between these stakeholders may vary, as they have different values (to protect) and different interests.

There were many stakeholders involved with the two projects –and therefore also potentially different approaches to and perceptions of risk. A stakeholder is a "person or [an] organization that can affect, or be affected by, or perceive themselves to be affected by a decision or activity" (International Standards Organization, 2018, p. 1). Some of the main stakeholder groups within a construction or engineering project include clients, consultants and contractors (Yornu & Ackah, 2019, p. 34). Clients typically provide the finances and owns the project outcome. Consultants usually represent the client and function as designers, project managers or specialist engineers. Contractors execute the project through construction or provision of parts and services. In the case of Mt. Coffee and other development projects, there are also donors who finance the project on behalf of the client.

Stakeholders usually have different expectations for a project. The client expects that the project will be completed on time and within budget, while the consultants manage the project and risk related to the project (Yornu & Ackah, 2019, p. 34). The contractor's aim is to maximize profit while also completing the project within time and budget. When dealing with issues of risk and safety, costs and benefits are often distributed among different stakeholders (Bjelland, 2013, p. 40). Which stakeholder, though, can be held accountable if the project is not completed on time and budget? When there are many partners and stakeholders involved in a project, it is key to have a clear understanding of division of labour, good and solid contracts and know who is carrying the responsibilities for risk management at various levels.

Even though there should be a clear line of responsibility and accountability for risk management and project implementation, the ISO 31000 standard contends that interaction with stakeholders has to be a part of managing risks (International Standards Organization, 2018, p. v). This is important because stakeholders bring their own perspectives and

approaches to risk to the table and involving the various stakeholders also established a common awareness and knowledge about risks within the project.

Both projects had a number of stakeholders involved. The high number of stakeholders and partners, combined with a variation in nationalities and cultural backgrounds, add complexities and risks as well. These risks might include lack of communication or miscommunication, cultural differences and disagreements, and competing approaches and concerns. Here, a risk management process can become a risk governance process whereby stakeholders or actors make decisions on processes that affect them (Aven & Renn, 2010, p. 181).

Holt recalls that there were generally agreements among the stakeholders about what constituted a risk to the project (2020). However, there were often disagreements on how to mitigate or handle risks. The research oriented academics from Sintef had different perceptions form the engineering and project management/execution environment. The entrepreneurs usually responded with just 'yes sir' (Holt, 2020). Mølltorp agrees that there were no disagreements on which risks were more important and how to reduce or handle risks because it was up to the project management team (2020). It was the project management's task to run the risk process and establish a good and common understanding of what was important. Unlike Holt, Mølltorp does not remember discord on how to mitigate risks: "We had lots of discussions but in the team we always found the best solution on risks" (2020). The project management team did not have any issues with the client, JTC Corporation. There were discussions with the contractor Hyundai about the level a risk posed but there were never disagreements about whether a risk should be added to the risk register (Mølltorp, 2020).

The stakeholders in the Mt. Coffee project were always interested in risk management and risk assessments. There were presentations on risk management in stakeholders meetings. The variation in risk management was not so much about differences in risk management across stakeholders. Instead, the focus on risk through the project stages changed. Ullyett claimed he had never seen such change in risk profile in any other project before. The risk profile was changing continuously. Hence, risk management has to be continuously updated, revised and dynamic (Ullyett, 2020). For example, in the beginning, there was more focus on handling risks related to getting started and procurement schedules (Brunes, 2020), whereas now there is a focus on risk related to closing the project with three contracts still running

(Ullyett, 2020). Dr. Trifkovic thought the regular stakeholder meetings enabled them to share their opinions and anticipations about risks (2020). Here, they identified the most important risks and established common situational awareness (Trifkovic, 2020). It was useful to have regular exchanges where different attitudes came together and where the stakeholders came to agree on what constituted the most important risks (Trifkovic, 2020).

Similar to the JRC project, the main responsibility for managing risks was allocated to the project management team onsite. In Mt. Coffee, this was the PIU and Multiconsult. The various stakeholders' own risk management plans were not shared or communicated in the project. Only the project's risk management plan that was communicated at the stakeholder's meetings. Hence, if there were variations between the stakeholders' risk assessments and risk perception, this was not communicated. Gakkestad remembers that the various project stakeholders mostly agreed on risk management (2020). There were variations in approaches in some areas, though. Brunes recalls variations among stakeholders on EHS for personnel, due to different standards and policies within the different companies (2020).

Brunes remembers that there were some disagreements among stakeholders on which risks were more important and how to reduce and handle risks (2020). Both Brunes and Gakkestad remember huge discussions about risk reduction measures for dam flooding and dam breach. The dam flooded and breached in 1990, causing the destruction of the hydropower plant. Coming up with solutions and risk mitigation to avoid dam breach because of flooding was therefore important to some of the stakeholders (Brunes, 2020).

One could expect variations among stakeholders in handling the Ebola-emergency as well. However, Brunes holds that there were no differences in approaches because the project stakeholders had to agree to a joint approach (2020). There were, though, differences in opinions. This, Brunes pointed out, was part of a natural process. There were many discussions (not disagreements) on how to handle the situation and to what extent Ebola posed a risk. "Everybody quickly understood that we needed to find a joint solution. I had many discussions with stakeholders, but they quickly agreed [to evacuation] because they had probably arrived at the same conclusions in their internal discussions" (Brunes, 2020). Gakkestad representing the Norwegian Government and the donor Norad said that the Government of Liberia representative was the only one not in agreement on the risk Ebola posed:

> In the beginning, they denied the risk of Ebola. We had some meetings with the chair of the board of LEC. He said Ebola was not a problem. We were a bit upset because several people had already died from Ebola. He downplayed the risk. The reason [why he downplayed the risks was because] stopping the project was a threat to the minster of Land, Mines and Energy and the chair. Halting the project meant defying an order from the President (Gakkestad, 2020).

Overall, it seemed as though stakeholders generally agreed on risk management and mitigation, despite the number and diversity in stakeholders. The next section examines potential cultural differences in risk perspectives and management in the two projects.

5.5.2 Cultural differences in risk perception and risk management

How much is it possible to attribute cultural differences to variances in risk perception and approaches within and between the two projects?

Mølltorp experienced a cultural difference in terms of reporting errors or mistakes. Mølltorp's understanding is that "when we do mistakes, our system forces us to come clean, report and tell. The culture there is different. They did not report mistakes but we would follow up and find out. The culture is not to come clean, but to swipe it under the rug" (Mølltorp, 2020).

Mølltorp also commented on this as a cultural difference: "They [Asians] always say yes. They never say no. We were never sure if they said yes and would follow up or not. That is why we had to always check and follow up" (Mølltorp, 2020). Having such a demanding role in a project implemented on the other side of the world, Multiconsult established a system that is beyond what would have been done in projects at home. The cultural aspects produced uncertainties – a Chinese culture in a country based on English legal principles and an unknown client. Additionally, the entrepreneurs were from Korea and Japan. These unknowns and uncertainties made it a higher risk project for Multiconsult (Holt, 2020).

There were cultural clashes and differences in how to mitigate risks and what was considered risk. The attention to EHS by Multiconsult and mitigations measures aimed at providing better safety to workers were not welcomed by the workers or even construction managers. In some instances, safety instructions and procedures were not followed, resulting in injury and the loss of life. Holt informs that the superintendent team focused on risk

management in their dialogues with the entrepreneurs, but they struggled with the cultural aspect (Holt, 2020). "Different cultures, especially as regards perceptions of risk and risk management, was one of the most challenging aspects in this project", Holt asserts (2020).

One of the reasons why the client JTC Corporation selected Multiconsult as the project manager was our zero accident vision. "When we arrived in Singapore, having sold in a zero accident vision to the client, and we meet a culture where EHS standards are very low and worker's safety and security not prioritizes, it was a clash", remembers Holt (2020). The data collected demonstrate how the avid attention to risk and thorough risk management practices were predominantly Western ideals and practices. Workers were transported at the back of trucks on the highways without any seat belts or safety. There were efforts to arrange bus transportation for the workers. Something as simple as setting up bus transportation for the workers was met with protest – as this was humiliating to the workers. Several of the EHS mitigation measures, ultimately there to protect the workers and ensure their safety and wellbeing, they found humiliating. "They have the cultural concept of losing face, which means they are humiliated. This is part of their culture, but we cannot address their culture as a risk factor" (Holt, 2020).

Holt had to follow up safety investigations at the beginning. There was an accident with explosives where the detailed instructions for how to handle the explosives and perform the tasks were not understood nor followed, which resulted in an uncontrolled explosion that sent one person to the hospital. This is an example of trying to implement methods and describe instructions so far from the cultural understanding of the person performing the task that they do not understand how and why they do these tasks (Holt, 2020).

It was hard to find an execution plan that was possible to implement in this culture and that Multiconsult could stand by. "I went from the ultimate security and safety focus [at my previous job in the Norwegian oil industry] to the Third World", Holt recalls (2020). There had to be a balance between what Multiconsult wanted to achieve in terms of risk awareness and safety and security and what was possible within that particular context. Multiconsult was responsible for implementing the zero accident vision while the entrepreneurs were responsible for EHS for their personnel (Holt, 2020). Occasionally, this could prove very challenging. Changing safety culture is not an impossible task, though. Fagervik points out how progress takes time and challenging and changing culture takes time. "When only one person does something, nothing happens. When several people act, they create a subculture. We tried to create a risk and safety subculture" (Fagervik F. , 2020).

Dr. Trifkovic did not experience major cultural differences in partners' approaches to risk in the Mt. Coffee project (2020). International companies implemented the whole project, with financing from international development banks and donors, design and consulting by Multiconsult and Fichtner, and contractors from the UK, South Africa, Sweden, Germany, and Austria. Only one contractor was Liberian – they ensured the provision of food and accommodation (camp services) (Trifkovic, 2020).

5.6 Crisis management

Despite efforts to reduce or mitigate risks, there will be incidents that materialize and negatively affect the project. Part of risk management is the ability to be prepared and manage crises that might occur. To what extent did Multiconsult have to deal with serious accidents and incidents in the two projects? How were project staff equipped and in what ways had these incidents been part of risk management efforts before they occurred?

The informants were asked whether any major incidents occurred during the lifetime of the project and how this was handled. There were some incidents in the Jurong Rock Caverns project but no major crisis occurred during the thirteen-year project period. There was one uncontrolled explosion on a drill barge that left one person injured. Holt does not recollect any other serious accidents or incidents. The project has a very good EHS and injury statistics, also compared to Norwegian accident and injury statistics on large projects. This was a success (Holt, 2020). Mølltorp recalls that there was one accident while he served as project manager but this was not a serious one (2020).

Accidents and incidents occurred in the Mt. Coffee project as well. There was one fatal accident onsite. A Liberian worker died from injuries sustained after work on transmission lines. This was considered a human error and occurred despite proper training (Brunes, 2020). There were also some drowning incidents related to the use of project equipment (canoes) and there were many cases of malaria, including the death of a Swedish contractor from malaria (Brunes, 2020). The overarching crisis for the project, though, was the Ebola-outbreak.

When the Ebola-virus broke out in Liberia and the rest of the sub-region, it became a major health emergency for the country, affecting every aspect of society. Ebola presented a major risk to the Mt. Coffee Hydropower project, both in terms of staff risks and risks for delays on completion. Hence, there were serious efforts at crisis management and emergency response both within the project and within Multiconsult during the Ebola outbreak.

Within Multiconsult, there was already an Emergency Plan Abroad, an EHS (Environment, Health and Safety) Master Plan, EHS rules for Multiconsult staff in Liberia and an Emergency Response Plan in place before Ebola. When asked whether Ebola or other fatal contagious diseases had been assessed as part of risk analyses before deployment to Liberia, Brunes responded that other fatal and contagious diseases had been part of risk assessment (2020). Ebola was not part of these assessments as no Ebola-outbreak had occurred in West Africa prior to this (Brunes, 2020). Gakkestad confirms that Ebola was not foreseen in any risk assessment (Gakkestad, 2020).

When the Ebola outbreak became known, Multiconsult established the Steering Committee and the project established an Ebola Monitoring Group. These bodies kept abrest of the situation and made decisions on procedures, actions and evacuation. An infection control procedure was developed, alongside a Global Action Plan, an EVD Alertness Plan, EVD risk assessment, a risk mitigation matrix and a risk management consultancy with medical expertise was brought in to provide advice (Rusten, 2016).

The demobilization and evacuation of personell and suspension of site works posed potentially serious risks to time schedule and cost increases. However, risks to cost and schedule were mitigated by using the demobilization period for planning (Gakkestad, 2020). Site works were suspended but the project continued in other ways: stakeholders meetings were held in London and manufacturing of parts continued according to schedule in other parts of the world (Brunes, 2020). The goal was to resume work as soon as possible after Ebola. Overall, the project response to the Ebola-outbreak was hailed a success. It is questionable, though, whether the project itself was a success. The following section will look into whether the Mt. Coffee and Jurong Rock Caverns projects could be deemed successful.

5.7 Project failure or success?

What makes a project successful? From discussions in Chapter 2, project failure was often attributed to not delivering a project according to schedule, budget and with quality. However, project success could be viewed from various perspectives. The informants were asked whether they considered the project a success from a project risk management perspective, taking into account budget, time and quality. Holt states that the JRC project was not a successful project when considering the schedule delays and costs: "The project went on for many years after initial completion date and the budget was overblown" (2020).

If we measure success by whether the project outcome has materialized, then the Mt. Coffee hydropower plant could be deemed a success once it started producing electricity to the Liberian people. Dr. Trifkovic pointed out the project's main aim has been achieved, namely to: provide clean and affordable electricity to the Liberian population (2020). Moreover, the Mt. Coffee hydropower plant is the only reliable source of energy in Liberia and energy demand and consumption in Monrovia tripled two years after the project ended. Completing the Mt. Coffee hydropower plant rehabilitation project was a major milestone for Liberia, says Dr. Trifkovic (2020). Mt. Coffee project manager Ullyett agreed: four units have been generated that provide electricity through the Liberian power grid (2020).

Likewise, the Jurong Rock Caverns could be hailed a success when its purpose of storing oil underground and freeing up valuable land is achieved. The main goal of the JRC project was to build a strategic oil storage facility where the petrochemical industries could rent storage and thereby free up valuable land. The client, JTC Corporation, has not managed to get rental contracts for the storage facilities, though. Since the completion of the caverns there has been a major drop in the price of oil and oil crises, leaving the JTC Corporation without clients in their new subsea storage facility (Holt, 2020). Hence, the project outcome has not yet materialized.

If we measure success in terms of experience and exposure to large international projects, managing the Mt. Coffee and Jurong Rock Caverns projects have been a major boost to Multiconsult. Holt points out that the JRC project has been a major success for Multiconsult as it has given Multiconsult international perspectives and experience managing large projects (2020). Dr. Trifkovic stated that the Mt. Coffee rehabilitation project has been successful for the Owner's Engineers: "All the main aims are achieved and even we as consultancy companies contributed to a large amount to that, because we were involved from beginning to end – from design and planning to advise, implementation and closure" (2020). He further states that Fichtner would have been happier of there were no delays and if the budget had stayed within its original limits (2020). However, this rehabilitation project was recognized as Liberia's chance not only to rebuild the hydropower plant but also improve it. That is why the international donors stepped in and provided more money. The Ebola-outbreak, and hence the project delays, was not a crisis that anyone could have seen coming (Trifkovic, 2020).

Both projects were completed, celebrated and inaugurated with the countries' respective President and Prime Minister, other high-level politicians, and project staff. The efforts of the

consultancy companies and contractors involved were applauded and the high-level presence at the opening ceremonies displayed both the importance and successful completion of the two projects (Brunes, 2020; Fagervik, 2019).

6 Chapter: Discussion

In the previous chapter, we examined the data collected through primarily qualitative interviews with key personnel involved in the Mt. Coffee and Jurong Rock Caverns projects. This chapter will summarize the main similarities and differences in the execution of the standardized risk management framework for the two projects, how the projects comply with standardized principles and approaches to risk management and the effect of cultural differences and risk perspectives on project risk management.

Some of the expectations at the onset of this study were that a large and well-established engineering consultancy firm like Multiconsult has developed standardized approaches to risk management in all its projects, regardless of where the project is implemented. Multiconsult's standardized management systems have evolved over time, based on experiences, lessons learnt, developments in various fields of expertise, and in order to comply with new laws, regulations and industry standards. Yet, there were insignificant variations in approaches to risk management in the Mt. Coffee and Jurong Rock Caverns projects, even though the JRC project commenced seven years before the Mt. Coffee project. Actually, Multiconsult shows consistency in project delivery, including risk management practices.

Multiconsult has developed standardized methods for project management with predefined actions depending on the size and budget of the project. Multiconsult operates with three management levels: simplified, standard and adapted management of projects. Mt. Coffee and the JRC projects were managed according to Multiconsult's adapted management model for large integrated and complex projects. Herein lie obligatory risk management tools and processes, which both projects utilized. This risk management system is comprehensive and holistic enough to be used in various settings and is not dependent upon contexts (high vs low risk), environmental and cultural factors, labour skills, industry, project specifics, staff personalities or underlying agendas, time lapses or project role. Instead, it allows for variations in risk focus over time while providing the overall framework for managing both external and internal project risks.

In addition to adopting standardized Multiconsult risk management approaches, both projects seemed to comply with the eight principles of risk management in the ISO 31000 *Risk Management -- Guidelines* (International Standards Organization, 2018, pp. 3-4). Firstly, risk management was an integral part of the activities of both projects from the start. This was partially due to Multiconsult's enterprise management model whereby projects with adapted management system have risk identification and assessment as obligatory activities. In

addition, the JRC project benefitted from a risk management champion who made sure risk management requirements were added in at an early stage. Secondly, both projects displayed a structured and comprehensive approach to risk management – not only looking at risk to cost, time and quality but also EHS and contextual risks. There were layers of risk management within the projects, from top-management to the workers onsite.

The third principle, customizing risk management processes, frameworks and methods, was seen in the way project management adapted and changed risk assessment methods, such as risk matrixes and risk register, to fit their needs. The focus on risk through the various project stages changed as well, and this was reflected in risk management and mitigation processes. Moreover, the various stakeholders were involved with and informed of risks and risk management in both projects. There were regular forums for discussing risks, establish common situational awareness and agree on joint risk mitigation actions. This also enabled the projects to fulfill principles five and six – implement dynamic risk management practices that adapted to changes in risk and that was based on current and updated information. The informants were all very aware of how human and cultural factors affected risk management, and in particular risk mitigation and EHS standards at lower levels of the project hierarchy. The eight and last principle calls for continual learning and improvement within risk management, which project staff has engaged in through presentations, evaluations and crisis management. Having found that the two projects abide by the same risk management standard, the following section will briefly showcase some of the similarities and differences in approach to risk management.

6.1 Differences and similarities in risk management

Given that both the Mt. Coffee and the JRC projects adopted Multiconsult's standardized risk management approach, there were many similarities between the two projects as regards risk focus and treatment. Simultaneously, there were some variations in approaches to risk management within the two projects. The variations between the two projects were not significant, though. Differences in approaches to risk do not necessarily stem from differences in projects or contexts but rather from project stages and the experiences, backgrounds and perspectives of staff.

In both projects, risks related to cost, time and quality were important risk factors – both projects were extremely delayed and experienced cost overruns. Both projects used risk

registers for risk identification and treatment, informed and involved other stakeholder to a large degree, and focused on environmental, health and safety standards.

Time and experience are contributing factors to why approaches, methods and tools within risk management might vary. For one, variations could be explained by the fact that the projects started seven years apart, with JRC commencing in 2006 while Mt. Coffee initiated in 2013. Even though the projects in Liberia and Singapore commenced at different times, which could imply that Multiconsult's standards and approaches were not the same at the start-up of these two projects, risk management practices were comparable

6.2 Cultural differences

Have cultural differences and variations in risk perspectives and practices affected the execution and implementation of risk mitigation strategies? Cultural differences were identified in both projects as problematic for risk management. Project managers would have gained from trying to understand the underlying reasons and perspectives for why there was opposition and a lack of compliance with mandated EHS requirements. The fact that workers and management view EHS standards differently attest to both cultural differences between the two groups and to risk as a social construct.

Workers found some of the safety measures humiliating while the project management team saw a responsibility to prevent injuries and loss of life as part of the zero accident philosophy. Perhaps the different views reflect what the groups value: reputation and not losing face versus life and safety. Personal experience also shape risk perception and the sense of threat. "Which incidents and practices will be considered 'risky' differs according to cultural grouping and social affiliation" (Mythen, 2004:113). The workers who opposed being transported by bus to the JRC construction site had probably spent years being transported at the back of trucks. They did not necessarily consider this form of transportation risky. The workers did not oppose the EHS standards and risk mitigation measures because they were uninformed. Instead, they had their own views of how potential risks will affect them. These workers' risk perceptions are no less valid than the project management team's assessments.

The informants from the JRC project revealed that other EHS and risk mitigation standards were opposed, ignored, or simply not understood. In order to improve implementation and compliance, it would be useful to understand variations in risk perceptive as well as cultural difference between and among stakeholders and workers. As Fagervik

mentioned, changing culture takes time. However, understanding the underlying risk perspectives might make it easier (and quicker) to change risk culture. Moreover, when we look into how psychological, cultural, and political processes shape, define and create risk and threats, we are better able to understand why some groups or cultures do not heed safety regulation or risk mitigation measures.

6.3 Dealing with contextual risks

While approaches to project risk management might be similar, it is expected that risk management as pertains to operating in a high-uncertainty country like Liberia will have a different focus than a project in a stable country like Singapore. As discussed in Chapters 4 and 5, implementing projects in these two countries offer widely different risk spectrums and context-specific risks. Hence, risks related to expatriate personnel and context-specific risks would have a much larger impact on project risk management and project planning and implementation in Liberia, given the country's challenges.

There is certainly no shortage of problems and challenges in post-conflict states such as Liberia. Implementing projects in failed states or states emerging from civil war implies dealing with ill-equipped or non-existent institutions, a high rate of political instability and volatility, violence, poor governance, underdeveloped or lack of basic infrastructure, poor or non-existent resource management, scarcity, economic hardship and devastation (Ika, 2013, p. 121). Agencies, whether aid agencies or private contractors, all have to contend with higher start-up and implementation costs as well as more severe risks to both project and personnel when operating in failed and post-conflict countries (Ika, 2013, p. 122).

Arguably, risk management will be higher on the agenda and conceived as more important in projects where risks have been amplified. Indeed, the contextual risks seemed to play a greater role within risk management in the Mt. Coffee project than in the JRC project. More risks from and to the surroundings were identified and had to be managed. In the Mt. Coffee project, there were personnel dedicated to community outreach. In addition, the lack of basic and critical infrastructure in Liberia meant that there were added protective measures, such as evacuation plans and procedures, emergency preparedness plans for election and detailed procedures for medical assistance. EHS also received significant focus within the Mt. Coffee, but here the contextual risks to staff played a much greater role than work-related accidents.

Contrary to expectation, personnel safety had a much more explicit focus in the JRC project than in the Mt. Coffee project. Actually, a zero accident philosophy was one of the reasons Multiconsult won the contract. However, there were fewer contextual risks to deal with and contingency plans and evacuation procedures were therefore not at the forefront of risk management planning. The focus on personnel safety was primarily linked to safety at work rather than contextual risks.

This brief discussion has highlighted the main findings and attempted to unearth whether cultural differences or varying risk perspectives may account for differences in risk management in the two projects. Despite the many differences between the two projects, adopting a standardized risk management system is possible with holistic risk management practices that involve looking at both the context and the project. Contextual risks, such as political violence or riots, strikes, environmental concerns, epidemics or the lack of infrastructure could have debilitating or devastating impact on project implementation and completion. Likewise, the lack of attention to internal risks, such as budget overruns or design flaws, could also lead to project failure. When taking into account both internal and external risks, standardized risk management frameworks can be implemented in all types of projects, regardless of the project's risk profile.

7 Conclusion

This thesis has attempted to compare and contrast how risk management has been implemented in two highly complex and diverse projects, the Mt. Coffee hydropower rehabilitation project in Liberia and the Jurong Rock Caverns subsea oil storage project in Singapore. This comparative case study of the Mt. Coffee and Jurong Rock Caverns projects demonstrate that approaches to risk management in the two projects and contexts are comparable, despite the many differences between the two projects. A standardized approach to risk management within Multiconsult, as well as consensus among stakeholders of the importance of risk management, might account for the similar approaches to risk management across the two projects. Whereas Multiconsult's standardized management systems have evolved over time, data collected through interviews show that there were insignificant variations in approaches to risk management in Multiconsult's Mt. Coffee and Jurong Rock Caverns projects.

In fact, Multiconsult shows consistent project management execution and risk management practices across time and projects, regardless of project context. Data show that the project risk management processes within the Multiconsult adapted management system can be applied to both high and low risk contexts or high or low risk projects. The standardized risk management model is robust and holistic enough to account for and process environmental and cultural factors, labour skills, industry, project specifics, staff personalities or underlying agendas, time lapses or project role. Yet, it is flexible enough to allow for variations in risk focus over time while providing the overall framework for managing both external and internal project risks.

In essence, we find that standardized approaches and frameworks for risk management in projects are adoptable to highly diverse settings. Being able to use a standardized international or company-specific risk management approach for all types of projects will serve to lighten and streamline risk management and ensure consistency and comparability across projects.

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