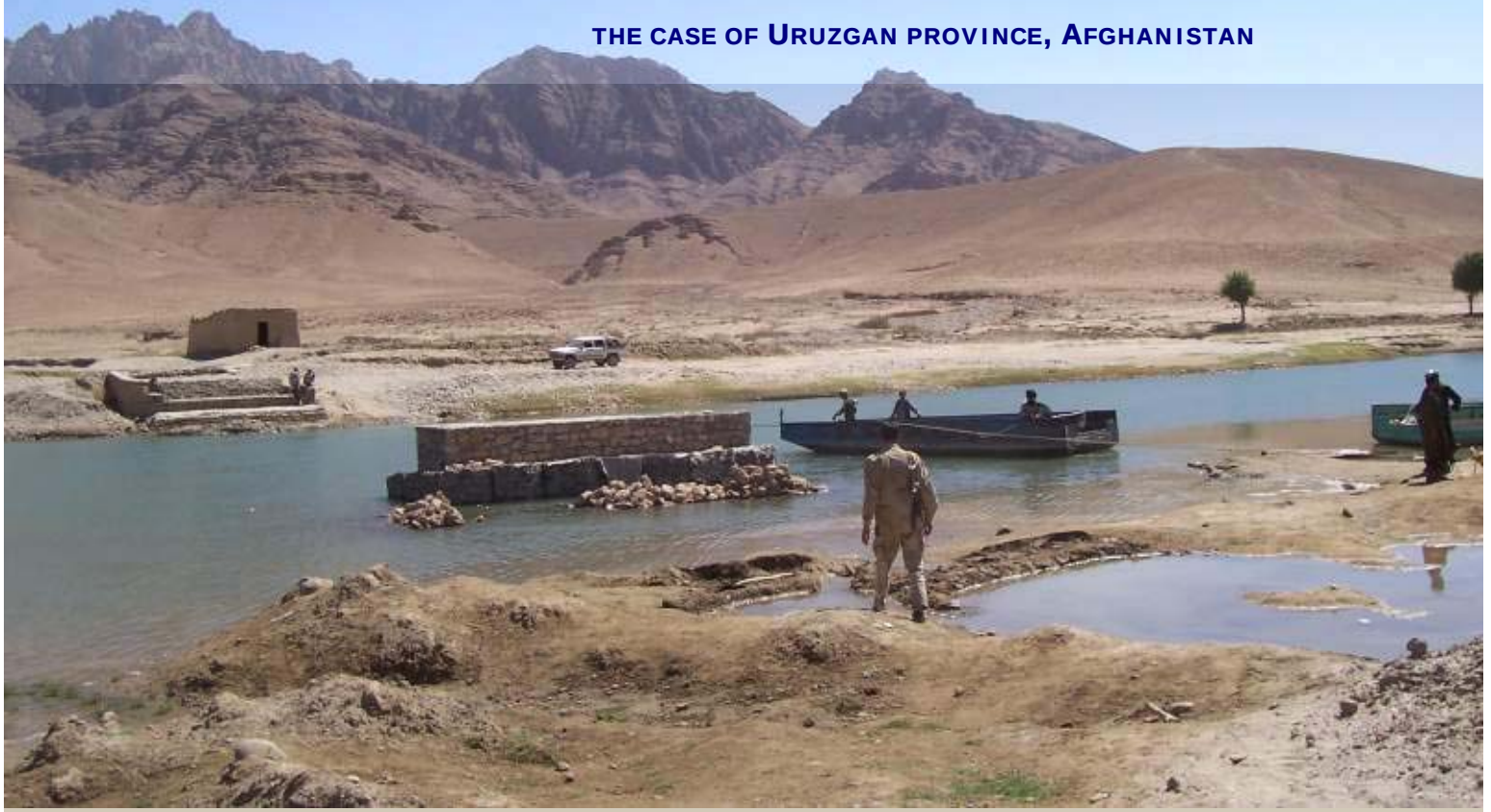
MASTER THESIS

A PROJECT MANAGEMENT ANALYSIS OF MILITARY INVOLVEMENT IN CIVIL ENGINEERING RECONSTRUCTION PROJECTS DURING COUNTERINSURGENCY OPERATIONS

THE CASE OF URUZGAN PROVINCE, AFGHANISTAN



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ENTREPRENEURS ARE SIMPLY THOSE WHO UNDERSTAND THAT THERE IS LITTLE DIFFERENCE BETWEEN OBSTACLE AND OPPORTUNITY AND ARE ABLE TO TURN BOTH TO THEIR ADVANTAGE.

NICCOLO MACHIAVELLI

PREFACE

This report presents the process and results of my graduation project at Delft University of Technology. During the period from February 2010 to November 2010 I went through ups and downs towards my final goal, to obtain a master degree in Construction Management and Engineering.

It all started in March 2009 when I had a brief informal talk with a friend of mine regarding the thesis subject I was looking for. To him, I mentioned my interest in combining my civil engineering background with 'something military'. Coincidence or not, his father Jan van der Woerdt appeared to be a former commander of the CIMIC section involved in various reconstruction activities in Afghanistan. An overseas phone call with him further fueled my enthusiasm regarding the subject and his network led me to an even more enthusiastic person, Bas Rietjens at the Royal Netherlands Defense Academy whose field of research is civil military cooperation.

At the same time, I was looking for supervisors at Delft University of Technology whose expertise could contribute to the research, who were interested in the research topic and -above all- could well support me in the task lying ahead. Soon I found Alexander Verbraeck, Joseph Barjis and Maurits Ertsen willing to contribute. From the appraisal of my research proposal to the delivery of my final report and the final presentation, cooperation with the whole committee has been fruitful and dedicated and this certainly contributed positively towards the final result.

During the course of the research I have conducted both interviews with experts and had many more informal talks with people (both military and civilian) I encountered. Their enthusiasm and willingness to put time and effort in my work was remarkable to me. As I was a newcomer in the subject of military reconstruction their insights and opinions have greatly helped me to understand the context and setting in which reconstruction projects take place.

Performing this research has been a challenge, especially the first months I encountered moments of mental exhaustion and could not see the wood for the trees in the vast range of available literature. My parents, sister, roommates and friends offered many pit stops along the way to recharge my batteries and continue.

Thanks to you all for contributing to this research and supporting me in the process.

I am sure that the presented work will give some interesting food for thought.

Cyriel Hodiamont
November 2010

SUMMARY

In counterinsurgency operations, the Dutch military gets involved in all kinds of reconstruction activities. Among other things, civil engineering reconstruction projects like roads, bridges, irrigation canals and water wells provide visible and tangible results that can contribute to win the hearts and minds of the host nation's local population. The realization of such projects encounters many diverse challenges. The socio-cultural reality and often hostile environment where the projects are carried out put a strain on the cooperation and coordination between stakeholders. Furthermore, military personnel are deployed based on rotations and a project might start under one team (rotation) and continue throughout multiple rotations, thus, leaving a knowledge gap between the teams. In this context, project managers have to deal with all kind of uncertainties and issues that, without being properly managed, stress the realization of such projects even further. Despite the risky, uncertain nature of reconstruction projects, the current project management practice in the Dutch military depends too much on personalities involved and ad hoc dealing with issues rather than on standard operating procedures and pro-active planning.

Discussion with military experts and study of past projects revealed that, compared to other project management aspects, risk management gets insufficient and inadequate attention on project level. In other industries that conduct risky projects, such as offshore platforms in the oil and gas industry, risk management has been recognized as the most essential part of effective project management. In future reconstruction projects, military project management might therefore be enriched with risk management tools and techniques. As such, the theoretical underpinning of this research is primarily based on the theories related to project management and more specifically risk management. The study of existing theories on risk management revealed that the Active Threat and Opportunity Management (ATOM) methodology presents a potential and adequate current best practice for the purpose of the research discussed in this thesis. ATOM is a practical, scalable method that can fit any project, guiding the user stepwise from the project start to its completion through stakeholder analysis, objective clarification, risk identification, risk assessment, response planning, response implementation and reviews.

From a range of past executed reconstruction projects, two projects were selected for in depth analysis based on certain criteria that are explained in the text. Both projects were carried out in Uruzgan (a province in Afghanistan) during the latest deployment of the Dutch military. One project is the planned construction of a bridge by the Dutch military, the other project is the construction of a 16 kilometer asphalt road which was funded by the Dutch Ministry of Foreign Affairs and Development Cooperation and partly supported by the Dutch military forces. The core section in this report describes the post-project review of these projects and demonstrates the use of the tools and techniques offered by the ATOM method. Following the stepwise ATOM process, the risk exposure in the observed projects is identified, assessed, prepared for mitigating actions and recorded in a project specific risk register spreadsheet.

Afterwards, the findings from both post-project reviews are compared and discussed. In both analyses, the application of the ATOM method has succeeded in capturing risk related information and experiences in a form that can be used for both future projects and to cover knowledge gaps between personnel rotations. In both analyses similar risk categories were found that are specific for reconstruction projects and not necessarily 'military' in nature. Military personnel

tends to focus primarily on the military risks while many other issues, for example relating to stakeholders, weather conditions, finances, contracts, quality and technology, require attention as well. Furthermore, besides threats also opportunities occur that are not being managed pro-actively. In future projects, a stakeholder analysis at the beginning of a project can improve insight in the project's stakeholder situation and therewith managers can more easily focus their efforts to create support from stakeholders for the project. The identified risk categories and risk registers can help military managers and project experts to check whether important uncertainties, threats and opportunities from various perspectives are being overlooked in the feasibility assessment or preparation of their project. During both the preparation and execution of projects, the use of risk management tools and techniques as demonstrated in this report can help project managers to control and deal with project risk more effectively.

To achieve this in future projects, simply applying the tools and techniques is not sufficient. For risk management to become effective in future military project management practice, key personnel needs to know clearly when to do what, they need a military organization that is supportive towards and equipped for a risk management approach, and they need the right competences to work with such an approach.

This research therefore suggests the implementation of a profound and simple to use risk management process in future projects. Based on the analyses findings, several suggestions for future project management have been developed. The following key process elements are proposed prior to approval, design and execution of any major project:

- A stakeholder analysis to define which other stakeholders are to be included in the risk management process,
- A half-day initiation meeting to prepare the risk management process
- A risk workshop to execute the initial risk assessment
- A continued risk management process during design and construction

These process elements are further elaborated in the conclusions and recommendations section of this report. Obstacles to overcome in the further development of the risk management process include:

- Fitting the process in existing organizational processes,
- How to deal with classified information and communication of this information to other stakeholders and,
- How to organize the document management system given the rotations in personnel.

These obstacles should be further investigated in the detailed design of the risk management process taking into account the findings presented in this report.

Further development, implementation and use of a risk management approach in future reconstruction projects also require a supportive military organization. The risk culture in the military organization is observed to be partly risk unaware and sometimes even risk ignorant. Therefore, the attitude of military commanders, project managers and (civilian) experts towards handling risk and uncertainty is important to engage in order to obtain their commitment and participation.

If the military organization decides to adopt a risk management approach in future project management, the competences of military project managers and project experts needs to be further developed. This includes understanding of the key concepts, appropriate attitudes and the ability to effectively apply risk

management tools and techniques. Also risk management experts are needed to facilitate and guide the risk management process in future projects. Risk management competences of key personnel can be trained through existing courses, training facilities and knowledge centers.

Towards the implementation of a risk management process in future projects, the following recommendations have been developed.

- Conduct further research using ATOM for smaller scale CIMIC activities to see if these projects can benefit from the same risk management process
- Create a broadly supportive military organization through discussion and lobbying
- Further develop the risk management process
- Perform a pilot project and study the results
- Improve the risk management competences of key personnel through training
- Appoint a risk manager in future (major) reconstruction projects to guide the risk management process
- Involve (a) risk management professional(s) to support and guide the implementation of the previously mentioned recommendations

Taking into account these recommendations as elaborated in the final section of this report, future project management of civil engineering reconstruction projects in counterinsurgency operations can be geared towards more effectively dealing with uncertainties, threats and opportunities. Therewith more satisfying project results can be achieved which in turn can contribute to the military operation as a whole.

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LIST OF ABBREVIATIONS

AIPM	Australian Institute of Project Management
ALARP	As Low As Reasonably Possible
ANA	Afghan National Army
ANSF	Afghan National Security Force
APM	Association of Project Managers
ATOM	Active Threat and Opportunity Management
BUZA	Ministry of Foreign Affairs (Buitenlandse Zaken)
CIMIC	Civil Military Cooperation
CIMIC COE	CIMIC Centre of Excellence
COIN	Counter Insurgency
DEVAD	Development Advisor
FS	Functional Specialist
FS CI	Functional Specialist Civil Infrastructure
GIRoA	Government of the Islamic Republic of Afghanistan
GoU	Government of Uruzgan
IED	Improvised Explosive Device
IO	International Organization
ISAF	International Security Assistance Force
ISO	International Standards Organization
M&J	Mabey & Johnson
MoD	Ministry of Defense
MRRD	Ministry of Rural Rehabilitation and Development
NATO	North Atlantic Treaty Organization
NGO	Non Governmental Organization
NLDA	Netherlands Defense Academy (Nederlandse Defensie Academie)
OMF	Opposing Militant Forces
PMBOK	Project Management Body of Knowledge
PMI	Project Management Institute
PRM	Project Risk Management
PRT	Provincial Reconstruction Team
RBS	Risk Breakdown Structure
RC-S	Regional Command South
RNA	Royal Netherlands Army
TFU	Task Force Uruzgan
USAID	United States Agency for International Development
USACE	United States Army Corps of Engineers

PART I – LITERATURE STUDY

1 INTRODUCTION

1.1 Counter insurgency operations

The spectrum of nowadays military campaigns in the Royal Netherlands Army (RNA) ranges from major combat to peaceful intervention and stabilization, depending on for example the political risk, desired effects, type of engagement and character of the opponent (Pijpers 2009). In this respect, counter insurgency (COIN) is the political-military concept developed for dealing with insurgencies.

An insurgency occurs when the gap between political expectations and opportunities of a certain group becomes unacceptable for them and their general belief is that the solution is to be sought in the use of force (Grandia 2009). Insurgent groups often show asymmetry in resources, motivations and organization, but according to several definitions, they have in common that they try to achieve a political result, something they consider illegitimate or aim to weaken the control and legitimacy of an established political authority while increasing their own area of control (USAFM 2006). In their efforts to reach their objectives insurgents use (sometimes unconventional) political means and violence. Their key objective is to win the support of the population, enabling insurgents to alter the balance of power in their favor (Verhagen 2008).

The established government is not always capable or strong enough to deal with the insurgency herself and therefore has to rely on foreign (for example NATO) assistance. For these kinds of operations NATO has developed the counter insurgency (COIN) concept. COIN operations consist of a mixture of political, military, economical, psychological and developmental measures aimed to defeat the insurgency (USAFM 2006). This approach is aimed towards an end-state where a stable government is back in control, capable of dealing effectively with the insurgency herself by managing security and development independently so the assistance force can eventually exit the area (Dimitriu and Graaf 2009).

A central aspect in the COIN concept is the local population. Insurgents rely heavily on the support of the local population in terms of shelter, camouflage, personnel recruitment, supplies and information, whether this is from affinity with or coercion from the insurgents (Verhagen 2008; Dimitriu and Graaf 2009; Grandia 2009). For the counterinsurgent the population is an important source for situational awareness and intelligence. It is the source of the support for the insurgency and at the same time the source of power and legitimacy for the government. Because of this it is vital for counter insurgents to win the 'hearts and minds' of the local population so they withdraw their physical and moral support towards the insurgents and shift to the side of the foreign assisted government (Grandia 2009). In their attempt to win the population, counterinsurgents rely on creating stability through the provision of safety and security to the population. Furthermore commitment towards the population is shown by implementing reconstruction projects aimed at the provision of basic services, education, healthcare, and jobs in order to address the grievances that led to the support of the insurgency (Verhagen 2008). This is done by deploying so called Provincial Reconstruction Teams in the area.

1.2 Provincial Reconstruction Teams

Within contemporary COIN operations as conducted in Iraq and Afghanistan military forces use the concept of Provincial Reconstruction Teams (PRT's). These PRT's are civil-military teams compromised of both armed military personnel and

civilian support personnel. The civilian component is designed to support reconstruction activities and establishing relations with the local population while the military component provides indirect security and stabilization by showing force presence (Verhagen 2008). In a counter insurgency situation stabilization and reconstruction is required in both permissive as semi and non permissive areas, so to say the better and lesser accessible areas in which insurgents are active or in control. In lesser accessible areas security issues will prevent humanitarian and development actors from going there. In these situations PRT's, in contrary to humanitarian actors, are able to reach these areas because they can provide in their own force protection (Ryan 2007). Therefore, the purpose of the PRT is to extend the reach of the central government by facilitating stability, security, development, reconstruction and governance into remote provinces and districts. This should prevent areas in which they are active from sliding back into conflict or in the hands of the insurgents (Frerks, Klem et al. 2006).

The composition of a PRT has no fixed format however there are components that can be seen in most PRT's, like for example Intelligence, Analysis and Psychological Operations units. These units deal with the gathering, analysis and distribution of information and media communication towards the population. Furthermore a PRT usually consists of a command, logistic, administrative, communication and force protection group to support operability of the team. In the command group NATO governments have embedded diplomatic and development staff in the PRT's to execute the foreign and development policies of their governments and advise the commander on issues related to their field (Hansen-Nord 2008). Apart from genuine components some PRT's also have unique features. In Afghanistan for example the complex tribal and ethnic setting has led to the integration of an extra tribal component in the Dutch PRT (Woerdt and Porte 2008). While most PRT's are military led, the Dutch eventually chose to place their PRT under civilian command in order to emphasize the civilian character of the mission (Matthijssen and Mollema 2008; Voet 2008). Furthermore, PRT's can be equipped with all necessary capabilities available for themselves (standalone) and sometimes also contain partner units from other military units like combat engineers. It occurs that PRT's are located in the heart of a town to gain close access to the population while it also occurs that they are located at some distance due to the need for supporting capabilities within the range of other military units (Hansen-Nord 2008). Concluding it can be stated that -depending on the need for certain capabilities, influenced of course by implementing country, deployed country and mission mandate- PRT's can differ significantly in size, composition and approach (Frerks, Klem et al. 2006).

As mentioned before, PRT's are also intended to facilitate and support all kind of reconstruction activities and to coordinate with other actors in the mission area (Grandia 2009). For the coordination activities PRT's usually contain a number of civil liaison teams with interpreters and liaison officers. For reconstruction support, PRT's can also have Civil Military Cooperation (CIMIC) functional specialists (FS) attached. These are civilians who are military trained and adopted as reservists in the PRT because of their experience and knowledge in a specific field of expertise, for example health care development, economic recovery or civil engineering related reconstruction (Arends 2008; Voet 2008).

1.3 Military involvement in civil engineering projects

Traditionally, reconstruction was the domain of humanitarian organizations. In COIN operations the military also becomes increasingly involved in reconstruction activities, often in cooperation with civilian organizations. Reconstruction activities in COIN operations show an extensive range, from military led hearts-and-mind activities and psychological operations, to foreign assisted rule of law activities and (inter-) governmental (national) development programs, to projects run by

local and international Non Governmental Organizations (NGO's) and activities implemented by contractors and companies (Frerks, Klem et al. 2006). Among this spectrum of reconstruction projects is the (re-) construction of civil engineering related objects like roads, bridges, facility buildings, power plants, water wells and irrigation systems. The military contribution and approach in these projects can take various forms, depending on their interests, goals and capabilities.

When entering hostile or unstable territory the military's first objective usually is to facilitate force acceptance in order to increase the safety for own troops. This is done by showing presence of the force while in the meantime interacting with local actors to smooth relations and boost popularity. Interaction with locals also allows the military to gather intelligence which increases their situational awareness (Frerks, Klem et al. 2006; Rietjens 2008). In this kick-off phase military forces focus on the implementation of CIMIC projects to win the hearts and minds of the population. These are small scale, highly visible projects aimed for short term results towards the population, for example a road renovation or reparation of an irrigation canal. The military initiates these projects often in consultation with the local population, while the execution can be done by local contractors or NGO's (Voet 2008; Woerdt and Porte 2008). However, in some cases it can prove to be tempting to implement projects without establishing relationships and local mentoring, using the own military construction capacity despite the more enduring and long-term benefits associated with local participation (Kamer 2009). In a situation of increased stability, gradually maintained by indigenous security forces, more NGO's will be able to come into play. In many cases activities are implemented by NGO's or private companies while military units fund, administer and monitor the projects (Frerks, Klem et al. 2006). Military CIMIC specialists then use their expertise to support the local authorities and organizations with the implementation of projects, besides advising the staff of their own unit with the implementation of larger scale reconstruction projects (Arends 2008; Woerdt and Porte 2008).

In projects, whether short or long term, cooperation between military and civilian actors occurs. For both civilian and military actors there can be several motives to cooperate. Military actors are key in establishing security, both direct and indirect. They have specific expertise and skills (for example disarmament), large presence in numbers, good logistic facilities and access to dangerous areas. Furthermore the exchange of information, knowledge and expertise regarding the local situation, security, customs and humanitarian assistance can be mutual beneficial. With regard to achieving the political-military end-state it is important that the indigenous population and government become self-sustainable, independent from foreign assistance. From that point of view it often proves useful to cooperate with local actors as well, for example regarding the transfer of tasks and responsibilities after completion of assistance activities or the involvement of local workforces and companies to stimulate the local economy (Ryan 2007; Rietjens 2008).

Despite the opportunities for cooperation in projects the military relation with civilian actors often can prove to be difficult, fragile, tensioned and conflicting, because of their fundamental differences in terms of mandate, objectives, approach, focus and organization (Rietjens and Bollen 2008). These differences partly originate from institutional incompatibility: short versus long duration of stay, independent versus government related, flat and flexible organized versus hierarchical top down, armed versus unarmed (Frerks, Klem et al. 2006). For military actors mission objectives are leading and the short deployment period for personnel (rotations usually last between 4 and 15 months) affects the continuity of the civilian relationships (Dimitriu and Graaf 2009). Due to the hostile

environment and short term relations mutual trust levels tend to be low. Under such conditions interdependencies expose collaborative stakeholders to other parties' hidden agendas, self interest or opportunistic behavior (Rietjens 2008). NGO's and International Organizations (IO's) are often guided by humanitarian principles (independence, impartiality and neutrality). Some refuse cooperation with the military because it is seen as a violation of their principles or as a blurring of lines between aid workers and the military. Thereby they risk to be seen as collaborators of the intervention force, thus losing the trust of the population or becoming a target for the insurgents. However, other organizations acknowledge their principles but deal with them in a more practical manner when the context allows. Again others welcome collaboration with the military in view of the urgent needs to be addressed (Ministry of Foreign Affairs 2005). Finally, for both the military and NGO/IO's, capacity can be unavailable due to organizational priorities and is also limited in means while the local environment usually has high needs.

Usually, when civilian actors and the military cooperate, they do not join hands in the actual design or execution of activities. In some cases they coordinate activities on staff level to align plans and activities in order to prevent duplication of efforts, neglecting certain areas as well as mutually distorting effects. In other cases the military has funding available for projects but has limited implementing capacity so the implementation of projects is subcontracted to NGO's and the private corporate sector. Sometimes also temporary provision of security and logistic support to NGO's occurs in the field (Frerks, Klem et al. 2006).

The management of civil engineering reconstruction projects is more complicated because of the actor relations and cooperation mechanisms described above. The uniqueness of both the military as an actor involved, as the complex, dynamic environment in which these projects are realized result in some unique difficulties and problems for the expeditionary project manager.

1.4 Problems in project management

The management of civil engineering reconstruction projects in a counterinsurgency setting encounters many challenges and problems. These result partly from the environment in which these projects are realized. Generally speaking that environment can be characterized as chaotic, unstable and conflicting, however the degree and form in which this is the case will differ per situation. From a political point of view the influence of indigenous government institutions tends to be low and its legitimacy can be questionable (Ryan 2007).

Usually in such environments there are numerous practical difficulties that could also be encountered in non military projects, for example the limited availability of means and services like power, communications and construction resources. Besides, project team members can be more or less affected by working in a high demanding stressful environment with different climatic and seasonal conditions. There can also be language barriers and cultural differences which lead to problems. The local standard of life, and therewith perception of quality and time could be different. The same counts for local construction methods, tools, materials and techniques (Neimes 2010).

Other aspects are more military in nature. The military is a government related hierarchical and armed organization which is temporarily involved in the situation for the duration of the mission. From a security perspective insurgents will do their best to disrupt counter-insurgency efforts through intimidation, retaliation and attacks which also affect freedom of movement in the area. Due to the foreign intervention, support from the local population is not self-evident and conflicts of interest regarding project benefits are likely to occur due to internal

rivalries or survival behaviour (Dimitriu and Graaf 2009). Cultural differences do not only arise between the foreign force and the indigenous population but also between vulnerable groups or ethnicities within the indigenous population. Projects are regularly performed in temporary relation with civilian actors who are involved in the same operational theatre. Cooperation and coordination between these actors often proves to be difficult as has been discussed in the previous section. To achieve project objectives, situational awareness and anticipation thereon is of importance through the entire project cycle. But to improve situational awareness information is key, while gathering, interpreting, processing, verifying, storing, structuring and updating information is often time consuming and difficult. These difficulties arise from the hostile environment in which accessibility and exchange of information is vulnerable for misuse (Rietjens 2008).

The examples above show that the environment in which projects are being managed is complex. However, the current approach depends too much on personalities involved rather than on planning and standard operating procedures. As a consequence, differences within and between rotations occur regarding priorities, budgets and involvement of other actors. Regularly, projects objectives are unclear or questionable, decision making and priority settings are based entirely on personal opinions and actor responsibilities are unclear. This approach leads to duplication of efforts, inconsistency and loss of knowledge and experience between rotations, inefficient use of limited resources, and unfilled expectations in the environment thereby threatening the achievement of project and mission objectives (Havermans and Koning 2008; Rietjens 2008).

That complex environment described above gives rise to all kinds of risks -or certain points of attention- that have to be taken into account and handled with care by the project manager towards achieving satisfying project results. During the course of this research it appeared that despite the risky nature of reconstruction projects, risk management gets insufficient and inadequate attention on project level while in other industries that conduct risky projects, such as offshore platforms in the oil and gas industry, risk management has been recognized as the most essential part of effective project management. Research conducted by Cooke-Davies in 2005 presents that effective project risk management is an influential factor in project success (Cooke-Davies 2005). Also in the setting of military reconstruction projects risk management could therefore prove to be of added value.

Summarizing, the many challenges regarding the complexity of the environment, the cooperation and coordination between stakeholders and the management of information and risk would require a more structured approach for the military management of civil engineering reconstruction projects. According to existing literature, various solutions can be sought in the development of checklists and guidelines, in the identification of problems and decision making criteria and in the development of updatable stakeholder maps to support project management processes (Ryan 2007; Havermans and Koning 2008; Rietjens 2008).

1.5 Research objective

This research is conducted for the Dutch Ministry of Defense, the organization led by the Minister of Defense together with the State Secretary. The Ministry has its own military-scientific research and knowledge institute, the Netherlands Defense Academy (Nederlandse Defensie Academie, NLDA) which also facilitates military higher education. As a research and knowledge institute the Academy is specialized in military strategy, command of operations, civil-military cooperation (CIMIC), logistics and technology systems. In total, the NLDA staff employs around 650 military and civilian personnel, spread out over locations in Breda, Den Helder and The Hague (MoD).

The problem analysis in the previous section revealed that the problem addressed in this research is the unstructured project management approach of civil engineering reconstruction projects in counterinsurgency operations. As reconstruction projects in COIN operations are part of the overall strategy towards the achievement of mission objectives, insight regarding the improvement of project management should be of relevance to the client and contribute to its business goals.

The problem intervention cycle as described by Verschuren and Doorewaard defines five phases, problem analysis, problem diagnosis, design, intervention/change and evaluation (Verschuren and Doorewaard 2007). This research focuses on applying existing risk management theory on executed projects (diagnosis), using so gained insights to develop a risk management method (design oriented) that is suitable for projects in a military operational context. Such a method could serve as a practical guideline during, for example, future project feasibility assessment, design and execution. Herewith the following research goal is formulated:

This research aims to develop a set of recommendations for the Dutch Ministry of Defense that can contribute to the development of future project management of reconstruction projects in counterinsurgency operations.

These recommendations are formed by applying existing risk management theory to past executed projects to develop a method that provides military project managers insight into the management of risks which influence successful project completion.

Because the time span of the research is limited a number of research boundaries have been formed along the research process. First, as project management is a broad field of expertise, not all project management sub-disciplines can and will be elaborated in the same detail but the gravity points for this research will be highlighted in the exploration of existing theory. Second, although military personnel is deployed into several operational theatres, the scope of this research is on past projects that took place in Uruzgan because this is the most recent and large scale deployment of the Dutch army and therefore will provide the latest state of operations. Third, although it would be interesting to look from different stakeholder perspectives to each project it is not always possible to talk to all former (especially local) stakeholders involved in past projects and therefore a practical selection will have to be made that fits the goal and time span of the research. Fourth, although the full spectrum of reconstruction projects entails multiple disciplines, specifically civil engineering projects are chosen due to educational requirements that need to be complied with to obtain a civil engineering degree. Finally a selection of projects is limited to a number of cases. The first case will allow testing the theoretical framework found most suitable, while next case(s) can be analyzed according to experiences from the previous case(s) and improvements derived thereof. The selection procedure of these projects is discussed in the case analysis section.

1.6 Research questions

Based on the research goal the following main research question is formulated:

Which theoretical framework is appropriate for practical use by military project managers to provide insight into the management of risks which influence the successful completion of civil engineering reconstruction projects?

In order to find an answer to this main question it is divided into a number of sub questions. Answering each sub question in the logical sequence as presented

below should allow answering the main question as a whole (Verschuren and Doorewaard 2007).

The core part of the research is the analysis of a number of executed projects. According to Yin, case study research has distinctive advantage when a "question is being asked about a contemporary set of events, over which the investigator has little or no control". As this is the case in this research a case study approach is suitable. However a concern with this kind of research is the lack of rigor and therefore the first step is to develop a theoretical framework that will steer the focus of the project analyses (Yin 2003). The first question to be answered is:

1- *Which theoretical framework is appropriate to evaluate the selected projects?*

   Based on a literature review on project- and risk management a guiding framework is to be developed which presents an outline of suitable theoretical methods that allow evaluating the selected projects within clear scope and focus. This framework is built from available literature on project management and related sub-disciplines keeping in mind the context of military expeditionary operations to make it suitable for this kind of projects. Interviews with experts provide additional practical insight regarding this context.

The next step is to define what selection of projects is best suitable to be studied further in the project analyses. The question to be answered in this respect is:

2- *What selection of projects can be made and how are these to be analyzed?*

   The development of a project inventory list should structure the available raw data and provide information on what projects are available to study. Then a set of criteria is needed to choose which projects are most suitable to contribute to this research. Depending on this analysis the number of projects is to be defined as well. This question will be answered based on desk research.

In the next step the case analyses are conducted. This should provide insight into the applicability of the selected theoretical methods in past executed projects. The questions to be answered are:

3- *What insight can be gained from past executed projects regarding the management of risks?*

   The research conducted in this phase uses the earlier defined theoretical framework to analyze past executed projects. Doing so shows how the theory can be used in practice and what results can be obtained from that process. It also allows finding difficulties and points for improvement in the selected analysis method. Data for the desk research will be collected from project documentation, case descriptions and interviews with experts involved.

4- *Which adjusted framework can be developed based on insight gained by confronting the individual case analyses?*

   The insights gained through the individual case analyses are to be linked to one another and to the initial theoretical framework. This should give insight into important characteristics, similarities and differences between the cases and strengthen the validity of the several individual outcomes.

This way the insights can be translated into the development of an adjusted framework that fits in the military organization and approach. Results of this process are reviewed with experts to refine the practical relevance of the outcome.

The final step is to translate the gained insight into a set of conclusions and recommendations. The following question is to be answered:

5- *Which set of recommendations can be developed that contribute to the development of future project management?*

At this point the acquired knowledge gained throughout the research is summarized and used to formulate a number of recommendations.

The answer to this last question will result in the following deliverables for the client that will be described and elaborated in the report.

- recommendations on what method could contribute towards a more structured risk management approach for civil engineering reconstruction projects in counterinsurgency operations
- a stepwise approach for the analysis of risks in projects and recommendations in what situations and for what projects these methods are helpful
- an identification of problems and suggestions that need to be taken into consideration to implement the approach in the military organization
- recommendations for further research

Therewith an answer for the main research question is formulated resulting in the accomplishment of the research goal.

1.7 Research methodology

In this section the research methodology to answer the research questions is elaborated and presented. The methodology is a framework for the research and guides the research activities. The model presented in Figure 1 is a schematic representation of the research process, based on the methodology presented by Verschuren and Doorewaard (Verschuren and Doorewaard 2007).

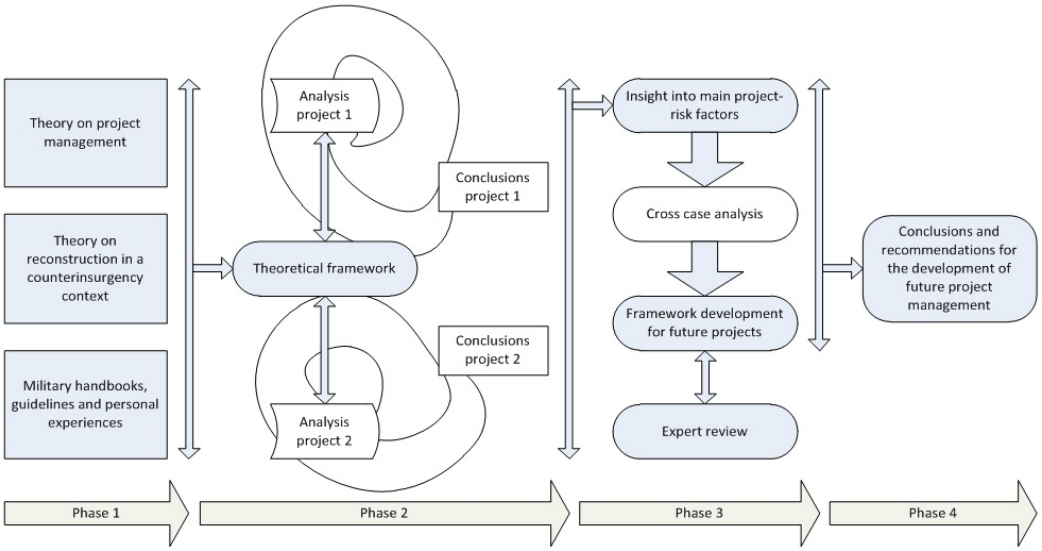


Figure 1, Research model

In the first phase the theoretical knowledge base is created which leads to the development of the theoretical framework. In the second phase the theoretical framework is confronted in an iterative process with the individual cases towards generating case specific conclusions. Between the different cases the framework can be adjusted if needed. This step results into insight regarding the main project-risk factors. In phase three the cross case analysis compares the individual case results with each other and the literature which leads to the development of a framework that can be used in future projects. Based on the analysis and discussion of the results in phase three, conclusions and recommendations are aimed towards the development of future project management.

Research can be conducted in many ways and it is important to determine the best suitable strategy (Rietjens 2006). In this research a form of field study, desktop research, interviews, literature review and case studies were the main research strategies.

Field study
Getting first hand empirical information by observation and experience would be a great source to draw on. For the researcher, field research in the current ISAF operation in Afghanistan proved to be impossible for organisational reasons. Alternatively the researcher took a two week CIMIC basic training course at the NATO CIMIC Centre of Excellence (CIMIC COE) in Enschede.

Desktop research
As possibilities for field study are limited, data collection will therefore mainly depend on available literature, project documentation and experts. The research strategies used for the desktop research are a mixture of literature review, multiple case studies and interviews.

Literature reviews
The researcher had almost no prior knowledge on reconstruction in military expeditionary operations. Therefore the literature review strategy is used to introduce the researcher into the topic of civil military cooperation and into the context of military counterinsurgency operations, thereby relying on existing literature. The advantage is that a basic understanding of the matter can be achieved relatively quick, cheap and easy (Verschuren and Doorewaard 2007). Literature review is also used for the exploration of existing project (risk) management theory to develop a theoretical framework that can be used for the case studies.

Interviews
Both semi-structured and unstructured one-on-one interviews with experts are conducted to gain in-depth insight in the practice of managing reconstruction projects. Experts are used for multiple purposes, all related to the advantage of increased practical relevance of the research. The first purpose is to get additional practical information in the case studies and second to validate the final framework (Bentley and Whitten 2007).

Multiple case studies
The case study can be used to gain in depth insight into time constrained objects or processes. According to Yin a case study approach usually has multiple cases, only when the case is critical, extreme or unique a single case study approach is appropriate (Steenhuis 2000). For this research the multiple-case research approach is chosen to get insight into the practical applicability of the analysis methods for different real-case situations. The external validity of results and the case selection are crucial and therefore these aspects deserve extra attention

(Verschuren and Doorewaard 2007). A separate section is dedicated to the selection process and case study methodology in the case analysis part of this report.

1.8 Outline of the report

The research model presented in Figure 1 links to the report lay-out as shown in Figure 2. The orange sections represent part I of the report, the green sections represent part II and the blue sections represent part III.

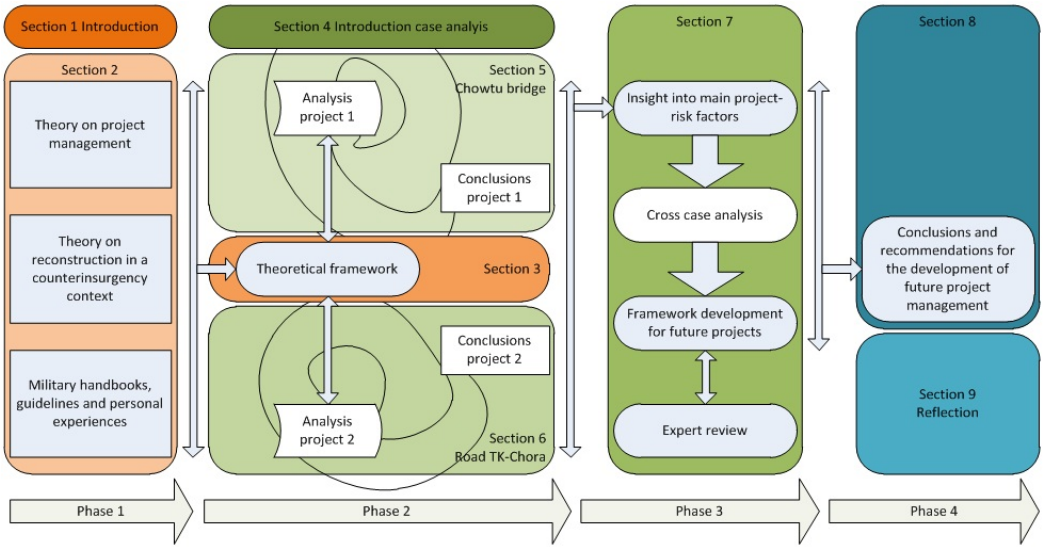


Figure 2, Overview of the report contents in relation to the research model

Depending on the interest of the reader the following (sub)sections of the report are more or less relevant.

The reader wishing to get a brief overview of the research and its main results can satisfy with reading the summary and section 8 which presents the conclusions and recommendations.

The reader who is interested in the research methodology can limit him or herself to reading subsections 1.5 till 1.7 which present the overall research definition. Also section 4 could be of interest as this section presents the case analysis approach and selection of projects.

The reader who is interested in the theoretical framework used in this research can focus his or her attention to sections 2 and 3. Section 2 focuses on project management, project objectives and project management aspects in a military reconstruction context. Section 3 focuses on risk management and especially the used risk analysis method, tools and techniques in this research.

The reader interested in the analysis of past executed reconstruction projects should definitely read sections 5 and 6. Also section 7 might be of interest as this section discusses and compares the case analyses results and presents some interesting implications of these results that can be used in future projects.

2 EXPLORATION PROJECT MANAGEMENT

2.1 Introduction

Project management is a widely discussed field of expertise with a broad range of topics as the inventory presented by Turner shows (Turner 1996). The aim of the theoretical exploration is however not to grasp the whole theoretical picture of project management in a nutshell. It is more important to distill a certain essence of what could be of added value to the existing practice of military project management in civil engineering reconstruction projects. Along this search process some theoretical concepts will have to be investigated for potential application and improvement of project management practices in the case analysis. A start is made by looking at some definitions of a project and project management to give a first impression.

In literature there are several definitions available what a project is of which three have been selected. According to the Project Management Institute (PMI) a project can be defined as “a temporary endeavor undertaken to create a unique product or service” (PMI 2000). The UK Association of Project Managers (APM) defines a project as “a discrete undertaking with defined objectives often including time, cost and performance goals”. According to the Guide to Project Management of the British Standard Institute (BSI) a project is “a unique set of coordinated activities, with definite starting and finishing points, undertaken by an individual or organization to meet specific objectives within defined schedule, cost and performance parameters” (BSI 2002). A project is thus clearly different from ongoing operational processes, for example compare building a house or process plant to the manufacturing of bricks or sausages.

For project management also several definitions have been found in literature of which three have been selected. Project management according to the PMI is “the application of knowledge, skills, tools and techniques to project activities to meet project requirements (PMI 2000). Or “the art of directing and coordinating human and material resources through the life of a project by using modern management techniques to achieve predetermined goals of scope, cost, time, quality and participant satisfaction” (PMI 2004). The UK APM defines project management as “the planning, organization, monitoring and control of all aspects of a project and the motivation of all involved to achieve project objectives safely and within agreed time, cost and performance criteria” (Smith 2008).

A project can be schematized as shown in Figure 3. The aim of the project arises from the stakeholders that want to change the environment by undertaking the project. The aim for which the project is initiated is translated into several objectives that need to be realized. During the project the project management team manages the work of the project which involves identification and control of competing demands for project objectives, project boundaries, stakeholders with differing needs, requirements and expectations and risks that may arise from stakeholders, the environment or context, threatening the achievement of the objectives.

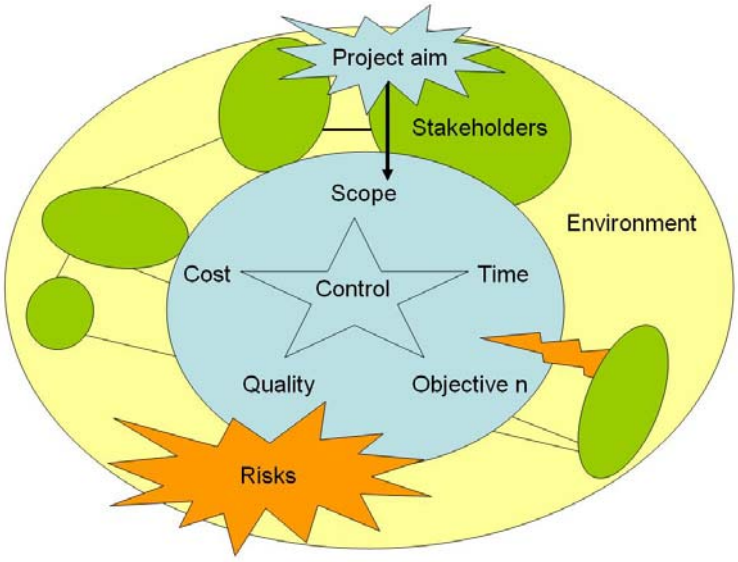


Figure 3, Schematic representation of a project[1]

In the next subsection the progress of a project through time will be discussed and in the following subsections the presented aspects as shown in Figure 3 are further elaborated. For each aspect also the implications for the military approach in counterinsurgency operations is briefly described.

2.2 Project life cycle

On the path from origin to completion projects go through stages or phases which vary per project and business sector. The project life cycle can be viewed as an abstract representation of this path, serving as a framework that improves control for the management team. Although every project proceeds through an initiation (or start), implementation (or execution) and termination (or end) phase, projects never proceed in an orderly, linear way through stages and events as described (Meredith and Mantel 2006). Along the project sequence phases can sometimes overlap, change or iterate.

The project life cycle can be used to define for example what work should be done in what order, who should be involved in each phase or what deliverables or milestones need to be completed to ensure a proper review of performance so far. Reviews should determine whether the project should continue to the next phase or which corrective measures should be undertaken. The project life cycle can vary in detail and may lead to the attachment of numerous forms, charts and checklists to provide additional structure and consistency (PMI 2000), for example procedures for information exchange.

Project life cycles are often adjusted to their specific business sector like for example IT, software development, engineering, materials acquisition and product design. For construction projects, one example is the life cycle presented in the PMBOK (PMI 2000) as shown in Figure 4 which distinguishes four stages:

- a feasibility phase in which the project is formulated, feasibility studies are carried out and a go/ no go decision is made at the end of the phase
- a planning and design phase in which the base design, cost and schedule, contract terms and conditions and detailed planning are completed, resulting in a number of contracts at the end of the phase

[1] Based on a figure from Turner 1998

- a construction phase in which the product is manufactured, delivered, installed and tested, resulting in a substantially completed facility at the end of the phase
- a turnover and startup phase in which final testing is done and maintenance is set up so the facility is in full operation at the end of the phase

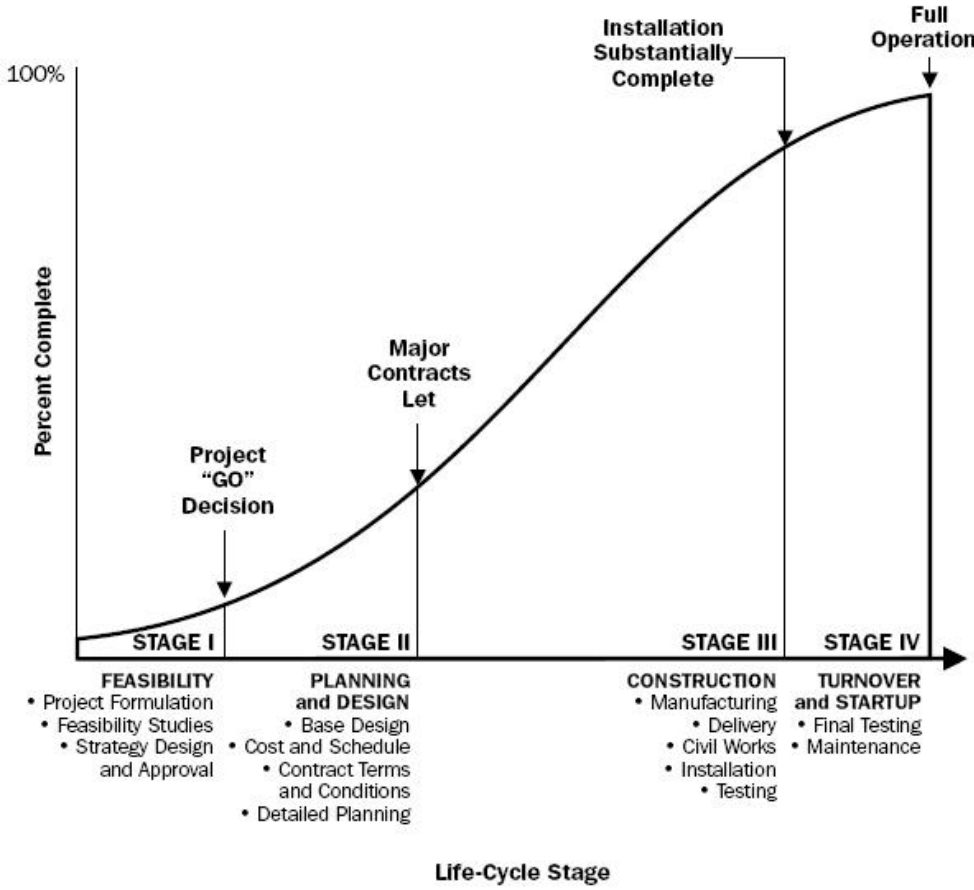


Figure 4, Construction project life cycle, per Morris[2]

Characteristically, the influence of stakeholders on the project is the greatest at the start of the project. The same is the case for risk and uncertainty which will decrease over the life of the project. The ability to influence the project's course is also highest at the start and decreasing as the project progresses towards completion. Changes in the late stadium of a project usually bring high cost. These characteristics can be graphically represented as shown in Figure 5.

[2] adopted from PMBOK 2nd edition 2000, page 15

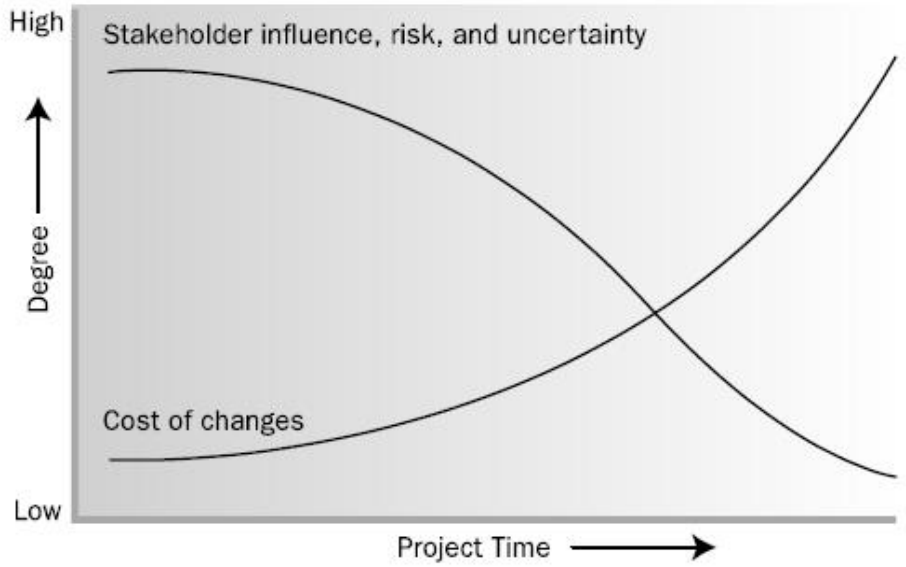


Figure 5, Dynamics in the lifetime of a project[3]

As is the case in almost any organization, there usually are multiple projects at hand that could contribute to its strategic objectives so some kind of selection process is done which allows management to evaluate and choose individual projects from the total inventory. Also in the military situation the identification and assessment of possible projects and their prioritization within military strategic goals is done. Eventually the military command decides whether a project will be executed or not. The authorization or go/no go decision therefore is an important decision making point as this is the moment where the project is discussed for further continuation (interview C).

Kremers has presented a construction process for CIMIC projects showing similar stages from initiative, feasibility, definition, concept design, final design, execution, to operation and maintenance. The division in actor roles per phase will be different per situation and project. He clearly distinguishes between different military actors involved in the decision making and approval of a project in the pre-trajectory, military actors (from engineer detachments, CIMIC staff or functional specialists) involved in the technical assessment and management of a project during actual execution and military actors who go out in the field to visit projects (Kremers 2009). The initiator for a project could be the military itself, but also examples of a local authority, community or company acting as initiating party have been mentioned during interviews. In Kremers' particular model project execution is in the hands of a local contractor. The military assumes a monitoring role in the execution phase which is aimed to control the progress of the work, the technical execution and financial aspects as these closely relate to the objectives of the mission. Another characterizing aspect is the handover to local authorities which are responsible for further operation and maintenance.

[3] adopted from PMBOK 4th edition 2008, page 17

2.3 Project environment

The project environment is important for any project manager (or project management team) to recognize as there are both internal as external factors that influence the project. External influences arise from stakeholders, political, economic, social, technical, legal and environmental factors. Internal influences include the organization's management, the project team, internal departments and possibly shareholders (Lester 2007). In order to manage a project effectively the project management needs to understand the current conditions and trends in the area in which the project is being carried out.

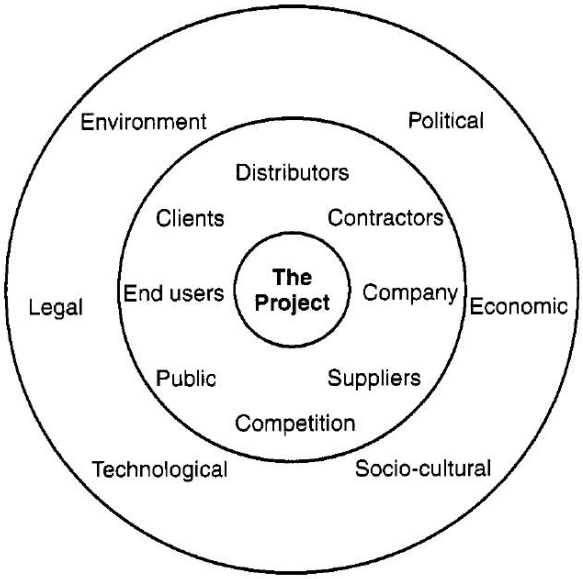


Figure 6, The project environment[4]

Lester explains the political dimension in terms of internal and external politics. Internal politics occur inevitably within all organizations. Relationships to the project by different people involved can vary from the very supportive to the downright antagonistic. Even within an apparently cohesive project personal interests can be disruptive so they must be recognized and managed. As can be seen in the figure above, a project also relies on clients, contractors, suppliers, local authorities and so on which all have their own agendas and preferences which could give rise to problems.

The economic dimension relates to the viability of the project in terms of net gain, whether financial or not financial. Another aspect here is development in the market sector, like changing interest rates, taxes and resource prices that affect the project.

Socio-cultural aspects relate to the community in which the project is being realized, how it affects the lives of people, existing relations and cultural biases in the area. This also relates to the technological dimension as culture also relates to which tools are being used, the way skills are used and how this affects the individual's social status and attitude towards work. Other cultural aspects are the structure of society, language and art (Meredith and Mantel 2006).

Also technological soundness is of vital importance for a project. The materials available and to be used, the technological feasibility and knowledge and skill needed to implement it are things to consider.

The legal environment is about how the relations between the collaborating parties are established and confirmed in contracts. Also the project and agreements should comply with legal requirements of the specific country it is established.

[4] adopted from Lester 2007, page 13

Environment aspects are for example the seasonal changes, climatic conditions, ground conditions, temperatures etcetera of the particular area in the world. But also the impact of the project on the environment in terms of emissions or pollution could be considered here.

A project stakeholder is any organization, group or individual who can affect or is affected by achievement of the project's objectives. These can be divided in primary stakeholders, the ones that are directly associated with the project, and secondary stakeholders, the ones that may not have direct involvement but may be influenced by the project's outcome (Smith 2008). As is shown in Table 1, primary stakeholders may include distributors, contractors, the company, suppliers, the competition, the public, end users and clients. Also the project sponsor, project management team, project management office, program managers, portfolio managers, functional managers, consultants could be added. Secondary stakeholders may include the government, regulatory authorities, community organizations, interest groups, non-governmental organizations, trade associations. Winch structures stakeholders in internal and external stakeholders, then subdivides them in demand-supply and private-public stakeholders as shown in Table 1 (Winch 2002).

Internal stakeholders		External stakeholders	
Demand side	*Supply side*	*Private*	*Public*
Client	Architects	Local residents	Regulatory agencies
Financiers	Engineers	Local landowners	Local government
Client's employees	Principal contractors	Environmentalists	National
Client's customers	Trade contractors	Conservationists	Government
Client's tenants	Materials suppliers	Archaeologists	
Client's suppliers		Non-governmental organisations (NGO)	

Table 1, Possible stakeholders in a project[5]

Important to realize is that within stakeholder groups, sub-categories with differing interest might exist. For example the concept of local villagers might turn out to be meaningless as various groups of people living in a village have little in common or belong to different ethnicities. Competition between departments or individuals of an organization could also be stronger than commitments to the institutions as a whole (ODA 1995).

In a counterinsurgency setting project management is influenced by the military organization, the security situation, and other stakeholders involved like for example the Ministry of Foreign Affairs and NGOs (interview B).

2.4 Strategic goals

For every organization the objectives of projects that are to be carried out should be consistent with the strategic goals of the organization. This ensures there's value for the organization to implement the project and top management is sufficiently dedicated to facilitate the project from inside the organization which is a factor crucial to the success of any project. Besides this there usually is a client for the project. Whether client expectations are an additional target or an inherent part of the project specifications, key is that both expectations between client and project team need to be aligned and integrated throughout the project (Meredith and Mantel 2006). Looking at the strategic picture a project is not only successful when it meets its time, budget and performance goals but it is evenly

[5] Adopted from Winch 2002, page 75

important how stakeholders perceive success at different times for different projects. Shenhar describes this according to four dimensions: direct project objectives, impact on the customer, business impact on the organization and future opportunities (Shenhar, Dvir et al. 2001). From these different viewpoints, projects in a counterinsurgency context can have multiple strategic goals.

Direct project objectives

This is a short-term dimension expressing the efficiency with which the project is managed relating only to the implementation of the project. Direct objectives for a project usually are performance, time and cost (Meredith and Mantel 2006). Performance contains the scope of the project including the clients expectations and the requirements of the product and process, for example regarding quality or safety (Lester 2007). Depending on the situation a project can be bound by one or more of these objectives or can be changed at the price of another objective (a so called trade-off).

Impact on the customer

This dimension addresses the importance placed on customer requirements and on meeting the customer needs as the receiver of the project. In the context of COIN operations this would be the host nation government, local authority or population. From this perspective several implications on project objectives can be made. First the project needs to fit within the larger national programs and priorities of the host nation (Kremers 2009). Also from a developmental perspective a number of objectives can be defined with regard to the sustainability of the project. Local ownership and participation is vital for acceptance of the project, as it is the local community who has certain needs and commitment to use and maintain the project. Non acceptance can result in abandoning, retaliation or destruction, thereby wasting the project effort even despite sound execution of a project. Capacity building is vital towards self sustainability of the community and therefore strengthening local institutions, transferring knowledge and skills, using local resources, materials and technologies are objectives to take into account if the project's effort is to be maintained in the long term, independent from the intervening or aiding organization (Damen and Olislagers 2004). In this respect it is also valuable to use local workforces to stimulate the local economy (Natsios 2005).

Impact on the military organization

This is the immediate and direct impact the project may have on the organization. In many cases the military mission will be aimed (among possible other things) at achieving the mission end-state, often translated in the creation of a secure and stable environment in which civilian actors can operate independently. In the integrated approach of COIN operations reconstruction support is part of the military mission, as it is believed to contribute towards a secure and stable environment. However, reconstruction support is only to be done within capabilities (time, cost, resources) of the military organization, within mission mandate and within scope of the commander's mission (NATO 2003). Thereby long term dependency to civilian organizations should be avoided, preferably is a quick and effective transfer to local and international civilian organizations. Operational objectives for the military also include safety for the own forces, freedom of action and quick visible short term results. Showing the presence of the force is believed to increase trust and acceptance between military and local actors and therewith increases safety for own forces. Besides, the process of information gathering and exchange through local contacts and activities provides experience with and understanding of the situation. So gained intelligence might also contribute to the wider military operation, thereby increasing the military freedom of action. Finally, the military organization has to show responsibility and transparency towards its client, the home country government. This means that

for example funding, casualties, delivered quality and mission progress need to be accounted for (Kremers 2009).

Future opportunities
In a counterinsurgency operation future opportunities are for example the possibly improved stability and economical spin off or for example misuse of the project by insurgents and negative effects on force security. So before embarking on a project it is important to be aware of possible strategic opportunities and threats. Projects might also trigger second and third order effects as the environment will adapt to the new situation

Summarizing, a project can serve several strategic goals depending on the long or short term focus of results and the priorities, requirements and perceived opportunities at that moment by the stakeholders involved.

2.5 Project objectives

From strategic viewpoint the need for a project could be clear, but therewith the project is preferably not yet ready to embark. A project will be in great danger of encountering serious problems if its definition is not right and is not developed properly, if its objectives, standards, technical base, and general strategic planning are inadequately considered or poorly developed (Morris 1994). Definition of project objectives, or what is to be achieved with the project, therefore is important. In reconstruction projects several objectives and promises can play a role in a project.

Time
The time objective refers to the duration of a project, which could for example be set by a deadline. It seems undesirable if projects are not executed at all or lay still for quite some time so it can be imagined that progress on a project could be an alternative objective. Projects under authority of Western institutions could have time constraints because these projects often fit into large scale development programs, military plans or country wide strategic plans which impose time constraints.

Budget and cost
The budget objective is defined as the amount of money a project may cost and how much overspent is allowed. The military usually has funding available for small projects while bigger projects are often funded by donor organizations. A constraint could be the capacity and of the local economy that could be inflated by the economical power of donor organizations.

Scope
The project scope describes what work needs to be accomplished for the realization of the project with a specified product scope. For small scale repetitive projects, like for example water wells, the project scope is clear and fixed while the scope of a unique project like for example a bridge or airport contains more uncertainty (interview B). During preparation attention is paid to whether the intended project scope fits the military organization's constraints and requirements, this is also called the business scope. For CIMIC and reconstruction projects this means that execution of a project should support the military commander's mission goals. As project aim is translated into the scope of a project, the latter (scope in terms of work and product) is often a crucial and driving objective.

Quality
Here, the quality objective is referred to as the quality of the product and its compliance with quality requirements. Countries in conflict tend to have a

different perception and attitude towards quality standards or certificates than what is considered acceptable by outsiders. Often the use of inferior materials and work methods used by local contractors implies lower quality. For example when mixing concrete, the use of inferior cement, unskilled workers and unavailability of mixing equipment result in poor quality concrete (interview D). In turn, this results in a short life time of the product. There could also be incentives for local contractors to maintain a low quality standard, as poor construction could result in new work or repairs that offer new opportunities to earn money. The selection of the contractor is crucial in projects that require better quality; in such situations usually more professional contractors are hired. A big issue with regard to quality is that it is not always possible to have sufficient supervision for a project (Navratil and Ranglova 2010) and the ability to coach unskilled personnel, especially in non permissive areas.

In the end, quality will only become a driving objective in projects when overall functionality or safety of the project is being threatened, like a generator in a hydro electric power plant or the roof construction of a building. In most cases however quality will be not that important.

Information

The information objective in this context could be the gathering of environment specific information. In reconstruction projects military teams visit project sites and have contact with local communities. The information they get regarding the surroundings increases their situational awareness and vital information obtained this way can be directly passed to the intelligence section. However this is never a primary objective of conducted activities as this would undermine the effectiveness of other reconstruction activities.

Organization

The organization objective refers to how the project is organized in terms of allocation of resources, tasks and responsibilities, authority and cooperation with actors. Reconstruction projects usually fall under the responsibility of a military unit and are done as part of other activities. In bigger projects it is commonly seen that officers from several staff sections are allocated to them which form some kind of project team.

An objective in this regard could be that local participation from government institutions or the population is required. This, among other things, improves the local acceptance of the final result and stimulates local employment. Another objective is that a project should not overstretch the capacity of the military organization. Neither should actors be made dependant from military resources. These organizational objectives are often assessed before embarking on a project and once started, not leading in most projects (interview C). These however put constraints on how the project is to be realized.

Reputation

For reconstruction projects the reputation of the intervention force is often the driving motivation for the project. By showing the local population that something's being done for them it is tried to shift support towards the foreign assistance force and the indigenous government. When aiming to improve your reputation it is important to consider what the other party wants and needs so these aspects can be addressed. In some projects the reputation aspect does not always come forward that clearly as it serves direct military purposes like for example the construction of a bridge in a remote area. In other cases the reputation objective is leading and a lot of effort is put into spreading the achieved project results among the local population.

Health, Safety, Security and Environment
The health and safety of personnel involved in the project strongly relates with security and the area in which the project is conducted. In projects in non-permissive area repetitive attacks on checkpoints, threatening and kidnappings of local personnel can occur. For locals, being seen with foreign troops is also not without risk as revenge by insurgents is always a possibility. Safety on the construction site with regard to accidents could be underrated in this setting. Environmental aspects in this setting don't seem to carry much weight. For the military organization security for own troops is always an issue. Project objectives relating to these aspects are certainly driving factors both when embarking on a project as well as during execution.

Other objectives might include technical performance, regulatory compliance, maintainability, operability, reliability etcetera but these are not further considered here.

In literature some criteria for successful completion of project objectives were identified. The main criteria found were clear definition of project objectives, identification and assessment of uncertainties and risks, early decisions and decent preparation, project planning, a committed project team, representation in decisions, communications, good leadership, delegation of authority, change management, using past experiences, and flexibility to adapt to external changes. Also the effort in the early stages of the life cycle is thought to improve the chance of project success (Meredith and Mantel 2006).

2.6 Project management aspects

When managing a project several aspects need to be considered to ensure that the project actually achieves the intended objectives in the end. To understand how this is done in reconstruction projects a structured visual framework would prove to be useful.

In research from Wirth and Tryloff six existing project management standards have been compared on context, approach, structure and content. Regarding the structure, the standards of the Project Management Institute (PMI), Australian Institute of Project Management and International Standards Organization have similar structures along 8-10 subject matter areas preceded by an introductory section. Regarding the content, the standards of the Project Management Institute and UK Association of Project Managers cover both project management concepts and project management processes in a broad manner (Wirth and Tryloff 1995). Although the subject matter related standards cover operational processes, knowledge areas or functions of project management, in the end these all come down to the same aspects scope, time, cost, risk, communication, personnel (or human resources), procurement, quality (or product) and the integration or coordination of these.

Because the PMI standard is both subject matter based and provides a graphical representation of project management aspects this is found to be the framework of choice. The framework presented in the PMI Project Management Body of Knowledge (PMBOK) divides project management in nine knowledge areas, subdivided in processes as can be as can be seen in Figure 7 (PMI 2000).

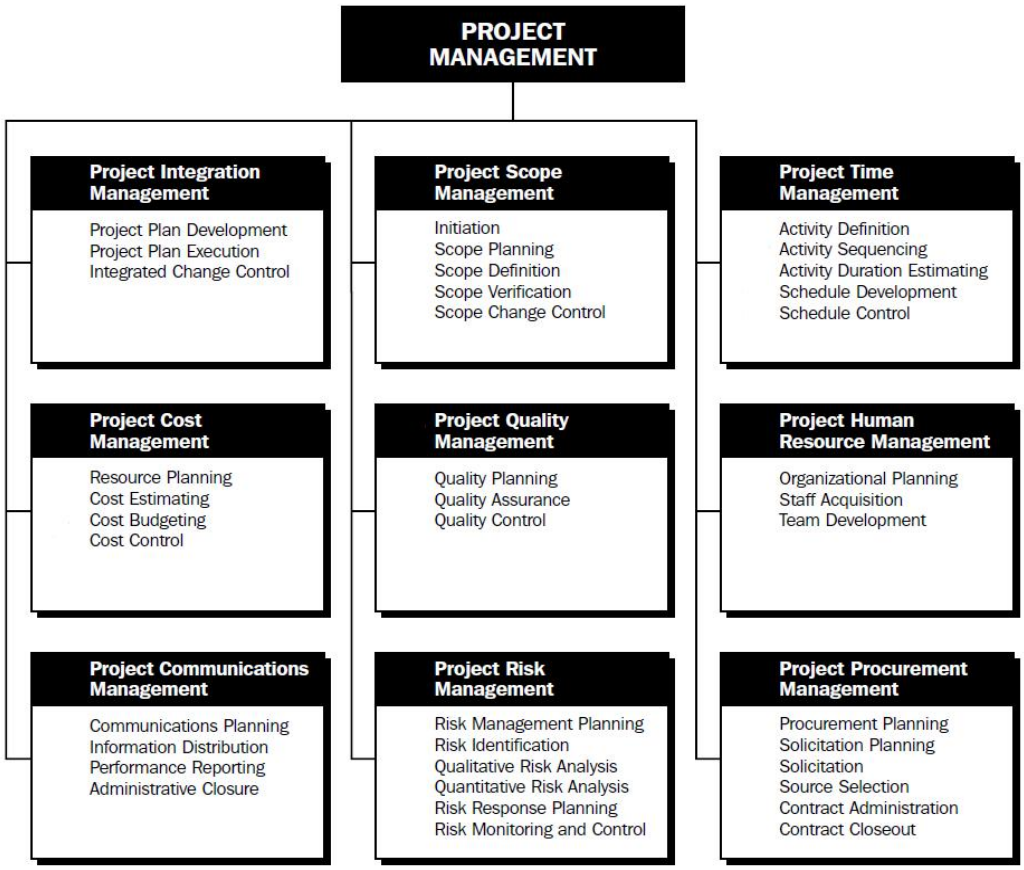


Figure 7, The nine knowledge areas of the PMBOK[6]

The nine knowledge areas can be briefly explained as follows.

- Project integration management describes the processes required to ensure that the various elements of the project are properly coordinated.
- Project scope management describes the processes required to ensure that the project includes all (not more or less) the work required to complete the project.
- Project time management describes the processes required to ensure timely completion of the project.
- Project cost management describes the processes required to ensure that the project is completed within the approved budget.
- Project quality management describes the processes required to ensure that the project will satisfy the needs for which it was undertaken.
- Project human resource management describes the processes required to make the most effective use of the people involved with the project.
- Project communications management describes the processes required to ensure timely and appropriate generation, collection, storage and ultimate disposition of project information.
- Project risk management describes the processes concerned with identifying, analyzing and responding to project risk.
- Project procurement describes the processes required to acquire goods and services from outside the performing organization.

[6] Adopted from the PMBOK 2nd edition 2000, page 8

Interviews with experts revealed that in a counterinsurgency setting the nine project management aspects were given different degrees of attention depending on the personal experience of the person, stability of the situation, phase in the conflict and the type of project at hand. The nine project management aspects were also confronted with specific problems arising from the unique context. In relation to the presented framework security and logistics were not mentioned separately but in the context of military operations would be additional aspects needing management attention. The main finding was that despite the mentioned regular occurrence of all kinds of issues and problems, risk management was considered to be an underrated aspect in almost every project. The experiences of the interviewed project managers revealed that on a military operational level the highest safety and security threats were considered and discussed so project activities could be cancelled if the situation posed unacceptable threats. However within projects, all kinds of risk events would just arise and had to be addressed as they occurred.

All interviewees agreed that it would be wise to think ahead of what could be done about risks, therewith managing risk more pro-active instead of reactive as it currently appeared to be. Another remark made during an interview was that military people tend to focus only on the military (security and safety related) risks but need to be stimulated to think of other project related risks. Interviewees mentioned specific risk areas, for example risks would arise from the control of scope, cost estimation of the work, rotations of military personnel, adhering to plans and procedures, the military organization and approach, getting local people to work on the job, seasonal and social-cultural factors, low quality and sustainability of the design solution and military operations or fighting in the area. Two interviewees also mentioned that evaluation of executed projects, as in many other industries, rarely took place while this could be valuable learning sources to improve the management of future projects (interviews A, B, C, D, E).

In existing military guidelines, some risk related topics can be found. The CIMIC field handbook contains some questions, factors and considerations to include in a risk assessment prior to the execution of a CIMIC project using the military's own means. The CIMIC planning process contains an orientation phase in which restraints, constraints, assumptions and objectives are to be reviewed to complete a mission analysis but this is not included in the project planning (CCOE 2009). The Allied Command Operations CIMIC manual contains a critical- and additional factors checklist for CIMIC area assessments which look like risk categories in a risk break down structure. The CIMIC projects section recalls that purpose, scope and parameters of a project must be clearly defined before development and initiation as well as tracked and reported along the progress of all projects. Also project characteristics and a checklist are presented with some questions, considerations and concerns to address during the feasibility assessment of a project. Furthermore is mentioned that eventually lessons learned should be collated (CIMIC 86-1-1). How to deal with the checklists, identified criteria, how to follow up with actions and how to record lessons learned remains unclear in both guidelines.

From the above gained insights through both experts and existing guidelines, it is concluded that evaluation from a risk management perspective could prove to be of added value in the current management practice of military civil engineering reconstruction projects. Therefore the next section is dedicated to find a suitable theoretical framework that can be used to analyze in detail the essence of risk management in this specific type of projects.

3 PROJECT RISK MANAGEMENT

3.1 Introduction

In literature, several international standards, professional standards, guidelines and books are available for the management of risk and each methodology has its distinctive characteristics. In previous done research by Joustra 10 international standards, 7 professional standards 5 guidelines and books and 5 chapters in project management literature are reviewed, analyzed and presented in an overview to find out about best practices in risk management. The various methods differ for example regarding the level of implementation, definitions, the risk area, year and country of publication, the inclusion of both the positive (opportunity) and negative (threat) side of risk, the process lay-out and the implementation of the method (Joustra 2010).

From the observed methods the Active Threat and Opportunity Management (ATOM) methodology by Hillson and Simon is chosen for the case analyses in this research for several reasons. ATOM is consistent with the main project risk management standards, however its emphasis lies on the practical applicability describing how to do risk management for a real project rather than a theoretical framework or set of principles (Hillson and Simon 2007). Furthermore the case analyses in this research consist of reviews on past executed projects and the chosen risk management method contains a separate section dedicated to post project review. As military reconstruction projects can differ significantly in type and size another advantage of this method is that it is designed to be applied and scaled to all projects of different types and sizes in any business sector or industry. ATOM is a recently developed method (2007) that contains both the upside and downside of risks which is a distinct advantage to older methods. Last but not least, the researcher had some prior basic experience using the ATOM method.

According to Hillson and Simon, a risk can be defined as *'any uncertainty that, if it occurs, would have a positive or negative impact on the achievement of one or more objectives'*. Here the distinction is made between an opportunity in the case of a positive impact and a threat in the case of a negative impact on project objectives. Some terms relating to risk can also be defined. An issue often refers to matters of concern, insufficiently defined and therefore vaguer than a risk, from which risks may arise. Other people see issues as something that has occurred but cannot be addressed by the project manager without escalation so it may also be the negative result of a risk that has happened. A problem is a risk who's time has come – it exists now and must (and can) be addressed immediately. Problems can be distinguished from issues because issues require escalation, whereas problems can be addressed by the project manager within the project. The causes of a risk describes existing conditions or circumstances from the environment that might give rise to risks while the effects only occur as the result of risks that have happened.

In the following subsections the ATOM risk process and the different risk analysis techniques and tools that are to be used in the project analyses are further elaborated.

3.2 The ATOM risk process

The typical steps to be taken in the ATOM process are shown in Figure 8 (Hillson and Simon 2007).

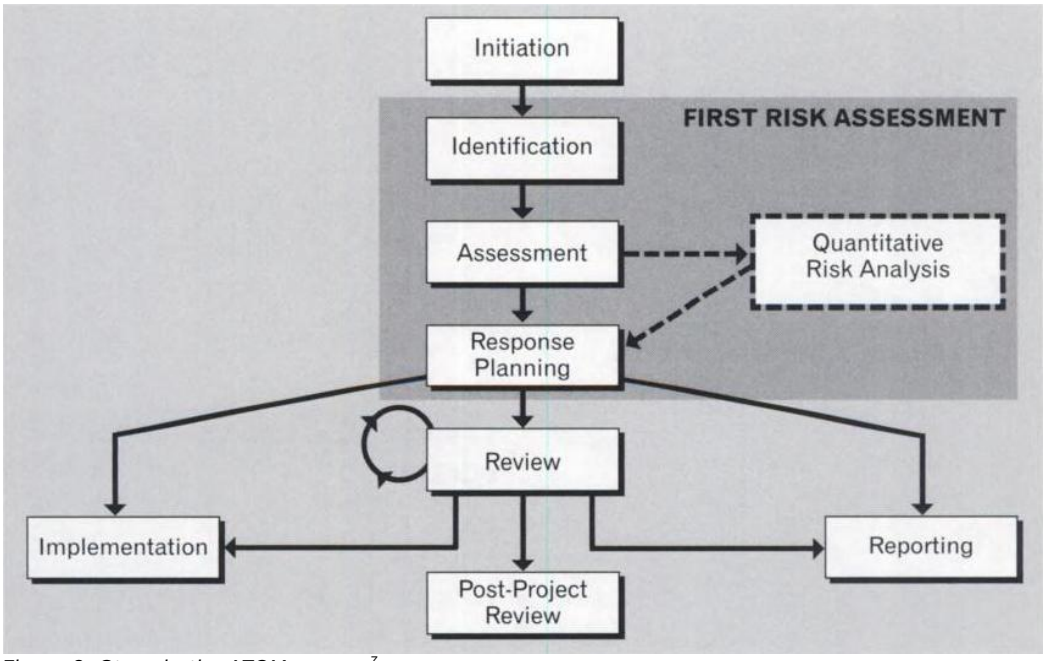


Figure 8, Steps in the ATOM process[7]

The process starts with the ***initiation*** step in which the objectives at risk are well defined and understood, without this the process cannot continue. After defining objectives, the relevant uncertainties (either threats or opportunities) are identified in the ***identification*** step. Because the uncertainties identified this way are not equally important, the following ***assessment*** step includes filtering, sorting and prioritizing the risks (qualitative or quantitative) to find the worst threats and the best opportunities. Here it might also be useful to examine groups of risk whether there are any significant patterns or concentrations and the overall effect of all identified risks on the final project outcome. Once risks are identified and prioritized, attention turns to ***response planning*** or deciding how to respond appropriately to the risks. In the ***implementation*** step the so planned responses must also be implemented and monitored to actually change the risk exposure of the project. As the risk process is undertaken by only a few members involved in a project the ***reporting*** step is important so to communicate risks identified, implemented responses and current risk exposure to other stakeholders. For a typical project ATOM starts before project approval to determine the risks associated with implementing the project. Clearly every project is dynamic and changing so after the initial risk assessment the risk process requires continuous ***review*** throughout the project life cycle to ensure appropriate action is being taken throughout the project. The final step in the process is a ***post-project review*** in which experiences from the past project and risk process are documented so that future projects can benefit from the results.
Depending on the size of a project, the degree to which each step can be elaborated may differ. ATOM recognizes small, medium and large size projects and for each of these the method can be tuned so the detail-level of the process matches the size of the project.

[7] Adopted from Hillson and Simon 2007, page 25

Critical success factors for a risk management process are summarized in Table 2. First, the support within the organization to conduct a risk management process is important to ensure that time is allocated to the process, resources are made available and that the process is conducted as early as possible in the project life cycle. Also the risk culture or the organizational attitude towards risk is important. A too risk-seeking or too risk-averse attitude might lead to ignorant or thoughtless behavior, while a pro-active risk neutral attitude is considered best. Second, competent people are necessary to apply and participate in the process effectively. Third, appropriate methods, tools and techniques that fit the level of risk management implementation are required to provide the necessary infrastructure to support the process. Fourth, a simple, scalable process that can be adapted to different projects of different sizes and in different phases to frame what is to be done in what order.

Supportive organization	**Competent people**
• Clear objectives for risk management • Availability of adequate resources • Buy-in from all stakeholders • A culture that recognizes that uncertainty is inevitable • Accept the need to change in response to risk management • Suitable contractual framework to support the risk process	• Shared understanding of the key concepts and principles of risk management • A common language and agreement of key risk management terms • Recognize the need for continuous training of staff • Skilled and competent staff • Combination of theoretical knowledge, effective behaviors and appropriate attitudes
Appropriate methods, tools and techniques	**Simple, scalable process**
• Required level of infrastructure and software tools to support appropriate level of implementation • Training in the selected methods, tools and techniques • Integrated toolkit, both internally coherent and interfacing with project management and business tools	• Recognize that 'one size fits all' is the wrong approach • Efficient procedural framework • A documented process • Clear instruction on 'what to do'

Table 2, Critical success factors for an effective risk process[8]

3.3 Initiation

Following the ATOM method the risk process starts with the initiation which consists of a stakeholder analysis, a definition of the scope and objectives of the risk process and a clarification of project objectives.

3.3.1 Stakeholder analysis

In any project other stakeholders can have influence on the project as well as the risk process and therefore it is essential to understand their relation to both the project and the process. Conducting a repetitive stakeholder analysis can draw out the interests of stakeholders in relation to the problems or purpose which the project is seeking to address, identify conflicts of interests between stakeholders, help to identify relations between stakeholders and how they can be best

[8] Adopted from Hillson and Simon 2007, page 17

engaged and help to assess the appropriate type of participation by different stakeholders at successive stages in the project life cycle (ODA 1995; ODA 1995). To gain insight in these aspects a stakeholder grid is produced by assessing three dimensions for each identified stakeholder (Murray-Webster and Simon 2006).

1. Their **power** or ability to influence the project is either influential (+) or insignificant (-). This may be their potential to influence derived from their positional or resource power in the organization, or may be their actual influence derived from their credibility as a leader or expert.
2. Their **interest** in the project as measured by the extent to which they will be involved active (+) or passive (-).
3. Their **attitude** to the project as measured by the extent to which they will be supportive (+) or resistant (-) towards the project.

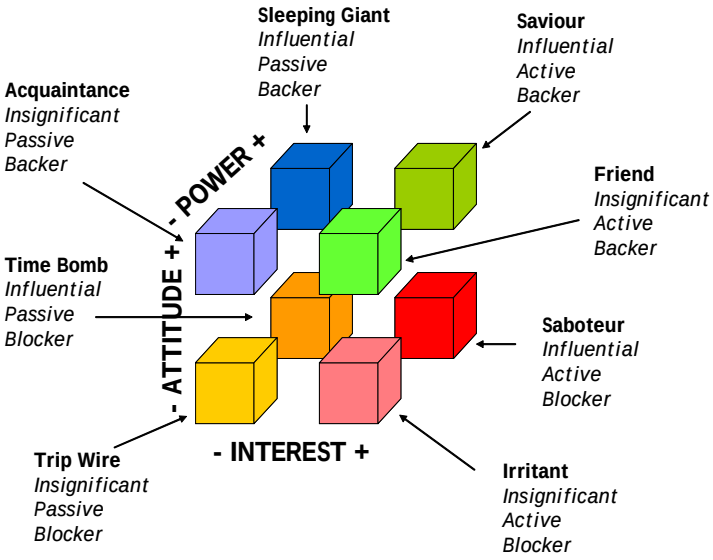


Figure 9, Stakeholder mapping cube[9]

Each identified stakeholder and their interest or stake in the project can be listed in the template shown in Table 3. Next, for each stakeholder their power, interest and attitude are assessed + or – as defined above. Because this assessment can be based on personal interpretation(s) it is important to document and describe the motivation for each of the identified dimensions.

Stakeholder	Area of interest	Power	Interest	Attitude	Type

Table 3, Stakeholder analysis template

Based on this assessment the stakeholder types can be determined using the grid presented in Figure 10 and placed into the template.

[9] Adopted from Murray-Webster and Simon 2006, page 2

TYPE	ATTITUDE	POWER	INTEREST	DESCRIPTION
Savior	+	+	+	Powerful, with a high interest level and a positive attitude toward the project. It is important to pay attention to these stakeholders; harness their support and do whatever is necessary to keep it.
Friend	+	–	+	Low power, but high interest and positive attitude, these stakeholders can be used as confidants or sounding boards. Maintain their support in case they gain additional power within the organization.
Sleeping Giant	+	+	–	Powerful stakeholders who support the project but displaying low levels of interest; they need to be awakened to raise their commitment to the project and maximize their positive input.
Acquaintance	+	–	–	Low-power, low-interest backers who should be kept informed, but need not be a top priority unless their levels of power or interest increase.
Saboteur	–	+	+	Powerful, with a high interest level in the project, but display a negative attitude; they must be actively engaged to prevent them causing significant disruption to the project. The aim is to make their attitude toward the project more supportive and to use their influence to benefit the project.
Irritant	–	–	+	Very interested in the project but do not support it, though they have little power to influence things. Their negative attitude must be contained and countered where possible.
Time Bomb	–	+	–	Powerful but with low interest levels and a negative attitude toward the project; these stakeholders must be understood so they can be "defused before the bomb goes off." Efforts should be made to improve their attitude and engage active input.
Tripwire	–	–	–	Low-power, low-interest, negative-attitude stakeholders who are likely to hinder the project; their interaction with the project should be minimized as much as possible.

Figure 10, Descriptions of different stakeholders[10]

The resulting table gives an overview of the stakeholders in the project the way these are estimated by its creator(s) at a certain point in time which improves insight into the stakeholder situation. Based on this assessment it can be decided who should contribute to decisions about the risk process. For example saviors should be included in decision making while it is also worth inviting sleeping giants in order to engage their interests. The project sponsor and manager might seek the views of saboteurs and time bombs if they feel able to contain any possible negative input and could be converted into supporters. Low power stakeholders are usually excluded from the risk decision making process.

Later, in the risk identification process is explained how this analysis can also be used to identify stakeholder related risks and how the stakeholder types and descriptions can help to decide on how certain stakeholders can be best engaged.

[10] Adopted from Hillson and Simon 2007, page 42

3.3.2 Risk process definition

Before kicking off with a risk management process it is important to define the degree to which ATOM should be applied, the objectives to be achieved by the risk management process and the tools and techniques to be used.

Depending on the size of a project it can be decided how extensive the risk process should be done so the right level of detail and effort can be put in. In small projects it could be sufficient for a project manager to regularly ask himself the following questions. What are we trying to achieve, what could hinder or help us, which of these are most important and what shall we do about it? Medium projects require a standard process led by a risk expert using risk management tools and techniques, initiating meetings and workshops, interviews and ongoing reviews. In large projects the review process is further extended and quantitative analysis is advised. Quantitative analysis could be valuable because it models the effect of identified risks on the project schedule and budget, calculating the range of possible completion dates and final project cost.

In medium and large projects an initiation meeting should be arranged at the start of the project in which stakeholders have the opportunity to agree on the appropriate level of risk management and who to involve at what point in the process. That means the following items -among possible other things- should be discussed and documented in a risk management plan together with the previously done stakeholder analysis.

- the project objectives
- scope and objectives of the risk management process
- the degree to which ATOM should be applied
- the schedule of planned activities
- tools and techniques to be used
- roles and responsibilities for risk management
- reporting and review requirements
- definitions of probability and impact scales for qualitative assessment

3.3.3 Clarification of project objectives

In reality, in many cases projects are still launched while project objectives are not clearly defined, not agreed or not documented. This lack of definition ultimately leads to ineffective risk management so before the risk process can start it is important to clearly define the objectives and what deviations are considered acceptable or not.

First, it is necessary to decide which objectives are to be included within the scope of the risk process. Project objectives usually cover the scope, time, cost and quality requirements of a project. Other objectives might be technical performance, organizational reputation, safety, regulatory compliance, maintainability, operability, reliability, health, security, environment etcetera.

To clarify objectives the following questions can be considered.

Scope	What is included and excluded in the project scope?
	What are the project deliverables?
Time	Is there a date by which this project must be completed?
	Are there any intermediate milestones during the project?
	Are any interim deliverables required before project completion?
Cost	What budget has been set for this project?
	How much contingency and/or management reserve is set aside?
	Are there targets for cash flow, margin, profitability, return on

	investment etcetera?
Quality	Are there specific quality requirements for this project?
	What are the acceptance criteria?
Other	Are there specific other requirements for this project?
	What are the acceptance criteria for this objective?
	What are we trying to achieve and what definitely not?

Table 4, Useful questions to clarify project objectives

Next, it is important to agree on what level of impact would hurt the defined project objectives and what probabilities of occurrence are considered. In the ATOM process a five-point scale is recommended for both probability and impacts however these can also be turned down to four or even three depending on what level is considered suitable for the particular project. Impact scales are project specific and in order to determine these, the following template can be used (here the example of a six-point scale is shown).

SCALE	PROBABILITY	+/– IMPACT ON PROJECT OBJECTIVES		
		TIME	COST	QUALITY
VHI	71–99%	Greater than <d>	Greater than <s>	Very significant impact on overall functionality
HI	51–70%	<c> to <d>	<r> to <s>	Significant impact on overall functionality
MED	31–50%	<b> to <c>	<q> to <r>	Some impact in key functional areas
LO	11–30%	<a> to <b>	<p> to <q>	Minor impact on overall functionality
VLO	1–10%	Less than <a>	Less than <p>	Minor impact on secondary functions
NIL	<1%	No change	No change	No change in functionality

Figure 11, Probability Impact assessment template[11]

In this template, the highest level of impact on each scale Very High (VHI) is defined as the level of impact that cannot be ignored, a showstopper or catastrophic impact for a threat or golden opportunity. The lowest impact scale Very Low (VLO) is defined as a degree of impact that does not need active management and is considered acceptable for this project. A negligible probability or impact can be assigned by the label NIL which means that there is no chance of occurrence or no change in impact for that particular objective. After defining the upper and lower impact scales the intermediate scales can be set between these limits using a nonlinear scaling, usually based on a doubling value at each point.

Finally, it should be agreed which combinations of probability and impact scales is considered acceptable and which combinations require priority for action. This can be done using a default probability-impact matrix as shown in Figure 12. In this matrix the red risks require top priority and urgent attention, the amber risks require medium priority and active monitoring, the green risks are low priority.

[11] Adopted from Hillson and Simon 2007, page 84

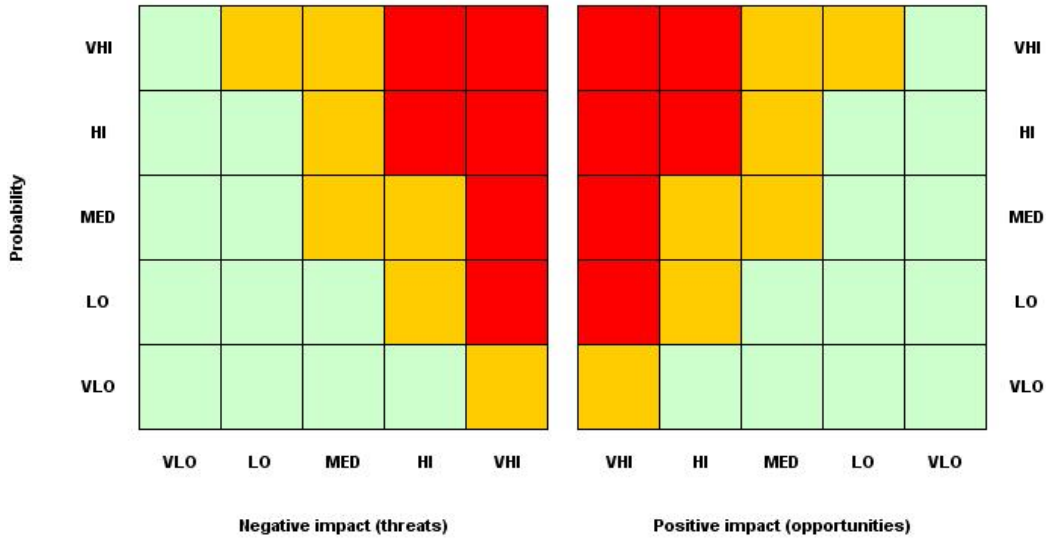


Figure 12, Double probability-impact matrix

In the risk assessment process the use of these templates will be further discussed.

3.4 Identification

The aim of the risk identification must be to identify all risks that are practically and realistically identifiable. ATOM describes several techniques to identify risks: structured brainstorming, analysis of constraints and assumptions, ad-hoc identification and use of a standard risk checklist or a existing risk break-down structure (RBS). This can for example be done in a risk workshop which is attended by the project manager, the project sponsor, members of the project team and other key stakeholders identified.

Questions that can help to identify risks are

- *Which assumption or constraint could prove to be false?*
- *What does this work method, task or technology require to be completed?*
- *Is there a chance that the requirement turns out to be unavailable?*
- *What could happen in the current situation that would really disturb (this task, part, work method, or technology to be used in) the project?*
- *What causes this to happen?*
- *What is the effect on the project (objectives) if this would happen?*

Also the stakeholder analysis can be used to identify risks. Stakeholders with a negative attitude can be assessed on what influence they might have on the project, while it might also be possible that stakeholders with a positive attitude could become negative for some reason which would again have influences on the project. The same counts for every stakeholder's interest and power.

Questions that can help to identify these risks are

- *What might happen to the existing situation that would change a stakeholder's attitude?*
- *What event might trigger a change in a stakeholder's power in the current situation?*
- *What event might trigger a change in a stakeholder's interest in the current situation?*
- *What influence could a stakeholder with a negative attitude have on the project in the current situation?*

- *What influence could a stakeholder have on the project in the changed situation?*
- *What causes this to happen?*
- *What is the direct effect on the project (objectives) if this would happen?*

Identified risks should be clearly and unambiguously described using risk meta-language. Risk identification should be done using risk meta-language that separates cause, event and effect (or consequence) in the form *"As a result of <cause 1> and because <cause 2>, <uncertain event> may occur, which -if it occurs- would lead to <effect on objective 1> and <consequence for objective 2>"* (Verbraeck 2009). Here it is important to realize that causes are described as definite facts, risks as uncertain events or set of circumstances, and effects as a direct impact on one or more project objective(s).

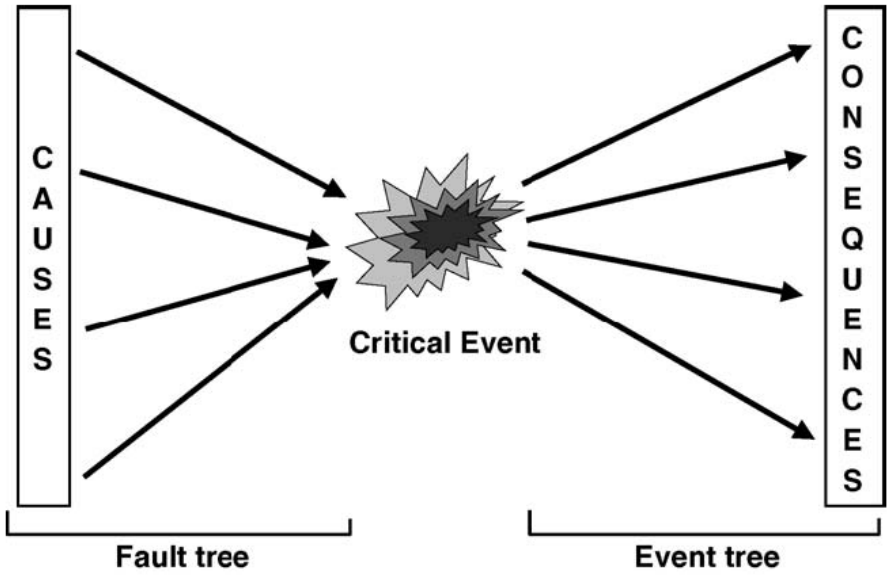


Figure 13, Representation of risk using a bow-tie diagram[12]

As is shown in Figure 13, each risk event usually has multiple causes that contribute to the actual occurrence of the event which can also be referred to as its fault tree. Even so, each risk event, if it occurs, has multiple effects or consequences on project objective(s) which can be referred to as its event tree (Dianous and Fievez 2005). All causes and effects should be recorded in the risk register.

3.5 Assessment

The aim of the assessment step is to determine the most important threats and opportunities in order to enable focused, active management. This is done by attaching probabilities of occurrence to each identified risk and evaluating potential impacts on objectives if the risk occurs.

Preferable the assessment is done during the same people who identified the risks during the risk workshop, who are often well placed to assess them as well. Assessment is done in two steps and must ignore possible responses. First a single probability of occurrence is estimated on the earlier defined five point scale. Second, the assessor imagines the risk occurring and determines its impact on the earlier defined project objectives using the five point scale. It may well be the case that a risk has different levels of impact for different objectives.

[12] Adopted from Dianous and Fievez 2005

Clearly different people will have different opinions about how to rate the probability and impact of a particular risk. Differences can be resolved by discussion, exploration of underlying assumptions and consensus seeking. Also perceptual factors play a role, such as the most recent experienced risk is most memorable and therefore overrated. Other factors are that the same risk will always occur in similar circumstances not taking into account local differences or change in circumstances, or that the first answer is always considered right especially in a group of people who are reluctant to disagree. These factors can be minimized by asking control questions.

- *When did that risk last occur? And previous to that? Could it really happen again on this project?*
- *When was the last time you experienced this risk? Could things have changed since then?*
- *Are you sure about this? Why so? What do others think about this?*

Once the probability and impact(s) of each risk are agreed, motivated and recorded in the risk register, these can be plotted in a double probability impact matrix as shown in Figure 12. Next, risks can be categorized by causes using a Risk Breakdown Structure (RBS) or by effects using a Work Breakdown Structure to determine whether any parts of the project are particularly exposed to risk. During this process it might turn out that a risk has more than one cause or effect and therefore could theoretically belong in several categories however it should be put in the category that seems to be the primary cause or effect. This process allows prioritizing most important risks and gives insight in the risk exposure of the project. This information is valuable for developing effective risk responses.

3.6 Response planning

The response planning step is where key decisions are made on how to manage risks, using risk information to modify project strategy where necessary, and positioning the project to gain the benefits offered by the risk process. For some risks initial responses may have been identified and recorded during the previous steps. During response planning possible mitigation strategies to deal with the risks are further explored, confirmed, accepted and prepared for action.

Possible response strategies for threats are (in order of priority) avoid, transfer, reduce and accept. For opportunities these strategies are exploit, share, enhance and accept. The strategies can be explained as shown below in Figure 14. For stakeholder related risks Figure 10 indicates useful strategies.

GENERIC RESPONSES TO THREATS

Avoid: A response to a threat that eliminates either its probability or impact on the project. This can often be achieved by changing the project management plan for the project or by addressing the cause of the risk.
Transfer: A response to a threat that transfers the risk to a third party who is better able to manage it. The act of transfer does not itself change the risk, but the new owner should be able to take action to avoid or reduce it.
Reduce: A response to a threat that reduces its probability and/or impact on the project, aiming to reduce the risk to an acceptable level. This may be achieved by addressing key risk drivers.

GENERIC RESPONSES TO OPPORTUNITIES

Exploit: A response to an opportunity that ensures that the opportunity is taken by guaranteeing that it will definitely occur.
Share: A response to an opportunity that shares the risk with a third party better able to manage it, either by exploiting or enhancing the opportunity.
Enhance: A response to an opportunity that increases its probability and/or impact on the project.

GENERIC RESPONSE TO THREATS AND OPPORTUNITIES

Accept: A response where either no proactive action is taken (perhaps because it is not worth doing anything or it is not possible to) or where responses are designed that are contingent upon a change in circumstances. Alternatively, a contingency reserve (time, money, and resources) can be established to deal with the risk should it occur.

Figure 14, Generic response strategies for threats and opportunities

When evaluating response strategies the bow-tie representation is again helpful as it immediately shows an overview of cause-effect relations of the particular risk (Dianous and Fievez 2005). To mitigate the risk one can work on the causes by taking them away or reducing them by placing safety barriers or blockers so to reduce the event's probability of occurrence. Or one can develop measures to avoid, transfer or reduce the impact on the project if the risk might occur. This is shown in the bow-tie diagram below in Figure 15.

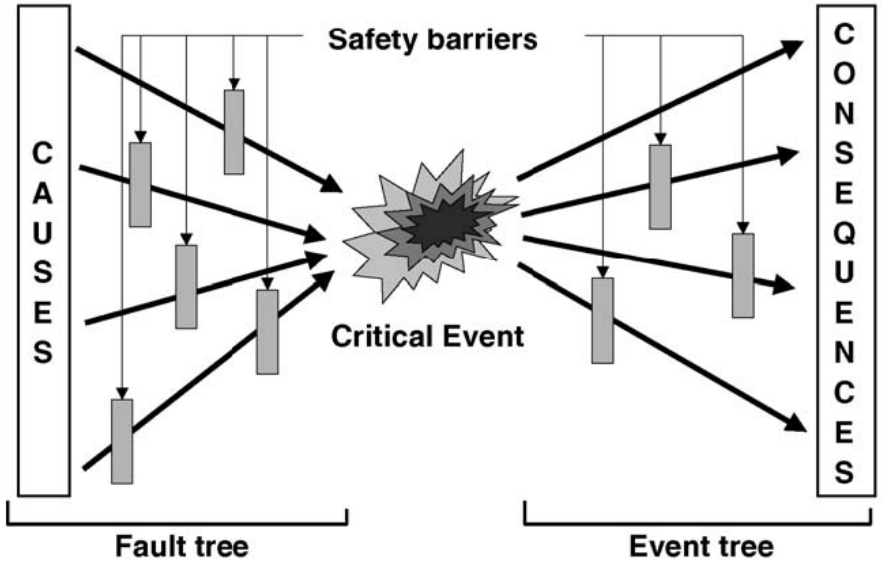


Figure 15, Representation of reduction strategies using a bow-tie diagram[13]

When transferring the risk it is important to investigate whether the party to whom the risk is transferred is capable of dealing with the risk effectively. Otherwise the risk might not be present for the organization itself but is still present in the project. When reducing the risk it will never be reduced completely

[13] Adopted from Dianous and Fievez 2005

so it is necessary to assess whether the residual risk is acceptable. It could also be that the planned response action introduces new risks to the project. This secondary risk should be placed and treated in the risk register as any other risk. Depending on the severity or manageability of the secondary risk it could be chosen to change the response strategy of the initial risk. When accepting the risk, a contingency plan should be made how to deal with the consequences of the risk so, if the event occurs, immediate action can be undertaken.

To decide which strategy is appropriate the manageability, impact severity, resource availability and cost-effectiveness should be considered. Next, specific actions can be determined that could be implemented to achieve the selected strategy. In any case, the preferred response strategy should be documented in the risk register together with a motivation for the considerations that have been made. The action itself might introduce new risks which should also be identified, assessed and recorded in the risk register.

In order to show how risk-effective the chosen action is expected to be, probability and impacts of the risk can be re-assessed assuming that the actions are completed successfully using the same probability-impact scales. Each identified risk should be reconsidered this way to generate the expected post-response situation. This can be presented in a post-response probability-impact matrix using the same format as in the initial assessment. This matrix will show the predicted position of all risks after the successful implementation of the planned actions which gives an overview of the remaining overall risk exposure of the project.

3.7 Reporting

The aim of the reporting process is simply to combine the outputs from the other processes into a single report which can be distributed to different stakeholders, for example senior management or individual risk owners. Most of the results are captured in the risk register or may be produced directly from it, though some additional details may be documented elsewhere, for example in a change log.

The report commonly includes a full risk register with clear risk descriptions, assessments of current probability and impacts, mappings of risk along the Risk Breakdown Structure and Work Breakdown Structure, assigned risk owners, agreed response strategies with actions and action owners, assessment of post-response probability and impacts and the status of the progress of agreed actions. A double probability-impact matrix which shows the distribution of risks across the grid based on current probability and impacts, while another probability-impact matrix shows the predicted distribution based on post-response probability and impacts. Furthermore the report contains two prioritized risk lists (both threats and opportunities), analysis of risk causes along the RBS and an analysis of risk effects along the WBS.

3.8 Implementation

Producing responses or actions does not in itself change risk exposure, although it does create the potential to do so. To change the risk exposure of the project it is necessary to implement and monitor the previously planned actions. During this step the risk register should be kept up to date; adding newly identified (secondary) risks that arise from implementing actions and review cycles of the risk process. Also the current status of each identified risk should be kept up to date so the risk register is contains the latest information regarding changed probability and impacts, progress on actions, changes to risk owners and action owners and changes to response strategies. During this process a log file should be kept in which all changes and issues are recorded.

3.9 Review

During key points in the project, for example at the beginning of a new phase or at significant milestones within a phase, the review process provides the necessary effort to ensure that the assessment of risk exposure remains up-to-date and the risk management process remains effective. This can be done by initiating new risk workshops, review meetings or interviews with relevant stakeholders.

After the completion of a project, a post-project review offers a structured mechanism for capturing lessons identified or 'to be learned' from previous completed projects in a form that can be used by future similar projects. To do this, all risk related information is gathered and considered by project team members and stakeholders during a post-project review meeting. During this meeting the lessons to be learned regarding project activities and the risk process can be identified and recorded, the final risk register can be drawn up and the Risk Break down Structure is adjusted.

Below are some questions that can help to identify lessons for future projects.

- *What were the main threats and opportunities identified on this project?*
- *Do any of these represent generic risks that might affect similar projects?*
- *Which foreseeable threats actually occurred and why?*
- *Which opportunities that could have been captured were missed and why?*
- *Which issues or problems occurred that should have been foreseen as threats?*
- *Which unplanned benefits arose that should have been identified as opportunities?*
- *What preventive actions could have been taken to minimize or avoid threats?*
- *What proactive actions could have been taken to maximize or exploit opportunities?*
- *Which responses were effective in managing risks, and which were ineffective?*
- *How much effort was spent on the risk process, both to execute the process and to implement responses?*
- *Can any specific benefits be attributed to the risk process, for example, reduced project duration or cost, increased client satisfaction etcetera?*

A post project report should contain summarized answers on these questions, recommendations regarding risks to be added to the organization's checklist for use in future projects, modifications to the organizations RBS structure, proactive and preventive actions to be included in the strategy of future similar projects and changes to the risk process to improve effectiveness.

Summarizing, the ATOM risk process as illustrated in this section provides a practical, structured and stepwise approach to risk management in projects. The several methods, techniques and tools presented therein serve as handles to ensure that each step provides the required output. In this research the presented initiation, identification, response planning and post project review steps provide the theoretical framework for the case analyses. The implementation, reporting and in between review steps are relevant in the risk management process for an actual projects and will be further discussed at the end of the cross case analysis section.

PART II – CASE STUDIES URUZGAN

4 INTRODUCTION CASE ANALYSIS

4.1 Case study research

In case study research the researcher tries to gain deep and overall understanding of a constrained object or process. Characterizing for this type of research is the small number of research objects (cases), a qualitative research approach, in depth (labour intensive) data analysis. The specific characteristics of case study research have the advantage that also the context of the case is investigated, the analysis can be changed or adjusted in following cases and results are often easier accepted by people in the field which is relevant if the research has to contribute to a change in practice (Verschuren and Doorewaard 2007).

Several variants of case studies exist, like for example a single case study and multiple case studies. In the multiple case study approach a hierarchical method and sequential method exist. In the sequential method the second case is selected based on findings of the first case and studied comparative to these results. In the hierarchical method cases are investigated independent from each other so it is easier to compare results afterwards. Moreover this tactic enhances the probability of capturing novel findings which may exist in the data (Eisenhardt 1989). The snowball sampling method selects cases one by one, this method is useful when the researcher is new to the research field and does not yet know what subject matter to expect from the cases (Verschuren and Doorewaard 2007).

The disadvantages of case studies can be the validity and quality of the results. This can be judge judged according to certain logical tests. Construct validity deals with the researcher's subjective judgment used to collect the data, for example whether the recorded information actually reflects real critical events or whether these are based on the investigators impressions. Internal validity deals with whether a certain identified causal relationship x really led to event y and not another factor z. The third test deals with the external validity, in other words the problem of knowing whether a study's findings can be generalized to the whole field beyond the immediate case. The reliability of a case study means that if another researcher would investigate the same case he or she would arrive at the same findings and conclusions (Yin 2003).

To counter these disadvantages data is often generated using different methods like personal interviews, group interviews, observations and analysis of documents and other materials. This is called method triangulation. Preferable the researcher also uses different sources of information, also called source triangulation (Verschuren and Doorewaard 2007).

In this research the hierarchical method was used as this allowed the researcher to compare the results in the different cases more easily and to be flexible in adjusting the theoretical framework between separate cases. Method triangulation was applied by combining desktop research with individual (military) expert interviews. The available project information came from different military sources but only minimal from other involved actors due to practical research limitations. Therewith source triangulation is only partly covered.

4.2 Case selection

The case selection is a crucial step in every case analysis. Selecting similar cases can be useful when the researcher is relatively new to the subject, this makes it

easier to generalize and find connections between key phenomena. Different cases can be useful when a key variable should be investigated under different circumstances to find key factors that influence that variable (Verschuren and Doorewaard 2007).

In order to select suitable projects for this research, the unstructured raw data set available to the researcher led to the development of a project inventory which can be found in appendix A. The identified projects were assessed along the criteria type, location, stakeholders involved, role of the military, time span, budget and available information. These criteria can be explained as follows.

Information
A crucial aspect in making the choice for the projects is the availability, quantity and relevance of project documentation and involved experts. Also to be considered is whether the same type of information and experts are available in order to have a consistent analysis between projects.

Project types and role of the military
In reconstruction projects different types of projects exist. Development projects are longer term, larger scale individual projects often initiated and funded by civilian actors like government organizations (GO), non governmental organizations (NGOs), International Organizations (IOs) or local contractors. For the military these projects are too big (regarding organization capacity, time span and also funding) so they cannot guarantee continuity for the project. Cooperation with the military in such projects does occur and could for example entail the exchange of (security) information, the monitoring of the project, or execution of small scale CIMIC projects in the surroundings to create additional support in the surrounding communities for the project at hand.

CIMIC projects are short term, small scale projects aimed to gain quick and visible results in order to improve the reputation of the military towards the local population. Examples of CIMIC projects could be the construction of a ford, a small bridge or gabion, a water pump, the repair of an irrigation canal or the construction of a small power plant. These projects are initiated, managed and monitored by the military. Actual execution is subcontracted to local contractors in order to provide sense of ownership and an impulse to the local economy.

Location
Projects are sometimes conducted within the safety barrier or in close proximity of a military compound or checkpoint (permissive area) under control of the intervention force or host nation military. Other projects are conducted far outside the military/government controlled zone; some are located nearby military bases or checkpoints and therefore relatively safe (semi permissive) areas and others in remote areas close to insurgent dominated (non permissive) areas. Compared to projects in permissive areas, projects in non permissive areas are riskier, for example monitoring by the military is difficult and security plays a big role.

Involved actors
Other actors involved in reconstruction projects could be civilian, military or local. Usually the more actors or stakeholders are involved in a project adds up in complexity of realizing the project and thus could implicate additional risks.

Budget and cost
The estimated cost and available budget of a project give an indication of the project size.

Time span and duration
Small scale projects can usually be completed within one personnel rotation. Development projects could easily run during several rotations, thereby running the risk for example of being cancelled due to the new commander's priorities. Together with the budget, the time span also gives an indication of the size of the project. Furthermore a specific project phase like the initiation, design or execution, or the whole project from start to finish could be focused on.

In the selection process, leading criteria were the relevance and added value for the Ministry of Defence and the Dutch military, the relevance for risk management to be applied and the quantity and quality of the available project documentation for the particular project. In order to make a selection also the following was considered.

As the selected ATOM methodology is designed to analyze project specific risk, analyzing specific projects was preferred over analyzing a whole spectrum of small scale CIMIC projects. Although relevant and valuable for military future operations, the latter was not chosen because it was uncertain whether the available information proved to be useful. Taking into account the time span of the research and the specified criteria, two cases were found to be most suitable and therefore were selected from the inventory.

The first project was an attempt to construct a bridge crossing the river Helmand near Chowtu by the Dutch military in 2007. This major project was located in semi/non permissive area, encountered severe setbacks and eventually did not succeed. Therewith the relevance for both the military and risk management was considered significant.

The second project was the construction of an asphalt road from Tarin Kowt to Chora in 2010 which was funded by the Dutch Ministry of Foreign Affairs and Development Cooperation. The documentation covered the construction of the first 16 kilometers. The military was indirectly involved as a stakeholder so the relevance for the military might be less. The relevance for risk management is considered significant because it was a major project located in semi/non permissive area.

4.3 Scope and setup of the analysis

Before kicking off the case analyses it is important to define the objectives to be achieved, the scope and the tools and techniques to be used.

The purpose of the case analysis is to demonstrate the application of the ATOM risk management tools and techniques on past executed projects in order to record risk-related knowledge and experience in a form that can be used in similar future projects.

The full ATOM risk management process as described in subsection 3.2 is meant to be applied in an actual project. The post project review as described in the ATOM method assumes ATOM has been actually applied in that project. In the projects analyzed in this research no risk management process of any kind was present and therefore part of the ATOM process had to be done in retroaction. The tools and techniques presented in the initiation, identification, assessment and response planning subsections 3.3 to 3.6 therefore are applied to the project documentation. The review, implementation and reporting steps are not part of the scope of the analysis because these are only relevant in an actual project. These aspects are briefly considered in the post project evaluation at the end of each case analysis. In the final section at the end of each case analysis an evaluation on the analysis method is presented to see whether the objective of

the analysis is achieved. The scope of the analysis is marked in red as shown in Figure 16.

The risk analysis process applied in the case analyses was intended to cover identified risks, mitigation actions, actually occurred risks and additional causes, events and effects identified by the researcher relying on the personal knowledge and experience gained so far.

In the first case analysis, experts involved in the project were engaged for interviews in order to get additional background information and to confirm the results and interpretations of the researcher. In the second case analysis this validation did not take place because involved experts were not available.

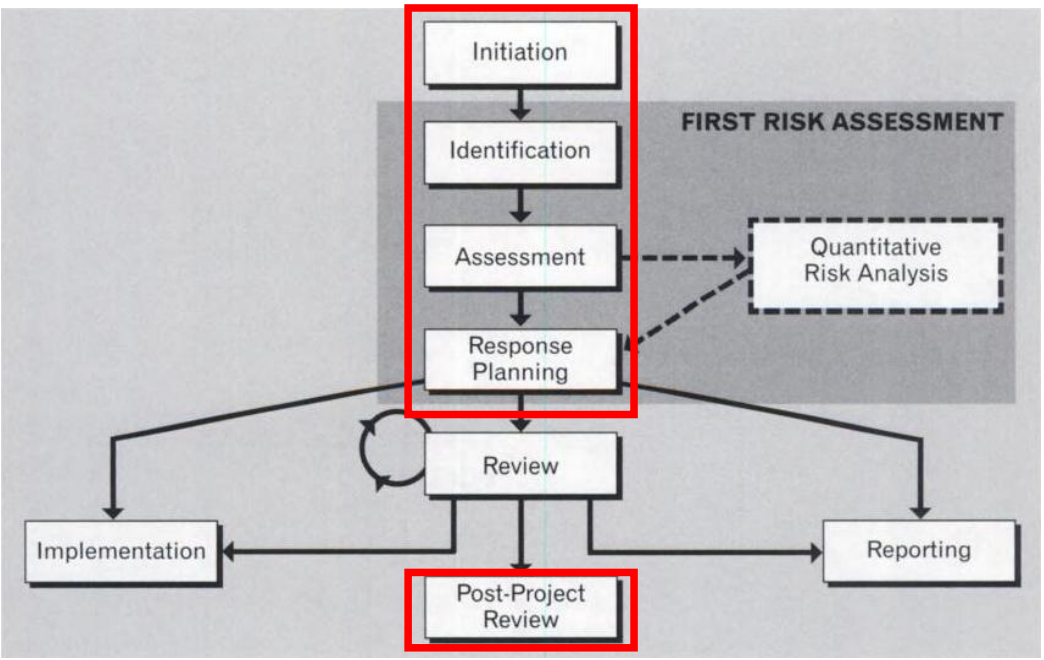


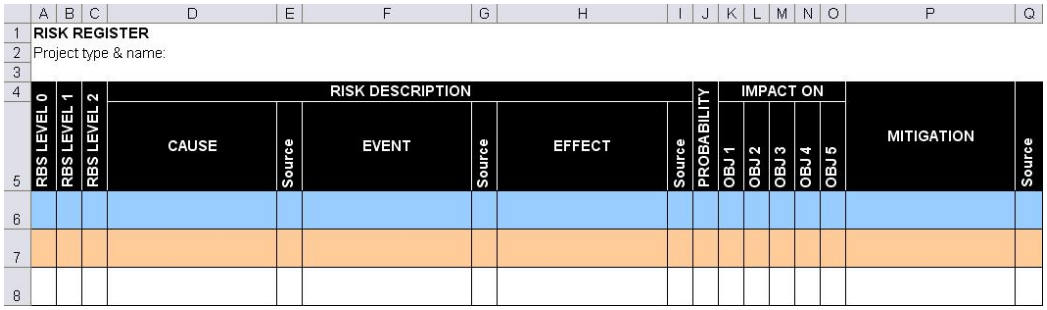
Figure 16, The scope of the project analyses

Before kicking off the case analyses, also the available information had to be prepared. The case analyses are based on confidential project documentation which consisted of excel sheets, pictures, records and meeting reports. This raw data was unstructured, poorly documented, incomplete and therefore had to be scanned for its relevancy first. The documents containing relevant information were numbered and merged in a single file while names, location grids and other sensitive information were filtered out. Next, the information was more deeply scanned and marked using colours to highlight risk related information like project objectives and requirements, identified and recorded opportunities, fired risks or uncertainties exposed and mitigation actions.

Before starting the analysis risk register tool was needed to record identified risks, which could be adopted from a risk software package, a standalone document, spreadsheet or database. From the documents available to the researcher it appeared that Excel was already available and also used by functional specialists in the mission area. A method using Excel might therefore be easier to adopt in future projects so the choice was made to start with an Excel spreadsheet.

Starting point for the spreadsheet was the example risk checklist from Hillson and Simon, using the risk categorization columns and risk description column. In order to use the risk meta-language the risk description column was split into

three columns cause, event and effect. In the assessment stage the probability and impact of the risk should be assessed and therefore the columns probability and impact were added. Also a mitigation column was added to record mitigations in the response planning step. A colour coding was added to easily distinguish opportunities and threats. Also columns named 'source' were added so the identified mitigation, cause, event or effects could be traced back to the original documentations they were found in. The initial risk register format is presented in Figure 17.



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	RISK REGISTER																
2	Project type & name:																
3																	
4				RISK DESCRIPTION						PROBABILITY	IMPACT ON					MITIGATION	
5	RBS LEVEL 0	RBS LEVEL 1	RBS LEVEL 2	CAUSE	Source	EVENT	Source	EFFECT	Source		OBJ 1	OBJ 2	OBJ 3	OBJ 4	OBJ 5		Source
6																	
7																	
8																	

Figure 17, The initial risk register set-up

Throughout the case analyses references to the original project documentations are numbered between brackets. In the risk register references to the project documentations are presented in the 'source' columns using numbers while references made to personal interviews are coded using capital letters. The translation of these encodings to the original sources can be found in the references section at the end of the report.

4.4 Introduction Uruzgan

Both selected projects were located in the province of Uruzgan, Afghanistan. The purpose of this brief introduction to Uruzgan is to give the reader a short overview of the province and some of its characteristics.

The country of Afghanistan is located in the south eastern part of central Asia and is surrounded by the countries of Iran, Pakistan, Turkmenistan, Uzbekistan, Tajikistan and China. The capital city of Kabul is located in the west of the country. In the political orientation adopted since 2004, the country counts 34 provinces (AIMS). In the past years provincial boundaries have changed regularly, and it should be noted that the exact boundaries as shown in Figure 18 are in reality unclear and do not represent the actual or locally agreed boundaries.

The province of Uruzgan is located in the central-southern part of Afghanistan at the southern foothills of the Hindu Kush mountain range. The region is most dominantly mountainous (up to 2778 meters) and rural. The province capital is the city of Tarin Kowt (also referred to as Tarin Kot, Tirin Kowt and Trinkot) which is connected by the secondary road network to the southern neighboring provincial capital city of Kandahar. Smaller towns and villages are connected by a road network mainly made up of dirt trails but accessible for motorized traffic all year round. The main water resource is a two river system (rivers Helmand and Tiri Rud) that joins in the Deh Rawud district and flows to Kajaki in the neighboring south-western province Helmand (TLO 2009). Besides these main rivers there are also numerous secondary and impermanent rivers.

Figure 18, General map of Afghanistan [14]

Uruzgan as shown in the figure above covers an area of approximately 28.552 square kilometers which is approximately 70 percent of the Netherlands. Only a small part of the population lives in the main towns of Tarin Kowt, Deh Rawud and Khas Uruzgan. The majority of the population lives in the rural areas, outside the main towns in smaller villages along the rivers (Embassy 2006).

According to the CIA Factbook 2005, HDI 2003 and the World Bank 2004, life expectancy in Afghanistan is estimated to be 43 years (in 2005). The adult literacy rate (above 15 years) is 36% so a significant part of the population can not read. Furthermore, the GDP per capita is estimated (in 2003) at 800 USD per year (Frerks, Klem et al. 2006).

The climate of the area is subtropical and continental. The actual weather depends on elevations of the mountainous terrain. Normal temperatures in summer are between 18 and 35 degrees Celsius, in winter between -4 and 6 degrees Celsius. Extremes range from -20 up to 43 degrees Celsius. Precipitation occurs as brief downpours in spring and summer and rain or snow in fall and winter. Long periods of drought, but also occasional flooding occur (Embassy 2006).

An economical perspective

Tarin Kowt and Deh Rawud are the key trading centers of Uruzgan. Small markets are also located in district centers and even smaller ones outside of these centers. Access to these markets is complicated by the poor state of the roads and the uncertain security situation. Agriculture and animal husbandry are the traditional key economic activities of the bulk of the population in Uruzgan. Products like wheat, vegetables and cereals are cultivated and used for local

[14] Adopted from www.wikipedia.com on 2nd of March 2010

consumption. Because irrigation systems often suffer from the war, and due to adverse weather conditions the harvest fluctuates. Because there are no financial institutions, loans and credits can be obtained through shopkeepers, traders and relatives. The need of farmers to bridge the gap until the next harvest was found to be one of the key reasons for farmers to engage in opium poppy cultivation in order to repay their debts. Opium serves as an important source of tax revenue for the insurgency. Officials and representatives could be involved in protecting narcotics and officials who refuse to comply with this system are not appointed, fired or physically eliminated. Power supply, health care and education are luxuries that are not self-evident for big parts of the population (Embassy 2006; TLO 2009).

A social-cultural perspective

In Uruzgan, there are over twenty major ethnic groups and more than thirty different languages. If the smaller ethnic groups or the tribes and sub tribes of the largest group, the Pashtun, are included, the number of different identity groups is much larger still. These groups overarch state, provincial and district boundaries. Woman play limited but important economic roles within the bounds of Islam, for example in performing a number of agricultural tasks. Ethnic (Pashtun/Hazara) and tribal (Durrani/Ghilzai) rivalries are just one element in the complex environment. The Hazara were the historically predominant group but were expelled by Pashtun from parts of the country in the late 18th and 19th century. Though they have a common interest in stability, there are lingering disputes between the two groups over land and resource allocation dating back to mid-18th and late 19th centuries (Embassy 2006; Frerks, Klem et al. 2006; TLO 2009).

A political perspective

At state level, the Afghan polity remains strongly fragmented with state authority weak or virtually absent in large parts of the country. State formation itself has been problematic. Setting up a central authority is controversial and has failed many times in Afghanistan. The state has never been strong enough to establish effective control throughout the countryside and has traditionally done little for it, whether in terms of educational, medical facilities or development in general. Despite the bonds of Islam, a sense of national unity has thus always been weak, except when an unusually strong leader has appeared or the nation has come together when threatened by an external enemy.

From 2002 until 2006 the provincial government was largely responsible for creating and deepening tribal rifts to weaken potential challengers, consolidate the government's influence and establish Popalzai rule. This was done by channeling a greater share of foreign aid and other external resources to the Popalzai community and selected individuals from other tribes. Current provincial governance is in the hands of the Popolzai. Local conflicts remain a dangerous trap for third party actors; local acts of revenge between persons, villages, clans or tribes could be underlying motives that are used to exploit the benefits offered by these third party actors. Incidents with Afghan casualties are used by Afghan leaders to promote against the international presence (Kamer 2009; TLO 2009).

A historical perspective and elaboration on the Dutch military involvement in Afghanistan is presented in appendix B.

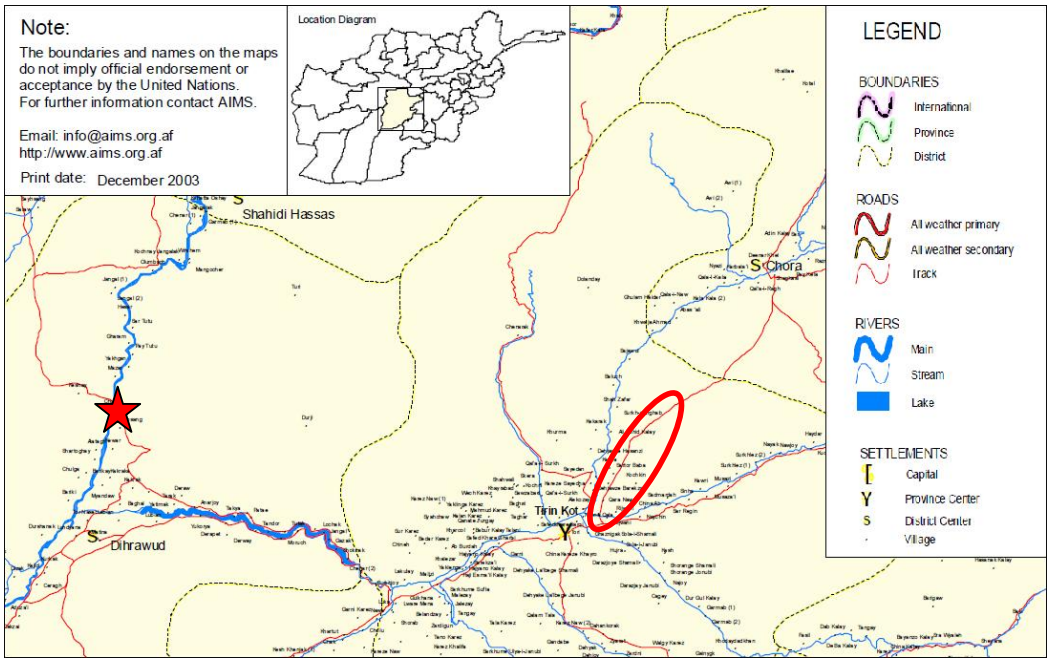


Figure 19, Project locations

The locations of the projects being investigated in this thesis are shown in Figure 19. The red star indicates where the river crossing near Chowtu (north of Deh Rawood) is located. The red oval shape indicates the first 16 kilometers of the asphalt road from the province capital Tarin Kowt to Chora.

5 CHOWTU BRIDGE

5.1 Introduction

Already in June 2006 the US Army recognized that a bridge crossing the river Helmand nearby the village Chowtu would be essential for both military and local economic purposes (3). A bridge would connect the northern part of Deh Rawud to the part of Uruzgan west of the river Helmand and above all year round instead of the existing small ferry that only operated in a calm river.

The first attempt to build a bridge at Chowtu was done by the Americans and construction on the abutments started on June 22nd 2006. Originally the completion was estimated on August 1st 2006 but this was postponed until damage caused by the Opposing Militant Forces (OMF) was repaired. Construction work on the approaches and abutments was reported almost complete in the beginning of January 2007 (27). When the American PRT left the Deh Rawud area the construction of the bridge was transferred and accepted by the Dutch Army command (interview G).

After reconnaissance of the existing bridge location in January 2007 the Task Force Uruzgan (TFU) received an order from Regional Command South (RC-S) to finish Chowtu bridge which was processed to the Dutch PRT (30). The idea was to use the existing constructions, however during the spring flooding in March 2007 the abutments and pier of the American attempt were destroyed and it became clear that the bridge, abutments and pier(s) had to be redesigned (32).

In June 2007 a new order was sent to the PRT to build a bridge at Chowtu. One month later a project team consisting of 4 persons was assembled and transported to Afghanistan (30). Their job was to get insight into the situation and come up with some feasible alternative designs (3). New reconnaissance conducted in July and August 2007 revealed that the river pattern had changed. The existing abutment was now located between the old and the new stream while the span of the area has almost doubled. Findings from the reconnaissance were reported to the staff TFU, staff PRT and RC-South Engineers. Also a project proposal was sent to the Dutch Embassy to acquire funding. In the reconnaissance also some alternative bridge locations were assessed (30).

In the beginning of September 2007 the commander of RC-S heard for the first time that there was no funding for the project yet (21). Later that month the project team drew a plan for preparations and execution of the project, including a planning and design drawings. Thereafter the team left Afghanistan due to the fact that the start of the actual construction work was uncertain because of budget allocation, the security situation and the delivery time of materials (30). Eventually the project was handed back to the US Army Corps of Engineers (USACE). They completed the bridge somewhere in the summer of 2009. Later would appear that the bridge pier displaced after the first major spring flood (interviews C, F).

5.2 Initiation

5.2.1 Stakeholder analysis

The stakeholder analysis resulted in a grid listing the stakeholders in random order as presented in Table 5. A description of each stakeholder and the motivation of this identification and assessment process have been documented and can be found in appendix C. For some of the attributes limited or no information was available and therefore was partly assumed. During this process

also thoughts about possible risks came up and these were recorded instantly in memo style. A review by two experts later revealed that the interpretation of two stakeholders had to be adjusted and one stakeholder was removed from the list because they were not sufficiently involved in the project.

Actor	POWER	INTEREST	ATTITUDE	TYPE
Project team	+	+	+	Saviour
Development Advisor (DEVAD, representative of the Ministry of Foreign Affairs)	+	-	-	Time bomb
Regional Command South	+	-	+	Sleeping giant
Task Force Uruzgan	+	-	+	Sleeping giant
Provincial Reconstruction Team	-	+	+	Friend
United States Army Corps of Engineers	+	-	+	Sleeping giant
USAID representative	-	-	+	Acquaintance
Minister of the Ministry of Rural Rehabilitation and Development	-	-	+	Acquaintance
Opposing Militant Forces	+	+	-	Saboteur
Local Afghan contractors	-	-	+	Acquaintance
Mabey & Johnson	-	-	+	Acquaintance
Afghan National Army	-	-	+	Acquaintance
Afghan Security Force	-	-	?	Unknown
Local population Chowtu	-	-	?	Unknown
Land owners (farmer)	-	-	?	Unknown

Table 5, The stakeholder types that were present in the Chowtu bridge project

As can be seen in Table 5, the Dutch military project team was the only saviour in the beginning phase of the project while interdependencies with one time bomb and three sleeping giants were present regarding funds, resources, manpower, expertise etcetera. To complete the project successfully, cooperation with these other stakeholders was inevitable and stakeholder management should require a lot of attention and effort from the initiator to make this work.

The Development Advisor (DEVAD) is considered a time bomb because they did not have an active interest and even a negative attitude towards the project because it served mostly military interests. Without their funding the project could not be realized so the DEVAD should have been understood and engaged to become supportive or other actors (if there were any) should have been found willing to fund the project. If the DEVAD would be willing to fund the project they might also be included in the risk management process.

The USACE had access to resources and manpower but was not interested in the project because their road project was not yet depending on the completion of the bridge. Most acquaintances were waiting until their interest would be triggered to become involved. The OMF was the only saboteur present in the project and could pose threats to the project. The ASF, local population and the local land owners remained partly unidentified due to lack of information. So far they could be considered tripwires or irritants. These stakeholders could pose

unexpected threats but also opportunities and should be further engaged and investigated in the risk identification and response planning steps.

5.2.2 Clarification of project objectives

The project promises were distilled from the project documentation. According to the documentation six categories came forward, time, cost, quality, scope, reputation and health safety & security as described in the project definition presented in appendix D. These had to be further translated into project promises and were placed in a hierarchical order which is shown in Table 6.

Health safety and security is considered most important as deadly incidents or heavy injuries would prove to be unacceptable. Next is reputation, because loss of face towards the home country, coalition partners or the guest country would harm the military organization and could hurt the legitimacy of the foreign intervention. Following, scope or the realization of the aim is necessary in order to complete the project. To realize this, a certain amount of time is available or required. Especially the duration on site is important as this can be directly linked to HSS objectives, the longer you stay on site the longer you are exposed to safety and security risks. The completion date is important in order to gain the intended tactical benefits of the project. Finally the quality of the project plays a role; the construction should fulfill its realized functionality to some degree and for some time.

Aim	A reliable river crossing that provides freedom of movement all year round for ISAF, ANA and local population
HSS	No deadly incidents, accidents and life threatening injuries, minor injuries kept to a minimum
	Construction site, ANP checkpoint and direct surroundings under control of ISAF and ANA
	Employable security personnel and workforce during construction
	Protection of a large group of workers in a highly volatile area
Reputation	No incidents in the provincial, national and international mass media that would lead to loss of face by ANA, GoA or ISAF
	Local population must have noticed the importance, capabilities and benefits of the local GoA, ANA and ANSF
	Involvement of local population and leadership from the beginning to gain commitment
Scope	Construction of an M&J bridge on top of one pier and two abutments with a maximum total span of 120 meters
	Upgrade of the security checkpoint and personnel lodge
Time	Construction on site as short as possible (2-3 weeks)
	Completion before the end of the year (January 2007), so foundations finished before the rising water level (October 2007)
	Completion before spring 2008 (road project reaches Chowtu)
Cost	Direct cost of 2.6 million USD
	Reserved risk and uncertainty budget of 790.000 USD
Quality	Maximum load of the bridge class 60 (heavy armored equipment)
	24/7 all year round access to river West bank for the coming 5 years

Table 6, The Chowtu bridge project promises in hierarchical order

When defining the probability scales it appeared that the probabilities in the standard template did not reflect realistic values. A probability ranging higher than fifty percent is close to certainty and can almost not be considered a risk. A probability of one percent (or one actual occurrence out of hundred) can be considered high for a fatality or safety incident while for a cost overrun this would

be low. The scaling was adjusted so the probabilities reflected a range that could be used for multiple objectives. A probability of more than fifty percent was considered to be very high, while a probability between one percent and one out of thousand was considered to be very low. In between the scales were distributed non-linear.

Next, the impact scales were defined. Regarding time, the construction on site was estimated to last between two to three weeks. A delay of more than a week, or not being able to finish the construction before spring 2008 would be considered a showstopper or catastrophic impact. A degree of impact that would not need active management or could be considered acceptable for this project would be a delay of less than a day. Another example is the impact on quality, catastrophic would be if the construction would collapse during or shortly after construction, if no armoured vehicles would be able to get across or if access to the river bank would be impossible longer than a month. An acceptable impact would be if the bridge would provide no access for less than a day. In a similar manner the impacts on the other objectives were determined. The resulting probability-impact scheme is presented in appendix E, showing the definitions of all impact scales defined for this project.

For this particular project it was decided to use the standard probability-impact matrix because there was no justification present to deviate from it.

5.3 Identification

The risk identification process, and especially the translation process of identified risk related information into a risk register using meta-language, is illustrated by presenting three examples.

Example 'pier and abutments washed away'
From the documentation it was identified that the project team had the intention to use the existing pier and abutments at the Chowtu river crossing to build a Mabey & Johnson bridge. This was the original idea of the Americans who started (but did not finish) the construction last year. The pier and abutments were built by local contractors using local techniques and the strength and stability of these foundations were uncertain. Furthermore, the river to be crossed was known for its yearly flooding in spring time which caused the water level to rise and the river current to increase. Therefore this flooding might lead to a situation that would be undesirable for the existing objectives.

Although the flood itself can also be considered an event, the effect of the flood is the *risk event* for the project. The pier and abutments in the river might be washed away by the flood, depending on the severity of the flood and the timing of the construction. The identified risk events were that the existing pier/and or abutment(s) were washed away or become undermined by the spring flood current.

If the risk occurred before completion of the bridge construction, a direct effect on the project could be that the existing structures could no longer be used to build a Mabey & Johnson bridge on top as was intended. Therewith the direct impact on the objectives being affected would be the scope of the project while the project would also be delayed as construction could not longer continue. If the risk occurred after completion of the bridge construction, the effect could be that the finished bridge construction might be washed away. The direct effect on the project objectives in that case would be that the coalition forces' reputation would be damaged and the provided functionality of the bridge would be lost. This information is recorded in the risk register as can be seen in Figure 20.

RISK DESCRIPTION			
CAUSES (definite facts)	Source(s)	EVENT (uncertain event or set of circumstances)	EFFECTS (direct impacts on one or more project objectives)
Because we intend to use the existing pier and abutments to build a M&J bridge on top	3, 11, 13	it might be the case that the existing pier and/or abutment(s) are washed away by the spring flood	so the existing pier and/or abutment(s) cannot longer be used to build a bridge, affecting the scope of the project
Due to high water level (??m) and strong current in the river during the yearly spring flood			so the construction of the M&J bridge would be delayed
Because the pier and abutments are built using local techniques			so the completed bridge would be destroyed, resulting in loss of face towards the population
Because the strength and stability of the existing pile foundations is uncertain			so the completed bridge would be destroyed, resulting in the loss of its functionality

Figure 20, Risk description example 'pier and abutments washed away'

The risk effect could be further detailed by describing what part of the construction is affected and how severe. Is this only the pier, only one abutment or other part of the existing construction? The degree of effect could range from physical damage to the structure(s), the structure(s) being completely destroyed or washed away, maybe no damage at all (in this case we do not talk of a risk as it does not affect the project), or the structure(s) being undermined by the water flow. This consideration shows that the degrees of impact could be slightly different for different imaginable outcomes. For this example the description was considered to contain sufficient level of detail as both the most likely event and biggest impacts were included.

Using the stakeholder analysis also stakeholder related risks could be identified. By looking at the stakeholder table in Table 5, it was considered what events would change a stakeholder's attitude.

Example 'initiator withdraws support'
Looking at the table we identify that most military actors are present between 2 to 6 months in the mission area, new rotations bring different people to the project which could have different attitudes, priorities or interests. This is the case for the project team, the DEVAD, the TFU command, the PRT command and the RC-S command. The RC-S command was the initiator of the project and it was also identified at some point that they had doubts whether the project should have this high priority and regarding the feasibility of the project. The risk event could be that RC-S command withdraws support for the project with the effect that the project is terminated so the scope does not longer have to be realized. Another effect might be that the project is temporary put on hold until a new window of opportunity is found. Also this risk information is recorded in the risk register as can be seen in Figure 21.

RISK DESCRIPTION			
CAUSES (definite facts)	Source(s)	EVENT (uncertain event or set of circumstances)	EFFECTS (direct impacts on one or more project objectives)
Because RCS has doubts whether the project should have this high priority	21	it might be the case that the initiator of the project withdraws support	which would lead to termination of the project so the scope does not longer have to be realized
Because RCS command personnel rotates every 6 months which changes priorities			
Because the operational/strategic situation changes constantly			so the project might be put on hold for a while
Because RCS has doubts regarding the feasibility of the project			

Figure 21, Risk description example 'initiator withdraws support'

Example ‘minister is threatened’
Another identified risk is that local actors are vulnerable to intimidation or bribery by the Opposing Militant Forces (OMF), especially in areas where OMF are influential. This is the case for the minister of the MRRD, local contractors, the guards in the security checkpoint and the local population. So what other definite facts contribute to cause this to happen to the MRRD? The minister of MRRD has no personal protection to guard him from possible attacks. Furthermore he cooperates with the foreign intervention force ISAF which makes him an interesting target for the OMF. Why is this cooperation taking place? This is because ISAF wants to transfer the project to the MRRD as soon as it is completed. Also the OMF was involved in previous attempts to threaten government officials who are involved in cooperation with ISAF. The effect of this could be that the minister could be forced to reject support to the project or to become uncooperative. This risk information is recorded in the risk register as can be seen in Figure 22.

RISK DESCRIPTION			
CAUSES (definite facts)	**Source(s)**	**EVENT (uncertain event or set of circumstances)**	**EFFECTS (direct impacts on one or more project objectives)**
Because the Minister of MRRD is cooperating with ISAF in highly volatile area Because we want the project to be handed over to and maintained by the MRRD Because the Minister of MRRD has no security of his own	C	the Minister MRRD might be threatened by OMF	attitude MRRD towards the project becomes negative and cooperation with local government might be terminated

Figure 22, Risk description example ‘minister is threatened’

Next, by looking at the stakeholder table in Table 5, it was considered which events would change a stakeholder’s interest.

For example, if the bridge would not be finished by the time the USACE road project reached Chowtu by spring 2008 the USACE would become an active player as they would have to build a bridge themselves using their own resources. In their current contract the bridge was not longer included because the previous attempt had failed.
Another example is that activities in other areas could shift the priority of OMF attention to these areas so they might loose their interest for this particular project.

The PRT preferred another bridge location that is in more densely populated territory and hence more visible to the local population. Because they were ordered to build the bridge at another location this stakeholder might actually be labeled ‘forced’ actively supporting the project. Their interest level might be improved if this other location would have been considered.

Next, again by looking at the stakeholder table in Table 5, it was considered what events could change a stakeholder’s power. For example BuZa is considered a powerful stakeholder because they have financial resources available for reconstruction projects. As soon as they are approached for funding they would be in a position to exert influence on the project, however in the case that they would decide to spent their money on other projects, their resources would no longer be available and cooperation would not longer be required and their power would have become insignificant.

Next, again by looking at the stakeholder table in Table 5, some more influences could be identified that stakeholders could have on the project. For example the project team had limited project management expertise and therefore the chance

to successfully complete the project might be lower. The OMF had the military power to attack supply transports towards the site, the construction itself and the building site, while they were also able to intimidate the surrounding villages and the workers involved. Local contractors and suppliers could make additional security demands or stop working when being threatened; on the other hand they run the risk of being attacked or losing materials while these are being transported to the site.

These additional identified causes, events and effects were translated in similar ways into risk descriptions in the risk register. Besides from documentation, risks were identified through interviews with experts and ad hoc identification by the researcher himself. An example Risk Breakdown Structure as presented by Hillson and Simon could also have been used to identify additional risks but this was considered to be out of the scope of this research due to time limitations. In total 38 main risk events were identified and recorded in the risk register. The results can be found in the risk register in appendix F.

5.4 Assessment

The probability and impact of each risk was estimated using the earlier defined probability-impact scales (see appendix E). All probability and impact assessments were based on both the documentation and the personal interpretation of the researcher and therefore do not necessarily reflect the reality of the project at that moment in time. The examples below were not aimed to produce a perfect assessed risk register but to show how an assessment in future projects could be done and what kind of results could be generated by doing so. This is demonstrated by assessing the risks from the previous examples.

Example ‘pier and abutments washed away’
The probability for the event ‘pier and abutments washed away’ was assessed to be medium because there was a significant chance that this could happen given the circumstances. The impact on the scope objective would be very high, as the intended objective to build a M&J bridge on top cannot longer be realized (hence a show-stopper) without having to redesign and reconstruct the pier and/or abutment(s). Without mitigation construction would not be able to continue which is a level of impact on time that cannot be ignored because it immediately threatens the direct time objectives unless something is being done. Therefore the impact on time was assessed very high. Whether it actually affects the time objectives depends on when it occurs and how quickly is responded but this is the impact after responding to the risk and should not be confused with the initial impact of the risk.

The event in the situation if the bridge would have been completed was assessed as follows. The entire intended lifetime span of the construction was estimated 5 years. The probability that a disastrous flood occurs in 5 years would be bigger than a same disastrous flood occurring only this year. The probability in this situation was assessed to be more than 1 out of 10 and therefore was labeled high. The impact on the reputation for ISAF in this case depended on whether the ISAF troops would still be present in the area. However the same event would still have a very high impact on the host nation government and military forces as it would mean losing face towards the population. This event would also have a very high impact on the functionality of the bridge, as the river west bank would not longer be accessible and therewith the aim of the project would become obsolete. The risk assessment is added to the risk record as can be seen in Figure 23.

RISK DESCRIPTION				PROBABILITY	IMPACT ON					
CAUSES (definite facts)	Source(s)	EVENT (uncertain event or set of circumstances)	EFFECTS (direct impacts on one or more project objectives)		HSS	Reputation	Scope	Time	Cost	Quality
Because we intend to use the existing pier and abutments to build a M&J bridge on top	3, 11, 13	it might be the case that the existing pier and/or abutment(s) are washed away by the spring flood	so the existing pier and/or abutment(s) cannot longer be used to build a bridge, affecting the scope of the project	MED	-	-	VHI	-	-	-
Due to high water level (??m) and strong current in the river during the yearly spring flood			so the construction of the M&J bridge would be delayed	MED	-	-	-	VHI	-	-
Because the pier and abutments are built using local techniques			so the completed bridge would be destroyed, resulting in loss of face of ISAF and GoA towards the population	HI	-	VHI	-	-	-	-
Because the strength and stability of the existing pile foundations is uncertain			so the completed bridge would be destroyed, resulting in the loss of its entire functionality	HI	-	-	-	-	-	VHI

Figure 23, Assessment example 'pier and abutments washed away'

Example 'initiator withdraws support'
The probability for the event 'initiator withdraws support' was assessed high for both the outcome that the project would be terminated or put on hold. The impact on the scope of the project would be very high as this definitely was a so called show-stopper. The impact on the time objective was considered very high because putting the project on hold could not be ignored and was likely to have an impact on the completion deadlines. The result is shown in Figure 24.

RISK DESCRIPTION				PROBABILITY	IMPACT ON					
CAUSES (definite facts)	Source(s)	EVENT (uncertain event or set of circumstances)	EFFECTS (direct impacts on one or more project objectives)		HSS	Reputation	Scope	Time	Cost	Quality
Because RCS has doubts whether the project should have this high priority	21	it might be the case that the initiator of the project withdraws support	which would lead to termination of the project so the scope does not longer have to be realized	HI	-	-	VHI	-	-	-
Because RCS command personnel rotates every 6 months which changes priorities										
Because the operational/strategic situation changes constantly			so the project might be put on hold	HI	-	-	-	VHI	-	-
Because RCS has doubts regarding the feasibility of the project because funding is uncertain and many risks are present										

Figure 24, Assessment example 'initiator withdraws support'

Example 'minister is threatened'
For the event 'minister is threatened' a medium probability and a medium impact on the reputation objectives was chosen. Again these results are put in the risk register as shown in Figure 25.

RISK DESCRIPTION				PROBABILITY	IMPACT ON					
CAUSES (definite facts)	Source(s)	EVENT (uncertain event or set of circumstances)	EFFECTS (direct impacts on one or more project objectives)		HSS	Reputation	Scope	Time	Cost	Quality
Because the Minister of MRRD is cooperating with ISAF in highly volatile area	C	the Minister MRRD might be threatened by OMF	attitude MRRD towards the project becomes negative and cooperation with local government might be terminated	MED	-	MED	-	-	-	-
Because we want the project to be handed over to and maintained by the MRRD										
Because the Minister of MRRD has no security of his own										

Figure 25, Assessment example 'minister is threatened'

The same process was repeated for the other identified risks in the project as can be seen in the full risk register in appendix F.

Next, the total pre-response risk exposure of the project was assessed by placing the previously assessed risks in a double probability-impact matrix. The result of this process is shown in Figure 26. In this figure the numbers correspond with the risk numbers in the risk register.

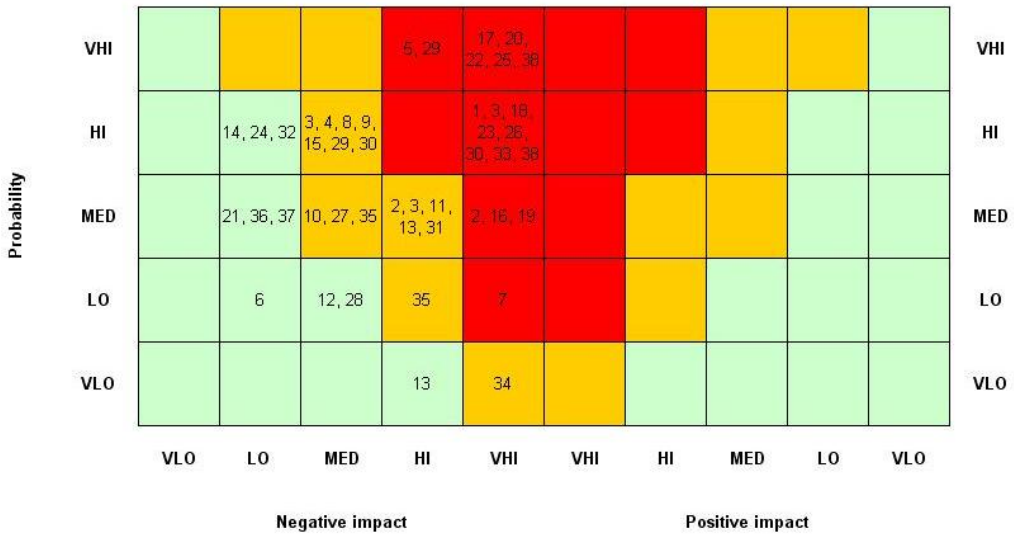


Figure 26, The assessment results combined in a double PI matrix

This figure allows us to recognize that there are 18 top-risks present in the red area and therefore should be addressed with high priority. Here the most important risks, having a very high probability of occurrence and a very high impact on the project, can be addressed first as they show up in the top middle part of the matrix. According to this prioritization risks number 17, 20, 22, 25 and 38 are the most highly ranked risks to be addressed, followed by risk numbers 1, 3, 5, 18, 23, 26, 29, 30, 36, 2, 16, 19 and 7. Also risk 34 should be addressed as this could ruin the project (a so called black swan risk). If time is left, the risks in the amber area should be addressed as well. The remaining green risks do not have priority unless a change in their assessment occurs. Furthermore the figure shows that there are no potential opportunities identified in the project so far. The figure also allows decision makers to interpret whether this level of risk is acceptable to continue with the project in the current situation. Based on this figure it can be seen that without taking mitigations the project is under high risk exposure.

Next a categorization for the identified risks was made by grouping risks that had the same type of main causes. A categorization on six main risk areas was found, environmental or weather risks, supply related risks, security related risks, technical risks, management risks and stakeholder related risks. For supply risk three subcategories were identified that relate to the supply of personnel, equipment or the distribution of these resources which was named logistics. For security risk the subcategories could be split into the security of the construction site and security of the supply lines. For management risks the subcategories were related to the management of information and knowledge, the management of procedures and the management of risks. For environmental, stakeholder and technical risks no distinct sub-categorization could be identified. Mapping the identified risks to this risk breakdown categorization we get insight into the main causes for risk in the project.

The result is shown in Figure 27. Supply of personnel related causes and stakeholder related causes for risk are found to be most present in this particular project. The reader should be aware of the fact that this picture does not say anything regarding the severity of the risks.

RBS LEVEL 0	RBS LEVEL 1	# RISKS	RISK ID's
environment / weather risk		4	1, 2, 3, 4
supply risk	personnel	6	5, 6, 7, 8, 9, 10
	equipment	2	11, 12
	logistics	3	13, 14, 15
security risk	construction site	3	16, 17, 18
	supply lines	2	19, 20
technical risk		3	21, 22, 23
management risk	information	1	24
	procedures	1	25
	risk and uncertainties	1	26
stakeholder risk		9	27, 28, 29, 30, 31, 32, 33, 34, 35

Figure 27, Identified risks mapped in the Risk Breakdown Structure

Mapping of risk effects along a Work Breakdown Structure (WBS) was not executed in this analysis as there was no existing WBS present while the added value would be insignificant.

5.5 Response planning

In this section is shown what possibilities the risk register offers on how to identify mitigation options to avoid, transfer, reduce or accept the risk so that decisions can be made on how to decrease the risk exposure best. This is demonstrated on the previously discussed first and second risk example.

Example 'pier and abutments washed away'
First some possibilities to reduce the chance of occurrence for this particular risk event are identified. The probability of this event can be avoided by building a crossing without using the existing structures. If new foundations could be constructed using better technology (sheet piling) or the bridge could be built at another location where new foundations would be less vulnerable for the flood the probability of occurrence would also be reduced. Other options can be found in a temporary solution, for example by upgrading the existing ferryboat so armoured vehicles can be transported. Regarding the option to transfer the risk, no other stakeholder that is better able to manage this risk was identified so this is not an option. The impact of the risk event might be reduced by reinforcing the existing structures so these are stronger to withstand the flood. Finally, the risk event could also be accepted by waiting until after the spring flood, to see if the existing structures survive the spring flood and the uncertainty regarding the strength and stability of the foundations is partly reduced. Should it occur that the structures are washed away, the contingency plan could be to redesign and reconstruct the foundations or still choose another location.

Example 'initiator withdraws support'
If the initiator would withdraw its support from the project the previously assessed stakeholder type 'sleeping giant' would turn into 'time bomb'. The stakeholder description figure mentions that sleeping giants should be awakened to raise their interest and that time bombs should be understood while efforts should be made to improve their attitude and engage active input. Thinking of possible ways this risk could be avoided or transferred does not generate sensible ideas. To reduce the risk, intensive communication with the initiating stakeholder is required to keep an up to date eye on the developments. Giving insight into the project risks by conducting risk management practices could increase the initiator's insight regarding the feasibility of the project and therewith might reduce their doubts concerning the project risks.

In order to show how risk-effective the chosen action is expected to be, probability and impacts of the risk can be re-assessed assuming that the actions are completed successfully using the same probability-impact scales. This is demonstrated on the first risk example 'pier and abutments washed away'.

For this example it is chosen to mitigate the risk by taking it. This means to wait for the flood to come which requires no effort and resources although some delay should be taken for granted. This response does not directly change the probability and impacts of the risk. Instead the outcome could be that the pier and abutments survive the flood (risk event does not occur) or they are washed away or damaged (risk event occurs). In either situation it can still be decided to continue building the bridge using the existing pier and abutments or avoid using these structures and build new foundations, possibly on another location.

In the situation that the pier and abutments survive the flood (risk event does no occur), the effects 'existing structures cannot be used' and 'construction would be delayed' are mitigated. However, if it is chosen to continue using these structures, there remains residual risk which is that the flood could be stronger next year, or each year the flooding wears out the existing structures further (so eventually the completed bridge still runs the risk of being destroyed). The probability of these impacts however could be reduced to low. There also remains a secondary risk which could be that the caused delay takes too much time so the construction cannot be finished before the required completion date.

In the situation that the pier and abutments are washed away or damaged (risk event does occur), the effects 'existing structures cannot be used' and 'construction would be delayed' are a fact. The mitigation action could be to construct new foundations on a better location or by using better technology. Therewith the residual risk that the bridge can be destroyed could be reduced to very low. A secondary risk could be that the delay caused takes too much slack and the construction cannot be finished before the required deadline.

In the situation that the risk event occurs, the scope of the project is affected because new foundations need to be designed and constructed. This also affects the cost and duration of the project which should be incorporated in the contingency planning however this is not further considered. The result of the assessment is shown in Figure 28.

RISK DESCRIPTION																				
EVENT (uncertain event or set of circumstances)	EFFECTS (direct impacts on one or more project objectives)	PROBABILITY	Reputation	Scope	Time	Quality	MITIGATION	PROBABILITY	Reputation	Scope	Time	Quality	MITIGATION	PROBABILITY	Reputation	Scope	Time	Quality
it might be the case that the pier and/or abutment(s) are washed away by the spring flood	so the existing pier and/or abutment(s) cannot longer be used to build a bridge, affecting the scope of the	MED	-	VHI	-	-	ACCEPT by waiting untill June using the existing structures if they survive the spring flood	-	-	-	-	-	ACCEPT by waiting untill June, risk occurs so redesigning and reconstructing the foundations	-	-	-	-	-
	so the construction of the M&J bridge would be delayed	MED	-	-	VHI	-		-	-	-	-	-		-	-	-	-	-
	so the completed bridge would be destroyed, resulting in loss of face of ISAF and GoA towards the population	HI	VHI	-	-	-		LO	VHI	-	-	-		VLO	VHI	-	-	-
	so the completed bridge would be destroyed, resulting in the loss of its entire functionality	HI	-	-	-	VHI		LO	-	-	-	VHI		VLO	-	-	-	VHI

Figure 28, Assessment of the planned response

The risk exposure of the project therewith changes as shown in the post-response double probability-impact matrix. In Figure 29 the risk number 1 has changed from the medium/high-very high red area to the low/very low-very high area.

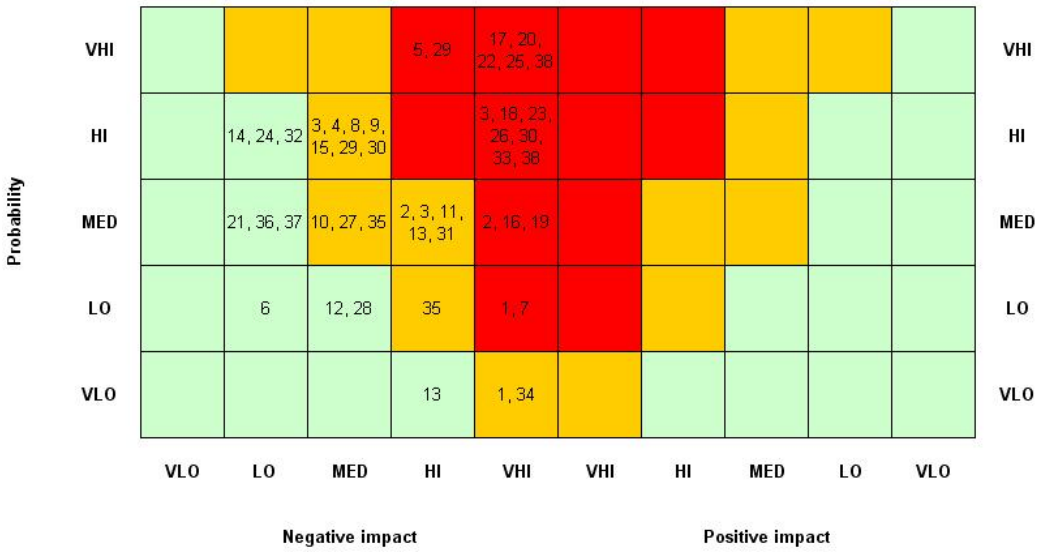


Figure 29, Post-response double probability-impact matrix

Based on the assessment of the expected post-response probabilities and impacts it can be decided whether the mitigation action is worth implementing, also taking into account the previously mentioned manageability, impact on the project, resource availability and cost-effectiveness of the action. The response planning assessment should be continued for all other risks in the risk register in order to address the remaining overall risk exposure. The full risk register in appendix F does contain identified mitigation possibilities for each risk, however for this case analysis the complete post response assessment is not further considered due to time limitations.

5.6 Post project review

The main risk identified on this project related to the security of the construction site and the supply chains, the deployment of personnel to construct the bridge, designing without a decent prior feasibility study and preparation (also the use of previous built constructions of which the strength and stability was uncertain), the technology to be used (high tech foreign technology or low tech local technology), the acquiring of funding, the limited available military capacity to provide the necessary security to project and the absence of a structured and effective way of managing the risks in the project. In future bridge building projects similar risks could be present so therefore the analysis and risk register provide useful information to use in the case a future bridge is to be built.

Threats that actually occurred in the project were the undermining of the existing pier and abutments (risk 2), erosion of the riverbed by the flooding (risk 3), the ANA engineers that were trained to build the bridge but were redeployed (risk 5), the loss of information due to rotations of personnel (risk 24), official procedures that took longer than anticipated (risk 25), the USACE who interfered in the project (risk 29), funding not being assigned (risk 30), and eventually the initiator of the project would withdraw support (risk 33) because there was not sufficient military capacity to provide security (risk 38). Most of these problems could have been foreseen but my impression is that things just went along until the project finally slipped into a vague chaos. Reasons for this could be not being aware of the risks, not thinking ahead of the consequences, maybe attention was paid to other things instead of the critical issues at hand, or seeing the problem but not doing anything about it. This could be summarized as a risk-unaware-ignorant

culture. On the other hand military and security related risks were foreseen, documented and focused on. An explanation for this could be that military personnel tends to focus on the military 'green' risks while in a construction project many other issues (stakeholders, finances, contracts, quality, technology) require attention as well. The only opportunity identified was to find an alternative location for the bridge however this was more a response action for avoiding the risks involved in the planned location using the existing abutments.

The risk register in appendix F shows many identified preventive actions that could have been implemented to minimize or avoid threats. Some effective responsive actions were identified that were implemented in the project. An example of a successful mitigation was the regular coordination meetings between the PRT and USACE in order to keep track of each others activities so to minimize the event that interference would occur. An example of an ineffective response was the choice to use an existing pier and abutments of unknown strength and stability to construct a bridge. Afterwards it appeared that these would not withstand the strong current in the river during flood. Another ineffective response was the transfer of personnel in the project without an overlap to exchange information and experience. Also the reliance on one stakeholder to provide funding while engaging this stakeholder in a very late stadium of the preparations was a reason that the project did not turn out as planned.

From the documentations observed the impression is that risk management did not get adequate attention in this project. The investigated meeting reports and documentations give the impression that certain (especially military) risks were identified and talked about, sometimes even actions were proposed to deal with the risk. In the concept project proposal (3) the heading risk even held a number of risk related questions which were not or very poorly answered. Project objectives and risk descriptions were written down vaguely, unclear, unstructured and ineffective throughout many documents. No structured process was present to clarify objectives, identify risks outside the military scope, to assess the overall risk exposure of the project and to identify effective responses to reduce this exposure to acceptable levels. Because the military managed the project mainly on its own, it should be responsible to deal with the risks in the project. The absence of risk management eventually contributed to the problem that there was no overview regarding the many uncertainties in the project which again contributed to the project not being realized.

5.7 Evaluation of the analysis

In this case analysis a post project review was done with the aim to capture and record risk-related knowledge and experience from a completed project in a form that can be used by future similar projects. Now the question is considered whether the aim of the analysis is achieved and how it can be improved in the next case.

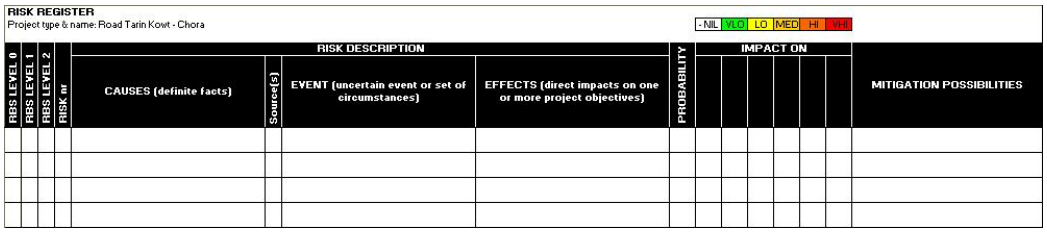
Information processing

The information file containing the documentations was not very easy to work with, because the date of the adopted documents was mentioned but not assembled in chronological order. Because of that a lot of back and forth searching was required. Next time it would be easier to place the documents in chronological order therewith speeding up the analysis process. During scanning the information file, mitigations, objectives, threats and opportunities were identified and highlighted. Next time also information regarding stakeholders (power, interest and attitude) could be highlighted so it would be easier to find stakeholder related information in the file during the stakeholder analysis.

Risk register development

In this analysis the choice was made to use an Excel spreadsheet as this software would be available and familiar to specialists in the field while professional risk software would require training and investment. One drawback of the Excel spreadsheet is that it requires a lot of manual actions and therewith is time consuming in its use. The advantage is that it is completely modifiable to one's wish. The initial risk register presented at the initiation of the analysis was changed along the process. Instead of three, one single column would be sufficient to document the sources from which the risks were drawn. Also the identified risks were numbered in order to easily represent them in the probability-impact matrix. So far the risk register as designed fulfilled its purpose to capture the risk related information from the case information. In another case, it might also be interesting to use professional risk management software to see if this could be useful and might be adopted in the mission area.

A developed version of the risk register format is presented in Figure 30. This version was also used for the second case analysis.



RISK REGISTER

Project type & name: Road Tarin Kowt - Chora

- NIL | VLO | LO | MED | HI | VHI

RBS LEVEL 0	RBS LEVEL 1	RBS LEVEL 2	RISK nr	RISK DESCRIPTION				PROBABILITY	IMPACT ON						MITIGATION POSSIBILITIES
				CAUSES (definite facts)	Source(s)	EVENT (uncertain event or set of circumstances)	EFFECTS (direct impacts on one or more project objectives)								

Figure 30, The developed template for the risk register

Stakeholder analysis

The purpose of the stakeholder analysis is to identify stakeholders that might be included in the risk management process. For this purpose, the Murray-Webster and Simon stakeholder approach is simple but effective. However, by using this method also other (hidden) useful information comes to light so some remarks are made how this information might be captured.

The current method does not show gradations between several stakeholders' attribute values while these differences are clearly present. This could be improved by using additional gradations ++, -- and 0 (indifferent). Also two-dimensional power-interest and power-attitude graphs could be used to show gradations in stakeholder attributes. The method may also be extended with a 'trust, reliability, (un)certainty or stability' column to show the possible uncertainty in the assessment of how likely a stakeholder could change attribute values. Other theory mentioned a predictability dimension (Newcombe 2003). It also makes the assessor aware of the current relations with and between stakeholders and could be used for relations management. This actually is only somewhat covered by identifying and assessing stakeholder related risks during the identification and assessment steps. Additional, also resource availability (and dependencies), skills, expertise and involved time period could be mentioned in the stakeholder analysis. In the analysis this was done by writing down a short summary of each stakeholder but could also be placed in an extended grid which provides a better overview. In future analyses, a stakeholder checklist could be used to improve the chance that all potential stakeholders are included.

Another observation is that several stakeholders were represented by individuals in important positions. Although the representation in the stakeholder grid suggests the involvement of an entire organization, the real situation is that the relation with the stakeholder heavily depends on that individual personal relationship between the project team member(s) and that particular contact or

representative. In the case the relation between individuals is not that good this can have severe consequences on the project as people are less willing to contribute and put effort in the project.

Risk management process

The process of describing a risk can be very time consuming and confusing. The risk description template in Hillson and Simon gives the impression that there's only one cause and effect per risk event, however for each risk there's always a combination of causes and a combination of effects. During this process it was important to build a clear, concise and complete picture of what choices, assumptions, facts and circumstances contributed to the actual happening of the event. The bow-tie representation shows these relations better by a fault- and effect tree which is also very helpful to get a graphical picture of the risk in your mind. Recording the cause-event-effect relations in a bow-tie representation also makes it very easy to determine response strategies in the response planning stage.

An uncertainty can also be a fact that is a cause for an event and does not necessarily need to be an event. Just as the effect of a certain event can be the risk event for the project. Without distinguishing these differences the meta-language gets confusing and might be done sloppy while the quality of this process is crucial in the rest of the process. Crucial in the identification step is a very clear understanding of what is considered a cause, an event and a direct effect on a promise in order to distinguish these very sharply. During this process also clearly distinguish between doing something to counter the risk or an effect (e.g. this is a response action) and risks that arise from this intervention (e.g. secondary risks) as these pop up almost instantly while they should not be confused with the initial risk.

In some situations the same risk may have different degrees of effect. If this occurs the worst case scenario was included as this would have the biggest impact. The identified effects and impact of effects could depend on when the risk actually occurs in time. This can sometimes be captured in the register by adding separate effects for these different situations. An effect could be an additional cause for another risk event. Between event and effect relations delays could be in place. Some risk events could occur several times in the same project and therewith the probability and impact accumulate. The complexity of this kind of relations is not captured in a basic register like the one presented in this analysis.

In this post-project review, the cause-event-effect relations were changing along the project. In the beginning the idea was to cover all risks along the timeline of the project but this made it difficult to distinguish between several points in time where the effects or impacts could be different. If this occurred the researcher would stick to a certain point in time, while in an actual project this would be captured by reviewing the register to keep it up-to-date.

The probability-impact matrix as developed in this analysis does not show any preference regarding the impacts on the individual hierarchy of objectives. For example a high-very high assessed risk effect with an impact on reputation could be of higher priority than a high-very high assessed risk effect with an impact on time. This could be improved by mapping assessed risks to an objective-specific probability-impact matrix.

In the case analysis the response planning step was completed by identifying and recording possible mitigation strategies that could give decision makers an idea on how to deal with a risk. However in order to implement mitigation actions in a real project, the effectiveness of the mitigation in terms of impacts should also be

considered as well as the cost to implement the action and the secondary risks associated with it. This whole process was demonstrated by only one example as this step was very time consuming and there were lots of possible scenarios to be considered. In the developed risk register the costs of the mitigations are not clear, while a decision maker would clearly want to see what a certain action would cost versus how it affects the risk impacts. Professional risk software does have this feature and it should be considered whether and how this should be included in a future (pilot) version of the Excel spreadsheet.

In the case analysis the produced results regarding the project promises, the impact scales on the promises, the stakeholder attributes, the assessment of the risk effects and possible mitigation effects partly reflect the interpretation of the documentation by the researcher. The stakeholder grid and an older version of the risk register were validated by expert reviews who revealed some misinterpretations. The review on the impact assessment was considered not very effective as people would go through and easily agree on the results, probably because it would take a lot of time to go through the entire list in detail. This could be improved by conducting the analysis with multiple persons in for example a workshop session however this is not an option for this research due to the restriction that it is conducted by only one researcher.

Overall, this first case analysis was a continuous feedback-loop between the different steps of identification, initiation, assessment and response planning instead of a structured linear process as described in the theory. In the next case analysis it would be interesting to see if the built-up experience in the first analysis allows the researcher to apply a more structured ‘out of the book’ approach. In the end, the applied analysis process did succeed in capturing and recording experience from the project documentations and interviewees in a form that can be used in future projects. The resulting risk register contains descriptions of risks that were actually present or occurred in the project and the risk breakdown structure that was found can be used to identify risks in next analyses. Taking into account the experience gained by the researcher and the suggestions made for improvement, the next case analysis can be executed more quickly and used as a validation to show whether the similar results can be obtained.

6 ROAD TARIN KOWT - CHORA

6.1 Introduction

The construction of a 42 kilometer long provincial asphalt road between Tarin Kowt and Chora had been planned since 2007. The road was a prestigious project funded by the Dutch Ministry of Foreign Affairs and Overseas Development. They contracted the German contractor Gesellschaft fur Technische Zusammenarbeit (GTZ) to manage the construction work (21).

Cooperation with the first subcontractor hired to execute construction activities ended September 1st 2009. In October 2009 GTZ conducted contract negotiations with eight different companies from Kandahar, Tarin Kowt and Kabul for the continuation of the first 16 kilometer road (3). GTZ eventually hired a local subcontractor named UBCC to do the job. Construction on this section started in the last week of January 2010 (4). The construction of the remaining 26 kilometers was put out to tender mid April by GTZ (9) but construction of this section is planned after August 2010 when the Dutch military mission has come to an end, so to be followed up by coalition members.

The road would contribute to the economical development of Uruzgan as it connected several bazaars and communities in non- and semi-permissive areas to the district capital Tarin Kowt. This city had access to health care, governmental services, a grand bazaar and an airstrip that connects the province to other parts of Afghanistan (22). From a military perspective the road would provide the Coalition Forces access to essential nearby areas within their area of operations while disrupting important insurgent controlled areas and supply networks (19).

The security on site was the main responsibility of the contractor while the Uruzgan government was responsible for security in the surroundings. The Dutch Provincial Reconstruction Team was involved in supporting activities to increase the security in the surrounding areas (25). Besides the road, also several other development projects were being executed in the surrounding communities, both military CIMIC projects and development projects carried out by GTZ.

Not withstanding its benefits, the project was considered complex due to the area it was covering, the time required for construction, the stakeholders involved and the conditions that were required for security (25).

In the following sections the analysis process conducted for this project and the obtained results are described step by step. In the final section at the end of the chapter an evaluation on both the analysis and the project itself is presented.

6.2 Initiation

6.2.1 Stakeholder analysis

The results of the stakeholder analysis are presented in the grid shown in Table 7. A description of each stakeholder and the motivation of this identification and assessment process have been documented and can be found in appendix G.

	Actor	POWER	INTEREST	ATTITUDE	TYPE
1	Gesellschaft fur Technische Zusammenarbeit (GTZ)	+	+	+	Saviour
2	Unique Builders Construction Company (UBCC)	-	+	+	Friend
3	Government of Uruzgan (GoU)	+	+	+	Saviour
4	Dutch Ministry of Foreign Affairs	+	+	+	Saviour
5	Local population	-	+	+/-	Friend / Irritant
6	Tribal leader Sorkh Murgab area	+	+	+	Saviour
7	Tribal leader Tarin Kowt area	+	+	+	Saviour
8	Opposing Militant Forces (OMF, insurgents)	+	+	-	Saboteur
9	Provincial Reconstruction Team (PRT)	+	+	+	Saviour

Table 7, The stakeholder types that were present in the road TK-Chora project

This figure clearly shows that several influential actors (GTZ, GoU, local tribal leaders, PRT, Ministry of Foreign Affairs) were supporting the project and sharing resources in an active way which provided a basis for cooperation. However actors with a negative attitude (OMF, possibly local population groups) were also present, which could pose threats to the project. This should be further investigated during the risk identification process.

6.2.2 Clarification of project objectives

The project promises were distilled from the project documentation which resulted in the description of five objective categories time, quality, scope, reputation and health safety & security as described in the project definition presented in appendix H. These were further translated into project promises and placed in a hierarchical order as shown in Table 8.

Reputation is considered most important as loss of face towards the home country, coalition partners or the host nation would harm the military organization and could hurt the legitimacy of the foreign intervention, while undermining the very essence of initiating the project in the first place. Health safety and security is considered second most important as the territory in which the road was constructed should be kept under government control. For the contractor, and with respect to the progress of the work, workers and personnel should be protected from all kinds of threats. Following, the scope or the realization of the aim is necessary in order to actually complete the project. To realize this, a certain amount of time is available or required. Especially the duration on site is important as this can be directly linked to HSS objectives, the longer you stay on site the longer you are exposed to safety and security risks. In this project the completion date was important as the Dutch military mission was about to end. Finally the quality of the project plays a role; the construction should fulfill its realized functionality to some degree and for some time.

Aim	To construct the first 16 km of road between Tarin Kowt and Sorkh Murgab connecting several villages and trading points to government services and the main airport in Tarin Kowt. The project results are transferrable to the new coalition partner.
Reputation	Dutch Embassy and military forces maintain a positive image towards the Afghan authorities, Afghan population and the Dutch government
	Showing the local population that GoU, GIRoA and ANSF (supported by the Dutch forces) are capable of reconstruction and provide benefit
	Acceptance of the road construction by the local population and key tribal leaders through involvement and participation of locals
HSS	The base camp area, construction site and direct road trajectory are under control of the contractor UBCC
	The direct surroundings along the road trajectory are under control of ANSF, ANP, ANA and GoU and if necessary supported by the Dutch PRT
	Protection of workers and personnel to maintain fully employable security personnel and workforce during construction while deadly incidents, life threatening accidents, injuries, kidnappings and intimidation are kept to a minimum
Scope	Construction of a 16 km double lane main asphalt road connecting the city center of Sorkh Murgab to the existing road net in Tarin Kowt
	Construction of 6+ km access road (partly asphalt) connecting the two main bazaars, the police station, several villages and the airport.
	Construction of checkpoints, culverts, bridges and a retention wall
	Small scale supporting projects in the surrounding villages
Time	Completion before June 30th 2010
Quality	Up to 40 ton heavy wheeled and light caterpillar transport 24/7 all year round under all weather conditions
	Lifetime of at least 10 years

Table 8, The TK-Chora road project promises in hierarchical order

The probability impact matrix was adopted from the first case analysis, the probability ranges remained unchanged. The time impact definitions were slightly adjusted by adding the possibility that in some cases time can be made up or not which would influence the impact. For quality, a very high impact would be if the construction would have a shorter life-time than one year. The road construction should be fit to transport heavy military armoured equipment and light caterpillar vehicles so if this would prove not to be possible this would also have a very high impact. If the road would be unavailable for more than 30 days per year this would prove to be unacceptable as well as the road would be inaccessible for more than a 5 days unbroken period of time during extreme (winter) weather conditions. A very low impact would be if construction lifetime would be less than 10 years eight and ten years or if the road would be unavailable for less than 5 days a year. In a similar manner the impacts on the other objectives were determined. The resulting probability-impact scheme is presented in appendix I, showing the definitions of all impact scales defined for this project.

For this particular project the standard probability-impact matrix was used because there was no justification present to deviate from it.

6.3 Identification

The risk identification process, and especially the translation process of identified risk related information into a risk register using meta-language, is illustrated by presenting three examples.

For the first example, the documentation revealed that jack hammer excavator, grader, and roller equipment is required for several construction tasks. At the beginning of the project only one piece of each was present on site while being operated in semi to non-permissive area in close proximity to insurgent controlled territory. Road construction was planned in a time of the year in which insurgents were known to become active in the area after winter in preparation of the coming poppy harvest season. During the course of the project, the contractor received several warnings that something could happen to the equipment if no payment was made. Furthermore the security consisted of a number of checkpoints along the road however their line of sight did not cover the entire road trajectory and therefore continuous protection was not guaranteed. As the road construction works progressed further away from the base-camp the equipment was parked on site for efficiency reasons. Local villages along the road were in conflict with each other and in order to deny each other benefit from the road they were also known to place Improvised Explosive Devices (IEDs).

RISK DESCRIPTION			
CAUSES (definite facts)	**Source(s)**	**EVENT (uncertain event or set of circumstances)**	**EFFECTS (direct impacts on one or more project objectives)**
Because there is only one jack hammer excavator, grader and roller on site	2, 5, 6, 8, 9, 16, 21	the equipment might be attacked by an IED, mortar, RPG or small arms fire during construction works	so the equipment is destroyed and cannot longer be used leading to delay on the construction work
Because these equipments are required to continue construction work on the road			
Because the equipment is operated in semi-non-permissive area close to insurgent controlled territory			
Because contractor has received several warnings from insurgents that accidents will happen if no payment is made			
Because contractor received a threat against the equipment parked on the site			
Because the current security arrangement does not provide sufficient checkpoints to protect the equipment on site			which shows the vulnerability of the project so the local authorities and military forces suffer reputation damage towards the surrounding villages and the insurgents
Because the equipment is no longer parked at the base camp for efficiency reasons			
Because of the start of the poppy harvest season in <April> many insurgents come back to the area after winter and the number of safety and security incidents along the road construction usually increases			
Because neighbouring villages, due to tribal conflict, deny each other to benefit from the road by placing IED's			
Because construction is planned from January till end of June			

Figure 31, Risk description example 'attack on equipment'

These facts give rise to the risk event that the equipment might be attacked by an IED, mortar, Rocket Propelled Grenade (RPG) or small arms fire during construction works. If this event occurs the equipment is destroyed and cannot longer be used resulting in delay on the construction works. Another consequence is that the incident shows the vulnerability of the project so the local authorities and military forces could suffer reputation damage towards the surrounding villages as they are not able to provide them safety and security and the insurgents as they are not able to prevent them from hurting government efforts. In the risk register this is presented as shown in Figure 31.

For the second example it was identified that mechanized patrols of the International Security Assistance Force (ISAF) patrol the area from time to time, thereby using the road from Tarin Kowt to Chora. The new asphalt road is not able to withstand instant braking and turning by caterpillar traffic, but due to for example an attack on the patrol or by human error the exigency for evasive maneuvers could arise while driving on the road, thereby damaging the road. If this occurs the contractor has to repair the caused damage which is additional scope, while it also costs additional time to conduct repair activities. Another consequence is that the reputation of ISAF towards the subcontractor and possibly local villagers who have witnessed the event is damaged. This risk information is recorded in the risk register as can be seen in Figure 32.

RISK DESCRIPTION			
CAUSES (definite facts)	**Source(s)**	**EVENT (uncertain event or set of circumstances)**	**EFFECTS (direct impacts on one or more project objectives)**
Because the asphalt road is not able to withstand caterpillar traffic, especially instant braking and turning	6, 10	a caterpillar vehicle might be forced into an evasive maneuver while driving on the road so <x meter> road works are damaged	which leads to additional scope and time for the contractor to complete the work
Because ISAF mechanized patrols <regularly> patrol the area during which the military exigency might arise to make instant evasive manoeuvres			
Because ISAF mechanized patrols sometimes use the road part that is open for transport			
Because the surrounding area is semi to non-permissive and in close proximity to insurgent controlled territory so attacks on ISAF patrols are imminent			which would hurt the reputation of ISAF towards the contractor and possibly the local population
Because the contractor, according to contract, has to deliver an undamaged road to the client in order to receive his money			

Figure 32, Risk description example 'caterpillar damage'

The third example is an opportunity which was identified from one of the documents. The causeway planned in the city of Sorkh Murgab was designed as a bridge but during project the local contractor came with a proposal to build a leveled clinker road instead. The local contractor based this on his own expertise and experience of local construction methods and because he was not involved in the design phase of the project this suggestion was not identified earlier in the project. The consequence of this event would be that the same functionality is provided however with a higher chance that the solution can be locally maintained and reaches the expected lifetime of at least 10 years. Also the local population would accept the construction more easily due to the use of local construction standards. In the risk register this is presented as shown in Figure 33.

RISK DESCRIPTION			
CAUSES (definite facts)	Source(s)	EVENT (uncertain event or set of circumstances)	EFFECTS (direct impacts on one or more project objectives)
Because the causeway in Sorkh Murgab is originally designed as a bridge	15	an alternative design solution might be suggested by the subcontractor during the project	which would provide the same functionality with better chance to last at least 10 years
Because the causeway could also be designed as a leveled concrete clinker road			
Because local contractors have knowlegde of and expertise with local construction methods and customs			which would improve the acceptance by the local population due to use of local standards
Because the local contractor was not involved in the design phase of the project			

Figure 33, Opportunity description example 'alternative design solution'

Besides these examples many additional risks were identified and described in the risk register. Also the stakeholder analysis provided input to this as shown in the first case analysis. Also the Risk Breakdown Structure presented by Hillson and Simon could have been used to find more risks but this was considered to be out of the scope of this research due to time limitations. While analyzing the project in total 27 main risk events and opportunities were identified and recorded in the risk register. The results can be found in the risk register in appendix J.

6.4 Assessment

The earlier defined probability-impact scales (see appendix I) were used to estimate the probability and impact of all identified risks by the personal interpretation of the researcher and therefore do not necessarily reflect the reality of the project at that moment in time. The examples below were not aimed to produce a perfect assessed risk register but to show how an assessment in future projects could be done and what kind of results could be generated by doing so. This is demonstrated by assessing the risks from the previous examples.

Example ‘attack on equipment’
The probability of the event is assessed high, because there is a fair chance that this could happen. The impact on the time objective would be very high as additional equipment would take more than 8 days to arrive. The impact on the reputation objective would be medium as this is a minor safety incident which could spread in the local mass media while the benefits of the local government and local security forces are being undermined. The result is shown in Figure 34.

RISK DESCRIPTION				PROBABILITY	IMPACT ON				
CAUSES (definite facts)	Source(s)	EVENT (uncertain event or set of circumstances)	EFFECTS (direct impacts on one or more project objectives)		Reputation	HSS	Scope	Time	Quality
Because there is only one jack hammer excavator, grader and roller on site	2, 5, 6, 8, 9, 16, 21	the equipment might be attacked by an IED, mortar, RPG or small arms fire during construction works	so the equipment is destroyed and cannot longer be used leading to delay on the construction work	HI	-	-	-	VHI	-
Because these equipments are required to continue construction work on the road									
Because the equipment is operated in semi-non-permissive area close to insurgent controlled territory									
Because contractor has received several warnings from insurgents that accidents will happen if no payment is made									
Because contractor received a threat against the equipment parked on the site									
Because the current security arrangement does not provide sufficient checkpoints to protect the equipment on site			which shows the vulnerability of the project so the local authorities and military forces suffer reputation damage towards the surrounding villages and the insurgents	HI	MED	-	-	-	-
Because the equipment is no longer parked at the base camp for efficiency reasons									
Because of the start of the poppy harvest season in <April> many insurgents come back to the area after winter and the number of safety and security incidents along the road construction usually increases									
Because neighbouring villages, due to tribal conflict, deny each other to benefit from the road by placing IED's									
Because construction is planned from January till end of June									

Figure 34, Assessment example 'attack on equipment'

Example ‘caterpillar damage’

The probability of the event is assessed medium because there is a small chance that this could occur. The impact on the scope objective is estimated to be low as in the most likely case repair activities would cause some minor additional scope to the entire project. The impact on the time objective is estimated low because in the view of the entire project there might be 1 or 2 days delay due to these extra repair activities. The impact on the reputation objective is estimated low because damage to the road property is not considered a major incident which it is not likely to spread to the mass media. In the risk register this information is added as can be seen in Figure 35.

RISK DESCRIPTION				PROBABILITY	IMPACT ON				
CAUSES (definite facts)	Source(s)	EVENT (uncertain event or set of circumstances)	EFFECTS (direct impacts on one or more project objectives)		Reputation	HSS	Scope	Time	Quality
Because the asphalt road is not able to withstand caterpillar traffic, especially instant braking and turning	6, 10	a caterpillar vehicle might be forced into an evasive maneuver while driving on the road so <x meter> road works are damaged	which leads to additional additional scope and time for the contractor to complete the work	MED	-	-	LO	LO	-
Because ISAF mechanized patrols <regularly> patrol the area during which the military exigency might arise to make instant evasive manoeuvres									
Because ISAF mechanized patrols sometimes use the road part that is open for transport									
Because the surrounding area is semi to non-permissive and in close proximity to insurgent controlled territory so attacks on ISAF patrols are imminent			which would hurt the reputation of ISAF towards the contractor and possibly the local population	MED	LO	-	-	-	-
Because the contractor, according to contract, has to deliver an undamaged road to the client in order to receive his money									

Figure 35, Assessment example 'caterpillar damage'

Example ‘alternative design solution’

The probability of this opportunity is estimated to be medium. The impact on the quality of the construction would be low as the alternative solution –if adopted- provides improved reliability and future maintenance to only a small part of the total project scope. The impact on the reputation objective would be low as the alternative solution is expected to slightly affect the acceptance of the local population of the entire project.

RISK DESCRIPTION				PROBABILITY	IMPACT ON				
CAUSES (definite facts)	Source(s)	EVENT (uncertain event or set of circumstances)	EFFECTS (direct impacts on one or more project objectives)		Reputation	HSS	Scope	Time	Quality
Because the causeway in Sorkh Murgab is originally designed as a bridge	15	an alternative design solution might be suggested by the subcontractor during the project	which would provide the same functionality with better chance to last at least 10 years	MED	-	-	-	-	LO
Because the causeway could also be designed as a leveled concrete clinker road									
Because local contractors have knowlegde of and expertise with local construction methods and customs			which would improve the acceptance by the local population due to use of local standards	MED	LO	-	-	-	-
Because the local contractor was not involved in the design phase of the project									

Figure 36, Assessment example 'alternative design solution'

The same process was repeated for the other identified risks in the project as can be seen in the full risk register in appendix J.

The result of placing the assessed risks in the double-probability impact matrix is shown in Figure 37 for the impacts on the reputation, HSS and scope objectives. The same is shown for the time and quality objectives in Figure 38. This separate representation was chosen to show the impact of the different risks in line with the hierarchy of objectives. Red risks that highly affect reputation, HSS and scope objectives should be prioritized above red risks that affect time and quality objectives.

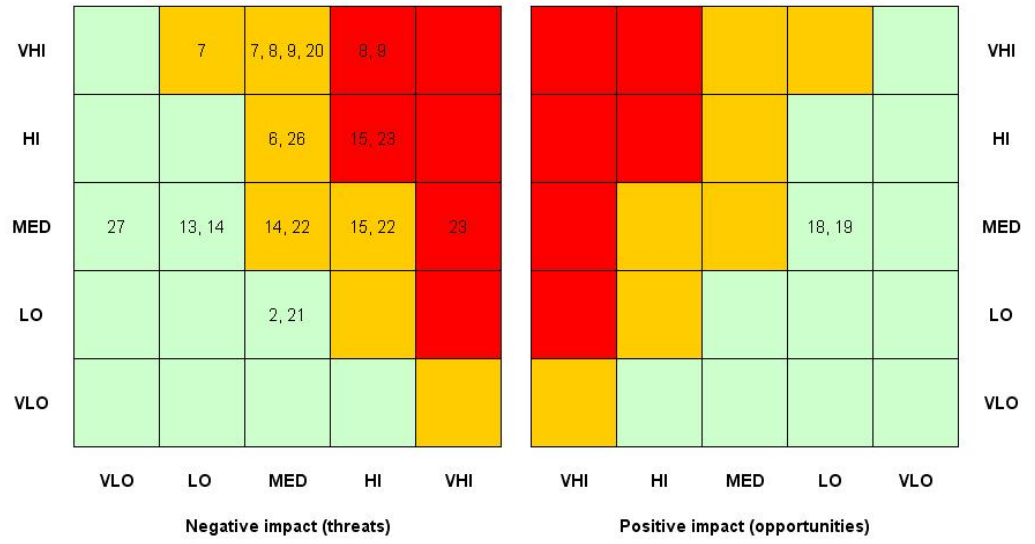


Figure 37, Double PI matrix for Reputation, HSS and Scope objectives

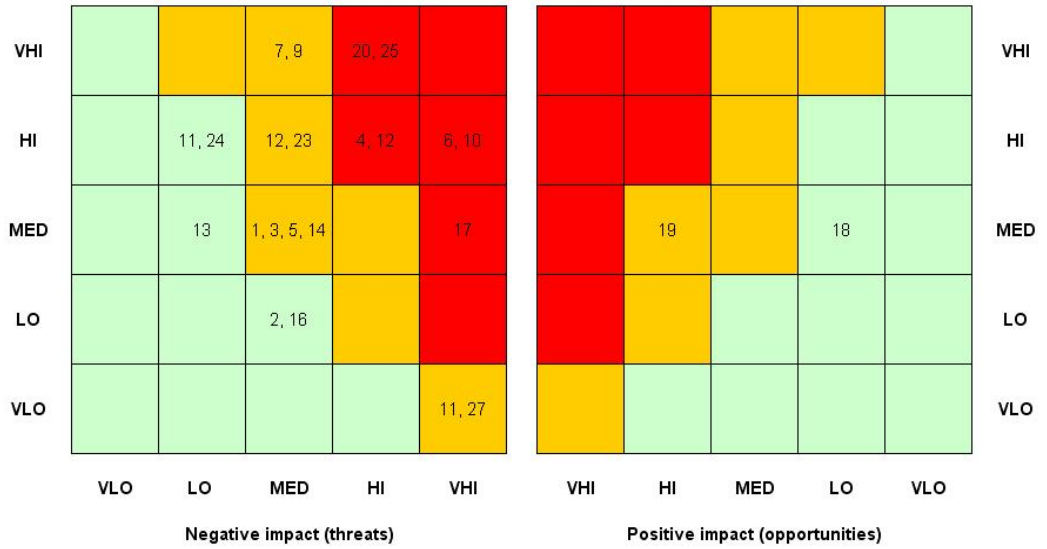


Figure 38, Double PI matrix for Time and Quality objectives

Analysis of both figures allows understanding the risk exposure of the project. Risks 8, 9, 15 and 23 should be addressed first, followed by risks 20, 25, 6, 10, 17, 4 and 12. Also the black swan risks 11 and 27 should be addressed as their impact could ruin the deadline of the project. Opportunity 19 might be interesting to explore because this could be a worthwhile benefit to the project. From these figures can be concluded that without taking mitigations the project was under considerable risk exposure.

A categorization for the identified risks was made by grouping risks that had the same type of main causes. Through personal interpretation of the researcher a categorization on six main areas was found. These categories are environmental or weather risks, supply related risks, security related risks, commercial and management risks, technical design risks and social-cultural related risks. The supply risk category can be subdivided into supply of personnel, equipment or the distribution of these resources (logistics). For security risk the subcategories could be split into construction site sabotage, stakeholder intimidation, supply line sabotage and military use during construction. For management risks the subcategories were related to procedures and regulations, contracts and tenders, and client stability. The social-cultural risk category was subdivided into internal rivalries and conflicts, religion and work ethic, poppy harvest and local property. For environment, weather and technical design risks no distinct sub-categorization could be identified. By mapping the identified risks to this risk breakdown categorization insight can be gained into the main causes for risk in the project.

The result is shown in Figure 39. Most risks are found in the security category (a total of nine) and the social-cultural category (a total of seven). Security and social-cultural related causes seem to be the most crucial drivers of risk in this particular project. Comparing the risk IDs to the probability-impact matrix shows us that the high impact risks are in different categories so the reader should be aware of the fact that the number of risks in a risk category does not say anything regarding the severity of the risks in that category.

RBS LEVEL 0	RBS LEVEL 1	# RISKS	RISK ID's
Environment / weather risk		2	1, 2
Supply risk	personnel	1	3
	equipment	1	4
	logistics	1	5
Security risk	construction site sabotage	2	6, 7
	stakeholder intimidation	3	8, 9, 10
	supply line sabotage	2	11, 12
	military use during construction	2	13, 14
Commercial and management risk	procedures / regulations	1	15
	contract / tender	1	16
	client stability	1	17
Technical design risk		3	18, 19, 20
Social / cultural risk	internal rivalries and conflicts	3	21, 22, 23
	religion / work ethic	1	24
	poppy harvest	1	25
	local property	2	26, 27

Figure 39, Identified risks mapped to the Risk Breakdown Structure

6.5 Response planning

In this section is shown what possibilities the risk register offers on how to identify mitigation options to avoid, transfer, reduce or accept the risk so that decisions can be made on how to decrease the risk exposure best. This is demonstrated with the following example.

Example 'attack on equipment'
In this example the event could be avoided by not using any mechanical equipment and machines but doing everything by hand however this would not be a very helpful strategy to choose. Transfer of the risk to another party could be done for example by having another company deliver and maintain the equipment maybe in cooperation with an insurance company. To reduce the risk several options emerge. First, the contractor could bring additional equipment to the site so if one is damaged the work can continue using the remaining equipment therewith reducing the impact on the time objective. Another option would be to increase the number of checkpoints along the road to reduce the chance and ability of insurgents to come close enough to the equipment to conduct an attack therewith reducing the probability of occurrence. By acquiring IED detection the contractor would be able to detect and disarm IED's before they can harm the equipment therewith reducing the probability of occurrence. The threat of insurgents might also be reduced by paying them a fee or by having someone negotiate an alternative with the villagers and insurgents, by planning the construction works in a less turbulent period in which the insurgents are less active or by keeping the insurgents busy with something else so they have no capacity left to disturb the project. Additional patrols by ANA or ANSF troops supported by ISAF could also help to keep insurgents from harming the equipment, while placing fences around the working area could do this in a physical way. Finally the probability could be reduced by park the equipment near to checkpoints during the night when they are most vulnerable for attack. The risk could also be accepted and, if it occurs, replacement equipment could be ordered which would then take time to arrive on site, or the Dutch Army could be approached to provide their equipment.

If these mitigation actions would be evaluated by experts -also taking into account the manageability, impact on the project, acceptable residual risk, secondary risks, resource availability and cost-effectiveness of the action- a conscious choice can be made what actions are worth implementing. Here it is chosen to reduce the risk by letting the contractor bring additional equipment to

the site in combination with construction of additional checkpoints, additional ANA, ANSF and PRT patrols, parking the equipment in so called safe havens and placing temporary fences around the work site. Now, the probability and impact of the risk can be re-assessed. Successful implementing the mitigations is estimated to result in a medium probability of occurrence while the impact on time is reduced to low as can be seen in Figure 40. The residual risk has reached an acceptable level.

RISK DESCRIPTION			pre-mitigation impact						post-mitigation impact					
EVENT (uncertain event or set of circumstances)	EFFECTS (direct impacts on one or more project objectives)	PROBABILITY	Reputation	HSS	Scope	Time	Quality	MITIGATION ACTIONS	PROBABILITY	Reputation	HSS	Scope	Time	Quality
the equipment might be attacked by an IED, mortar, RPG or small arms fire during construction works	so the equipment is destroyed and cannot longer be used leading to delay on the construction work	HI	-	-	-	VHI	-	REDUCE by bringing extra equipment (7), by placing additional checkpoints (16), by additional PRT, ANA, ANSF patrols in the area, fences around the road construction site, parking the equipment near checkpoints, ACCEPT the residual risk and	MED	-	-	-	LO	-
	which shows the vulnerability of the project so the local authorities and military forces suffer reputation damage towards the surrounding villages and the insurgents	HI	MED	-	-	-	-	REDUCE by placing additional checkpoints (16), by additional PRT, ANA, ANSF patrols in the area, fences around the construction site, ACCEPT the residual risk and arrange PRT patrol to engage villagers if it occurs	MED	MED	-	-	-	-

Figure 40, Post response assessment example 'attack on equipment'

Implementing these mitigation actions would also affect the causes for some other security risks in the risk register. The probability of risk numbers 7, 8, 9 and 10 would also be reduced to medium. The total effect of the planned mitigations therewith affects the expected risk exposure of the project as shown in Figure 41. When comparing this figure to the pre-response situation (Figure 37) it shows that the risk exposure of the project is reduced. Risks 8 and 9 are no longer present in the red area, while risk 7 has shifted from the amber to the green area.

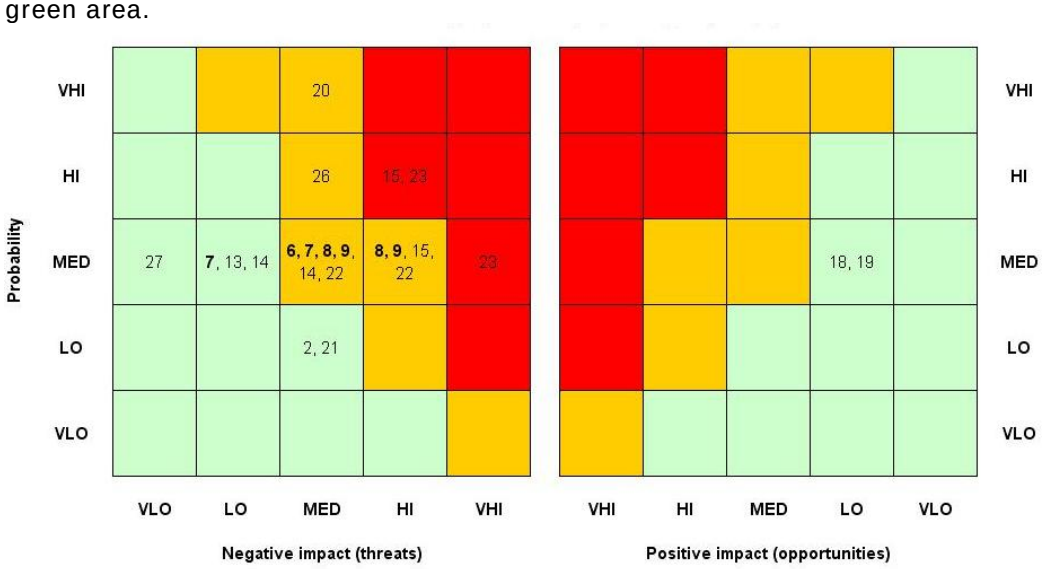


Figure 41, Post response double PI matrix for Reputation, HSS and Scope

The response planning assessment should be continued for the other risks in the register as well in order to address the remaining overall risk exposure. The full risk register in appendix J does contain identified mitigation possibilities for each risk, however for this case analysis the complete post response assessment is not further considered due to time limitations.

6.6 Post project review

The main risks identified on this project relate to the security situation and how was dealt with these threats. People from the surrounding villages were hired as workers and security personnel but the internal rivalries between different villages, leaders and tribes posed a significant additional security threat to the project. Therewith the local population is eventually exposed to the consequences of security risks (e.g. attacks, casualties) while they are also expected to see benefit and accept the project with the ultimate goal to win their hearts and minds. A remarkable observation was that several documents mentioned that the local natives were supportive towards the project and welcomed the initiative, other documents reveal that they had to be engaged to prevent them from turning against the project.

The most important opportunity identified related to the design of the project. The contractor found ways to improve the design according to local standards and found some additional works that could benefit the quality of the final product. This is typical the case in turn-key contracts where one party designs and the other party constructs. Other cooperation forms include the expertise of the (local) contractor already in the design phase so the design and execution are better geared to one another.

One risk which was identified but not recorded in the risk register was that the asphalt plant used to construct the road was the first asphalt plant in Uruzgan (interview H). However no further detailed information was found regarding this asphalt plant.

The threats that actually occurred in the project were rainy weather interrupting the asphalt paving works (risk 1), a flood that damaged the construction works (risk 2), no contractor willing to provide crushed stone supplies (risk 5) which was mitigated by having the local villagers to this, attacks on equipment, workers and security personnel, supply transports and the road works itself (risks 6-12), the issue with the weapon permits for the security guards (risk 15 and 22), a contractor stopping the construction activities (risk 17), delay due to Ramadan (risk 24), local workers abandoning work to earn more money in the poppy harvest (risk 25) and damages to local property (risk 26). From the documentation it was not possible to identify whether the opportunities to make changes to the design (opportunities 18 and 19) were captured. Similar risks and opportunities could affect future road construction projects.

Beforehand it would be clear that security risks were going to take place during the project. Attacks on equipment, personnel and the road works were foreseen as threats. Also damage to the road works due to military use was foreseen but did not occur. Other risks, the flooding, the issue with weapon permits, delay due to Ramadan, local workers abandoning the work and damages to property were not foreseen. This is mainly caused by unawareness regarding the dynamics that are present in the different environment in which the project is being executed in.

The risk register in appendix J shows many identified preventive actions that could have been used to minimize or avoid threats. Some effective responsive actions were also identified. An example of a successful mitigation was the installation of steel meshes in culverts in order to make them IED proof. Another example was the additional equipment that was brought to the site in order to speed up construction work. At some point the contractor started working from both sides (A to B and B to A) to complete the road faster, conducting activities simultaneously at different sections. Another observation is that security risks were not transferred to a party who was better able to deal with the threats (the Afghan security forces or Dutch military), but to a party whose losses would be of

lesser concern (the local contractor and population). An example of an ineffective response was to give the local security guards weapons without a legal weapon permit. This caused the additional problem that weapons were taken in by the ANP while also conflict arose between ANP personnel and the local key leaders.

From the documentations observed the impression is that risk management did not get adequate attention in this project. No evidence of risk meetings, risk documentations or anything that could point into the direction of a risk management process was found. Instead in meeting reports issues and problems were discussed and described. In some meeting reports (15, 16) action lists were documented while their status was weekly tracked. The main contractor GTZ should be the responsible party to address risks but no information regarding their practices was obtained due to research limitations. The Dutch military was mainly consulted in a weekly meeting to give their point of view and advice on the ongoing work and to exchange security information. The involvement of the Ministry of Foreign Affairs was not discussed in the documentation and their practices were also not further investigated due to research limitations.

No information was available regarding the successful completion of the project. The latest documentation dated back to May 2010 and at that point the project at that point was still on schedule.

6.7 Evaluation of the analysis

In this case analysis a second post project review was executed aimed to capture and record risk-related knowledge and experience from a completed project in a form that can be used by future similar projects. Taking into account the evaluation from the first case analysis it is considered whether the intended results are achieved.

The main difference with the first case was the faster progress of the second case analysis. There were several reasons for this, one being that the identified improvements from the first case analysis were implemented, so by aligning the information in chronological order the information processing could be completed faster. Another fact contributing to the faster analysis was that the risk register and other analysis templates were already available and could be used from the previous analysis. Also the risk analysis process was done more structured, step by step, while writing down the results after each step instead of at the end of the entire process as was done in the first analysis. Describing the risks also had become faster due to the previous experience gained with the meta-language and the pitfalls associated with its use.

Difficulties were encountered in the handling of incomplete and unstructured information from the project documentation and translating this into useful project objectives and risk descriptions. The danger here was that in some cases assumptions had to be made based on personal interpretation of the researcher. The same counts for the impact and probability estimations. A remedy to this would be to further discuss the findings or, in a real case project, to assess the risks with experts.

Another difficulty was dealing with the level of detail of assumptions of several gradations or scenarios of possible impact and combinations of probability and impacts. For example the effect could be a small reputation damage which is reasonably likely but, big reputation damage is therewith not excluded although highly unlikely. Such examples would then require separate effect descriptions for each and every possible combination of impact but with which a level of detail is reached that becomes unworkable. The best way to deal with this is to imagine and adopt both the worst case and highly likely scenario.

When estimating risks from a distance, in some cases it was nothing more or less than a rational interpretation of causes, events, consequences, probabilities and impacts. Estimating the probability of something that actually has occurred is difficult as there was often no evidence whether this would be a very high risk which was consciously expected and therefore almost certain to occur or a highly unlikely risk that occurred unconsciously per accident in this case. In a real project situation people also would have their intuition available to them which provides instant radar for such assessments.

Some identified risks are difficult to predict or anticipate on, as they can be completely out of control and understanding of the project manager. Take for example the risk 'the ANP takes the weapons from local key leaders'. People who have no experience in a mission area would never come up with something like this beforehand. That is why it is important to document risks as they have occurred and why, so it could be taken into account next time, in future projects in which the same conditions for such a situation are present and the risk could be prevented from taking place again.

In the end, the applied analysis process did –again- succeed in capturing and recording experience from the project documentations and interviewees in a form that could be used in future projects. The resulting risk register contains descriptions of risks that were actually present or occurred in the project and the risk breakdown structure that was found can be used to identify risks in next analyses.

7 CROSS CASE ANALYSIS

7.1 Introduction

In this section both case analyses and the theory are compared and discussed to find important characteristics, similarities and differences. The discussion is framed along three themes, stakeholder management, project management and risk management. Together with personal observations and all gathered knowledge during the entire research these are forged into a discussion on how risk management could contribute and might be implemented in the current practice of military project management.

7.2 Stakeholder management

In the Chowtu bridge project (the first case), the stakeholder situation could be described as problematic. The military was the only stakeholder wanting to kick off the project while successful completion largely depended on the contribution of other parties as well. In contrary, the stakeholder situation in the road TK-Chora project (the second case) provided a much stronger basis for cooperation as several powerful stakeholders were determined to contribute their effort to the project which is also crucial if things get hot. The role of the military in the first case was the one of main contractor and initiator; therewith they were responsible for the project management themselves. In the second case the military played a minor part in the entire project. They were mainly consulted regarding the security situation and they provided some additional support by executing small scale supporting projects and monitoring the construction site from time to time. The Ministry of Foreign Affairs as a sponsor and GTZ as the main contractor were responsible for the overall project management. Although the role for the military in the second case was less relevant, the case proved useful to demonstrate the ATOM methodology.

In every project the engagement of and relationship with stakeholders is crucial to get things done. During interviews in general, I have repeatedly heard about politics and work atmosphere in the mission arena including prestige projects, own (hidden) agendas, competition and scoring. In such an atmosphere it might matter most how your direct senior command or boss at home perceives your effort so when back at home promotion can be made. Differences in personalities and attitude also seem to play a role in the cooperation between military actors and civilian personnel, which might also be a clash of company cultures. Some simply don't like each other, while others, both military and civilian, tend to work within their own world and overlook the requirements and differences of the other parties. It might be needless to say that differences in personalities and experiences can be valuable, but in a tensioned setting, in a 'getting things done' culture there's no room for discussing such differences. Also the cooperation with stakeholders in such an environment is mostly short term and based on low trust because a stakeholders' power, interest and attitude can easily change due to the changing circumstances.

Concerning local stakeholders it was observed that these are consulted only sporadic while they do possess a lot of knowledge regarding local construction methods, social structures and religious and cultural preferences. The difficulty here is the semi to non-permissive area in which projects are executed which makes it difficult to get in contact with the population, while you can never be sure whom to trust or not. The alternative here is to interpret local issues with a western mindset, but in that case assumptions are made that could very likely prove to be wrong. Another aspect here is that not only the relation with local stakeholders is important but also the relation between different local

stakeholders. Internal rivalries, resource competition, cultural differences and ethnic superiority are all factors that cause conflict between stakeholders, which can indirectly pose threats to a project as well.

The purpose of the stakeholder analysis was twofold, to identify stakeholders that might be included in the risk management process and to identify stakeholder related risks. For this purpose, the used theory by Murray-Webster and Simon was found to be simple but effective in both cases. However, the theory also has its limitations which are not covered in the applied approach. An important aspect to consider for the identification of risks and implementation of response actions in reconstruction projects is the interrelationships between stakeholders and how to deal with minorities and rival parties. It is also important to include unknown stakeholders instead of leaving them out of the analysis.

Whether responsible for the project management or not, a stakeholder analysis in the preparation phase of a project would be a good start for staff members to become better aware of the stakeholders involved, their requirements, position, resources, attitude and interests. By making such an analysis understanding, insight and overview is gained of the situation and therewith efforts to engage stakeholders can be better aligned towards fruitful cooperation. However making wrong assumptions is a dangerous pitfall and -where possible- discussion and dialogue should take place in the preparation of a project. In a real case project it could be useful to keep track of stakeholders in a spreadsheet or separate log file to maintain an overview of the situation and past activities.

7.3 Project management

The investigated projects were observed in different phases of the project life cycle. In the case of Chowtu bridge, the project was still in the preparations phase while the TK-Chora road was analyzed mainly during the execution phase. One observation regarding this was that both projects were located in semi/non-permissive area. It is inherent for this type of projects that the security situation limits the possibility to go out into the field to do proper feasibility research during initiation and design or project monitoring during execution. In the first project the construction site could only be visited two times by a military reconnaissance patrol. In the second case local contractors were hired to do field research and site visits while PRT patrols did some additional project monitoring. In the first situation there was very limited information regarding soil conditions and local surroundings, while PRT reconnaissance patrols were exposed to security risks. In the latter situation the client depended mainly on the contractor's technical skill, expertise, observations and trust in the relationship while the contractor was the one exposed to security threats. In both situations this could turn out to be at the cost of quality.

In both projects the aim and promises of the project were not clearly defined and documented. In the observed documentation, the end-state for the Chowtu bridge project was described as 'a properly built bridge' however requirements and constraints regarding what was considered a properly built bridge were not found in the documentation. The same was observed in the case for the road TK-Chora. Here the end-state was to 'successfully construct the first 16km road'. In the documentation a road construction standard was found, which was also applied. During an interview regarding the Chowtu bridge the statement was made that 'the whole atmosphere around the project was vague and uncertain' (interview F). Stakeholders probably have their reasons to keep their objectives vague as it allows more slack, and it helps other stakeholders to realize their hidden objectives. Although this phenomena cannot completely be avoided, an objective clarification process as applied in the analysis does have the potential to improve this as it forces players to make the objectives explicit. Having (or

getting) a clear objective of what is to be achieved is a crucial aspect in any undertaking. If not, combined efforts are less likely to be geared to one another and might not focus on doing the right things.

The hierarchy of objectives in both cases was found to be the same. Clearly reputation and health-safety-security objectives were top priority based on the documentations. The scope to be realized was found to be clear in both cases. Time and budget requirements came in the fourth and fifth place and the risk analysis also revealed that in both projects many events could affect the timeline (and for the first case also the cost) of the project. Another observation in the Chowtu bridge project was that the stated objectives regarding time were unrealistic (or better said - estimated opportunistically) and under constant time pressure which did not contribute to preparing the project well. Preparations for the Chowtu Bridge took place in an accumulated time span of six months while in the TK-Chora project preparations were ongoing from mid 2007 till mid 2009 so to say almost 2 full years. When conducting projects in a setting as this it should be taken into account beforehand that due to uncertainties and risks the project is likely to last longer and be more costly than estimated on first thoughts. That is partly because of unforeseen events and partly because these objectives are likely to be traded-off against reputation, security, safety and scope objectives.

In both cases quality was an objective that was in danger of being overlooked or ignored, construction lifetime and functional requirements were most poorly or even not specified. Quality standards and time horizon can be perceived quite differently by different people and are also defined by culture or the 'software of people's mind' (Hofstede and Hofstede 2004). The military tends to have a short term view, because efforts always run the risk of being destroyed and because they are only present in an area for the duration of the mission. Most civilian actors have the opinion that this attitude does not serve the community in the long run. The objective clarification process as shown in the analysis makes the definition of quality objectives explicit and allows for discussion with stakeholders so to agree on a mutually beneficial view.

In both cases the information provided revealed that data storage was unorganized. Map structures were unclear and contained several personal maps and project related maps. In several interviews experts expressed their annoyance regarding this. In the period September 2008 till March 2009 a log file regarding executed projects was maintained but after three rotations this was not continued further. The successor might not have been instructed regarding this file, or could not have been interested in logging his activities. Due to these rotations important project related information, experience and slowly built up relations might be lost. There were situations reported in which there was no possibility, time or will to transfer gained knowledge or to introduce newcomers to existing relations. Although this research did not focus on these problems it can be stated that document management and the alignment of personnel transfers certainly are fields of attention to improve future management of projects. One suggestion made by an interviewee was to have a project suitcase in which all the project information would be stored alphabetically or in another relevant structure. During the project this case would always go with the responsible person and during personnel transfer this suitcase could be handed over to the newly arrived person.

In the first case the problems of rotating military personnel were clearly present. The military project team at some point had gained a lot of knowledge regarding the situation but at some point had to leave the mission area. Also several Functional Specialists were involved during the period from January 2007 till the end of the same year. One interviewee mentioned that a big project like this

would have required a single project management team for the duration of the entire project. The main contractor from the second case used a continuous project team which was privately organized but how this contributed to the completion of the project could not be further investigated.

7.4 Risk management

The scale of both analyzed reconstruction projects was relatively big. The bridge project was a military initiative while the road project was an initiative from the Ministry of Foreign Affairs and Overseas Development. During the course of the research it appeared that the military is preferably not involved in big construction projects as these tend to require too much of the organization's operational capacity. Instead the focus of CIMIC activity is on small scale reconstruction projects but these were not analyzed in detail in a case analysis. It should be further researched how the risk management method could be scaled for use in these smaller scaled CIMIC activities. Interviews revealed that also risks and issues were present in these projects, even similar threats as identified in the two cases. A risk register could even be used as a deployment evaluation tool to record people's actual experiences, for example risks that were foreseen, nearly occurred or did occur during their work period in the mission area. This would capture the gained experience so this could be used by people in preparation of their next deployments or by management to address organizational related issues.

The risk culture observed in the military organization based on the interviews can be considered ambiguous. So when is a risk a risk in the eyes of a military engineer or consultant? In conducted interviews and the analyses of both projects was found that risk management does not get adequate and sufficient attention in the current practice of reconstruction projects while this type of projects are exposed to a wide range of potential risks. In one interview was mentioned the pitfall of over-thinking risks (the one extreme) while another person clearly had a military 'can do' mind-set and tended to think too positive in advance of a situation which indicated a somewhat risk unawareness (the other extreme). After being confronted with some examples from the risk register most persons tended to acknowledge the presence of risks and most interviewees would acknowledge that room for improvement was present.

The overall impression was that the people involved in these projects like the adventurous setting and find the various problems that occur during projects a challenging and interesting job. An interviewee mentioned that the military is highly oriented towards achieving visible results which enforces an imbalance between project preparation and execution. Risks are being dealt with as they occur on the job, which would indicate an ad-hoc fire-fighting mentality. Because of this mentality people are too busy dealing with issues so no time is left to look ahead. This in turn reinforces the likelihood of more issues coming up. Maybe this mentality could be reinforced by not knowing or having the experience how to effectively deal with risk in a project. Or people might have years of previous practical experience in another company culture that is similarly risk ignorant or adopted unworkable risk management practices like making endless risk registers. A sometimes risk unaware, risk ignorant or risk incapable mentality in the execution of reconstruction projects can be a reputational risk for the military professional organization as a whole as it has responsibilities towards both the home and host nation government.

The risk break down structure in both projects showed similar main categories of risk. In both projects risks were found relating to the environment and weather conditions, the supply of materials and personnel to the construction site, the security of the construction site, supply lines, the management of the project and

risks related to the use of technology. Separate subcategories of risk observed were intimidation of stakeholders, internal rivalries and conflict between stakeholders and social-cultural differences. In evaluative interviews both categorizations were recognized by experts. One person mentioned that he would normally check similar categories in his own mind when for example assessing a project proposal (interview I).

In both cases security threats to personnel and equipment were important risks in the projects. In the first case the military did not have the capacity to deal with the security risks while in the second case the security risks were transferred to the local contractor and population. From a security risk perspective the latter prevents losses on the side of the military coalition, but from a strategic point of view, it is rather questionable if this approach really contributes to winning the hearts and minds of the local population. The alternatives offered to them are working on a road project with the risk of getting killed, working for the insurgents in the poppy harvest or farming. The question might also arise whether projects like this really show the benefit and capabilities of local authorities towards the population, or strengthen the perception of the incapability and corruption still present. Efforts achieved by the local authorities with the help of coalition partners might be seen as the latter by the local public.

Technology and design related risks mainly concentrate around the theme whether local technology, construction methods and design solutions should be preferred over foreign high technological design solutions. This will be a returning risk category in deployments that are to be planned in countries that are less familiar with modern western technology. Either the local methods do not fulfill the requirements of the intervention forces or the foreign solutions do not fit the local culture and available expertise and experience. Local solutions might for example not be fit to deal with armoured equipment, take more time to implement or simply might not fit the western standard or culture. Implementation of high tech foreign design solutions often requires advanced machinery and is dependant on other not locally available technologies and resources which are in turn scarce and need to be transported through volatile area. These solutions run the risk of not being maintained because the local available expertise and experience does not match, because they depend on expensive spare parts or other import resources or simply are not accepted because the solution was brought upon people and does not match the local culture and habits. There's no direct solution for these issues although discussion and dialogue could increase mutual understanding.

The opportunities identified in both cases were only a few. This could imply that the identification process in this research was focused mainly on threats. However the documentation was leading in the identification process and the identified opportunities do reflect what was found in there. A remark made for future projects is that identification of opportunities could provide potential benefits. Interviewees for example mentioned opportunities to improve project quality, for example the use of a concrete mixer on site would substantially improve the quality of the concrete used in small scale projects (interview D).

In both case analyses the applied ATOM methodology by Hillson and Simon succeeded in capturing risk related information and experiences in a form that can be used for future projects. However the literature misses example sections, the process and methods are very well described but the actual identifying and assessing is not further illustrated, so the 'how to actually do it' still remains vague.

In both projects the added value of a structured risk management process was observed. As discussed above, the clarification and documentation of a stakeholder analysis and objectives in the observed projects can help to focus efforts in a common direction. However the main contribution of such an approach is that military personnel becomes better aware of the (non-military) risks in the project and learn to deal with identified risks more effectively. Identification and documentation of risks in a risk register provides a better overview of the uncertainties and risks that are present and it allows effective responses to be planned and implemented. For example in the Chowtu bridge project such an overview could have served as a decision making tool to support the appraisal of the project and the acquisition of funds. The risk break down structures can serve as checklists for identifying risks in similar future projects while the risk register could be developed further into a knowledge database for reconstruction projects as each future completed project could add additional risks and experiences. In projects not all risks can be identified beforehand, but this is exactly what makes it important and interesting to record them afterwards for use in future projects.

7.5 From case analysis results to project risk management in practice

In the case analyses was demonstrated how risk management tools and techniques can be applied and what results can be obtained by doing so. To go ahead with ATOM risk management in practice several adaptations and modifications to the process and risk register should be considered which are to be discussed below.

In the theory four main categories for successful implementation of a risk management process were mentioned, a supportive organization, competent people, appropriate methods, tools and techniques and a simple, scalable process. Throughout the research also additional requirements were found. First the process should be flexible enough to not only fit different types and sizes of projects, but also be capable of dealing with a dynamic environment that involves rotating personnel, messy document management, changing objectives and risks. For staff members willing to adopt a risk management process it would require to be easy to understand and practical in its use. A quick and dirty approach would be most beneficial as a highly scientific, time consuming, extended and detailed process would kill the support among executing staff so it could turn into nothing more than a formality on paper. In this research the first case analysis took four weeks while the second case took two weeks. The first case partly took longer because of the development of the risk register and partly because describing risks in the meta-language is a time consuming process, especially for someone who is not used to work this way. Last, one person should be end-responsible for the risk management in the project and overlook, guide and support the process. This could be an appointed project manager or a project team member who adopts the role of risk manager.

7.5.1 A simple, scalable process

Whether the process is to be applied in a single big scale or multiple small scale projects, the basis of the method always remains the same. Specific design of the risk management process in the existing organizational processes should be further investigated using design science theory. Some ideas on how this could be done in the Dutch military organization are presented below.

The first thing to consider for a project manager before embarking on a new project is to be aware of other players in the project and find out who might be interested in or affected by the intended results and the risks associated with achieving these. Also find out who could be valuable in contributing to the process

of the clarification of objectives and identification of risks and responses as doing this by oneself is likely to provide a very one-dimensional picture. During the project keep track of stakeholders in a spreadsheet, record and structure all acquired information so to have a constant overview.

Second, depending on the size of the project, organize a one- or half-day initiation meeting with relevant stakeholders to discuss and agree upon the scope and objectives of the risk process, the degree to which ATOM should be applied, schedule of activities to be implemented next, the tools and techniques to be used, the roles and responsibilities in the team, the reporting and review requirements as well as the definition and clarification of objectives, probability and impact scales. By writing down objectives explicitly in a hierarchical order it becomes clear what needs priority of attention during the entire project especially when things get difficult. Also write down explicitly what effects would ruin the project and which would turn out to be acceptable. The probability-impact scaling framework as demonstrated in the analysis is a suitable tool to do this. Doing so everybody can see what is considered more or less important to achieve, and what deviations from this are considered acceptable or not. The outcome of this initiation process should be documented by the risk manager in a risk management plan.

The third very essence is to become aware of the risks in the project and writing them down in a risk register using the meta-language which makes them explicit and discussable. To do this the risk manager could organize a one-day risk workshop for project team members, also consider including or consulting technological experts, staff section members, cultural and developmental specialists, project sponsors, commanders who eventually decide on the project, people with previous experience in a similar project or other relevant stakeholders as agreed in the initiation meeting. After an introduction, the confirmation of project objectives, the scope of the process and the workshop, a risk management briefing and a short clarification of expectations the identification of risk can start. During the workshop first brainstorm main threats and opportunities as observed by the persons involved and analyze assumptions and constraints that are present in the project. After this process use previous risk breakdown structures, for example the ones presented in this research or additionally a standard list as presented by Hillson and Simon, to see if the most important categories are covered or something is missing. When writing down the risks pay attention to the meaning of the definitions used and persons' own assumptions and interpretations when addressing the causes, events and effects of a risk. Here the ability to communicate and work with the cause-event-effect meta-language is necessary to really deeply understand the risk. Making a mind-map of the risk is very helpful when complexity is distracting or overwhelming. Bear in mind to keep it realistic, do not over-think the risks or generate lists of everything that could possibly happen. Focus on the likely, foreseeable threats and opportunities.

Fourth a prioritization is required to have specific risks selected to be addressed while others can be put aside till later. This could either be done in the same risk workshop after the identification, on a second day of the same risk workshop or in a separate risk workshop. It is preferred however that the same people that identified the risks also assess them. After an explanation of the assessment scheme, the assessment is done in two steps, first the probabilities of all listed risks are estimated, next the participants imagine the risk occurs and determine its impact on the objectives. Both assessment steps are based on the earlier agreed probability-impact scales and are recorded in the risk register as demonstrated in the case analyses of this research. During this step it might be necessary to rephrase some risk descriptions before assessing them in order to

get a clearer view on the nature of a particular risk. During assessment it is important to include the opinions of multiple persons as the results of one person provide a one sided judgment. Differences about how to rate the probability and impacts should be resolved by discussion and exploration of underlying assumptions. Once the workshop attendees have agreed on the probabilities and impacts of each risk, these can be plotted in a risk assessment matrix as demonstrated in the case analyses. Next the risks are to be mapped into a breakdown structure for risk categories or into an activity list which helps to identify the driving sources or activities of risk in the project, so called risk hot-spots. After this categorization so-called risk owners are assigned to the high-priority risks. These risk owners should be named individuals within the project best placed to manage the risk, not necessarily the person who identified the risk, the project manager or the risk manager.

Fifth, if sufficient time is available, it is preferably chosen to consider risk response planning during the workshop. If the risk workshop runs out of time, a short feedback session and explanation of the next response planning step would conclude the risk workshop. The risk manager schedules 2-hour interviews with all risk owners within one week to deal with the risks not covered during the workshop. In both situations, response planning requires that the priority order derived from the previously generated risk assessment matrix determines which threats and opportunities are to be considered first. For each risk the attendees identify possible response strategies according to the RATA principle as demonstrated in the case analyses and select the most appropriate one by taking into account the manageability, impact severity, resource availability, additional information required and cost-effectiveness. Next, possible actions to implement that strategy are identified, recorded and action owners are assigned to each action. Next, the post-response probability and impact should be assessed to consider whether the planned actions are expected to mitigate the risk to acceptable levels (residual risk) and any secondary risks associated with the planned strategy should be identified, recorded, assessed and response actions developed. Where direct data entry is not possible, the risk manager should always ensure that all information is properly documented and organized in the risk register and meeting reports. After the workshop or interviews the risk owners are responsible for liaising with nominated action owners to ensure that planned actions are being implemented and reporting progress to the risk manager. The risk manager should keep the project manager up to date regarding the progress of the process, to be implemented actions, funds and schedule changes. Because situations and risks are dynamic and fast changing, it is important to communicate and implement response strategies and actions preferably within less than a week after being identified.

From this point forward, the risk manager continues with recording and communicating progress results, monitoring the implementation of agreed actions, keeping the risk register up to date and maintaining a change log file, planning and implementing additional actions, recording newly identified risks and dealing with issues that emerge. If the need arises, additional risk workshops could be organized to review and update the risk process.

7.5.2 A supportive organization

Implementation of a risk management process as illustrated above would also require a military organization that is supportive towards its use. This however depends on how the military management assesses the ideas offered by this research. Seeing the opportunities offered, it would be necessary to do additional research on how support for a risk management approach can be created.

Start discussion among military managers and consultants about the possible benefits, need for and possible resistance against risk management in projects. This is aimed to identify and explore pro's and con's and to find out whether there's sufficient support throughout the organization to work with a structured risk management approach. If not, this support should be broadened or one could notice the importance but continue current practice (for example due to the availability of financial resources). Without sufficient support from within the organization and the people involved, a risk management approach would easily turn into a must-go-through formality which is all but effective.

Resistance towards risk management might arise from the result-oriented, can-do culture present within the military organization. In that case it would be important to consider the benefits, frequently cited reasons or excuses and possible approaches to deal with these as presented by Hillson and Simon page 11-16.

Next, discuss and think about how a structured approach could be implemented, taking into account the findings of this research. For example what objectives are to be achieved by the process, the required level of detail, what tools, techniques and methods are to be used, what risk exposure is acceptable for the projects the military is involved in, what assessment matrix can be adopted best, how to deal with classified information and communication of risk information to other stakeholders, with the current document management system and how to deal with rotations in personnel. Also past experience from reconstruction projects and experiences from current practice in other projects within the military organization, for example within materiel supply (Defensie Materieel Organisatie), could be considered in developing the approach further to fit the military practice of project management in reconstruction projects.

Next, a pilot project could provide additional insight in the use and benefit of the risk management process and tools developed so far. By tweaking further bit by bits together with military managers and specialists in the field the process could be developed into an effective, accepted method that is practical for use in different kinds and sizes of reconstruction projects. Meanwhile start improving the competence of the people who are expected to execute the approach.

7.5.3 Competent people

If the organization is ready to adopt risk management practices in future reconstruction projects, the people involved should be trained to understand the key concepts and principles of risk management. In order to achieve this, the training centre for military CIMIC personnel (CIMIC Centre of Excellence) should adopt a risk management module in its existing CIMIC basic course so both newly trained and currently operational CIMIC professionals become known with the use of the risk management language, tools and techniques, the processes within the organization and required behaviors and attitudes. The existing CIMIC Staff and Functional Specialist courses should adopt advanced modules so that people in management positions become really competent in the use of the risk management language, tools and techniques. Finally a newly developed CIMIC Risk Management Staff module could be developed to train the military risk managers of the future. These persons should become able to organize, guide, overlook and support the risk management process in actual reconstruction projects.

These are just some first ideas regarding the development of the training program, what exactly to be provided in what course, what people to provide with which course etcetera could be further developed and worked out in detail by the CIMIC COE.

7.5.4 Appropriate methods, tools and techniques

The risk register as developed in the case analyses proved its worth for this purpose, however if the register is to be used in a real project setting several additions and tweaks will have to be made. Already some additional requirements for the register could be identified from the ATOM theory.

For actual use in practice the risk register should be tweaked to track the risk status through time. An additional risk status column could be added in the risk register using the eight possible status values as provided by Hillson and Simon page 101-102. These are draft, rejected, escalated, or active –and if active- further specified as deleted, expired, closed or occurred. Besides, a column should be added to record the risk owner of the particular risk.

In the risk register used in the case analyses, one column was assigned to record mitigation possibilities. For use in a real project, also the agreed actions for implementation should be recorded as well as the responsible action owner, the implementation deadline and current status of the action.

Finally, a change log file could be used to record changes in the risk register and their underlying motivations. For example the date that a risk was identified and recorded, the date and result of a risk status or assessment change, the date and impact of a risk that has occurred or the outcome of an implemented response action.

The proposed pilot project could help to further identify requirements and test the usability of the developed dynamic risk register. A template for an Excel spreadsheet risk register, which is a modification of the risk register used in the case analyses incorporated the above mentioned improvements, is available on request.

Additionally, the process and used techniques could be adopted in the existing CIMIC Tactical Techniques and Procedures guideline.

PART III – CONCLUSIONS, RECOMMENDATIONS AND REFLECTION

8 CONCLUSIONS AND RECOMMENDATIONS

Project managers of civil engineering reconstruction projects in counterinsurgency operations have to deal with unique problems, issues, uncertainties and risks towards achieving satisfying project results. Therefore the objective of this thesis was to develop a set of recommendations that can contribute to the development of future project management, specifically from a risk management perspective. The main research question that was discussed and answered is:

Which theoretical framework is appropriate for practical use by military project managers to provide insight into the management of risks which influence the successful completion of civil engineering reconstruction projects?

This question is answered by answering the following sub questions.

Which theoretical framework is appropriate to evaluate the selected projects?
The exploration of project management aspects in current practice revealed that despite the risky and uncertain nature of reconstruction projects, insufficient and inadequate attention is given to risk management. Therefore a risk management perspective was chosen to evaluate past executed projects. From the existing theories on risk management methods, it was concluded that the Active Threat and Opportunity Management (ATOM) method by Hillson and Simon is most appropriate because it provides a recently developed, practical stepwise approach that can fit any type and size project. The several methods, techniques and tools presented in this method formed the theoretical framework for the two project-analyses conducted in this thesis.

What selection of projects can be made and how are these to be analyzed?
From available project documentation, five major and over thirty small scale projects were identified. Based on predefined selection criteria two major projects were selected, the military initiated Chowtu bridge project and a Dutch government funded asphalt road section from Tarin Kowt to Chora. In these project analyses, the initiation, identification, assessment and response planning steps adopted from ATOM formed the basis to conclude the post-project reviews.

What insight can be gained from past executed projects regarding the management of risks?
Although projects are exposed to a wide range of potential uncertainties and risks, conducted interviews and the analyses of both projects confirmed that risk management gets inadequate and insufficient attention in the current practice of reconstruction projects. Military personnel tends to focus on the military 'green' risks while in a construction project many other issues, for example relating to stakeholders, finances, contracts, quality and technology, require attention as well. Opportunities also occur but just as with some risks, these are not pro-actively managed. Therewith the observed risk culture in the organization was partly risk unaware and sometimes even risk ignorant.

Both analyzed projects showed that reputation, scope, safety and security are driving objectives in reconstruction projects conducted by the intervention forces while objectives regarding time, cost and quality are often of secondary importance.

In both analyzed projects similar categories of risk were found relating to the environment and weather conditions, the supply of materials and personnel to the construction site, the security of the construction site, supply lines, the management of the project and risks related to the use of technology. Separate subcategories of risk observed were intimidation of stakeholders, internal rivalries and conflict between stakeholders, social-cultural differences and security threats to personnel and equipment.

The demonstrated application of the ATOM method, tools and techniques to past executed projects succeeded in capturing risk related information and experiences in a form that can be communicated and used for future projects. A stakeholder analysis at the beginning of a project can improve insight in a project's stakeholder situation and therewith managers can focus their stakeholder engagement efforts which are essential for creating support for the project. Besides, the stakeholder analysis can help managers to identify stakeholder related risks. The clarification of project objectives process helps to identify the essential promises and can help to focus stakeholder's views and efforts towards achieving these. The risk break down structures can contribute to the identification of (non military) risks (opportunities and threats) in similar future projects. The risk register can serve as a powerful tool to assess a project's risk exposure in an early stage in support of the project appraisal and the acquisition of funds. A risk register allows managers to keep track of the risks involved in the project, to prioritize efforts to deal with the risks, to plan effective responses and -most important- to implement actions that actually address the causes and/or effects of the risks.

This thesis suggests that application of the ATOM methodology in practice can help military project managers and project experts to become better aware of the (non-military) risks in the project and to deal with identified risks more effectively. This in turn can lead to more satisfying project results. To achieve this, a supportive organization and competent key personnel are needed. Besides a simple, scalable process is required to guide and structure the risk management efforts.

Which adjusted framework can be developed based on insight gained by confronting the individual case analyses?
Whether the process is to be applied in a single big scale or multiple small scale projects, the basis of the method always remains the same. The following key process elements should be in a professional risk management process prior to approval, design and execution of any major project in practice.

- Perform a stakeholder analysis
  The method provided in the theoretical framework fulfils the purpose to identify other players who influence or are being affected by the project and whom of these to include in the risk management process. For the identification of stakeholder related risks, involvement of experts in humanitarian and cultural affairs could also have additional value. An updatable stakeholder spreadsheet in which stakeholders are listed and constantly re-assessed can be used to keep track of stakeholders during the project.

- Perform a half-day initiation meeting
  This is a meeting in which key stakeholders discuss the scope and objectives of the project and the risk process. Also the tools and techniques to be used, the roles and responsibilities in the team, the reporting and review requirements, the definition and clarification of

project objectives and the probability-impact scales should be defined and agreed.

- Perform a two-day risk workshop
  This is a follow-up meeting dedicated to the execution of the risk identification, assessment and response planning processes, attended by project team members and possibly military staff members, cultural, developmental, and technological experts, project sponsors and military commanders. In the process, risk related information (for both threats and opportunities) is identified, assessed and recorded using the meta-language in a spreadsheet-based risk register. Individuals within the project best placed to manage the identified high priority risks are assigned as risk owners and therewith made responsible for response actions to be implemented. The so obtained insight regarding the expected overall risk exposure of the project allows the project manager to provide decision makers insight into the feasibility of the project. The risk register can also be used to keep track of risks during the project and allows transfer of risk related information to future rotations of personnel.

- Continue the risk management process during design and construction
  Once the initial risk assessment is done and the project is approved for further implementation, the risk management process passes into a monitoring and control process. From this point forward, the project management continues with recording and communicating progress results, monitoring the implementation of agreed actions, keeping the risk register up to date and maintaining a change log file, planning and implementing additional actions, recording newly identified risks and dealing with issues that emerge. If the need arises, additional risk workshops could be organized to review and update the risk process. At the end of the project a post project review can be conducted to evaluate the risk process and the project results to identify lessons to be learned for future projects.

Which set of recommendations can be developed that contribute to the development of future project management?
The following set of recommendations is developed towards the implementation of a professional risk management process in the military practice of managing civil engineering reconstruction projects.

- Conduct further research using ATOM for smaller scale CIMIC activities
  In this research two large scale projects were analyzed however military CIMIC reconstruction mainly focuses on small scale reconstruction projects. Similar research into the applicability of the ATOM methodology to a portfolio of similar or different types of small scale CIMIC projects is needed to see how the risk management method can be scaled for use in CIMIC activities.

- Create a broadly supportive military organization through discussion
  In the short term, discussion among military managers and consultants is needed to explore pro's and con's and to find out whether there's sufficient support throughout the military organization to work with a professional risk management process in different projects. Resistance towards risk management might arise from the existing risk culture present within the military organization. Once realizing the importance of risk management, negative arguments can be overcome by positive ones through a strong top down and bottom up lobby driven by the will to professionalize further.

- Further develop the risk management process towards implementation
  Discussion among military managers and consultants is needed to think about how a professional risk management process could be implemented and developed further to fit the military practice of project management in reconstruction projects. This research already presents several key process elements to be included in the process, stakeholder analysis, an initiation meeting and a risk workshop. Difficulties to include are how to deal with classified information and communication of risk information to other stakeholders, with the current document management system and how to deal with rotations in personnel. Specific design and implementation of the risk management process in the existing organizational processes could be further investigated using design science theory.

- Perform a pilot project and study the results
  In the longer term, if it is decided to continue with the implementation of a professional risk management process, it is advised to conduct a pilot project which can provide additional insight in the use and benefit of the risk management process and tools developed so far. By tweaking further bit by bits together with military managers and specialists in the field the process could be developed into an effective, accepted method that is practical for use in different kinds and sizes of reconstruction projects.

- Improve risk management competences of key personnel through training
  Start improving the competence of the people who are expected to work with the risk management approach. Good experts are needed for good risk descriptions and a good interpretation of the results. To achieve this, the training centre for military CIMIC personnel (the NATO CIMIC Centre of Excellence) should adopt a risk management module in its existing courses so both newly trained and currently operational CIMIC professionals become known with the use of the risk management tools, techniques. The military project-risk managers of the future should become able to organize, guide, overlook and support the risk management process in actual reconstruction projects.

- Appoint a risk manager in future (major) reconstruction projects
  In future (major) projects, it is recommended to have one person being end-responsible for the risk management in the project and overlook, guide and support the process. This could be an appointed project manager or a project team member who adopts the role of risk manager. People with project management experience and expertise in civilian construction can contribute to the identification of non-military risk. Therefore it is crucial to link the right people with the right expertise to the right project or task at hand.

- Involve (a) risk management professional(s)
  It is recommended to involve one or more (experienced) risk management professionals to support and guide the implementation of the previously mentioned recommendations.

9 REFLECTION

This section describes the researcher's reflection on the validity of the research results and the research process.

9.1 Reflection on the research results

The conclusions and recommendations presented in this report are based on the analysis of two major projects. In section 4 was stated that the disadvantages of case studies can be the validity and quality of the results. These disadvantages were addressed by using method and partly also source triangulation. Now the questions are raised whether the two projects are sufficient, whether the selected (major) projects are representative for the military organization and whether the analysis was conducted properly. Therefore the following remarks have to be made regarding this research.

The findings from both post-project analyses were reviewed with two experts. This review revealed that a lot of identified problems and issues were recognized. By analyzing additional projects, definitely additional (project specific) insights can be gained. It is expected that the main findings of such additional research comes up with similar main findings as presented in this report.

In the case analyses, two major projects were evaluated while the majority of projects in CIMIC reconstruction are small scale. Although not directly demonstrated in this research, also for small scale projects the ATOM method is expected to have similar opportunities as presented in this thesis. This could be further investigated by applying the same research method to a portfolio of small scale CIMIC projects.

Looking back at the selection of projects, the bridge project can be seen as a typical example of a military driven project, while in the road project the military was involved at a distance and therefore the findings might be less relevant for the ministry of Defense. Still the second case provided very interesting insights also for the military as a stakeholder. As a powerful stakeholder the military was involved in dealing with certain risks and therewith had an impact on achieving satisfying project results. These in turn can have influence on the military mission objectives, for example the local perception of safety and security in the area.

The documentation used in the project analyses mainly originated from (different) military sources, only some parts originated from other stakeholders involved in the projects. The used information covered the projects only in parts, for example in the case of the TK-Chora road only documentation from the military was available that concerned the execution phase of the project. The opportunities to include the views of development advisors, cultural advisors, military mission teams, sponsors, project managers from NGO's and local stakeholders were limited due to practical research limitations. Therewith the analyses results do not include different perspectives of other stakeholders involved in the projects environment. This is not considered to harm the value of the final conclusions and recommendations.

The case analyses were mainly based on available project documentations. Although the researcher put great care in correctly interpreting and presenting the information it might occur that some misinterpretation, for example of cause-event-effect relations, is present. In the first case this was partly reduced by reviewing the stakeholder analysis and risk register with experts, while in the second case this opportunity did not arise. The risk assessment was based on

personal interpretation of the information by the researcher and only in the first case partly reviewed by experts. This is not considered to harm the value of the final conclusions and recommendations.

9.2 Personal reflection on the research process

Back in November 2009 I presented the first research proposal for this research not really knowing what to expect from the coming months. I had been working on this proposal for some months in order to be well prepared for the challenge lying ahead which resulted in very few changes to the initial research approach. The research definition was not yet fully clear at that point and had to be further specified along the process.

The CIMIC course provided in December 2009 by the CCOE in Enschede was my first introduction to the field of civil military cooperation which also proved to be useful. This allowed me to explore the research field by talking to persons who had extensive experience in the field. In the first week of February 2010 I kicked off full time into the thesis starting with literature research in which I ploughed trough all kinds of papers, articles and other written documents to better understand the specific context of counterinsurgency. Some originated from the military, others from research organizations or (non-)governmental organizations which gave me a broad perspective on the subject matter. So far in all courses and projects I had been working together with other students and for now I had to get used to merely working on my own. Also I felt I had no clear goal and direction at this point which was at times frustrating.

At some point the reading saturated my mind and I continuously felt a tendency to write in order to generate tangible results. I spent a month on trying to write down the entire context of counterinsurgency but this proved to be way out of scope. After meeting my supervisors the focus was readjusted on the theoretical framework diving into project management literature. Here again I was saturated at some point, but by only sitting behind a desk staring at written texts I missed the tangible results, the connection with practice and the feeling with the subject matter. At the next committee meeting in April 2010 my supervisors at systems engineering advised me to start focusing on the practical side, to find out what was actually going on in the project management of these projects.

Through my supervisor at the NLDA I attended a CIMIC network meeting which allowed me to get into contact with CIMIC project managers. After a couple of interviews my enthusiasm was fueled again and I started to get a better grasp on the subject.

In May 2010, the choice had to be made what aspects of project management I would focus on in the project analyses. Already in the preparation phase of the research my intuition and interest pointed towards a risk management perspective but at that point this was not yet substantiated. Apparently the past months brought me back to this subject although now supported by actual research findings. Still, my research so far advanced slowly and with difficulty. This was mainly because my work was not yet very concrete and tangible and especially my professor urged me to come up with real case projects. In May 2010 I also completed my last course of the MSc program and therewith the road for graduation was now open.

At that point I came into possession of interesting and useful, partly confidential project documents. However the information was completely unstructured and different projects were documented throughout several folders. At that point my supervisor at Civil Engineering advised me to make an inventory of the available information and what projects were available and suitable for in depth

investigation. Therewith a well-considered choice could be made in the upcoming committee meeting regarding which projects were selected for the analysis.

In the summer of 2010, I conducted the in depth case analyses. Now the actual research work had to be done. This phase was characterized by extensive analysis of the selected project documentations. Translation of the unstructured information into the risk registers proved to be difficult and time consuming as part of the information was missing or poorly documented. In the end I think I succeeded in puzzling the information together into presentable content. Also my regular meetings with my supervisors helped me to make steady progress.

In this phase I also started writing the final report. During the literature research I already noticed that writing (in English) was not my strongest competence and it cost me a lot of time to decently put my thoughts on paper. Another difficulty I encountered was that I always tried to start writing from the beginning of the report in chronological order. Trough consulting my supervisors I got the insight to focus on writing the core section first and working back- and forward from there. Gradually, also the structure in the report improved.

Looking back on the process I think it would have been more time-efficient if I had started conducting interviews from the beginning of the literature research. That would make the research more concrete and practically relevant from the beginning. Compared to my expectations the graduation process took longer than expected, partly because of the slow start and partly because of my tendency to keep improving my work further. As there was no real deadline for this project the only deadline was the one in my mind and this was a quite flexible one.

During the process, I tried to keep in close and regular contact with my supervisors in order to keep them informed of my progress and to get early feedback on my work. As I already mentioned in the preface, I feel this cooperation was very fruitful and also contributed to a nice result. My English writing skills have significantly improved during the process which will come in handy during my future career. Furthermore the completion of this thesis has been a test for my self-discipline and perseverance. Through hard work eventually the intended results are achieved and I can say that I am proud of my work.

REFERENCES

AIMS. "Website Afghanistan Information Management Services." Retrieved 2nd of March 2010, from www.aims.org.af.

Arends, W. M. (2008). "Civiele kennis in een militaire verpakking." Carré **1**: 10-12.

Bentley, L. and J. Whitten (2007). Systems analysis and design methods, McGraw-Hill.

Bergen, P., J. Lindley-French, et al. (2007). Afghanistan: Mission Impossible?, CEPS, IISS & DCAF.

BSI (2002). Britisch Standard 6079, Guide to Project Management, British Standard Institute.

CCOE (2009). CIMIC field handbook, NATO Civil-Military Cooperation Centre of Excellence.

CIMIC, A. (86-1-1). Allied Command Operations CIMIC Tactics, Techniques and Procedures manual. Belgium, Supreme Headquarters Allied Powers Europe.

Cooke-Davies (2005). "Can we afford to skimp on risk management?" Project Manager Today **10**: 12-15.

Damen, R. and M. S. F. Olislagers (2004). Development of a decision framework for the Dutch military to inventory and prioritise humanitarian tasks in a complex emergency. Technology and Development Group, University of Twente.

Dianous, V. d. and C. Fievez (2005). "ARAMIS project: A more explicit demonstration of risk control through the use of bow-tie diagrams and the evaluation of safety barrier performance." Journal of Hazardous Materials **130**: 220-233.

Dimitriu, G. R. and B. A. d. Graaf (2009). "De Nederlandse COIN aanpak: drie jaar Uruzgan, 2006-2009." Militaire Spectator **11**: 613-635.

Eisenhardt, K. M. (1989). "Building Theories from Case Study Research." Academy of Management Review **14, no. 4**: 532-550.

Embassy, R. N. (2006). Context Analysis Uruzgan Province. Kabul, Afghanistan, Royal Netherlands Embassy.

Frerks, G., B. Klem, et al. (2006). Principles and Pragmatism, Civil-Military Action in Afghanistan and Liberia, Cordaid.

Grandia, M. (2009). The 3D approach and counterinsurgency, the case of Uruzgan, University of Leiden.

Hansen-Nord, J. (2008). CIMIC and PRT operations in ISAF, NATO JALLC.

Havermans, D. and J. d. Koning (2008). Projectmanagement in CIMIC projecten.

Hillson, D. and P. Simon (2007). Practical Project Risk Management: the ATOM methodology. Virginia, Management Concepts Inc.

Hofstede, G. and G. J. Hofstede (2004). Cultures and Organizations: Software of the Mind. New York USA, McGraw-Hill.

Joustra, B. (2010). Risk-based Project Management at Heerema Marine Contractors. Faculty of Technology, Policy and Management, Delft University of Technology. **Master of Science**.

Kamer, T. (2009). Tussentijdse evaluatie ISAF 2008.

Kremers, J. J. F. J. (2009). Aanbesteden en Civiel Militaire Interactie, University of Twente.

Lester, A. (2007). Project Management, Planning and Control, Elsevier.

Matthijssen, K. and P. Mollema (2008). De Civiele organisatie in Task Force Uruzgan.

Meredith, J. R. and S. J. Mantel (2006). Project management, A Managerial Approach, John Wiley & Sons.

Ministry of Foreign Affairs, D. a. E. A. (2005). Notitie: wederopbouw na gewapend conflict, Ministries of Foreign Affairs, Defense and Economic Affairs.

MoD. "Website Ministry of Defence." Retrieved March 2nd 2010, from http://www.defensie.nl/nlda/over_de_nlda/.

Morris, P. W. G. (1994). The management of projects. London, Thomas Telford Services.

Murray-Webster, R. and P. Simon (2006). "Making sense of stakeholder mapping." PM World Today **VIII**(11).

NATO (2003). NATO CIMIC doctrine, AJP-9.

Natsios, A. S. (2005). "The Nine Principles of Reconstruction and Development." Parameters **35, 3**: 4-20.

Navratil, M. and B. Ranglova (2010). Construction Project Management Handbook, Czech Provincial Reconstruction Team Logar Province Afghanistan.

Neimes, W. C. (2010). "Afghan Construction Practices." The Military Engineer **March-April**: 49-50.

Newcombe, R. (2003). "From client to project stakeholders: a stakeholder mapping approach." Construction Management and Economics **21**: 841-848.

ODA (1995). Guidance note on how to do stakeholder analysis of aid projects and programmes. S. D. Department, Overseas Development Department.

ODA (1995). Note on enhancing stakeholder participation in aid activities. S. D. Department, Overseas Development Administration.

Pijpers, P. B. M. J. (2009). "Een nieuwe generatie oorlogvoering, Counterinsurgency als antithese." Militaire Spectator **12**: 685-693.

PMI (2000). Project Management Body of Knowledge. Pennsylvania USA, Project Management Institute.

PMI (2004). A guide to the Project Management Body of Knowledge, Project Management Institute.

Rietjens, S. J. H. (2006). Civil-Military Cooperation in Response to a Complex Emergency: Just Another Drill?

Rietjens, S. J. H. (2008). "Managing Civil Military Cooperation. Experiences from the Dutch Provincial Reconstruction Team in Afghanistan." Armed Forces & Society **34, no. 2**: 173-207.

Rietjens, S. J. H. and M. T. I. B. Bollen (2008). Managing Civil-Military Cooperation, A 24/7 Joint Effort for Stability, Ashgate Publishing Company.

Ryan, M. (2007). "The Military and Reconstruction Operations." Parameters **Winter 2007-08**: 58-70.

Shenhar, A. J., D. Dvir, et al. (2001). "Project success: a multidimensional strategic concept." Long range planning **34**: 699-725.

Smith, N. J. (2008). Engineering project management. Oxford, Blackwell Publishing.

Steenhuis, H.-J. (2000). International Technology Transfer, University of Twente. **Doctor**.

TLO (2009). Three Years Later: A socio-political assessment of Uruzgan Province from 2006 to 2009, The Liaison Office.

Turner, J. R. (1996). "International Project Management Association global qualification, certification and accreditation." International Journal of Project Management **14, No. 1**: 1-6.

USAFM (2006). US Army Field Manual 3-24 Counterinsurgency. Washington, Headquarters Department of the Army.

Verbraeck, A. (2009). Guideline for describing project risk.

Verhagen, F. R. (2008). Provincial Reconstruction Teams: a tactical asset for ISAF's Counterinsurgency Operations in the south and east? International Politics. Wales, Aberystwyth University. **MSc**.

Verschuren, P. J. M. and H. A. C. M. Doorewaard (2007). Het ontwerpen van een onderzoek, Uitgeverij Lemma.

Voet, G. S. v. d. (2008). "Het Provinciaal Reconstructie Team in de praktijk." Carré **1**: 14-17.

Winch, G. M. (2002). Managing Construction Projects, Blackwell Science.

Wirth, I. and D. E. Tryloff (1995). "Preliminary comparison of six efforts to document the project management body of knowledge." International Journal of Project Management **13, No. 2**: 109-118.

Woerdt, J. v. d. and H. A. d. l. Porte (2008). "Het Nederlandse Provincial Reconstruction Team, het concept." Carré **1**: 6-9.

Yin, R. K. (2003). Case Study Research, Design and Methods, SAGE Publications.

List of interviews

The names of the interviewees are left out due to confidentiality reasons.

Interview	Position	Date interview
Interview A	Project manager DMO	14-05-2010
Interview B	Functional Specialist Civil Infra, 1st CIMIC Batallion	17-05-2010
Interview C	Functional Specialist Civil Infra, 1st CIMIC Battalion	19-05-2010
Interview D	Functional Specialist Civil Infra, 1st CIMIC Batallion	03-06-2010
Interview E	Functional Specialist Civil Infra, 1st CIMIC Batallion	10-06-2010
Interview F	Functional Specialist Civil Infra, 1st CIMIC Batallion	12-08-2010
Interview G	Functional Specialist Civil Infra, 1st CIMIC Batallion	17-08-2010
Interview H	Functional Specialist Civil Infra, 1st CIMIC Batallion	30-09-2010 (phone call)
Interview I	Functional Specialist Civil Infra, 1st CIMIC Batallion	27-10-2010
Interview J	Functional Specialist Civil Infra, 1st CIMIC Battalion	27-10-2010

Confidential sources Chowtu bridge

ID	DOC NAME
1	Report contractorsmeeting
2	Assignment definition
3	Concept proposal
4	Plan Chowtu
5	Meeting report
6	Progress report
7	Meeting report
8	Rough cost calculation
9	Report contractorsmeeting
10	CJSOTF meeting
11	Report contractorsmeeting
12	Rough cost calculation
13	Report Chowtu Embassy
14	Calculation and foundation check
15	State of affairs G9
16	Investigation funding RCS
17	Request for information memo
18	Memo state of affairs RCS
19	Reaction to breefing RCS
20	Bemo Chowtu
21	State of affairs SitRep G9
22	Plan Chowtu 2
23	USAID meeting report
24	Status report Chowtu
25	FRAGO 1
26	FRAGO recce
27	FRAGO 2
28	Material list
29	Planning Chowtu
30	Chronological overview
31	Final Recce report Chowtu
32	Final Recce report Chowtu
33	Bridge crossing Chora

PERSONS		
F		CIMIC Functional Specialist Civil Infra involved in preparation phase of the project until project was transferred back to the Americans
G		CIMIC Functional Specialist Civil Infra involved in preparation phase of the project
R	C. Hodiamont	Researcher

Confidential sources road Tarin Kowt – Chora

ID	DOC NAME
1	Weekly reports RRCC (six in total), May-June 2009
2	Email conversation GTZ-PRT, September 2009
3	Monthly report GTZ, October 2009
4	GTZ weekly meeting report, January 28th 2010
5	UBCC workplan, January 26th 2010
6	UPDP weekly report
7	UPDP ninth coordination meeting
8	UPDP tenth coordination meeting
9	Meeting report GTZ and PRT
10	Meeting report GTZ, PRT and UBCC
11	Meeting report GTZ, PRT and UBCC
12	UPDP 12th coordination meeting
13	UPDP 13th coordination meeting
14	UPDP 14th coordination meeting
15	Meeting report GTZ, PRT and UBCC
16	Meeting report GTZ, PRT and UBCC
17	UPDP 15th coordination meeting
18	Access roads picture
19	TK-Chora internal meeting PRT
20	Presentation TK-Chora april 16th
21	S2 FRAGO TK-Chora road April 18th
22	Dreigingsanalyse S2, April 20th
23	Issue of order (ppt), April 24th
24	Commanders Back Brief, April 26th
25	FRAGO rev 1, April 28th
26	FRAGO TFU, May 21st
27	FRAGO PRT, June 22nd

PERSONS	
R	C. Hodiamont (researcher)

Name	Type	Location	Civil participants	Role military	Time span	Budget	Information	Assessment
Road Tarin Kowt-Chora	42 km provincial asphalt road, part of Uruzgan Provincial Development Program (UPDP)	outside of base in non/semi permissive area	GTZ (German NGO, main contractor), Afghan subcontractor, Dutch government (BUZA & OS sponsor), local workers and security	Involvement PRT mainly side projects and site visit/monitoring, staff sections, DEVAD and FS consultancy	planning started in 2007, execution phase 1 (first 16 km) expected end of June 2010, status still running	?, funded by OS/BUZA	98 files ex photo's, ranging from 28-5-09 till 21-5-10, no direct contacts, maybe via FS	Nice project, big scale, no direct contacts but quite some docs that hold risk info, role military is limited in the project, relevance risk for the military? Still running?
Airport Tarin Kowt	local airport, not realized in the end because dit not fit requirements BUZA/OS	TK, near base camp?	BUZA & OS, GTZ, consultant	HQ ISAF (client), Australian RTF (design and research), project too big for the PRT, some consultancy FS	first intiatives reported date back to Oct-06, conceptual design in nov-07, project was cancelled somewhere July-08	Estimated 27M USD (option B)	86 files, ranging from 20-11-07 till 17-7-08, two FS contacts	Good example of a project that did not make it, some docs that hold risk info, HQ was client so could be relevant, role PRT/FS?
Chowtu bridge	steel bridge, project got 'tail' later on when bridge pier subsided	outside of base in non/semi permissive area, near Chowtu close to Deh Rawud?	?	engineers PRT TFU, FS, local ANA training	originally planned for Aug-06 but due to damages postponed, planned opening end Feb-07	Rough estimate 3,7M USD and one of 0,7M USD?, funded by PRT?	155 files ex photo's, ranging from 30-11-06 till 28-10-07, 1 FS contact but more names and contacts in docs or via FS	Nice bigger scale project, several contacts and many various docs, leading role military in the project and relevant for risk management
Karez Dolanday	repair of local irrigation system	Dolanday?	Local (watershura's)	FS technical coordination, PRT force protection site visit	somewhere between January and May 2010	Between 30000-100000 USD, funded by?	20 files ex photo's, ranging from 26-12-09 till 4-5-09, 2 FS contacts	Relatively small irrigation project, few useful docs, 2 contacts and some relevance for risk
Police Training Centre	new training compound for the ANP	TK, outside the base perimeter within safety ring	Built by a local contractor	Supervised by FS	?	?	1 FS already interviewed, 1 other contact, 1 or 2 documents	In the interview already some occurred problems were identified
CIMIC projects	various types, small scale high visibility, quick impact projects	various locations	usually local contractors and village communities	MT monitoring, CSE project office, FS technical and financial advice, managed by the PRT	usually short term	probably all below 12000 USD	79 files, 15+ FS contacts	These projects are less suitable for individual case analyses, however could be interesting for an overall general analysis

APPENDIX B Uruzgan historical background

Afghan history is closely related to domestic political developments, regional and imperial dynamics, development of trade and commerce, cultural and religious features and local ethnic and tribal characteristics and tradition. From a recent political-historical perspective, a division can be made into seven periods (adopted from Frerks, Klem et al, 2006)(Bergen, Lindley-French et al. 2007).

From the beginning of the 20th century Afghanistan was an Independent monarchy (1919-1973). In 1973 former prime minister and member of the royal family Daoud Khan staged a coup and exiled the sitting king Zahir Shah. The republic was declared and so the Republican period (1973-1979) was initiated. With the help of the communist People's Democratic Party of Afghanistan (PDPA) Daoud came in a powerful position. Daoud's reign was autocratic and several opposing groups emerged. A constitutional revision for a one party state largely filled with the president's nominees worsened the relation between the regime and the Russians. When Daoud tried to eliminate the communist PDPA leaders a military coup by Russian trained officers killed the king and handed power over to the PDPA.

The PDPA introduced reforms that provoked resentment among the rural population. With the Russians a treaty of friendship and cooperation was signed, but after growing internal resistance the Soviets grew worried and invaded Afghanistan. During this period of Soviet invasion and domination (1979-1988) international attempts to affect Soviet withdrawal failed and the US started backing and arming Mujahideen fighters operating from Pakistan. After change of USSR and Afghan leadership new plans for withdrawal were talked over and agreed upon so the Russians left in 1989.

The eruption of a Civil War (1989-1992) between the Afghan interim government and the various Mujahideen factions supported by Pakistan and Iran resulted in the conquest of Kabul by the Mujahideen forces. The following period of Mujahideen rule (1992-1997) was characterized by deep divisions and disagreements based on ethnic, tribal, regional and religious affiliations. This situation escalated with regular fights.

Disillusioned by these achievements, a new force of religious students (talib or Taliban) was determined to correct the wrongdoings of the Mujahideen. Supported by Pakistan, the Taliban succeeded in taking the capital city Kabul. During Taliban rule (1997-2001) a drastic version of Islamic practice was imposed in the areas under their control. This regime was characterized by human rights violation, discrimination of women and opium trade. However they did not control the whole country permanently and the Northern Alliance seized control of the Northern provinces several times.

Following the attacks on 9/11 the US government linked the responsibility to Al Qaeda which was alleged hosted and supported by the Taliban regime. Seeking collaboration with the Northern Alliance the US-led invasion ('war on terror') titled Operation Enduring Freedom (OEF) became a fact. Following the invasion, the Bonn conference held in 2001 assured international support including a peacekeeping force (International Security and Assistance Force, ISAF). At this conference various Afghan representatives signed an agreement establishing the Afghan Interim Authority which became the later Afghan Transition Authority (2001-2004).

After a number of interim arrangements, a new constitution was agreed to by the Loya Jirga[15] and resulted in the election of Hamid Karzai as the first president of the Islamic Republic of Afghanistan (2004-present). Besides military operations against the Taliban, the international and domestic efforts also aimed their efforts on rehabilitation, reconstruction and development in general.

Dutch political and military involvement

During the Bonn agreement in December 2001 various Afghan representatives requested the United Nations Security Council (UNSC) to consider authorizing the early deployment to Afghanistan of a United Nations mandated force. This resulted in the establishment of the International Security and Assistance Force (ISAF). Because the Operation Enduring Freedom was still in place, NATO came up with an operational plan which addressed the phased transfer from OEF to ISAF in the different regions. Being a member of NATO, the Dutch government was informed about this plan in April 2004. A year later, in June 2005, the House of Representatives was requested by the NATO secretary-general to contribute to the ISAF mission by deploying Dutch armed forces into one of the Southern provinces. Two weeks later it was reported that it would investigate a possible contribution in cooperation with the Canadians, the UK and possible other partner countries. In December 2005 the outcome of this investigation was presented, the Dutch Task Force Uruzgan (TFU) would participate from August 2006 in the province of Uruzgan for a time period of 2 years. Besides the taskforce, the Dutch would take command of the Regional Command South Head Quarters (HQ RC-S) in Kandahar from November 2006 till May 2007. In November 2007 the Dutch government received a new request to lengthen their efforts in Uruzgan with another 2 years from August 2008 till August 2010. In February 2010 the Dutch government decided that the Dutch forces will leave Afghanistan after this second term (Frerks, Klem et al. 2006; Kamer 2009).

[15] An unique Afghan forum, only conveyed on special occasions, in which elders from various regions and ethnic groups settle major national affairs

APPENDIX C Stakeholders Chowtu Bridge

Military project team
The project team consisted of a captain, sergeant-major, sergeant and a captain from 1st CIMIC battalion civil infra. The team had limited positional power compared to the military command. However they operated as an independent unit of experts whose advice should be influential enough to have an impact on decisions made by higher command. Being ordered to build the bridge they had an active interest and a supportive attitude to complete the project. The project team was only temporary involved and limited project management expertise was available.

Dutch Army
The Dutch TFU and RC-S had a supportive attitude towards the realization of the bridge near Chowtu mainly because it provided tactical benefits. The commanders within the TFU and RC-S are powerful military actors because they determine the priorities and courses of action of the military units situated in the area. As initiator they were actively involved in the project but after delegating the execution and preparation of the project to the project team they would not remain actively involved. RC-S and TFU had access to smaller scale ISAF funds but these budgets were not sufficient for a project of this size. For funding they would therefore have to rely on external actors. For RC-S, the initiator of the project, feasibility and priority of the project became uncertain at some point (21), undermining the basis of the entire project. Different military commanders were temporary involved in the project.

The PRT had another preferred location for the bridge which would reach a greater public among the local population and therefore was less enthusiastic about the project at Chowtu which would be visible to only one small village. This makes it difficult to assess their attitude and interest towards the project which could be best expressed as 'forced actively supportive'. Their resource power is not assessed; positional power to influence the project is assessed low as they had to execute the order given from the TFU.

Ministry of Foreign Affairs and Development Cooperation (BuZa)
The Dutch ministry of Foreign Affairs and Development Cooperation was represented in the mission area by the Civilian Representative (CivRep) and Development Advisor (DEVAD). BuZa had the required funding available and therefore was a powerful stakeholder. Their ability and willingness to actively support the project had been uncertain for some time (15, 16) and they would not become more actively involved in the project until September 2007. In a status report dating end of October 2007 it is reported that they were reluctant to fund the project because they believed that the bridge was built for military purposes only instead of economic development. Their attitude towards the project therefore was negative. Because of the difficult relation between the DEVAD and FS, the course of action of the Ministry as a stakeholder might be significantly influenced (interview F).

US Army Corps of Engineers
The USACE was working on the road development program and had several road projects running, including the road Tarin Kowt-Deh Rawud-Oshay. The bridge at Chowtu was a key part in this multi million dollar program however was not contracted in the road project because at the time of the tender procedure the US attempt to build the bridge was already underway (19). Their interest in the project was passive as they requested the Dutch Army to build the bridge. By

personal interpretation the USACE is a big player in the reconstruction of Afghanistan and their attitude is assessed positive.

USAID
Direction for USAID to fund this project would have to be approved by the Ambassador because money should be reallocated from another project (23). Based on the available documentation their power is assessed low. Their interest was passive as they were only involved in some coordination meetings and their attitude towards the project was uncertain, probably not a blocker.

MRRD
The representative of the MRRD showed high interest in the project (31) and therefore has a positive attitude towards the project. As one interviewee mentioned 'local Afghans would never show a negative attitude towards an initiative even if they think it is not going to work or contribute' (interview F). As soon as the bridge would be constructed they declared to be willing to take over the property (20). Their power to influence the project was rather low as they did not take part in the decision making and no specific resources were available. Their active contribution is assumed to be limited because of their own limited ability to execute such a big project.

OMF
The construction of a bridge would probably have been seen as a threat to the OMF as it gave ISAF more mobility to operate west of the river bank which was OMF controlled territory. They are influential and aggressive in the area and therefore assessed to be a powerful active blocker.

Local contractors
Some contractors were consulted regarding the feasibility of the design, execution and technology used. So for this stage the power of local contractors to influence the project is assessed to be limited. As no contractor had been selected so far they had a rather passive interest and somewhat positive attitude towards the project in this stage as it offered them an opportunity to earn money in the future.

Mabey & Johnson
The company Mabey and Johnson produces their famous bridge elements in the UK. Their attitude towards the project is positive as it offers them an opportunity to earn money. Their interest is assessed to be passive as their only concern in the project is customer support (expertise) and possibly delivering extra materials. They do not have direct power or ability to influence the project as the bridge materials are already present at several base locations in Uruzgan.

ANA
The Afghan National Army would provide personnel that will be trained to become qualified Mabey & Johnson bridge building engineers. Based on personal interpretation they are assessed to be a low power, low interest stakeholder, probably not blocking the project.

ASF
The security checkpoint at the river crossing was occupied by a local militia, who guarded the OMF controlled area on the west bank of the bridge. During preprations the organization of the project relied on the security performance of this checkpoint. The ASF was not in a decision making position and therefore are considered low power, low interest with an uncertain attitude.

Local population

According to a proposal dating May 2007 the population of Chowtu supports Afghan authorities and ISAF (3). However in documentation it remains uncertain whether they would be really supporting the project. In this stage their interest was probably passive and their power to influence the project insignificant. Also one landowner had been identified which was located on government land property. This farmer was assumed to be insignificant, passive with an uncertain attitude.

An impression of the ANA engineer training. Here the engineers were taught how to construct a Mabey and Johnson bridge.

APPENDIX D Project definition Chowtu Bridge

Aim of the project
In the order of RC-S is described that successful construction of the bridge will provide freedom of movement all year round for the local population as well as ISAF and ANA forces (25). Opening up of the area west of the river bank results in increased intelligence (2) and more mobility with armoured vehicles to operate in that area (27). Villages on the west bank of Chowtu get the opportunity to travel to and get access to services and trade provided in Deh Rawud (3), local employment is created although big economic benefits are not expected (2). The end state is described as a properly built bridge that will provide the population an opportunity to cross the river Helmand all year round.

Scope development
From the above mentioned goal the scope of the project is derived. In the order given to the PRT in January 2007 it is mentioned that the existing pier and abutments are used temporarily to build a Mabey & Johnson bridge until the new pier is constructed (27). At the end of February 2007 the project scope was to remove the existing pier and build a new one on which the M&J bridge could be positioned (1). In a concept proposal dating May 2007 the scope is to construct a new pier and new abutments on which a M&J bridge is built (3).

The scope of the project also included the rebuilding of the nearby checkpoint and extra defensive positions, to be able to lodge the extra people during construction and to fit the new requirements after the bridge is completed (6, 27). Commissioning after completion to local authorities, the Ministry of Rural Rehabilitation and Development (MRRD), and training of an Afghan National Army (ANA) maintenance crew were also part of the scope. It is also mentioned that there remains uncertainty whether the roads leading to the site need to be improved or repaired (6), because the soil conditions of the river bed were unsuitable for heavy equipment according to an US reconnaissance patrol. The connecting roads were not included in the scope because this fell under the responsibility of the USACE road project.

In nearly half a year the scope of the project changed from building only the top M&J construction to a full scale construction including foundation, abutments and pier. The goal to complete - building a bridge over the river – was clear but what to construct, the location and construction methods were uncertain and difficult to define and therefore still ongoing in the decision making process. Trade-offs were to be made so construction could be as quick as possible, requiring no additional delivery time of materials, or that technical feasibility of the foundations would be maximized. An addition to the scope of the bridge construction was the checkpoint upgrade and lodge for personnel including all necessary services to keep the work and security force operational during construction.

Duration and time
In the first attempt, dating January 2007, the time needed for construction was estimated around 4-6 weeks. Construction could start within 3-4 months (June-July) after the expected spring flood in the coming 2-3 months (1). Construction on site should be as short as possible (4). For the first plan which is to construct only a M&J bridge on existing abutments this is estimated between 7-10 days. In a later report the construction of piers and abutments takes at least 2 months excluding the bridge construction which is then estimated to take 2-3 weeks.

In the second attempt, after flooding destroyed the existing bridge remains, documents dating August 2007 reveal that it is crucial from tactical point of view to have a bridge at the end of the year. It is expected that the checkpoint on the West bank is being attacked by OMF as soon as ISAF is not able to reach the other side of the river due to high water levels (13). Additional time pressure is caused because the expected high water level makes it impossible to conduct construction activities in the river. End of November 2007 the pier and abutments should be ready, so the bridge could be finished by January 2008 (13). This appears to be wishful thinking as in a later memo dating beginning of September 2007 it is reported that Chowtu bridge is highly unlikely to be completed this year and it is assessed that the bridge can be finished at the earliest by the end of March 2008 (19).

In October 2007 is reported that the connecting roads being built by the USACE could reach Chowtu area by spring 2008, however the road project could be delayed as well (24). If a bridge would be completed by that time, the route of the road could be adjusted to take advantage of the bridge. If the bridge would not be in place probably the contractor of the road project would be required to build one which could be of a different type and in a different place than considered so far.

Documentation dating August reported that American engineers were planning to build a temporary low water crossing. They conducted a site visit and concluded that the remaining abutments could be used for a temporary M&J bridge which then should be removed before spring so a definitive new bridge could be constructed in summer 2008 (10).

In some documents it seems that time was important from a tactical perspective, due to the rising water levels and because of the expected progress of the road project. Also the proposal to use no official tender procedure to save time (6) and the long delivery times of materials indicate trade-offs with respect to a preferred early completion date. However in the end the project was not realized by that time due to infeasibility of the project or maybe due to changed tactical priorities. One clear promise identified is the construction duration on site which should be as short as possible.

Cost and budget development

In January 2007 the cost of the bridge pier is estimated at 25.000-35.000 USD (1). In May 2007 the project costs are estimated 200.000 USD for the construction of a new pier, abutments and M&J bridge on top (3).

In August 2007 a rough cost calculation shows a total amount of 2.6 million USD direct costs (8). Including overhead, risk and unforeseen this adds up to 3.7 million USD. It is expected that the entire project will need an additional budget of between 1.5 and 2 million USD. This difference in cost is caused by free provision of the M&J bridge material (estimated value 1.200.000 USD) by the Americans (18).

A cost calculation for the Dutch Embassy already shows 700.000 USD total cost including overhead, risk and uncertainty but contains unknowns in the estimation like the required sheet piles and the transport to Afghanistan of additional materials.

Acquiring funding was crucial in this stage of the project. Project promises regarding cost were not yet identified because part of the cost estimations still remained highly uncertain. In a rough calculation the total amount reserved for

risk and unforeseen events adds up to 790.000 USD (8) which gives some indication for possible acceptable cost impacts on the promises.

Quality
Quality can be seen as how good the realized project fulfills certain functionality requirements regarding the final product or service to be delivered. In the available documentation some constraints, some technical requirements, dimensions and work methods are mentioned. Above all the construction of a reliable bridge is mentioned (13) as previous attempts to build a bridge have failed because the construction was damaged or washed away during flood. When the construction of the founding is done well the bridge will be more likely to withstand a high water level in the river (3). How this is 'done well' depends on factors as the technique used (a pier on concrete piles, use of sheet piles), the quality of the materials used, proper execution etcetera, however further details remain unspecified. Other requirements are unclear or not found. One would for example expect some requirements regarding the maximum load of the bridge, as this relates to the functionality to hold what type of equipment, one vehicle at a time or a whole convoy simultaneously etcetera. Also the lifetime of the project is not defined while quality also relates to what functionality can be delivered for a certain duration of time.

In terms of functionality the requirements that were found can be translated into a project promise as follows. The functionality requirements are to provide reliable infrastructure that allows access to the river West bank with heavy equipment 24/7 all year round for a period of at least 15 years.

Reputation
A specific objective on organizational strategic level is to improve the reputation of the home country government and national army supported by ISAF in the perception of the local population. In project proposals these objectives translate into the following. One example is to demonstrate the joint planning and execution of operations between GoA, ISAF and ANA so people see that the ANA not only defends their country but is also capable of reconstruction (25). Another example is that the local population must have noticed the importance, quality and benefits of the local GoA and ANSF (27). This is attempted by involvement of the local population and local leadership in the project from the beginning and to gain commitment through an intensive IO campaign (27).

So reputation objectives are mentioned in documents but do not always seem to reflect practice. A patrol was planned to visit the elders of Chowtu to make an assessment of the situation. Because there was only one interpreter in the patrol, who had to be used at the checkpoint visit, they did not manage to get in contact with the local population (5). Some forms of local involvement and cooperation do exist, for example contact with local authorities (MRRD) and ANA is established for operation and maintenance after completion and also local contractors are involved in giving advice regarding the design.

In one document is mentioned that an attack on the checkpoint would result in loss of face for the local government and ISAF towards the local population (13). Reputation damage might result in a lot of resistance towards the project by the population (and risk not being used) or lead to increased support from the population towards the OMF (for example in later stadium) therewith undermining the legitimacy of the project and the mission as a whole. An attack during construction or project failure could have the same effect towards the population and therefore prevention of loss of face is an important project promise. Once started, a successful project gives the opportunity to show reputational benefits

for ISAF, GoA and ANA. Reputation relates to stakeholder relations and therefore these should be managed with care.

Health safety and security

Usually in projects health safety and environment objectives are defined. From the documentation is observed that the environment is not considered important but security rather is and therefore the term has been changed into HSS.

Health relates to the physical conditions of personnel employed during construction, for example disease, injury or death. Safety relates to safety of the personnel during construction but can also relate to safety of the construction during or after completion, for example accidents. Security relates to the protection of personnel, construction site and equipment from attacks during construction (4). Security can be split into passive security, construction of for example strong points and reinforced check points, and active security, manned observation points and patrols.

From a project proposal the project promise HSS can be derived. During the project 'someone will need to protect a large group of workers over a long period of time in a very volatile area (24). De construction of the bridge could be disturbed by OMF, however force protection from TFU and ANA will be present to prevent this' (20). Besides security surveillance is meant to prevent theft of materials 24/7 on site. During and after realization of bridge the area itself and movement therein should be controlled and secured by a checkpoint to allow ISAF, ANA and the local population to use the bridge while OMF forces should be retained from using or disturbing it.

This picture shows the crossing before the spring flood, this one is taken from the west side of the embankment. The existing pier and abutments and the ferry boat can be clearly distinguished.

This picture was taken from the hill on the east side of the embankment showing the crossing after the spring flood. On the middle sand bank in this picture the east abutment was located. The pier has been completely washed away.

The official opening of the bridge after it was built by the US Army Corps of Engineers. On the mountain top in the right upper corner one can see the checkpoint overlooking the bridge.

APPENDIX E Probability-Impact scales Chowtu Bridge

SCALE	PROBABILITY	+/- IMPACT ON PROJECT PROMISES					
		Time	Cost	Quality	Scope	Reputation	HSS
VHI	> 50%	> 8 days delay during construction, not able to finish before spring 2008	> 80.000 USD	due to major construction error, no access with any equipment only personnel, no access for more than 1 month, lifetime shorter than 5 years	new design, construction span is longer than 120m, pier and abutments have to be reconstructed, an additional checkpoint is required	reconstruction failes during construction, safety or fraud incident in the (inter)national mass media, loss of face in the province by ISAF, GoA and ANA	multiple deaths and life threatening injuries, multiple kidnaps, loss of control in the area, no access by air en road to the site, protection not guaranteed
HI	11-50%	4-8 days delay during construction, not able to finish before January 2008	41.000-80.000 USD	construction heavily damaged due to major construction error, no access with heavy equipment only light equipment, no access during flood (1 month), lifetime shorter than 10 years	major design change, pier or abutment has to be constructed, additional river training works needed, additional upgrade to security checkpoint	safety or fraud incident in the provincial mass media, local population does not notice the importance and benefits of GoA and ANSF, local population turns negative towards the project	single death, multiple heavy injuries or long term unemployable personnel, single kidnap, strong reduced control in the area, limited access by road and air transport to the site, protection partly not guaranteed
MED	2,6-10%	2-4 days delay during construction	21.000-40.000 USD	construction slightly damaged due to construction error, limited access with heavy equipment, no access during maximum of 2 weeks	minor design change, major repairs to existing pier or abutments, major repairs to security checkpoint, major repairs to adjacent road, additional culvert	no commitment gained from the local population and leadership, minor safety incident spreads in the surrounding villages like damage to a public service, local population does not use the bridge, insult towards local leadership	multiple persons lightly injured or (partly) short term unemployable, reduced control or access by road in the surroundings, protection slightly deteriorated
LO	1,1-2,5%	1-2 days delay during construction	10.000-20.000 USD	no access during maximum of 1 week, local population has no access, lifetime shorter than 15 years	minor repairs to existing pier or abutments, minor repairs to security checkpoint, minor repairs to adjacent road	minor safety incident spreads in the local village, one family is affected by a single incident like damage to personal property	single person short term (partly) unemployable due to work related injury
VLO	0,1-1,0%	< 1 day delay during construction	< 10.000 USD	no access for less than a day	a single minor repair	a minor dispute with a local family being affected by the project	single person short term partly unemployable due to disease or weather conditions
NIL	< 0,1%	no change	no change	no change	no change	no change	no change

APPENDIX F Risk Register Chowtu Bridge

RBS LEVEL 0	RBS LEVEL 1	RISK nr	RISK DESCRIPTION				PROBABILITY	IMPACT ON						MITIGATION POSSIBILITIES
			CAUSES (definite facts that contribute to the occurrence of the event)	Source(s)	EVENT (uncertain event or set of circumstances)	EFFECTS (direct impacts on one or more project objectives)		HSS	Reputation	Scope	Time	Cost	Quality	
environment / weather risk		1	Because we intend to use the existing pier and abutments to build a M&J bridge on top	3, 11, 13	it might be the case that the pier and/or abutment(s) are washed away by the spring flood	so the existing pier and/or abutment(s) cannot longer be used to build a bridge, affecting the scope of the project	MED	-	-	VHI	-	-	-	AVOID by not using the existing structures, by building new foundations using better technology (sheet piling), by choosing an alternative location, by choosing for an upgraded ferryboat
			Due to high water level (??m) and strong current in the river during the yearly spring flood			so the construction of the M&J bridge would be delayed	MED	-	-	-	VHI	-	-	
			Because the pier and abutments are built using local techniques			so the completed bridge would be destroyed, resulting in loss of face of ISAF and GoA towards the population	HI	-	VHI	-	-	-	-	REDUCE by reinforcing the structures, ACCEPT by waiting untill June to test if the existing structures survive the spring flood, redesigning and reconstructing the foundations or bridge if it occurs
			Because the strength and stability of the existing pile foundations is uncertain			so the completed bridge would be destroyed, resulting in the loss of its entire functionality	HI	-	-	-	-	-	VHI	
		2	Due to high water level (??m) and strong current in the river during the yearly spring flood	3, 11, 13	it might be the case that the pier and/or abutment(s) are undermined by the spring flood	so the existing pier and/or abutment(s) would no longer provide the required strength and stability to build a class 60 bridge	MED	-	-	-	-	-	HI	AVOID by not using the existing pier and/or abutments or by building another type of bridge that does not require the existing pier and/or abutments, choosing an alternative location
			Because a class 60 bridge is required to transport armoured vehicles											
			Because a class 60 bridge requires strong (??kN) and stable foundations			so the existing pier and/or abutment(s) cannot longer be used to build a bridge, affecting the scope of the project	MED	-	-	VHI	-	-	-	TREAT by waiting untill June to test if the existing pier and/or abutments survive the spring flood or by construction of additional counter-undermining-measures
			Because we intend to use the existing pier and abutments to build a M&J bridge on top											ENHANCE by building a new pier and/or abutments using sheet piling technology
			Because the strength and stability of the existing pile foundations is uncertain			so the completed bridge would no longer provide the required strength and stability to be used as a class 60 bridge	MED	-	-	-	-	-	HI	ACCEPT and take no direct action, fix the damage if it occurs
			Because the pier and abutments are built using local techniques											ACCEPT and take no direct action, fix the damage if it occurs
		3	Because we have chosen a location for the bridge just before the coming spring flood	13, 33	it might be the case that the riverbed at the chosen location erodes	so we might have to choose an alternative location for the bridge and make a completely new design which would lead to additional time, scope and cost, new reconnaissance	HI	-	-	VHI	HI	HI	-	AVOID by choosing an alternative location with a better fixed riverbed, TREAT by waiting untill June to see the effect of the spring flood on the riverbed
			Because the design for the bridge is based on the current riverbed conditions			so we might have to adjust the existing bridge design to make it fit into the changed riverbed which would lead to additional time, scope and cost	HI	-	-	MED	LO	LO	-	TREAT by making a flexible design that is still adjustable to changed riverbed conditions or a design that is not affected by changing riverbed conditions
			Because we want to start construction just before the coming yearly spring flood			so we might have to modify (part of) the finished construction which would lead to additional time, scope and cost	MED	-	-	MED	HI	MED	-	ACCEPT and take no direct action, fix the construction if it occurs
			Due to high water level (??m) and strong current in the river during the yearly spring flood											

RBS LEVEL 0	RBS LEVEL 1	RISK nr	RISK DESCRIPTION				PROBABILITY	IMPACT ON						MITIGATION POSSIBILITIES
			CAUSES (definite facts that contribute to the occurrence of the event)	Source(s)	EVENT (uncertain event or set of circumstances)	EFFECTS (direct impacts on one or more project objectives)		HSS	Reputation	Scope	Time	Cost	Quality	
		4	Because there's a wadi crossing the adjacent road towards the bridge site Because the wadi has strong currents during rain periods Because the road is not fit to withstand strong currents	13, F	it might be the case that the adjacent road is washed out	so we might have to repair the adjacent road which would lead to additional scope, time and cost	HI	-	-	MED	MED	LO	-	AVOID by redirecting the wadi, TREAT by placing culverts underneath the road, ACCEPT and repair the road if risk occurs
personnel		5	Because we want the M&J bridge to be built by a group of qualified ANA engineers To qualify these ANA engineers get specialized training which takes time ANA engineers are scarcely available Because the ANA engineers could be required at other projects as well	4, 6	the qualified ANA engineers who are trained to build the bridge might be needed elsewhere and are redeployed	so we have to continue with fewer qualified personnel, which would lead to delay during construction	VHI	-	-	-	HI	-	-	AVOID by not using ANA engineers for the construction and do it ourselves, TREAT by reserving time for selection and training of new personnel just before embarking on construction, ACCEPT and assemble unqualified personnel directed by PRT engineers
		6	Because we want the M&J bridge to be built by a group of qualified ANA engineers To qualify these ANA engineers get specialized training which takes time ANA engineers could prove to be unreliable or supporting the OMF	4,6	qualified ANA personnel might have to be removed from the project during construction	so we have to continue with fewer qualified personnel which could lead to delay during construction	LO	-	LO	-	LO	-	-	ACCEPT and continue with the remaining ANA personnel
		7	Because personnel needs to be fully operational during construction of the bridge Because hygiene conditions are primitive	4	there is the possibility that disease breaks out	which would lead to (temporary) loss of personnel and delay during construction	LO	HI	MED	-	VHI	-	-	TREAT by taking sufficient food, water and medical supplies, organize lodging and sanitation facilities, medic on site responsible for hygiene, ACCEPT the residual risk
		8	Because personnel needs to be fully operational during construction of the bridge No safety gear is applied during construction	R	there is the possibility that an accident occurs	which could lead to multiple injuries and long term unemployable personnel, time delay during construction	HI	MED	LO	-	LO	-	-	TREAT by using safety gear, experienced safety officer on site responsible for safety, medic on site including medical supplies, ACCEPT residual risk, MedEvac prepared
		9	Because local contractor needs to work in highly volatile area Local contractor does not have security of his own	F	there's a chance that the local contractor is threatened or intimidated by OMF	so the local contractor might be forced to stop working on the project which would lead to time delay	HI	-	-	-	MED	-	-	TRANSFER to contractors own responsibility, TREAT by providing contractor security, ACCEPT and take no direct action, find another contractor if it happens

RBS LEVEL 0	RBS LEVEL 1	RISK nr	RISK DESCRIPTION				PROBABILITY	IMPACT ON						MITIGATION POSSIBILITIES
			CAUSES (definite facts that contribute to the occurrence of the event)	Source(s)	EVENT (uncertain event or set of circumstances)	EFFECTS (direct impacts on one or more project objectives)		HSS	Reputation	Scope	Time	Cost	Quality	
supply risk		10	Because we want the sheet pile foundation and bridge construction to be built by a local contractor Because we do not know and control the contractor's performance The military does not provide clear quality requirements to local contractors	9	the performance of the selected contractor might be unsatisfying	so he has to be removed from the project and we have to find another contractor which would lead to time delay	MED	-	-	-	MED	-	MED	TREAT by conducting contractor meetings, regular or continuous work supervision (monitor), contractor's design checked by Dutch engineers, providing clear quality requirements, ACCEPT and take no direct action, find another contractor if performance is unacceptable
	equipment	11	Because we need a crane and shovel to construct the bridge Equipment is subject to wear Repairs require qualified repair personnel which are scarce Spare parts not available and large distance to repair shops and spare parts	4	the shovel or crane might (temporarily) stop functioning due to damages	so we have to order and transport new spare parts which would lead to delay during construction	MED	-	-	-	HI	-	-	TREAT by taking sufficient supplies, oil gas, qualified personnel, repair kit and engineer, most important spare parts, TREAT by bringing an extra shovel and crane for backup, ACCEPT the residual risk, take into account more delay
		12	Because we want to use a military crane and shovel to construct the bridge which are scarce Military equipment requires qualified operators which are scarce Other projects also require crane and shovel equipment The project planning is uncertain	4	there might be a resource conflict	so the military equipment and qualified operators are unavailable which would lead to delay during construction	LO	-	-	-	MED	-	-	TRANSFER by using local contractor's equipment, TREAT by planning ahead, coordinating, monitoring
		13	Because we need fully operational personnel to construct the bridge, which requires requires food, water and medical supplies which are limited	4	there is the possibility of a supply shortage	which could lead to (temporary) loss of personnel and delay during construction	VLO	MED	-	-	HI	-	-	TREAT by taking extra crucial supplies to cover shortage gap
			Because we need a crane and shovel to construct the bridge which require oil, gas and spare parts supplies to be fully operational which are limited											ACCEPT the residual risk and have a backup plan by air supply
			Because of a possible longer stay then expected Because the resupply lines cover long distances through highly volatile area to the nearest supply depot Because road transports are often cancelled			the shovel or crane might (temporarily) stop functioning which would lead to delay during construction	MED	-	-	-	HI	-	-	TREAT by taking extra oil, gas supplies to cover shortage gap ACCEPT the residual risk and have a backup plan by air supply

RBS LEVEL 0	RBS LEVEL 1	RISK nr	RISK DESCRIPTION				PROBABILITY	IMPACT ON						MITIGATION POSSIBILITIES
			CAUSES (definite facts that contribute to the occurrence of the event)	Source(s)	EVENT (uncertain event or set of circumstances)	EFFECTS (direct impacts on one or more project objectives)		HSS	Reputation	Scope	Time	Cost	Quality	
	logistics	14	Because the transport drives poor quality roads through highly volatile area with high IED threat	F	the road transport might be cancelled	so it takes longer to deliver the required materials, equipment or supplies, leading to delay during construction	HI	-	-	-	LO	-	-	TRANSFER to a local or private party that is capable of conducting transport
			Because construction cannot continue without the transport's materials, equipment or supplies											TREAT by having all materials needed on site, plan transport in good weather period, construct an asphalt road towards the construction site
			Because bad weather conditions from November till March make the roads unsuitable for heavy road transport											
			Because there's not sufficient military personnel and equipment available to provide the necessary security											ACCEPT the residual risk and have a backup plan by air supply
		15	Because the routes towards the site are dirt roads which can easily be boobytrapped	6	the road transport might get stuck on it's way to the construction site	which could delay the transport so it takes longer to deliver the required materials, equipment, or supplies, leading to delay during construction	VHI	MED	-	-	MED	-	-	AVOID by using helicopter transport
			Because boobytraps might be detected and need to be disarmed											
			Because construction cannot continue without the transport's materials, equipment or supplies											TREAT by having all materials needed on site, plan transport in good weather period, construct an asphalt road towards the construction site, check on alternative routes
			Because bad (winter) weather conditions make the roads unsuitable for heavy road transport											ACCEPT residual risk and assure force protection
			Several small bridges unsuitable for heavy transport are located along the route											
			Several steep hills and narrow roads are located along the route											
		16	Because there's no slack in the amount of equipment and materials which to be stored on site 24/7	4, 32	vital equipment or construction part(s) might get stolen	so we have to re-order new materials or equipment which would lead to delay during construction and extra cost	MED	-	-	-	VHI	MED	-	TREAT by locked and secured storage containers, welding loose bridge parts, active (patrols) and passive (fences) security on site
			Equipment and materials could be high demand items for locals,											
			Equipment and materials are not being (properly) guarded or secured											ACCEPT the residual risk and have some extra spare key materials

RBS LEVEL 0	RBS LEVEL 1	RISK nr	RISK DESCRIPTION				PROBABILITY	IMPACT ON						MITIGATION POSSIBILITIES
			CAUSES (definite facts that contribute to the occurrence of the event)	Source(s)	EVENT (uncertain event or set of circumstances)	EFFECTS (direct impacts on one or more project objectives)		HSS	Reputation	Scope	Time	Cost	Quality	
security risk	construction site	17	Because we will be working in a highly volatile area	F	an rocket, mortar, sniper or suicide bomb attack on site might occur	which could lead to multiple deaths and heavy injuries amongst security personnel or workers, incident in the international news, delay during construction	VHI	VHI	VHI	-	MED	-	-	TRANSFER site security to ANA forces, special forces or hire local militias
			The ASF checkpoint responsible for security in the area does not have reliable security performance			which could lead to destroyed materials or equipment which need to be replaced and therewith delay during construction and extra cost	VHI	-	MED	-	VHI	MED	-	TREAT by active (patrols) and passive (checkpoints, observation posts) security on site and main approach routes, checkpoint upgrade, construction of an extra checkpoint
			The surrounding terrain offers possibilities for attacks			which could lead to a (partly) damaged or destroyed bridge construction so we might have to do extensive repairs, resulting in additional time, scope and cost	VHI	-	MED	MED	VHI	MED	-	ACCEPT residual risk, QRF in backup
		18	Because OMF forces are not in favour of the project and wants to be in control of the crossing	5, F	the security checkpoint and/or construction site might be overrun by an organized OMF attack	which could lead to multiple deaths and heavy injuries amongst security personnel or workers, incident in the international news, delay during construction	HI	VHI	VHI	-	MED	-	-	TRANSFER site security (partly) to ANA forces, special forces or hire local militias
			ASF security is not very reliable, they easily get bribed or flee			which could result in loss of control by ISAF/ANA over the river crossing area resulting in termination of the project and loss of face towards the local population	HI	VHI	VHI	VHI	VHI	VHI	-	TREAT by active (patrols) and passive (checkpoints, observation posts) security on site and main approach routes, checkpoint upgrade, construction of an extra checkpoint, coordinate responsibilities between US/NLD
			The ASF checkpoint responsible for security is not able to sustain itself			which could lead to destroyed materials or equipment which need to be replaced and therewith delay during construction and extra cost	HI	-	MED	-	VHI	MED	-	
			It is unclear who is responsible (US/NLD) to improve the security performance of the ASF checkpoint			which could lead to a (partly) damaged or destroyed bridge construction so we might have to do extensive repairs, resulting in additional time and cost	HI	-	MED	MED	VHI	MED	-	ACCEPT residual risk, QRF in backup with additional heavy artillery or air support, not all construction materials on site and some extra spare key materials behind on base
	lines	19	Because materials, equipment and supplies need to be transported to the construction site through highly volatile area controlled by OMF	4	an organized OMF attack on the road transport might occur	which could lead to multiple deaths and heavy injuries amongst personnel, incident in the international news	MED	VHI	VHI	-	-	-	-	TRANSFER transport security (partly) to ANA forces, special forces or hire local militias/private parties
			Because OMF could become aware about the coming transport			which could lead to destroyed materials or equipment which need to be replaced and therewith delay during construction and extra cost	MED	-	MED	-	HI	HI	-	TREAT by including force protection and recon, alternative routes, secret transport departure, night transports
			Because construction cannot continue without the transport's materials, equipment and supplies			which could delay the transport so it takes longer to deliver the required materials, delaying the project	MED	-	-	-	LO	-	-	ACCEPT residual risk, QRF in backup with additional heavy artillery or air support, having all materials needed on site while some extra spare key materials behind on base

RBS LEVEL 0	RBS LEVEL 1	RISK nr	RISK DESCRIPTION				PROBABILITY	IMPACT ON						MITIGATION POSSIBILITIES
			CAUSES (definite facts that contribute to the occurrence of the event)	Source(s)	EVENT (uncertain event or set of circumstances)	EFFECTS (direct impacts on one or more project objectives)		HSS	Reputation	Scope	Time	Cost	Quality	
	supply	20	Because materials, equipment and supplies need to be transported to the construction site through highly volatile area controlled by OMF	9	the road transport might hit an Improvised Explosive Device (IED)	which could lead to multiple deaths and heavy injuries amongst personnel, incident in the international news	VHI	VHI	VHI	-	-	-	-	TRANSFER to a local or private party that is capable of conducting transport
			Because the routes towards the site are dirt roads which can easily be boobytrapped so there are plenty IED's			which could lead to destroyed materials or equipment which need to be replaced and therewith delay during construction and extra cost	VHI	-	MED	-	HI	HI	-	TREAT by IED detection and countermeasures, construct an asphalt road towards the construction site, check on alternative routes
			Because construction cannot continue without the transport's materials, equipment or supplies											
			Because information regarding the bridge location has leaked OMF could become aware about the project			which could delay the transport so it takes longer to deliver the required materials, equipment or supplies, leading to delay during construction	VHI	-	-	-	LO	-	-	ACCEPT the residual risk and have a backup plan by air supply, some extra spare key materials behind on base
sk		21	Because we want the M&J bridge to be built by a group of qualified ANA engineers	C	unexpected construction errors might occur during construction	leading to delay during construction, extra cost and loss of quality	MED	-	-	-	LO	LO	MED	TREAT by having an experienced M&J instructor on site for monitoring and control
			Qualified ANA engineers have limited experience building M&J bridges											ACCEPT residual risk
			Qualified ANA engineers sometimes have a careless attitude											
		22	Because we have very limited insight in the soil and riverbed conditions	6, 7, 14	we might design foundations using invalid assumptions regarding soil and riverbed conditions	which would lead to insufficient stability and strength of the foundations and therefore poor quality	VHI	-	-	-	-	-	VHI	AVOID by using an alternative location which has clear conditions
			Because the local knowledge of the soil and riverbed conditions is very limited											TREAT by conducting a soil survey (by an external party), calculations check by Dutch engineering firm, take into account uncertain soil conditions in the design
			Because there's no local expertise to conduct soil surveys											
			The construction site is located in highly volatile area											ACCEPT and take the gamble

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			CAUSES (definite facts that contribute to the occurrence of the event)	Source(s)	EVENT (uncertain event or set of circumstances)	EFFECTS (direct impacts on one or more project objectives)		HSS	Reputation	Scope	Time	Cost	Quality	
technical ri		23	Sheet piling technology is preferred because it is the only reliable method to prevent undermining of the foundations	11, 13, 14	we might not be able to use sheet piling technology	so we have to fall back on local technology resulting in scope change and less reliable foundations	HI	-	-	HI	VHI	-	HI	AVOID by using local methods or by choosing an alternative location for the bridge, changing the design so no foundation is required
			Because sheet piles are unavailable in Afghanistan and surrounding countries they have long delivery times to be ordered from Asia											TRANSFER to a local or private party that is capable of conducting transport
			Sheet piling technology is preferred because it is the only method quick enough to start construction just before the coming yearly spring flood											TREAT by flying the materials in, hiring a contractor from outside the country
			Because sheet piles need to be transported long distances from the border with Pakistan trough highly volatile area with bad roads											
			Because only two contractors from Kabul have experience and equipment to work with sheet piling technology which have other projects as well											
			Because the military wants the bridge built by local contractors to stimulate the local economy											ACCEPT residual risk so time delay and less reliable foundations
	information	24	Because key military personnel involved in the project rotates after 2-3 months	F	important information, contacts and experience regarding the project could get lost	which would result in duplication of efforts, additional time and cost, reduced quality	VHI	-	-	-	LO	VLO	VLO	
			Because newly arrived personnel has to get used to the environment and work during the first one or two weeks											TREAT by improving transfer overlap, longer rotations for longer projects, document management system
			Because transfer of knowledge is poorly coordinated and executed in the mission area											ACCEPT residual risk

RBS LEVEL 0	RBS LEVEL 1	RISK nr	RISK DESCRIPTION				PROBABILITY	IMPACT ON						MITIGATION POSSIBILITIES
			CAUSES (definite facts that contribute to the occurrence of the event)	Source(s)	EVENT (uncertain event or set of circumstances)	EFFECTS (direct impacts on one or more project objectives)		HSS	Reputation	Scope	Time	Cost	Quality	
management risk	procedures	25	An official tender procedure requires a minimum of three contractors to subscribe to a bid while there are less than three suitable contractors available	14	official procedures might take longer than expected	so we can't start in time and finish construction before the water level becomes critical which would lead to delay on the project	VHI	-	-	-	VHI	-	-	
			Because the external funding procedure through the embassy is initiated which takes additional time											TREAT by starting preparations in time, adjusting unrealistic time promises, skipping the tender procedure and selecting a single contractor directly, arrange funding through TFU/RCS which is quicker than embassy
			Because we intiated official procedures in a late stadium											
			We need to start construction as soon as possible if we want to have the bridge finished before the coming spring flood											
			Because the project cannot start before funding is assured											
	risk and uncertainties	26	There are many uncertainties and risks in the project	R	the project management team might loose grip on the project	the project goes out of control so time delay, waste of resources	HI	-	-	VHI	HI	HI	-	TREAT by using risk management tools and techniques, adding risk manager to the team, adding additional project management specialist(s) to the team, longer rotations for longer projects, document management system
			Risk management does not get sufficient and adequate attention											
			Project team members rotate every 2-3 months											
			There is no risk manager in the project team											ACCEPT residual risk
		27	Because we don't know the local population's attitude towards the project, the local government and ISAF	5, R	it might turn out that the local population has a negative attitude towards the project	which would hurt ISAF's reputation among the local population in this area	MED	-	MED	-	-	-	-	TREAT by sending an emissary to the local population, conducting a new reconnaissance patrol with an available interpreter
			Because we don't know the local population's other needs											
			Because during our last patrol we could not visit the local population as we had no interpreter available											ACCEPT residual risk
		28	Because we don't know the local tribal situation in the region	R	it might turn out that the project disturbes relationships between the local tribes in the area	which would hurt ISAF's reputation among the local population in this area	LO	-	MED	-	-	-	-	TREAT by investigating tribal relations (local advisors, CULAD) before embarking on the project, address the issue during new reconnaissance patrol
			Because a bridge connects different tribes that have been apart for a long time											
			Because during our last patrol we could not visit the local population as we had no interpreter available											ACCEPT residual risk

RBS LEVEL 0	RBS LEVEL 1	RISK nr	RISK DESCRIPTION				PROBABILITY	IMPACT ON						MITIGATION POSSIBILITIES
			CAUSES (definite facts that contribute to the occurrence of the event)	Source(s)	EVENT (uncertain event or set of circumstances)	EFFECTS (direct impacts on one or more project objectives)		HSS	Reputation	Scope	Time	Cost	Quality	
stakeholder risk		29	Because the USACE has initiated plans to construct a temporary low water crossing while the bridge project is ongoing	9	the USACE project might interfere with our project	so that our bridge project has to be put (temporarily) on hold	VHI	-	-	-	HI	-	-	TREAT by coordination actions between US and NLD, ACCEPT residual risk
						so the scope of the bridge needs to be adjusted	HI	-	-	MED	-	-	-	
		30	Because the military has insufficient funds external funding is necessary to embark on the project	7, 15	funding from BUZA & OS might not be assigned to this project	so other actors need to be engaged for funding which will require additional time	HI	-	-	-	MED	-	-	AVOID by not relying on external funding
			Because the project relies on funding by the ministry of BUZA & OS											TREAT by engaging BUZA & OS to improve relations and their interest and attitude towards the project, addressing their requirements very carefully, engage USACE to become involved and cooperate, make cost uncertainty visible through range estimates, put more actors in the pipeline, lobby through RCS towards ministry of Defense and BUZA
			Because BUZA & OS have specific equirements regarding funding military projects											
			Because the relation and cooperation between OSAD, DEVAD and the military is tensioned											ACCEPT residual risk
			Because the attitude and interest of BUZA & OS towards the project are negative											
			Because other BUZA & OS projects also require funding											
			Because other investors are scarce			so we might not be able to get sufficient external funding for the project and the project could be terminated because there is insufficient budget available	HI	-	-	VHI	-	-	-	TREAT by engaging BUZA & OS to improve relations and their interest and attitude towards the project, addressing their requirements very carefully, engage USACE to become involved and cooperate, put more actors in the pipeline, lobby through RCS towards ministry of Defense and BUZA
			Because the cost estimate is still uncertain because of the additional material and required transport											
			Because too much uncertainties in the project and estimations could scare the investor											
		31	Because the bridge is not in the scope of the road development program of the USACE	7	USACE might retake their initiative to construct a bridge at Chowtu	so the project would be realized with money and support from USACE and the PRT's efforts become obsolete	MED	-	-	HI	-	-	-	
			Because the road program could possibly reach the bridge area in the coming spring											TREAT by coordination actions between US and NLD, integrate the project in the road development program
			Because USACE is a powerful stakholder with a positive attitude towards the project and possibly available financial resources											
			Because the Dutch PRT does not have sufficient capacity and means to finish the project in time											ACCEPT residual risk

RBS LEVEL 0	RBS LEVEL 1	RISK nr	RISK DESCRIPTION				PROBABILITY	IMPACT ON						MITIGATION POSSIBILITIES
			CAUSES (definite facts that contribute to the occurrence of the event)	Source(s)	EVENT (uncertain event or set of circumstances)	EFFECTS (direct impacts on one or more project objectives)		HSS	Reputation	Scope	Time	Cost	Quality	
		32	Because the bridge ends on a piece of land used by a local farmer The local farmer might not be willing to leave the land A local contractor living in the neighbourhood claims that the land is government property	32	the local farmer might be forced to leave the land	which would hurt the reputation of the local government and ISAF for this local farmer and his family	HI	-	LO	-	-	-	-	TRANSFER to local authorities TREAT by giving the farmer an acceptable alternative, ACCEPT residual risk
		33	Because RCS has doubts whether the project should have this high priority Because RCS command personnel rotates every 6 months which changes priorities Because the operational/strategic situation changes constantly Because RCS has doubts regarding the feasibility of the project because funding is uncertain and many risks are present	21	it might be the case that the initiator of the project withdraws support	which would lead to termination of the project so the scope does not longer have to be realized	HI	-	-	VHI	-	-	-	TREAT by close communication, improving insight into the uncertainties in the project by conducting risk management practices
						so the project might be put on hold	HI	-	-	-	VHI	-	-	
		34	Because the ISAF mission has an end-date at the end of 2008 Because the tactical situation changes Because extension of the mission duration is not yet certain	R	it might be the case that the military forces have to retreat before the project is finished	so their interest and attitude towards the project become negative which would lead to reputation damage and scope not being realized	VLO	-	MED	VHI	-	-	-	AVOID by not conducting such long term projects, TREAT by not conducting projects in highly volatile area, ACCEPT
		35	Because the Minister of MRRD is cooperating with ISAF in highly volatile area Because we want the project to be handed over to and maintained by the MRRD Because the Minister of MRRD has no security of his own	R	the Minister MRRD might be threatened by OMF	attitude MRRD towards the project becomes negative and cooperation with local government might be terminated	MED	-	MED	-	-	-	-	TREAT by providing external or private personal security

RBS LEVEL 0	RBS LEVEL 1	RISK nr	RISK DESCRIPTION				PROBABILITY	IMPACT ON						MITIGATION POSSIBILITIES
			CAUSES (definite facts that contribute to the occurrence of the event)	Source(s)	EVENT (uncertain event or set of circumstances)	EFFECTS (direct impacts on one or more project objectives)		HSS	Reputation	Scope	Time	Cost	Quality	
	secondary risks	36	Because the poppy harvest takes place in June and November each year Because during poppy harvest OMF is busy harvesting and is less active in sabotage attempts	F	so it may be possible to construct the bridge during poppy harvest season (impact blocker 9, 10)	which could prove to be safer than outside the harvest season	MED	LO	-	-	-	-	-	ACCEPT and take no direct action
		37	Because the poppy harvest takes place in June and November each year Because during poppy harvest OMF is busy harvesting and is less active in sabotage attempts	F	so it may be possible to transport equipment and supplies during poppy harvest season (impact blocker 16, 18)	which could prove to be safer than outside the harvest season	MED	LO	-	-	-	-	-	ACCEPT and take no direct action
		38	Because 24/7 security of the construction site and workers requires a lot of military equipment and personnel which are scarce	R	the PRT might not have sufficient personnel and equipment available to provide the necessary security support during construction (secondary risk 9, 10, 16, 17)									ACCEPT residual risk
			Because security of the supply lines requires a lot of military equipment and personnel which are scarce			so the project is delayed untill security support is available	HI	-	-	-	VHI	-	-	TREAT by giving the bridge project highest priority cancelling other activities, attract extra personnel from another region, ask support from coalition partners, hiring local private parties, ANA, coordination within the management team
			Because the project is in highly volatile area controlled by OMF Because the military conducts other activities that also require military security capacity and support			so the scope of the project cannot be realized	VHI	-	-	VHI	-	-	-	TREAT by giving the bridge project highest priority cancelling other activities, attract extra personnel from another region, ask support from coalition partners, hiring local private parties, ANA, coordination within the management team

APPENDIX G Stakeholders Road TK-Chora

Gesellschaft fur Technische Zusammenarbeit (GTZ)
The German NGO GTZ was contracted by the Dutch Ministry of Foreign Affairs to plan and manage the road construction, which is part of the Uruzgan Provincial Development Project (UPDP) (3). The agreement foresees in construction of the road, security on and around the road and supporting projects in the peripheral areas to obtain and/or increase the acceptance for the road construction among the local population (25). GTZ had a supportive and active attitude towards the project. Being the main contractor they also had some positional power and influence regarding the course of the project. Their interest in the project is to complete their work satisfactory for the project sponsor, the Dutch Ministry of Foreign Affairs.

Unique Builders Construction Company (UBCC)
GTZ in turn hired a contractor (UBCC) to execute the actual construction work. UBCC hired 180 local guards from different tribes (4) which are paid directly by the contractor. They also hired local workers from nearby villages, both skilled and unskilled (10), to contribute to the road works. UBCC was actively involved in the project and had a positive attitude. Based on the documentation their power is estimated to be low as they are in service of GTZ. Their interest in the project is likely to execute the construction works in order to earn money.

Government of Uruzgan (GoU)
The wider security arrangements for the construction of the road are guaranteed by the main governmental bodies. These are the Afghan National Army (ANA), the Afghan National Police (ANP), the Provincial Governor and the Afghan National Security Force (ANSF). The ANSF was responsible (being supported by the coalition forces) for the general security in the wider area in which the road was being constructed (20). The interpretation is that GoU had some power to influence the project as they were representing the official legitimate government. They were actively contributing to the project and were supporting it in cooperation with the coalition forces.

Dutch Ministry of Foreign Affairs
In the documentation the Dutch Embassy was mentioned as the sponsor of the project (3). Because they provided financial resources they were considered to be a powerful actor with a positive attitude towards the project, while actively supporting.

Local population
The local population in the area consisted of several tribes, living in the village communities along the road. These local natives were mentioned to be generally supportive (10) towards the project. However tribal unrest based on cultural jealousy in the neighboring villages along the road expressed itself in attacks towards each other and mining of the road (25). Their power to influence the project is assessed to be low. Workers and security guards were drafted from the local population so they were actively involved. For some the project provided an income, while others would block other tribes from benefitting from the project, which could lead to disruption of the project. Their attitude could be both positive as negative.

Tribal leader Sorkh Murgab area
MDK was the District Chief (DC) in the Chora area (21). Construction of the road would provide his tribe and communities economical benefits (22). He is hired to

provide security guards along the construction site (4) so the project offered an opportunity to earn money. This actor was actively involved, supporting the project and considered to be very influential (25).

Tribal leader Tarin Kowt area
MNKT was chief in the area where the first 20 km road passed through (22). Construction of the road would provide his tribe and communities economical benefits (22). He is hired to provide security along the construction site (4) so the project offered an opportunity to earn money. This actor was actively involved, supporting the project and considered to be very influential (25).

Opposing Militant Forces
The insurgents had an active presence in the area (25). They did not support the road construction between TK and Chora as it would provide more freedom of movement to the Afghan military and coalition forces in areas that were vital logistic hubs for the insurgents (25). The OMF were active in the area and they had significant power to influence the project.

Provincial Reconstruction Team
The PRT was responsible for enabling an unimpeded progress of the construction of the first 16 km of the road by increasing security around and execution of CIMIC activities along the road in order to increase the support of the local population. The PRT contained a Political Advisor (POLAD) (4) and Development Advisor (DEVAD) (6), while being under command of the Civilian Representative (CIVREP) (9). Also Task Force Uruzgan command (9), the CIMIC Support Element (19) and Mission Teams were mentioned in documents (25). These were actively involved, supporting the project and powerful due to available resources and position.


The construction works have the attention of the local villagers.

APPENDIX H Project definition Road TK-Chora

Aim of the project
In the documentation the end-state of the project for the military was to successfully construct the first 16 kilometer of the Tarin Kowt-Chora road before 30 June 2010, while local natives support the road and benefit from it. All results should be transferable to and beneficial for follow-on-forces, e.g. the western coalition forces that will replace the Dutch forces after their mission would come to an end in August 2010 (23). On strategic level the finished road is aimed to provide the Afghan National Security Force (ANSF) and western coalition forces more freedom of movement and freedom of action in insurgent controlled areas while putting pressure on surrounding areas, logistic hubs and insurgent logistic lines running through Uruzgan (21).

Besides, the road complements the existing road net by connecting part of Uruzgan to the airport in Tarin Kowt which connects the province to the rest of Afghanistan. From a developmental perspective the road is aimed to contribute to sustainable economic development in the long run. This is achieved by improving trading possibilities and providing access to governmental services. Through this increased prosperity the local natives should benefit from the road (23) and this was expected to show them that the Government of the Islamic Republic of Afghanistan (GIRoA), the Government of Uruzgan (GoU), the Afghan National Security Force (ANSF) and coalition forces were able to make progress in the area and therewith winning the local population for their side (19). The road could contribute in the long run to boosting the trust of the local natives towards the government (24) therewith decreasing home-grown insurgency (25). Local natives were even expected willing to actively defend the gained prosperity, thus denying insurgency in hampering area security (25).The TK-Chora road eventually should become a widespread success in Uruzgan and beyond (24).

Scope
The scope of the project is to construct a 16 kilometer main asphalt road between Tarin Kowt and Sorkh Murgab, connecting the bazaar and airport in Tarin Kowt to several smaller bazaars in the surrounding villages along the road. The road also contains several smaller structures (culverts and bridges), a retention wall and 6+ kilometers of access roads to the villages. Several supporting projects (for example micro hydro power stations) were conducted in surrounding villages which also were part of the scope. The alignment and design specifications were available in the documentation but were not investigated in depth. During the project some minor scope changes were mentioned, the additional construction of a causeway, an access road to the police station and an access road to the bazaar in Sorkh Murgab.

Time and duration
Time was an important objective in the project, as the mission of the Dutch forces would end by August 2010. In order to start early, the Dutch Embassy allowed GTZ to contract a company directly without tendering (3). According to documentation, the PRT facilitated the road construction in order to enable unimpeded progress (26). According to the end-state the construction of the first 16 kilometer road had to be successfully completed before June 30th 2010 (21) however the time frame of the first 16 km could draw out until July 31st 2010. The entire duration of the first part of the road project would therewith take approximately 5 months, as the project started end of January. During this entire period the construction work would be exposed to security threats as well.

Reputation
The documentation shows that one objective was to obtain and/or increase the acceptance for the road construction among local natives by presence, posture and profile of military units, engagement of key leaders and local natives and the implementation of supporting projects in the peripheral areas (25). Attacks on the road works could result in loss of face for the local government and ISAF towards the local population as this would undermine their promise to create a more stable and secure region. Reputation damage might result in resistance towards the project by the population (and risk not being used) or lead to increased support from the population towards the insurgents therewith undermining the legitimacy of the project and the mission as a whole. An attack during construction or even project failure could have the same effect towards the population and therefore prevention of loss of face is an important project promise. On the contrary, a successful project would give the opportunity to show reputational benefits for ISAF, GIRoA and ANSF. Reputation also relates to stakeholder relations and that is why these should be managed with care.

Quality
In the available documentation some constraints, some technical requirements, dimensions and work methods are mentioned. During construction contractor UBCC had to make sure that half of the road was always open for military transport (6, 25). Rain should not have any effect on the construction of the road (6) and damages by caterpillar traffic and convoys were to be avoided (6). After placing the asphalt binder course the road could not be used for 24 hours, thereafter traffic would be possible again. In one of the documents is mentioned that the road has a maximum load of 64 tons however within an undefined temperature range (15). It is also mentioned that the road fits Afghan national standards for road construction (19). In one report is mentioned that external laboratory equipment was used to check the quality of the compacting (6), also road tests for various military vehicles were conducted successfully. Additional requirements could be brainstormed regarding capacity, speed, number of lanes, availability, comfort, functionality, life time and quality and wear-out of materials etcetera as these were not specified in the documentation.

In terms of functionality the requirements that were found can be translated into a project promise as follows. The quality requirements could be formulated as to provide road infrastructure that allows up to 40 ton heavy wheeled and light caterpillar transport 24/7 all year round under all weather conditions for a period of at least 10 years.

Health Safety and Security
The construction site was secured by 16 checkpoints along the road and 5 checkpoints at the construction base camp. These checkpoints had to be manned 24/7 with a minimum of 7 guards per checkpoint. In total 180 guards were drafted from the surrounding villages and this was to be coordinated by two tribal key leaders but the responsibility of the contractor UBCC to ensure (4). The compilation of guards was to be tribally-balanced in order to improve public ownership for the project (21). Further down the first section of the road, also six checkpoints from the Afghan National Police (ANP) were positioned (22). For wider security in the area in which the road is constructed the Afghan National Security Force was responsible, however would be supported by patrols from the Provincial Reconstruction Team. During the project the base camp in which the crushing plant and other equipment was stored and also several checkpoints had to be replaced (6) in order to keep up with the progress of the construction work. Later also a secondary base was established in order to work backward from Sorkh Murgab (11). No further details regarding for example worker safety and protection should be protected from being intimidated or kidnapped. Based on

this information it could be formulated as the contractor UBCC, GoU, ISAF and ANSF should maintain control in the road area and its direct surroundings and provide a safe and secure environment to work in.

Cost

Regarding funding no information was found except that the Dutch Embassy provided funding and was approached for additional funds (15).

A military patrol from the Dutch PRT arriving near the stone crushing site to monitor the progress of the work. Also the nearby road construction works were visited.

An asphalt roller in action. This road section was located close to a populated area.

APPENDIX I Probability-Impact scales Road TK-Chora

SCALE	PROBABILITY	+/- IMPACT ON PROJECT PROMISES Time	Quality	Scope	Reputation	HSS
VHI	51-100%	> 8 days no construction progress, lost time cannot be made up, not able to finish before end of July 2010	Construction lifetime shorter than 1 year, no heavy transport possible, more than 30 days/year unavailable, unavailable for military mechanized transport during extreme weather conditions	No connection to the bazaar or airstrip Tarin Kowt, bazaar or police station in Sorkh Murgab, incomplete construction of retention wall	Local population and key leaders turn against the project, catastrophic safety, fraud or incapable governance incident in the (inter)national mass media, loss of face in the province by Dutch ISAF, GIRoA and ANA	Loss of control of the base camp area, construction site, checkpoint or part of the road trajectory
HI	11-50%	4-8 days no construction progress, lost time cannot be made up	Construction lifetime shorter than 3 years, road 20-30 days unavailable, no continuous 24/7 traffic possible	more than 500m needs to be reconstructed, repaired or additional access road	Road is not accepted by half the local population and one key leader, major safety, fraud or incapable governance incident in the provincial mass media, loss of face in the province by GoU, ANSF and ANP	Loss of control of one of the surrounding villages, major safety incident with multiple deaths and life threatening injuries, multiple kidnaps, increased hostility (multiple minor incidents), personnel protection not longer guaranteed
MED	2,6-10%	2-4 days delay during construction, possible that lost time can be partly made up, not able to finish before end of June 2010	Construction lifetime shortened to between 3 and 6 years, road 10-20 days/year unavailable, no continuous traffic possible	No connection to the villages along the main road, construction of one less/more checkpoint, bridge or culvert, 500-200m need to be reconstructed, repaired or additional access road	Minor safety, fraud or incapable governance incident in the local mass media, local population does not notice the importance and benefits of GoA and ANSF, an insult towards local leadership	Less permissive access to multiple surrounding villages, single minor safety incident with single heavy injuries or long term unemployable personnel, single kidnap, personnel protection severly deteriorated
LO	1,1-2,5%	1-2 days delay during construction, possible that lost time can be partly made up	Construction lifetime shortened between 6 and 10 years, road 10-5 days unavailable, no access for light motorized traffic during extreme weather conditions	No small scale development projects realized in surroundings, less than 200m need to reconstructed or repaired, one extra base camp movement	Road is not accepted by one minor village, minor safety incident spreads in the surrounding villages like damage to a public service or personal property	Multiple personnel lightly injured or (partly) short term unemployable, less permissive access in one surrounding village, personnel protection slightly deteriorated
VLO	0,1-1,0%	< 1 day delay during construction	Less than 5 days a year unavailable	Half of the development projects realized, minor road/culvert/bridge/retentionwall repair	Road is not accepted by a minority of individual locals, a minor dispute with a local family being affected by the project	Single person lightly injured or (partly) short term unemployable
NIL	< 0,1%	no change	no change	no change	no change	no change

APPENDIX J Risk Register Road TK-Chora

RBS LEVEL 0	RBS LEVEL 1	RISK nr	RISK DESCRIPTION				PROBABILITY	IMPACT ON					MITIGATION POSSIBILITIES
			CAUSES (definite facts)	Source(s)	EVENT (uncertain event or set of circumstances)	EFFECTS (direct impacts on one or more project objectives)		Reputation	HSS	Scope	Time	Quality	
Environment / weather risk		1	Because from <February> till <month> heavy rain showers <mm> might occur in the area in which the road is being built Because these rain showers can last for a couple of days Because work on the asphalt paving takes place in the rainy season Because non-workable days due to bad weather are not accounted for in the current planning Because work on asphalt paving cannot take place when rain showers are	6, 17	rainy and cloudy weather might occur	the contractor might have to temporarily interrupt the asphalt paving due to cloudy and rainy weather so the asphalt paving is delayed for a couple of days	MED	-	-	-	MED	-	AVOID by planning the asphalt paving work in the summer, REDUCE by taking into account non-workable days due to bad weather in the planning, by adjusting the deadline, ACCEPT and make a plan to engage extra asphalt paving equipment to catch up the delay if it occurs
		2	Because from <February> till <month> heavy rain showers <mm> might occur in the area in which the road is being built Because the contractor, according to contract, has to deliver an undamaged road to the client in order to receive his Because heavy rain showers of more than <mm> can wash away the compact grading layer of the road Because the compact grading takes place from <> to <> in which heavy rain showers can take place	6, 17	the compact grading works might be damaged by heavy rain showers	so the contractor has to repair or reconstruct <x meter> road which leads to additional scope and time	LO	-	-	MED	MED	-	AVOID by planning the compact grading work in the summer, REDUCE by taking into account extra repair days in the planning, ACCEPT and make a plan to engage extra equipment and workers to do repairs to catch up the delay if it occurs
	personnel	3	Because there are only limited <number> qualified operators available to the man the jack hammer excavator, grader and roller equipment on site Because these equipments require <a minimum number of> qualified personnel which are scarce Because qualified personnel might get killed, injured, kidnapped or stop working on the project Because these equipments are vital to continue construction work on the road	R	it might be the case that there is insufficient qualified personnel to man the jack hammer excavator, grader or roller equipment	so the equipment becomes temporary unavailable and work on the main road construction is delayed	MED	-	-	-	MED	-	AVOID by not using equipment that requires qualified personnel, TRANSFER by using military construction support, REDUCE by learning other personnel the basics to operate the equipment so there is a back-up, ACCEPT and bring additional qualified personnel if it occurs

RBS LEVEL 0	RBS LEVEL 1	RISK nr	RISK DESCRIPTION				PROBABILITY	IMPACT ON					MITIGATION POSSIBILITIES
			CAUSES (definite facts)	Source(s)	EVENT (uncertain event or set of circumstances)	EFFECTS (direct impacts on one or more project objectives)		Reputation	HSS	Scope	Time	Quality	
Supply risk	equipment	4	Because there is only one crush plant at the construction base Because there is only one jack hammer excavator, grader and roller on site Because these equipments require mechanical spare parts, oil, frequent maintenance and repair personnel, which are scarce in this area As it is uncertain how these requirements are organized by the contractor and might not be met Due to intensive use under demanding conditions these equipments are subject to wear and tear Because of the large distance <km> to the closest repair shop that holds spare parts and repair personnel Because these equipments are vital to continue construction work on the road	5	the crush plant, jack hammer excavator, grader or roller might stop functioning due to wear and tear	so the equipment becomes temporary unavailable and the work on the main road construction is delayed	HI	-	-	-	HI	-	AVOID by not using equipment that requires qualified personnel, TRANSFER to military repair personnel, REDUCE by bringing additional spare parts and oil, by having a qualified repair mechanic on site, or by acquiring additional backup equipment, ACCEPT and arrange instant maintenance service with the repair shop
	logistics	5	Because the transport roads between the quarry and the construction site are in volatile area and therefore vulnerable to IED attacks Because crushed stone is needed to construct the base layer of the road The nearest crushed stone quarry is located at <location> at a distance from <meters> from the construction site	3	the crushed stone supplier might not want to provide transport of the required materials to the construction site	so the base layer of the road cannot be constructed as intended and construction is delayed	MED	-	-	-	MED	-	TRANSFER to local villagers and let them get the stone, get another contractor, REDUCE by getting crushed stone from another quarry, using another material, by driving an alternative (longer, less dangerous) route, ACCEPT and provide security to the supplier if it occurs

RBS LEVEL 0	RBS LEVEL 1	RISK DESCRIPTION				PROBABILITY	IMPACT ON					MITIGATION POSSIBILITIES
		RISK nr	CAUSES (definite facts)	Source(s)	EVENT (uncertain event or set of circumstances)	EFFECTS (direct impacts on one or more project objectives)		Reputation	HSS	Scope	Time	Quality	
		6	Because there is only one jack hammer excavator, grader and roller on site which are required to continue construction work on the road	2, 5, 6, 8, 9, 16, 21	the equipment might be attacked by an IED, mortar, RPG or small arms fire during construction works	so the equipment is destroyed and cannot longer be used leading to delay on the construction work	HI	-	-	-	VHI	-	AVOID by not using the equipment, REDUCE ALARP by bringing extra equipment (7), by placing additional checkpoints (16), by providing IED detection equipment, by paying the insurgents and villagers or negotiating an alternative, by planning construction works in a less turbulent period, by additional PRT, ANA, ANSF patrols in the area, fences around the road construction site, parking the equipment near checkpoints, ACCEPT and arrange replacement equipment if it occurs
			Because the equipment is operated in semi-non-permissive area close to insurgent controlled territory										
			Because the contractor has received several warnings from insurgents that accidents will happen if no payment is made and received a threat against the equipment parked on the site										
	construction site sabotage		Because the current security arrangement does not provide sufficient checkpoints to protect the equipment on site			which shows the vulnerability of the project so the local authorities and military forces suffer reputation damage towards the surrounding villages and the insurgents	HI	MED	-	-	-	-	AVOID by not using the equipment, REDUCE ALARP by placing additional checkpoints (16), by providing IED detection equipment, by paying the insurgents and villagers or negotiating an alternative, by planning construction works in a less turbulent period, by additional PRT, ANA, ANSF patrols in the area, fences around the construction site
			Because the equipment is no longer parked at the base camp for efficiency										
			Because of the start of the poppy harvest season in <April> many insurgents come back to the area after winter and the number of safety and security incidents along the road construction usually increases										
			Because neighbouring villages, due to tribal conflict, deny each other to benefit from the road by placing IED's										
			Because construction is planned from January till end of June										

RBS LEVEL 0	RBS LEVEL 1	RISK nr	RISK DESCRIPTION				PROBABILITY	IMPACT ON					MITIGATION POSSIBILITIES
			CAUSES (definite facts)	Source(s)	EVENT (uncertain event or set of circumstances)	EFFECTS (direct impacts on one or more project objectives)		Reputation	HSS	Scope	Time	Quality	
		7	Because the contractor, according to contract, has to deliver an undamaged road to the client in order to receive his	2, 6, 10, 16, 21	the road works might be damaged by an IED, mortar or RPG explosion	so the contractor has to repair or reconstruct <x meter> road which leads to additional scope and time	VHI	-	-	LO	MED	-	REDUCE by placing additional checkpoints (16), by providing IED detection equipment, by paying the insurgents and villagers, by planning construction works in a less turbulent period, by additional PRT, ANA, ANSF patrols in the area, fences to guard the construction site
			Because the surrounding area is in close proximity to insurgent controlled territory										
			Because contractor has received several warnings from insurgents that accidents will happen if no payment is made										
			Because the poppy season starts in <month> many insurgents come back after winter so the number of incidents along the road construction increases			which would show the vulnerability of the project and hurt the reputation of ISAF and local authorities towards the population	VHI	MED	-	-	-	-	
			Because neighbouring villages deny each other to prosper by placing IED's										
			Because the current security arrangement does not provide sufficient checkpoints to protect the entire road site										

RBS LEVEL 0	RBS LEVEL 1	RISK nr	RISK DESCRIPTION				PROBABILITY	IMPACT ON					MITIGATION POSSIBILITIES
			CAUSES (definite facts)	Source(s)	EVENT (uncertain event or set of circumstances)	EFFECTS (direct impacts on one or more project objectives)		Reputation	HSS	Scope	Time	Quality	
		8	Because security guards are vulnerable (unarmed?) and alone on their way home from or towards duty	2, 5, 6, 8, 9, 16, 21	local security personnel might be attacked by an IED, mortar, RPG or small arms fire	so multiple guards might get killed or injured	VHI	-	HI	-	-	-	REDUCE by placing additional checkpoints, by providing IED detection equipment, by paying the insurgents and villagers, by planning construction works in a less turbulent period, by additional PRT, ANA, ANSF patrols in the area, fences to guard the construction site, renegotiate the security contract, use of disguises, protected base for the guards
			Because all security guards wear clearly distinghuishing uniforms										
			Because road construction works are close to insurgent controlled area where personnel is vulnerable for attack										
			Because contractor has received several warnings from insurgents that accidents will happen if no payment is made			so fewer security personnel is available/willing to provide protection which leads to reduced safety on site	VHI	-	MED	-	-	-	
			Because the security contract obliges guards to remain 24/7 on duty which is considered not workable										
			Because the poppy season starts in <month> many insurgents come back after winter so the number of safety and security incidents along the road construction increases			so the reputation of the coalition and local authorities among the local population is damaged	VHI	MED	-	-	-	-	
			Because neighbouring villages, due to tribal conflict, deny each other to benefit from the road by placing IED's			so a single guard might get killed or injured	VHI	-	MED	-	-	-	
			Because construction is planned from January till end of June										

RBS LEVEL 0	RBS LEVEL 1	RISK nr	RISK DESCRIPTION				PROBABILITY	IMPACT ON					MITIGATION POSSIBILITIES
			CAUSES (definite facts)	Source(s)	EVENT (uncertain event or set of circumstances)	EFFECTS (direct impacts on one or more project objectives)		Reputation	HSS	Scope	Time	Quality	
Security risk	stakeholder intimidation	9	Because the current security arrangement does not provide sufficient checkpoints to protect the personnel on site	2, 5, 6, 8, 9, 16, 21	local workers might be attacked by an IED, mortar, RPG or small arms fire	so multiple local workers might not longer be able/willing to work on the project leading to delay on the construction activities	VHI	-	-	-	MED	-	REDUCE by placing additional checkpoints (secondary risk 10 and 3), by providing IED detection equipment, by paying the insurgents and villagers, by planning construction works in a less turbulent period, by additional PRT, ANA, ANSF patrols in the area, fences to guard the construction site, renegotiate the security contract, use of disguises, protected base for the guards
			Because road construction works are close to insurgent controlled area where personnel is vulnerable for attack										
			Because the poppy season starts in <month> many insurgents come back after winter so the number of safety and security incidents along the road construction increases			so the reputation of the coalition and local authorities among the local population is damaged	VHI	MED	-	-	-	-	
			Because neighbouring villages, due to tribal conflict, deny each other to benefit from the road by placing IED's										
			Because contractor has received several warnings from insurgents that accidents will happen if no payment is made			so multiple workers might get killed or severely injured	VHI	-	HI	-	-	-	
			Because construction is planned from January till end of June										

RBS LEVEL 0	RBS LEVEL 1	RISK nr	RISK DESCRIPTION				PROBABILITY	IMPACT ON					MITIGATION POSSIBILITIES
			CAUSES (definite facts)	Source(s)	EVENT (uncertain event or set of circumstances)	EFFECTS (direct impacts on one or more project objectives)		Reputation	HSS	Scope	Time	Quality	
		10	Because the contractor requested additional checkpoints to deal with the deteriorated security circumstances Because of the the increasing number of threats, safety and security incidents along the road construction Because permission by the project sponsor (Dutch Embassy) to increase the number of checkpoints takes additional Because the Dutch Embassy wants a independent second opinion from the TFU / PRT regarding the security assessment which takes time Because the construction of additional checkpoints is not taken into account in the initial planning Because it is uncertain how much additional time the procedure and assessment take	15, R	the contractor might decide not to proceed construction works untill the current security situation has improved	so construction work is delayed until the checkpoints are in place	HI	-	-	-	VHI	-	REDUCE by changing contractual arrangements, by not going through official procedures, by getting additional information regarding the procedure, by improving the security situation
	upply line sabotage	11	Because the asphalt roller equipment needs to be transported to the construction site from Kandahar to Tarin Kowt through volatile area Because the weight of the truck is approximately 40 tons while the current weight limit on the road is 30 tons Because the equipment might not arrive from Kabul before <date> to join the planned military convoy from Kandahar to TK Because the next convoy from KH-TK is scheduled after <at least two weeks> The asphalt roller equipment is vital to continue road construction works Because the contractor is already in contact with the convoy manager for arrangements	6, R	insurgents might attack the equipment transport on its way to the construction site	so the equipment does not arrive in time on the construction site and work on the road construction is delayed	HI	-	-	-	LO	-	REDUCE by taking an alternative route, by ordering additional equipment early so delay does not have a direct effect on the work, by letting the convoy wait for the transport, ACCEPT and take the next convoy
						so the equipment is lost and the work on the road construction is delayed	VLO	-	-	-	VHI	-	

RBS LEVEL 0	RBS LEVEL 1	RISK nr	RISK DESCRIPTION				PROBABILITY	IMPACT ON					MITIGATION POSSIBILITIES
			CAUSES (definite facts)	Source(s)	EVENT (uncertain event or set of circumstances)	EFFECTS (direct impacts on one or more project objectives)		Reputation	HSS	Scope	Time	Quality	
	s	12	Because cement, gravel, earth and rocks are transported unprotected by the contractor from <location> to the construction site	21, R	insurgents might attack the supply transport on its way to the construction site	so supplies are stolen and the work on the road construction is delayed	HI	-	-	-	MED	-	REDUCE by taking a safer route or supply location, by storing additional supplies early so delay does not have a direct effect on the work, by providing security for the transport, ACCEPT and take the loss
			Because cement, gravel, earth and rock transports take place every week										
			Because the transport has to drive through volatile insurgent controlled territory										
			Because cement, gravel, earth and rocks are required to complete the road construction works			so supplies and transport equipment are lost and the work on the road construction is delayed	HI	-	-	-	HI	-	
	g construction	13	Because the asphalt road is not able to withstand caterpillar traffic, especially instant braking and turning	6, 10	a caterpillar vehicle might be forced into an evasive maneuver while driving on the road so <x meter> road works are damaged	which leads to additional scope and time for the contractor to complete the work	MED	-	-	LO	LO	-	AVOID by not using the road with caterpillars while under construction, use alternative routes, REDUCE by communicating contractor detailed paving plan and changes about the status of road sections (10) but did not do this yet (16), by calculating additional repair works, ACCEPT and assemble an extra repair team, and pay the repair cost
			Because ISAF mechanized patrols <regularly> patrol the area during which the military exigency might arise to make instant evasive manoeuvres										
			Because ISAF mechanized patrols sometimes use the road part that is open for transport										
			Because the surrounding area is semi to non-permissive and in close proximity to insurgent controlled territory so attacks on ISAF patrols are imminent			which would hurt the reputation of ISAF towards the contractor and possibly the local population	MED	LO	-	-	-	-	
			Because the contractor, according to contract, has to deliver an undamaged road to the client in order to receive his										

RBS LEVEL 0	RBS LEVEL 1	RISK nr	RISK DESCRIPTION				PROBABILITY	IMPACT ON					MITIGATION POSSIBILITIES
			CAUSES (definite facts)	Source(s)	EVENT (uncertain event or set of circumstances)	EFFECTS (direct impacts on one or more project objectives)		Reputation	HSS	Scope	Time	Quality	
	military use durin	14	Because the road has to be open for transport which might not always be the case due to uncertain circumstances	6, 10, 16	the road works might be damaged by premature use of the road	so the contractor has to repair or reconstruct <x meter> road which leads to additional scope and time	MED	-	-	LO	MED	-	AVOID by not using the road with convoys while under construction, REDUCE by communicating contractor detailed paving plan and changes about the status of road sections (10) but did not do this yet (16), by calculating additional repair works, ACCEPT and assemble an extra repair team
			ISAF convoys <regularly> use the road and might have military exigence to keep on driving										
			Because the asphalt remains vulnerable within the first 24h after construction										
			Because local people are hired for road signing using flags who will stop oncoming traffic			which would hurt the reputation of ISAF towards the contractor and possibly the local population	MED	MED	-	-	-	-	AVOID by not using the road with convoys while under construction, use alternative routes, REDUCE by communicating contractor detailed paving plan and changes about the status of road sections (10) but did not do this yet (16), by calculating additional repair works, ACCEPT and assemble an extra repair team and pay the repair cost
			Because the contractor cannot be informed prior to the arrival of a convoy which has to kept secret until the last										
			Because the contractor did not provide the military with a detailed road plan in which the status of lane change points is shown										
ment risk	procedures / regulations	15	Because the local security guards have to be legally armed with AK-47's which requires signed weapon permits	4, 6	it might be the case that the weapon permits cannot be signed before guard duty is required	so the security guards cannot be armed with legal weapons and cannot provide protection to personnel	HI	-	HI	-	-	-	TRANSFER and let another available government official sign the permits, REDUCE and arrange contact with the governor early, provide temporary weapon permits, ACCEPT and arm the guards without a weapon permit (impact blocker, with secondary risk 22)
			Because the weapon permits for the local security guards can only be signed by the governor										
			Because the security guards need to be available before <date>										
			Because the governor has a busy schedule and has to come from <far away										
			Because it was previously reported that the governor does not always take his responsibilities according to the principal guidelines			which shows the local hired security guards the incapability of the local authorities	HI	MED	-	-	-	-	
			Because the governor is not yet approached regarding the signing of										

RBS LEVEL 0	RBS LEVEL 1	RISK nr	RISK DESCRIPTION: CAUSES (definite facts)	Source(s)	EVENT (uncertain event or set of circumstances)	EFFECTS (direct impacts on one or more project objectives)	PROBABILITY	IMPACT ON: Reputation	HSS	Scope	Time	Quality	MITIGATION POSSIBILITIES
Commercial and manage	contract / tender	16	Because key leader <name> is a prominent person in the area Because key leader <name> has close ties with the construction companies in Because key leader <name> has a low opinion of the foreign intervention force and the project Because the construction companies want to be on good terms with the key leader Because the road project is an initiative of the foreign western intervention forces Because the initiator and main contractor have agreed to use local subcontractors to do the actual construction work	3	the construction companies in the tender might not offer their services to the project	so the road cannot be constructed as intended using the selected local contractors and construction is delayed	LO	-	-	-	MED	-	REDUCE by engaging key leaders to cooperate, by seeking a contractor that is not affected by key leaders for example from another province
	client stability	17	Because the subcontractor claims not to be paid for his work Because GTZ (main contractor) paid all invoices presented by the subcontractor Because the subcontractor refused to sign the security concept Because the subcontractor has broken contractual terms several times	3, 2	the subcontractor might decide to stop construction activities due to a contractual dispute	so construction progress comes to a halt	MED	-	-	-	VHI	-	REDUCE by renegotiating the contractual terms, by discussing the issue, by having two contractors working on a part of the project, ACCEPT and conduct a new tender procedure or search for another contractor if it occurs
		18	Because the causeway in Sorkh Murgab is originally designed as a bridge Because the causeway could also be designed as a leveled concrete clinker Because local contractors have knowlegde of and expertise with local construction methods and customs Because the local contractor was not involved in the design phase of the project	15	an alternative design solution might be suggested by the subcontractor during the project	which would provide the same functionality with better chance to last at least 10 years	MED	-	-	-	-	LO	EXPLOIT by involving the subcontractor in the design phase, ACCEPT and change the design as it occurs
						which would improve the acceptance by the local population due to use of local standards	MED	LO	-	-	-	-	

RBS LEVEL 0	RBS LEVEL 1	RISK DESCRIPTION				PROBABILITY	IMPACT ON					MITIGATION POSSIBILITIES
		RISK nr	CAUSES (definite facts)	Source(s)	EVENT (uncertain event or set of circumstances)	EFFECTS (direct impacts on one or more project objectives)		Reputation	HSS	Scope	Time	Quality	
Technical design risk		19	Because the access road to the police station and bazaar in Sorkh Murgab are not included in the initial scope of the project	16	it might be the case that the subcontractor proposes extra beneficial work during the project	which would provide additional functionality of the main road construction	MED	-	-	-	-	HI	EXPLOIT by involving the subcontractor and consulting the population in the design phase, ACCEPT and change the design as it occurs
			Because an asphalt road connection to the police station would allow the police to reach the main road quicker										
			Because an asphalt road connection to the bazaar would satisfy the local										
			Because the local contractor was not involved in the design phase of the project			which would provide an opportunity for the coalition forces to improve their reputation towards the local population	MED	LO	-	-	-	-	
			Because the closer contact local contractors have with the local population might reveal their actual needs										
			Because extra work is an opportunity for the contractor to earn additional money										
		20	Because the culverts as designed are attractive for conceiled IED placement	15, 16, 21	it might be the case that newly constructed culverts are used to place IED's	so future convoys will have to stop and check each culvert before crossing it which hampers continuous transport on the road	VHI	-	-	-	-	HI	REDUCE by placement of steel wire meshes (16) (additional scope)
			The culverts are to be built in semi or non-permissive areas at a close distance to insurgent controlled area										
			Because insurgents will use every opportuntiy offered to place IED's			which would show incompetence and vulnerability of the intervention force and the local authorities towards the local population	VHI	MED	-	-	-	-	REDUCE by placement of steel wire meshes (16) (additional scope)
			Because neighbouring villages, due to tribal conflict, deny each other to benefit from the road by placing IED's										
			Because the designer did not take into account the IED threat when designing the construction										

RBS LEVEL 0	RBS LEVEL 1	RISK DESCRIPTION				PROBABILITY	IMPACT ON					MITIGATION POSSIBILITIES
		RISK nr	CAUSES (definite facts)	Source(s)	EVENT (uncertain event or set of circumstances)	EFFECTS (direct impacts on one or more project objectives)		Reputation	HSS	Scope	Time	Quality	
		21	Because the ANP checkpoint at <location> is located close to the KAU post at <location>	4	a conflict might escalate between the ANP and KAU checkpoint commanders	so the reputation of the ANP commander suffers and therewith the opinion of the public regarding GoU and GoA services	LO	MED	-	-	-	-	TRANSFER by having the checkpoints operated by ANA, REDUCE by mediating the dispute, ACCEPT see and wait how the situation evolves as soon as the construction works come closer
			Because it has been reported that there are tensions between both checkpoint commanders										
			The road works are to be secured by both checkpoints			so the safety and security provided by these checkpoints becomes unreliable	LO	-	MED	-	-	-	
	internal rivalries and conflicts	22	Because the weapon permits could not be signed by the governor before guard duty	4, 6	the ANP might take the illegal weapons from the security personnel	so the relation between the key leaders is damaged and the security provided as confirmed in the security contract becomes less reliable	MED	-	MED	-	-	-	REDUCE by using temporary weapon permits (6), by informing ANP about the problem with signing the permits,
			Because it was chosen to arm the security personnel temporarily without signed weapon permits										
			Because according to previous arrangements security is to be coordinated by key leader <name1> and key leader <name2>			so the security guards are unarmed and cannot provide protection to personnel	MED	-	HI	-	-	-	
			Because the ANP is authorized to take illegal arms, but were not informed about the fact that the local security personnel was illegally armed										
			Because key leader <name 1> and key leader <name 2> are from a different tribal background they have a already tensioned relationship which might give rise to conflict of interest			so the relation between both key leaders and ANP is damaged which leads to reputation damage for the intervention force and local authorities	MED	MED	-	-	-	-	
			Because key leader <name 2> feels his reputation is damaged by the fact that ANP took more weapons from him than from leader <name 1>										

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Social / cultural risk		23	Because the local population could turn against the project due to tribal conflict	R	the majority of the local population might turn against the road project	so the number of security and safety incidents increases due to sabotage attempts by the local population	HI	-	HI	-	-	-	REDUCE by conducting additional CIMIC projects, additional PRT patrols in the area, hire workers from another location, keep insurgents away from the population
			Because the local population could turn against the project due to unsolved damages to their homes										
			Because the local population could turn against the project due to intimidation by insurgents			so the required local labour cannot be supplied leading to delay on the construction work	HI	-	-	-	MED	-	
			Because the population could turn against the project due to the attracked violence										
			Because the local population might not appreciate the local government and western coalitions influence			so the local population does not longer want to be involved in the project and the reputation of the local government and coalition forces is damaged	MED	VHI	-	-	-	-	
			Because it is assessed that the populationin general supports the project										
	religion / work ethic	24	Because the access road is being built by local workers which are Muslim	3, 10, 15	the progress on the construction work during Ramadan might proceed slower than planned	so construction work on the main and acces roads is delayed	HI	-	-	-	LO	-	ACCEPT and plan different activities after Ramadan simultaneously at different sections (10)
			Because the access road is being built during Ramadan										
			Because in Muslim religion Ramadan takes place from <date> to <date> which obliges Muslims not to eat and drink during daytime which affects their availability										
			Because the current time planning did not take into account Ramadan										
			Because activity <name> becomes critical if suspended more than <x> days (why?)										
	poppy harvest	25	Because the poppy harvest season takes place from <month> till <month>	16	the local labourers might be tempted to earn money somewhere else	so multiple local workers leave their work on the project which would lead to delay on the road construction works	VHI	-	-	-	HI	-	AVOID by not relying on local workers during poppy harvest, REDUCE by increasing the worker salary or providing company car
			Because the worker salary on the project is lower than the salary workers get for harvesting poppy <amount?>										
			Because the work on the project takes place during poppy harvest season										
			Because work on the project depends on skilled and unskilled labourers from the local villages										

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	local property	26	Because the road planners did not adequatly take into account the distance between the road and the existing buildings in the environment Because the road as designed requires a free profile of 11 meters wide Because the road workers carelessly execute construction activities near existing buildings Because the local population has no money to repair damage to their homes	21, R	the nearby homes of the local population might be damaged due to the road works	so the attitude of the local population towards the project turns into negative	HI	MED	-	-	-	-	AVOID by adjusting the design so the road profile is not situated close to the houses, ACCEPT and arrange in the contract that damages have to be paid by the contractor
		27	Because the road alignment is planned through <area> which is owned by <local villager> Because the local land owner asks <amount> of money for his permission to build on his land Because the <amount> is not according to expectations and requirements of the main contractor (what are these requirements, why?) Because construction on the local owner's land is planned to start within <weeks>	3	a conflict of interest with the local land owner might arise	so construction cannot start on that location which leads to delay on the construction works	VLO	-	-	-	VHI	-	TRANSFER to local authorities to negotiate and mediate, REDUCE by mediating the conflict, negotiate alternatives, start earlier with negotiations
						so the project (and possibly its stakeholders) might suffer reputation damage towards the local population	MED	VLO	-	-	-	-	