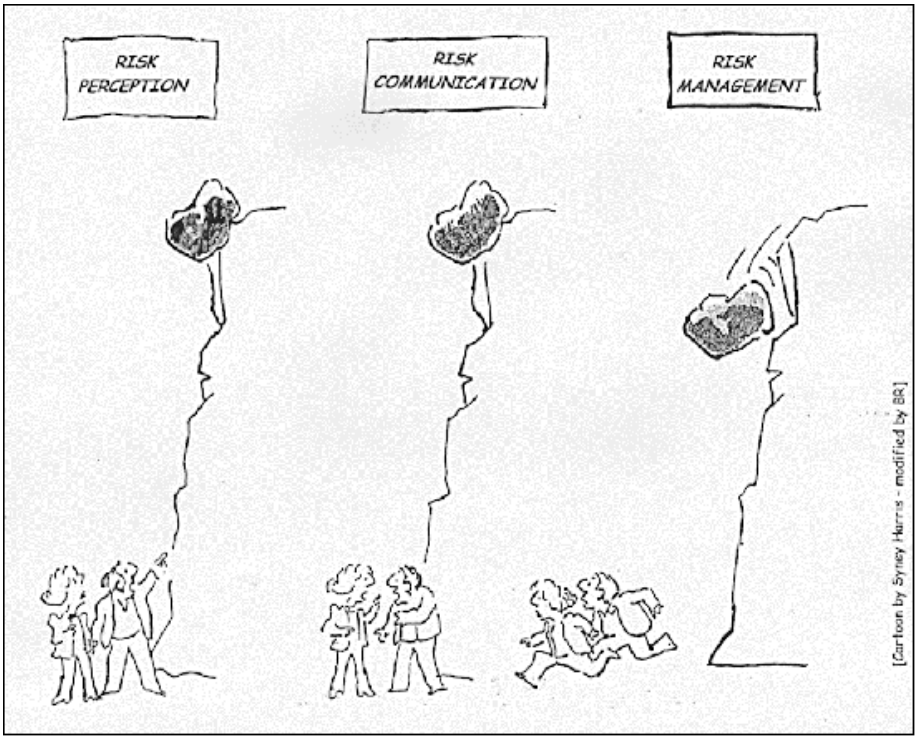
Risk Management: Regulations and practice

"*Once all the hazards have been identified, the organization must devise risk management strategies. At its simplest level, this will involve assessing the trade-offs between the benefits to be derived from a given reduction in risk, and the costs incurred in achieving this reduction."*

Ritchie B. and Marshall D. (1993, P.145)



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1. Executive summary

The purpose of this research is to describe and analyze how seven Norwegian municipalities satisfy the requirements for risk management in the economic policy in Norway, and to which degree they integrate risk management in their comprehensive management. Besides the requirements of risk management and internal control, the Royal ministry of finance in Norway does not give any directive of how the method should be developed or implemented in the municipalities. As a result of this, the Norwegian Government Agency for Financial Management, SSØ, published a method of risk management. The directorate for social security and precaution (Direktoratet for samfunnssikkerhet og beredskap: DSB) yearly conducts risk and vulnerability research to indicate the safety of the society and consider the readiness of the municipalities to for instance handle crisis when they are doing the ordinary municipality-planning. These two publications, together with the theory create the foundation to describe and analyse how seven municipalities satisfy the requirements for risk management in the economic policy, and to which degree they integrate risk management in their comprehensive management.

In chapter 4 the requirements in the economic policy are presented. The requirements mainly says that the municipalities should ensure that established objectives and performance requirements are monitored, that resources are used efficient and that the municipality is run in compliance with applicable laws and regulations. The governance and monitoring shall, however, be adapted to the municipalities' distinctive characteristics as well as to its risk profile and its significance. In chapter 5, SSØ's method of risk management is presented and their contribution is eight steps that mainly are about identifying objectives, identifying critical success factors, identifying risks, prioritize risks and finally implement risk treatment activities and monitor the risks.

The empirical research in chapter 6 focus on risk management in seven Norwegian municipalities, the findings from DSB's risk and vulnerability analysis as well as how risk management is integrated in the municipalities' comprehensive management. In chapter 8 the conclusion is drawn based on the analysis from the previous chapters. The main findings show that risk management are mainly integrated in the comprehensive management by identifying risks, conducting risk and vulnerability analysis for the essential risks, implementing actions to reduce the risk and revising their analysis. This indicates similarities with the method suggested by SSØ.

The findings also indicate that the bigger the municipality the more actions to reduce risks are being integrated in the municipality management. The bigger municipalities (more than 100.000 inhabitants) have integrated the requirements on office or department levels while the smaller municipalities (less than 100.000) make the most amendments in the areas representing high potential risk.

The approach of the risk management method differs slightly from municipality to municipality. The two municipalities researched with more than 100.000 inhabitants opt to integrate risk management in the comprehensive management through the objective and performance requirements set, by identifying critical success-factors for achieving the objectives. This means that the risks are tried identified based on the objectives they might jeopardize. The smaller municipalities (less than 100.000), on the other hand, identify areas at risk not necessarily directly linked with the objectives, but mainly based on the threat they

represent either to the municipality assets, the people in the society and the like. However, in both cases risks are being prioritized based on probability and consequence and reduced by risk control and financing activities. The main conclusion that can be drawn is that the municipalities satisfy the requirements set in the economic policy and that risk management is integrated in their comprehensive management.

A thought for reflection is that the requirements are meant to be adapted to the municipalities' distinctive characteristics as well as to its risk profile and its significance. Risk management should therefore, according to SSØ, be developed in such a way that it can identify, evaluate, manage and follow-up risk so that the risk is within an accepted level. Acceptable level of risk is, however, subjective.

2. Acknowledgements

This is a final project for the Master of Science Business Administration – Financial Management - program at The University of Twente. The subject of this master project is Risk Management: Regulations and practices in Norwegian municipalities.

The information analysed and obtained in this project is mainly from personal interviews and phone conversations with representatives from seven Norwegian municipalities, as well as literature on risk management like theory and specific requirements in Norway, the Norwegian Government Agency for Financial Management, SSØ, and the directorate for social security and precaution (Direktoratet for samfunnssikkerhet og beredskap: DSB). The theory and requirements are mainly obtained from printed and online sources such as reports from the Norwegian Royal Ministry of Finance and published books to mention some.

The statements and points of view presented in this paper are the student's responsibility. The University of Twente takes no responsibility of the contents in this report.

I have received good help from the interviewees who has given me a lot of useful information, taking time to provide me with data and their opinion on risk management in their municipality. I would also thank Mr. P.A Kvam, the project manager for the risk and vulnerability research conducted by DSB, who has provided me with their empirical findings. I would also like to give a special thanks to my supervisors, Professor P. Boorsma and Dr. S. Morssinkhof, who both through meetings and emails has provided me with helpful professional guidance during my process.

I am pleased for being a graduate at the University of Twente which has enabled me to obtain the knowledge required to finish my final project. I am grateful for a good cooperation and useful guidance during the development of my master project.

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PART 1: INTRODUCTION

This part is about the background of the study and defines the research questions. It will also explain how this study plan to assess the research questions, explain the objective of this study as well as provide an outline of the thesis.

1. Risk Management and the background of the study

All organizations face risk and risk management is therefore an essential part of being in business. Organizations are in general choosing their own risk-appetite – consciously or unconsciously, but they might be influenced by restrictions or requirements from laws and regulations. In Norway such regulations are given by the Royal Norwegian Ministry of Finance and administered by the Norwegian Government Agency for Financial Management, SSØ, (Royal Ministry of Finance, 2008, P.4).

In addition to laws and regulations when assessing the overall risk, one must take into account different levels of risks (Stiglitz, 2000, P.291). Therefore organizations need to look at their own specific risk culture rather than following a more general approach to assessing their risk. It is a rational strategy for organizations trying to identify their weaknesses and vulnerabilities. The problem is how to keep a proper sense of proportion in the estimation and measurement of risks so that managers can decide what level of resource to devote to risk avoidance, and then concentrate the resources made available in those areas most at risk (Ritchie and Marshall 1993, P.175).

There are many definitions of risk, but in general we can say that risk is about to which extent it can jeopardize an organization's operations and refers to the potential loss and to the chosen methods of protecting against losses (Bradley Johnson, 1987, P.5). Some also consider the desirable side of the risk which is often referred to as the opportunities (Ritchie and Marshall 1993, P.1). Risk may therefore influence the objectives and results of organizations positively and negatively, but in this research the focus is on the downside risks. According to SSØ, Risk Management should be a process integrated in the objective and performance management which is developed in such a way that it can identify, evaluate, manage and follow-up risk so that the risk is within an accepted level (SSØ# 5, 2008). This should be exerted in the strategy and plans of the organization to give confidence that the objectives will be achieved, or that the weaknesses in the preconditions for achieving the objectives are discovered (SSØ# 5, 2008).

Risk management is being implemented in more and more organizations in Norway and has become a more common management tool in achieving the specified objectives over the last years (Tema NHH, 2007). Both new financial management regulations and provisions in central government, increased focus on corporate governance and financial fraud among others have contributed to increased focus on risk management (Strøm and Østreng, 2007, P.9). In 2005, SSØ therefore published a document describing methods for risk management and internal control in accordance with the economic policy. The main administrative management document in the economic policy is the regulations and provisions on Financial Management in Central Government (SSØ # 6, 2008). SSØ also published a guideline as a continuation of the publication of method with the purpose to ease implementation and help organizations to adjust the method to their own agency (Andreassen, 2007, P.4).

The integration of risk management in the objective and performance management accounts for all levels in the central government (SSØ# 5, 2008). The central government in Norway is divided into several ministries where the ministry of local government and regional development includes the municipalities (government.no). This means that the municipalities have to follow the requirements for risk management and that the relationship between the central government and municipalities is based on an objective and-performance perspective where the central government is managing the municipalities by first and foremost focusing on results and less on resources and organizing (Kommunal- og regionaldepartmentet, 2004). Municipalities in Norway have to integrate risk management with their developed methods for objective and performance measurement (SSØ # 2, P.5), in other words their comprehensive management.

Doubt can, however, be raised about the enforcement, or about the degree of integration of risk management in the objective and performance management. An example of this is the involvement of eight Norwegian municipalities in an investment scandal that became public in 2007. This scandal is known as the Terra Securities- scandal and involved highly speculative investments. The investment package, which was sold by Terra securities in Norway, was very complicated and the municipalities did obviously not understand the high degree of risk the investment products involved (Hegnar online, 2008). These investments can be traced back to 2001, when the municipalities borrowed money secured in future income from hydroelectric power production and invested the money in bonds through Terra Securities (Wikipedia).

Based on requirements for risk management and a recent example of a failing risk management process in a few municipalities in Norway, this paper will search to discover how a selection of municipalities satisfy the requirements, and it will analyze to which degree the municipalities integrate risk management in their comprehensive Management. Theory about risk management will also be researched in order to discover if there are big differences and to obtain knowledge to ensure that important factors are included in the empirical research.

1.1 Research objective and questions

A thesis should, according to Troye and Grønhaug (2005; P.17), illustrate essential angles of a research question. However, the objectives can be many. The objective can for instance be theoretical and contribute with descriptions, recommendations, or can analyze or compare different theories. It can also contribute with predictions, or explain certain relations (Troye and Grønhaug 2005; P.18). The focus of this paper is theory about risk management and the requirements for risk management set by the ministry of Finance. The objective is to analyze how the chosen municipalities satisfy the requirements, and to which degree they integrate risk management in their comprehensive management. In order to reach this objective the following general research question is identified:

How are the municipalities' methods for risk management developed in order to satisfy the requirements set by the economic policy in Norway, and to which degree is risk management integrated in the municipalities' comprehensive management?

To find answers to the research questions above, the following sub-questions are stated:
1. What type of method for risk management can be identified in the theory?

2. What is required by the economic policy regarding risk management, and what type of method does SSØ suggest?
3. How do the municipalities amend their management according to the requirements?
4. To which degree do municipalities integrate risk management in their comprehensive management?

This thesis is divided into five main parts as illustrated in the figure below.

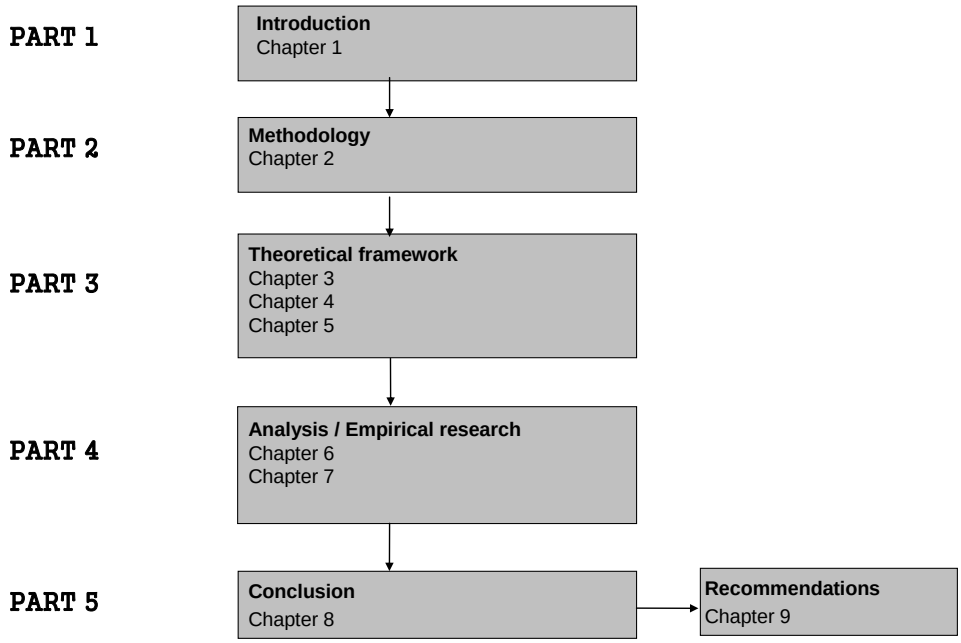

Figure 1: Structure of the research

Part 1: Introduction, includes chapter 1 in which the main focus is the background and the chosen research questions. Part 2: Methodology, consists of chapter 2. This chapter describes the choice of research design and data collection. Part 3: theoretical framework, consists of chapter 3-5. The purpose of these chapters is to present relevant theory about risk management. The theoretical framework will include the historical development of risk management and the principles behind, it will outline a theoretical method and give an overview of risk management in the economic policy as well as SSØ's method for risk management will be presented. The findings in part 3 will be used to ensure that important factors are included in the empirical research and in the analysis in order to say something about the pros and cons of the methods. Part 4: Empirical research and Analysis, consists of chapter 6 and 7. In chapter 6 the municipalities will be analysed with the purpose to tell how they amend their management according to the requirements. Findings from the analysis of risk and vulnerability analysis executed by the directorate for social security and precaution (Direktoratet for samfunnssikkerhet og beredskap: DSB) will be included in this chapter as well. Chapter 7 will discover to which degree municipalities integrate risk management in their comprehensive management. Part 5: Conclusion, consists of chapter 8 and 9. Chapter 8 consists of main findings from the analysis, while chapter 9 consists of recommendations and ideas for further research.

PART 2: RESEARCH METHODOLOGY

This part will detail how the research objective will be achieved and it will also justify the choice of method in the light of the research objective *(Saunders et al. 2003; P.30)*. Before deciding upon the research design and the different types of data collection methods, the research approach should be identified (*Saunders et al.2003; P.83).*

2. Methodology

Saunders et al. *(2003; P.85)* point out that there is a difference between inductive and deductive research approach. In an inductive research the researcher begins with collecting the data and systematizes it for finally forming the theories. Pre-assumptions of the researcher are therefore not the main limitation in the data collection and this is ensuring relevant and correct information. In a deductive research, on the other hand, the researcher is first forming expectations of how the reality looks like, secondly the researcher collects empirical data to discover if the expectations are in line with the reality. The expectations are based on earlier empirical data and theories. The critic of the deductive theory is that the researcher may limit the search for information to just include the information they think is relevant, and therefore important information may be overlooked. The critic on the inductive method is that it may consist of finding facts without forming any theory, besides, every researcher has ideas about what kinds of facts (s)he is interested in, starting with at least rude ideas or expectations.

This research will have a combination of deductive and inductive research approach. Inductive research approach means that theory will follow data and that no (strong) pre-assumptions are made before the research is conducted. The deductive research approach on the other hand tries to explain causal relationships between variables. This means that the deductive approach is working from the more general to the more specific and is therefore narrower in nature than the inductive approach. However, a combination of the two approaches is perfectly possible and also advantageous according to Saunders et al. *(2003; P.88)*. A combination of the two approaches allows for greater understanding of the research context and also make it possible to continually cycle from theories down to observations and back up again to theories. This approach will be essential in order to analyze if the requirements for risk management are fulfilled, and to which degree risk management is integrated in the comprehensive management. The combination of inductive and deductive reasoning processes also enable the researcher to observe patterns in the data that may lead to development of new theories (Trochim, 2006).

2.1 Research design

This part provides an overall view of the methods chosen and the reason for that choice *(Saunders et al. 2003; P.31)*. Research design should, according to Saunders et al. *(2003; P.31),* consist of an explanation of where and why the research is intended to be carried out, an identity and reason for the chosen research population, and a general way in which the research is intended to be carried out.

The research is going to be conducted in Norway. Because of requirements for risk management in the central government and since risk management is a field under development in the public sector (Andreassen, 2007, P.4), municipalities is chosen as a basis

for this research. An extra reason to focus on municipalities is the interest at Twente University where research has been performed in risk management of Dutch municipalities.

The identity of the research population is primarily risk managers, given that the municipalities have such managers. If this is not the situation, it is natural to contact those in a position with responsibility for achievements of objectives which may be influenced by risk, or those who are working with risk management for instance through risk control or risk financing techniques. Rather often, the Finance officer will be the official in charge of the general municipal risk management.

The figure below gives a more detailed description of the theoretical and empirical structure of the thesis.

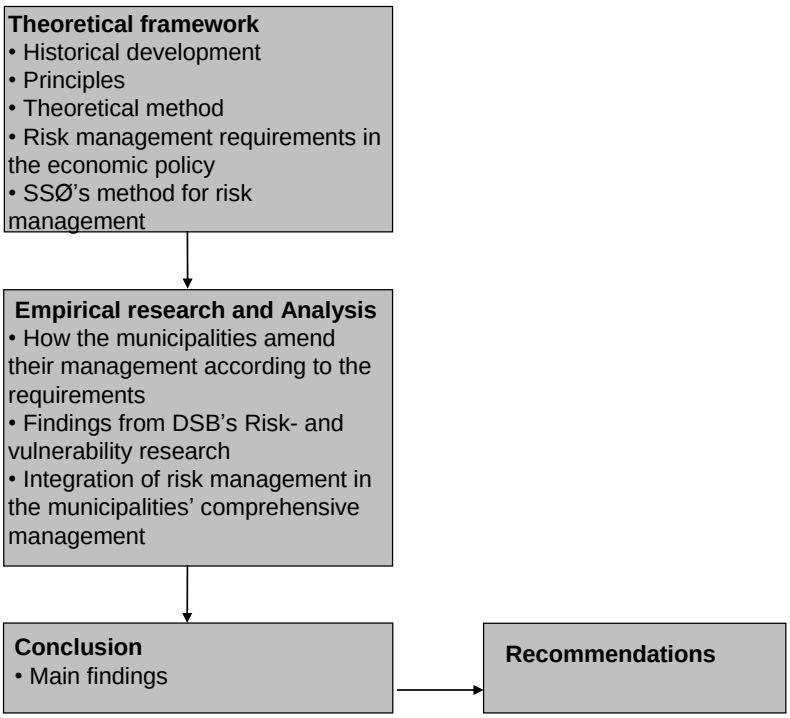

Figure 2: Construction of the theoretical and empirical framework

The first step in the theoretical and empirical framework is a reflection of influential work done on the topic risk management, the requirements for risk management in the economic policy as well as the method provided by SSØ. The empirical research is meant to identify characteristics regarding risk management in seven municipalities in Norway, and is the starting point of the analysis. Findings from DSB's research about risk and vulnerability in municipalities will also be included in this manner, as this gives a nice comparison of multiple municipalities and gives complementary information. The municipalities will be analysed with the purpose to illustrate how they amend their management according to the requirements. The analysis will also discover to which degree risk management is integrated in the municipalities' comprehensive management. The conclusion summarizes the main findings and together with the analysis, the recommendations will be drawn for further research.

In order to discover how the requirements for risk management are fulfilled and to which degree risk management is integrated in municipality management, it is necessary with a systematic overview of the different literature available. The purpose with this is to register the data with relevance for the research question *(Saunders et al. 2003; P.286)*. This can be

achieved by a combination of qualitative and quantitative data *(Saunders et al. 2003; P.378).* Qualitative research is associated with ambiguous concepts and is characterized by their richness and fullness based on the opportunity to explore a subject in as real a manner as is possible. Quantitative research allow a collection of a large amount of data from a sizable population and the data is standardized which allows for easy comparison *(Saunders et al. 2003; P.92).* The research questions will therefore be assessed with a combination of qualitative and quantitative research.

The research strategy of this thesis will be a combination of interviews and case study method with elements of quantitative data from DSB's research *(Saunders et al. 2003; P.92 and 93)*. The research design has implications for both its collection and its analysis which will be *(Saunders et al. 2003; P.378)* discussed in the following part.

2.2 Data collection

This part demonstrates that the issues regarding the methods and the relation to the research objectives are considered thoroughly. This part describes how the data are to be collected *(Saunders et al. 2003; P.31)* in order to answer the stated research question: *How are the municipalities' methods for risk management developed in order to satisfy the requirements set by the economic policy in Norway, and to which degree is risk management integrated in the municipalities' comprehensive management?*

The research question above can be divided into four main sub-questions and these are again specified into points of consideration. The figure below specifies the data collection methods that are going to be used in part 3 and part 4 of the research.

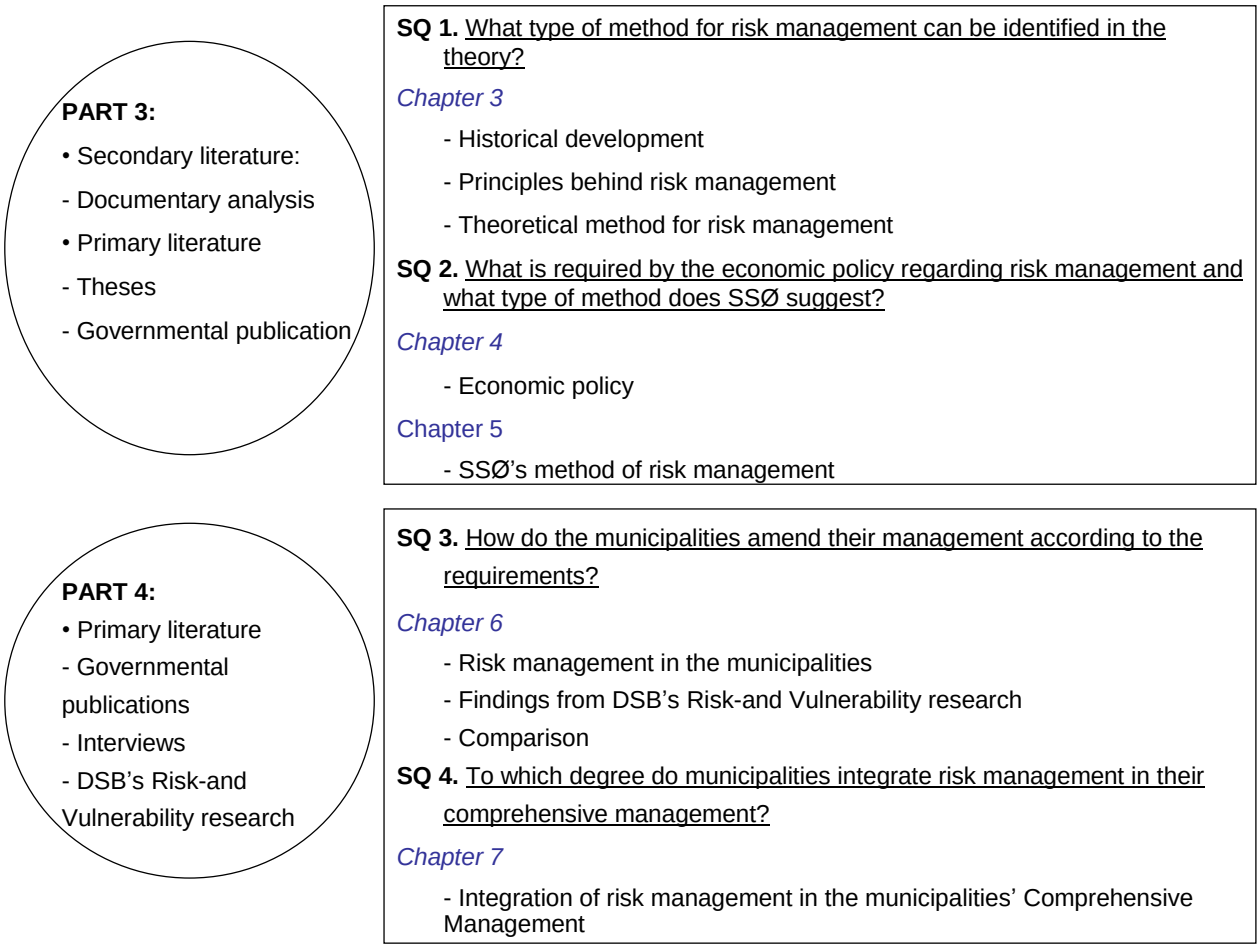

Figure 3: Overview of the data collection methods

Literature review

Saunders et al. *(2003; P.50)* divide the literature sources that can help developing a good understanding of, and an insight into research, into three categories. These categories are primary literature, secondary literature and tertiary literature. According to Saunders et al. *(2003; P.50)*, the three categories represent the flow of information from the original source and often as information flows from primary to secondary to tertiary sources, it becomes less detailed. In reality these categories overlap but as far as a distinction is possible, the literature review in this research, Part 3, will consist of secondary and primary literature.

Secondary literature sources such as books and journals are the subsequent publication of primary literature, but secondary data can also be data that are collected for some other purposes than your research objective *(Saunders et al. 2003; P.51 and 188)*. Despite this, secondary data can provide a useful source from which to answer, or begin to answer, research question(s). Secondary data include both raw data and published material and can include both quantitative and qualitative data *(Saunders et al. 2003; P.188-189)*.

Saunders et al. *(2003; P.189)* have created three main subgroups of secondary data: documentary data, survey-based data, and those compiled from multiple sources. The secondary literature review in this research will consist of documentary data. Documentary secondary data include written documents such as organization's communication like notes emails and letters, organization's web sites, reports of committees, books, journals and newspaper among others. Documentary secondary data also include non-written documents such as tape and video recordings, films, television programs etc. Because of the limited

availability of non-written documents, this research will collect written documentary data *(Saunders et al. 2003; P.190).*

Primary data are the first occurrence of a piece of work and may be collected for a specifically purpose *(Saunders et al. 2003; P.51 and 188).* The Primary literature review in this research will consist of theses, reports produced by the ministry of finance, SSØ and DSB.

Empirical research:
New primary data can be collected through methods like observations, interviews and questionnaires. An advantage of questionnaires is that the number of informants can be increased without increasing the work of analyzing the results considerably. Disadvantages on the other hand are that once a questionnaire is sent, it is not possible to edit the questions or explain if uncertainty arises. The research participants may also be reluctant to complete the questionnaire for a number of reasons and the researcher has little control of who answers the questions *(Saunders et al. 2003; P.51 and 250).* Despite the disadvantages, questionnaire was the first initial method for the empirical research since collecting data from a sample of municipalities gives room for comparison and analysis with background characteristics (like size, methods etc.) which serves the purpose of this research. However, due to low response rate, interviews and phone conversations with seven municipalities has been conducted instead. This gives room for more detailed information about each municipality. In combination with the interviews, findings from DSB's Risk- and Vulnerability research have been used to enable data from a sample of municipalities. This combination also gives room for comparing and analysing municipalities based on background characteristics (like size methods etc.) which serve the purpose of this research.

Norway can be divided into nineteen counties which again can be divided into 430 municipalities (Statens Kartverk, 2008). Out of these, seven municipalities have been interviewed. Two of the seven municipalities have more than 100.000 inhabitants, two have between 10.000-100.000 inhabitants and three have less than 10.000 inhabitants. In total, out of the 430 municipalities, 5 Norwegian municipalities have more than 100.000 inhabitants, 100 municipalities have between 10.-100.000 inhabitants and 325 municipalities have less than 10.000 inhabitants (Norges Kommunekalender, 2009). The seven municipalities researched have been randomly selected from the three classes mentioned above and mainly from different counties. The seven municipalities therefore only represent a small part of the total number of municipalities in Norway and it is therefore not possible or the purpose to generalize from this sample.

A sample of municipalities will enable a reduction of the amount of data needed to be collected by considering only data from a subgroup rather than all possible municipalities *(Saunders et al. 2003; P.150).* Out of 430 municipalities, 366 municipalities answered DSB's research in 2008. This gives a response rate of 85% (Kommuneundersøkinga, 2008, P.11). Based on this response rate it is therefore possible to generalize about all the municipalities *(Saunders et al. 2003; P.150-151).* DSB has also conducted this national survey about risk and vulnerability in the society since 2002 (Kommuneundersøkinga, 2008, P.8.). This gives confidence that the questions asked and the experience analysing them are reliable.

The combination of methods is beneficial because the methods (first of all) are used for different purposes in the study, but employing the literature review and getting feedback from my supervisors also allows for getting eased with the topic and getting a picture of the important issues to address in the empirical research *(Saunders et al. 2003; P.99).*

Analysis/Comparison:
According to Saunders et al. *(2003; P.394)*, Miles and Huberman (1994) found that the process of analysis of qualitative data may be composed of three concurrent sub-processes. These are data reduction, data display and drawing and verifying conclusions which is a part of the analysis in this research. Data reduction includes summarizing and simplifying the data collected and selectively focusing on some parts of this data. This will be done in chapter 6 which is summarizing the main findings from the interviews and phone conversations with the municipalities researched. In this chapter the important issues will be noted down in order to get an overview to write the conclusion. The questionnaire executed by DSB has also been analyzed by DSB by entering the data in a data matrix and using numerical codes. This has given them room for comparison between different factors in the municipalities.

The analysis may show that there are apparent relationships between the municipalities' risk management and the integration of this in their comprehensive management, which consequently may indicate a best practice. However, it may also show that there is a lack of relationship and that the municipalities are advised to improve their risk management according to their comprehensive management.

The validity and reliability of empirical research depend on the design of the questions, the structure of the interview and the rigour of DSB's questionnaire *(Saunders et al. 2003; P.291)*. According to Saunders et al. *(2003; P.291)*, a valid question will enable accurate data to be collected, and reliability means that the data are collected consistently. The conclusions drawn from the analysis may be considered valid and reliable because the data are collected according to the described data collection methods and tried interpreted without subjective evaluations.

PART 3: THEORETICAL FRAMEWORK

The theoretical framework is divided into three chapters; chapter 3-5. These chapters will present relevant theory about risk management and is the first input for the analysis in part 4. Sub question 1 and 2 will be answered in this part by looking at several points of consideration and by using different sources of literature, as illustrated by the figure.

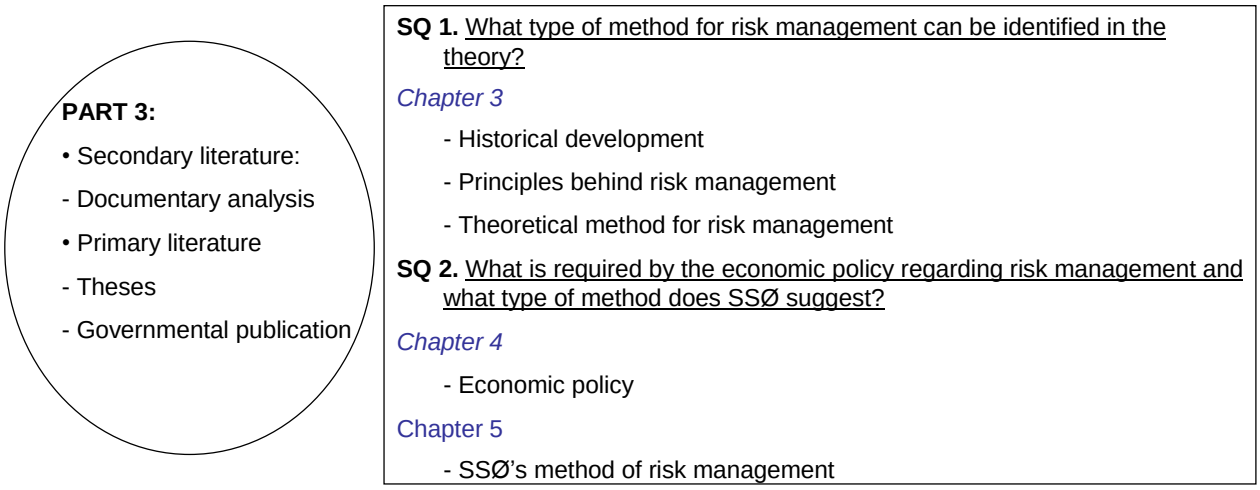

Figure 4: overview of part 3: Theoretical framework

3. A theoretical perspective of Risk Management

In this chapter theory about risk management will be presented. The chapter gives a brief presentation of the historical development of risk management, principles behind and theoretical methods of risk management like risk control and risk financing techniques.

3.1 Historical development of Risk Management:

One can look at risk management as something that has been practiced for a number of years ever since mankind learned to reduce or avoid risk. D'Arcy (2001:P.4) exemplifies this by imagining a proto-risk manager burning a fire at night to keep wild animals away. However, according to D'Arcy (2001:P.4), it was not until the 1960's that risk management was formally named and principles were developed and established.

Risk management has long been a mainstay of good business management but the concept of addressing risk holistically in a single integrated framework is a relative newcomer (Wood 2008). The initial focus of risk management was those risks that have traditionally been addressed by insurers including fire, theft, and health among others. According to D'Arcy (2001:P.2-3) this is now termed hazard risk. Financial risks began to be addressed later by a separate segment of most organizations, and this field developed its own terminology and techniques for addressing risk. According to D'Arcy (2001:P.3-4) each speciality area developed different methods for reporting the risks the organization faced, but since the hazard manager and financial risk manager both generally reported to a common position, often the treasurer or chief financial officer of the firm, the different approaches to dealing with risk created awareness of a problem. For instance each area could expend resources to deal with a risk that in aggregate would cancel out within the organization. The tolerance for risk applied in each area could also be greatly different between hazard risks and financial risks. These issues provided the drive for a common approach for dealing with risk, which could also be applied to other risks such as operational risk and strategic risk. This approach is the heart of enterprise risk management (D'Arcy, 2001:P.4).[1]

3.2 Principles behind Risk Management

Risk-tolerance is the level of risk that an organization can accept. If the organisation evaluates a risk to be outside their risk-tolerance, then they have to implement risk management techniques to reduce the risk to an accepted level. However, as a result of uncertainty about the future, limited resources and limitations associated with operations, it is not possible to limit the risk to zero (SSØ #4, 2007: P.7). Risk management techniques are therefore supposed to adjust the level of risk an organisation faces according to their risk tolerance (SSØ #4, 2007: P.7). Before these risk management techniques are being discussed some definitions will be provided.

Risk and Uncertainty defined

There are many definitions of risk, which can be illustrated by the following description given by Bettis (1983, P.413): "*the term risk is taken in modern financial theory to be a precise technical term in defining the probabilistic distribution of market returns. In the strategic*

[1] Since an enterprise is a for profit market firm, the denominator "enterprise risk management" is too narrow. Since the principles may be applied also for other types of organizations, notably also public agencies, the term "comprehensive risk management" is preferred and used in this research.

management literature, however, it is often taken (among other things) as a manager's subjective judgement of the personal and organizational consequences that may result from a specific decision or action." (Ritchie and Marshall, 1993, P.143).

It is also argued that risk is not purely negative. Risk has both a positive and a negative side, where the positive is desirable (and often refers to the opportunities) and the negative is not (Ritchie and Marshall 1993, P.1). Risk, whether we consider the positive effects or the downsides of risk, it implies an unknown outcome. Knight (1921) argues that risk has an unknown outcome but that underlying distribution is known (Ritchie and Marshall, 1993, P.141). This takes us to the next term, uncertainty. According to Knight (1921) uncertainty is different from risk. Uncertainty also implies an unknown outcome, but in addition to this we do not know what the underlying distribution looks like (Ritchie and Marshall, 1993, P.141). The ability to objectively asses the likelihood of each outcome occurring is therefore the basis for risk, while subjective probability underlies uncertainty (Ritchie and Marshall, 1993, P.141).

Even though the theory makes a division between the positive and negative sides of risk and a slightly distinction in the definition of risk and uncertainty, this is not always relevant or easy to do in practice. In order to avoid confusion regarding definitions, this paper will use the same definition as SSØ use in their risk management method. According to SSØ, risk is those circumstances or events that may happen and that will affect achievements of merits and objectives negatively (SSØ #4, 2007: P.7). The evaluation of risk should be done according to probability of occurrence (frequency) and the expected consequence it will entail (severity). SSØ's definition of risk therefore includes both risk and uncertainty, which might have a negative affect on the objectives, under the condition that the frequency and severity criteria might both be assessed objectively and subjectively.

Risk Management defined and its premises

"*Risk Management is a process that helps you to identify the areas of your organization at risk, analyze and select the techniques that are most appropriate to cope with that risk, implement the techniques, and monitor the results."* (Bradley Johnson, 1987, P.2).

Risk management can make an organization more competitive in qualifying for insurance on favourable terms (obtaining better policy terms) because of different control activities that can be implemented (Bradley Johnson, 1987, P.10-11), which will be discussed more in detail in chapter 3.3.3: Risk treatment. Risk management will also help identifying the efficient means of financing risk by improving where and how funds are spent, and it can reduce the fear of undertaking new projects (Bradley Johnson, 1987, P.10-11). The explanation is that it helps making future losses less frequent, less severe or more predictable by for instance screening staff, provide good risk management training or undertake measures to avoid loss. Risk management also provides stability and structure to the operations by avoiding the types of losses unlimited insurance coverage cannot compensate for. Finally, risk management can help educate stakeholders about safe practices that will prevent or reduce serious losses (Bradley Johnson, 1987, P.10-11).

According to Bradley Johnson (1987, P.9) George Head has noted that risk management is composed of two elements: a decision process and an administrative process. The decision process consists of events designed to identify exposures and decide on the best way to handle them. The administrative aspect entails planning of what needs to be done to protect the organization from loss, organizing staff and resources to carry out the plans, leading and

motivating staff to carry out risk management tasks and finally controlling the program by evaluating its performance and making necessary changes (Bradley Johnson, 1987, P.10). The following chapter explains risk management in greater detail.

3.3 Method for comprehensive risk management identified in the theory

"*The function of risk management is to identify areas possibly at risk, analyze and select the most appropriate techniques to cope with that risk, implement the technique, and monitor the results"* (Bradley Johnson, 1987, P.13). The following steps in the risk management process identified in literature, e.g. by Bradley Johnson (1987, P.13), can therefore be outlined:

Decision process	1.	Risk identification: Identify areas at risk.
	2.	Risk evaluation: Measure the frequency and severity of each loss.
	3.	Risk treatment: Analyze the alternatives available for dealing with the risk
Administrative process	4.	Decision and implementation: Select and implement the best alternative.
	5.	Monitoring: Follow up on the decision and modify if necessary

Figure 5: Risk management process

3.3.1 Risk identification

Risk may, according to SSØ, be defined as those circumstances or events that may happen and that will affect achievements of objectives negatively (SSØ #4, 2007: P.7). Before risks are identified an organization therefore needs to identify their objectives and critical success factors (SSØ# 4, 2005, P: 28). Critical success factors are those factors that are important not to fail accomplishing in order to reach the objectives, and are therefore implicitly the risks (SSØ# 4, 2005, P: 28). This indicates that there are different forms of risk that can be identified in an organization. Despite this, the perceived risk does not need to be constant throughout the decision process (Fill 2005, P.154). Risk identification tools include questionnaires, analytical tools and brainstorming which focus on the threat areas (Futron #6 and #8, 2008). Risk that can be identified is for instance losses that may occur like human, physical, financial and natural (Bradley Johnson, 1987, P.14, 15&18). Ritchie and Marshall (1993, P.114) have a list of risks that may affect aspects of an organization's activities, and consequently is important to identify. Market risks like demand, price, taste, preferences and changes in government regulations are one example. Another example is financing risks like costs of providing and maintaining capital or factors that are subject to government policy like interest, currency exchange rates, taxation, exchange control and cross-boarders capital movement restrictions (length). Resource Management risks like costs and availability of raw materials, strikes, bankruptcies, technological change, lack of trained labour etc. may also affect aspects of an organization's activities. Finally, political risk (Investopedia) and environmental risks like anti-pollution and safety regulations may also affect organizations' activities (Ritchie and Marshall, 1993, P.114).

3.3.2 Risk evaluation

When the risks have been identified, risk evaluations will take place and the result will give an estimation of how high the expected risks are. This is therefore a part where the risks are being prioritized based on how much they will influence the achievements of objectives

negatively. Those risks that may have a significant influence on the objectives should consequently be addressed in the risk treatment process (SSØ #4, 2007: P.7).

Risk evaluation determines the loss potential of each risk. The potential is assessed in terms of frequency, which is how many times a loss may occur in a certain time frame, and severity. Both the maximum probable loss and the maximum possible loss should be examined. The probable loss is an assessment of the (Euro) amount of loss likely to occur from a risk. The possible loss is a worst case scenario (Bradley Johnson, 1987, P.18-19). Source of information to evaluate the risks is past history by industry, occupation or the enterprise itself. Estimating the severity of losses require the organization to determine the severity of both property and liability losses. The evaluation process is speculative and a good deal is therefore hypothetical losses (Bradley Johnson, 1987, P.18-19).

When evaluating risks, organizations can categorize the different risks into four different quadrants as illustrated in the figure below. This will give a good overview of the most severe risks and those risks that can be considered as minor, which is the basis for the next step, risk treatment.

		Frequency	
		Low	High
Severity	L	Quadrant A: Low severity Low Frequency	Quadrant B: Low severity High Frequency
	H	Quadrant C: High severity Low Frequency	Quadrant D: High severity High Frequency

Figure 6: Risk quadrants
Source: Bradley Johnson, 1987, P.19.

Examples of risk in quadrant A might be minor theft, vandalism, routine injuries and minor building damage (Bradley Johnson, 1987, P.20). Quadrant B includes risks such as minor auto accidents, workers' compensation claims, and some general liability exposures (Bradley Johnson, 1987, P.20). Risks that can be classified in quadrant C are boiler and machinery, property loss, large liability suits against the organization, data processing losses, permanent injuries or major theft (Bradley Johnson, 1987, P.20). Risks in quadrant D are the most critical and include property loss and some general liability exposures (Bradley Johnson, 1987, P.20).

In Queensland Government implementation guide for risk management it is suggested a more detailed risk evaluation than described above. In this guide it is suggested that evaluations of risks should be based on consequences and likelihood using a 5x5 matrix, as illustrated in the figure below (Queensland Government, 2002, P: 9).

Likelihood	Consequences				
	Insignificant 1	Minor 2	Moderate 3	Major 4	Catastrophic 5
A (almost certain)	H	H	E	E	E
B (likely)	M	H	H	E	E
C (moderate)	L	M	H	E	E
D (unlikely)	L	L	M	H	E
E (rare)	L	L	M	H	H

Figure 7: Levels of risk
Source: Queensland Government, 2002, P: 9.

Notes to the figure above:
E: extreme risk
H: high risk
M: moderate risk
L: low risk
(Queensland Government, 2002, P: 9)

Examples of risk that can be categorized low are the same as in quadrant A in figure 5 above. Moderate risk is similar with risks in quadrant B, high risk is similar with risks in quadrant C and Extreme risk is similar with risks in quadrant D above. It might, however, be argued that there are different levels of for instance extreme risk. A risk that has catastrophic consequence and where the likelihood is almost certain is for instance more extreme than a risk that is moderate and almost certain or catastrophic and unlikely. An example of the latter is a natural disaster, which normally can not be insured. Organizations and private persons as well tend to ignore such risks, in a kind of "ostrich policy". Based on the different risk characteristics, different risk treatment techniques apply which will be discussed in the next chapter.

3.3.3 Risk treatment

The purpose of risk management includes reducing the economic costs and can therefore be considered as an optimizing-problem consisting of two parts. The first part is concerned with the risk control techniques in order to minimize the risk of loss. The second part is concerned with risk financing techniques by either retaining the responsibility for loss or seek to transfer that responsibility to some other party (Bradley Johnson, 1987, P.20-22).

Risk control
Management control failures can lead to large financial losses, damage to reputation and even organizational failure *(Merchant and Van der Stede, 2007: P.3)*. Management control can address problems like thefts, fraud and unintentional errors. However, adding more controls does not necessarily lead to better control *(Merchant and Van der Stede, 2007: P.4)*.

It is widely accepted that good management control systems are important *(Merchant and Van der Stede, 2007: P.4)*. Some management controls are proactive, rather than reactive, which means that the controls are designed to prevent problems before the organization suffers any

adverse effects on performance. Designed properly, control systems can increase the probability that the organization will achieve its objectives, which is also the benefit of management control systems *(Merchant and Van der Stede, 2007: P.5)*.

There are different ways to control or manage risk. In general, however, risk control techniques are meant to minimize the risk of loss and this include avoidance and loss control as illustrated in the figure below.

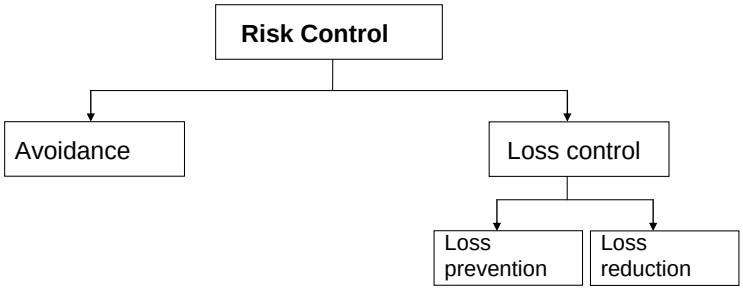

Figure 8: Risk Control

If the loss is very small, the risk may be accepted, even in the case of high frequency. A famous example is the loss of paperclips. Acceptance is a time saving policy with not too high losses to be covered by the annual budget. On the other hand, if the task is not worth the risk and it is not a prime function, it should be avoided (Bradley Johnson, 1987, P.20-22). Avoidance means eliminating the possibility that an activity will cause the organization harm. Organizations can never avoid all risky activities, but they can often avoid some of them by limiting exposure to certain types of problems and problem sources, or by reducing the maximum potential loss if the problems occur (Merchant and Van der Stede, 2007: P.12). It is rarely possible to avoid all risks because firms are rewarded for bearing risk, however, some examples of avoidance strategies are activity elimination, automation, centralization, and risk sharing (Merchant and Van der Stede, 2007: P.12 and 15).

Loss control is concerned with the frequency or severity of both insured and retained risk. Even though a risk is insured it does not preclude the need to reduce the frequency or severity of its occurrence (insurance will be discussed more in detail under risk financing). The reason for this is that a bad history affects an organization's bargaining position in negotiating insurance as well as insurance cannot replace many losses. Loss control includes both loss prevention and loss reduction. Loss prevention is techniques for reducing the frequency like maintenance, inspections, training and safety programs. Loss reduction techniques on the other hand, are used to reduce the size or severity of losses when they occur. For instance fire extinguishers, seat belt requirements and first aid training (Bradley Johnson, 1987, P.20-22). Loss control is a form of risk limitation, which means that it is a partial avoidance of problems that might arise (Merchant and Van der Stede, 2007: P.13).

A dilemma by implementing several risk control techniques is that the costs associated with risk control will increase. If, however, fewer control techniques are implemented, the costs as a result of unwanted incidents may increase. It is therefore in the organizations' interest to get this balance right. "*Once all the hazards have been identified, the organization must devise risk management strategies. At its simplest level, this will involve assessing the trade-offs between the benefits to be derived from a given reduction in risk, and the costs incurred in achieving this reduction."* (Ritchie and Marshall, 1993, P.145)

Risk financing

Risk-financing are techniques for retaining responsibility for loss or seek to transfer that responsibility to some other party (Bradley Johnson, 1987, P.20-22). Risk-financing techniques therefore include retention and transfer as illustrated in the figure below.

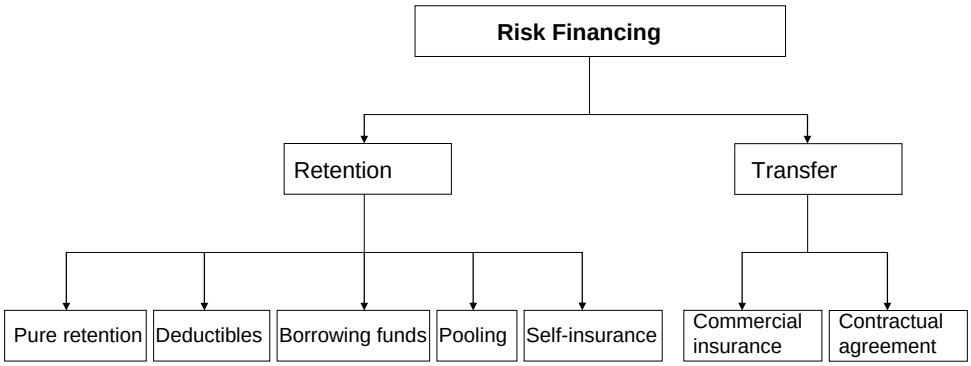

Figure 9: Risk Financing

Commercial insurance is the most well-known form of risk transfer. Transfer through contractual agreements is another form (Bradley Johnson, 1987, P.20-22). Retention is a decision to assume responsibility for all or some portion of a potential loss. This can be both a conscious decision but also a result of not knowing the risk or the loss potential and as a result failing to transfer responsibility to another party.

Tools of retention are pure retention, deductibles, borrowing funds for losses and retention through pooling or self-insurance. Pure retention means paying for the loss out of its current budget or out of some form of reserve. Deductibles are a portion of loss assumed by an insured and the remainder is covered by the insurance coverage. Borrowing funds for losses are agreements that provide credit to pay for substantial losses, so in essence this is a form of retaining the loss because the loan have to be repaid (Bradley Johnson, 1987, P.20-22). Self-Insurance and pooling includes paying losses on a funded or unfunded basis, and purchasing excess insurance for catastrophic losses (Bradley Johnson, 1987, P.58-59). Although individual organizations may be able to finance all of their exposure, they may wish to pool together to create a common fund to cover at least a portion of their losses. Out of this fund the group pays for the losses incurred by any one member (Bradley Johnson, 1987, P.58-59).

Advantages of pooling are to spread the risk and costs, and the service within the pool may be better than those offered by the commercial insurance market because you have more control over the services connected with insurance. Pooling also solves the availability problem inherent in a hard market, the costs might be reduced as a result of return on invested fund held in reserve, it gives better control over costs of related services and increased staff awareness of costs (Bradley Johnson, 1987, P.58-59). The members will also be more motivated to prevent loss and manage claims effectively. One disadvantage of pooling is that there are some losers in the group. The pool may also be forced to come back and ask the group for more money which may lead to unforeseen costs. Long-term commitment will make it financially costly for members to leave. Finally, there are only certain lines of coverage and the premiums in pools may not always be less expensive than those in the commercial marketplace (Bradley Johnson, 1987, P.58-59).

The purchase of commercial insurance can be well advised. The problem has, however, been that the decision is often made without any idea of what risks are present and how they can be

controlled (Ritchie and Marshall, 1993, P.253). As a result many organizations purchase a good deal of unnecessary insurance. A deficit of insurance is that the existence of an insurance policy can not prevent accidents from happening or ensuring that the losses are not being sustained (Ritchie and Marshall, 1993, P.253). When premium costs are low, people tend to buy more insurance than is necessary. However, insurance will hardly ever cover the total loss (Ritchie and Marshall, 1993, P.253). A claim will rarely cover items such as loss reputation, retraining, loss of market share and the like (Ritchie and Marshall, 1993, P.253).

In economic terms, buying insurance may help to stabilize and/or lower an organization's risk financing costs by allowing it to substitute the cost of a known insurance premium for the unknown costs of unpredictable losses. According to Ritchie and Marshall (1993, P.258), insurance premiums have behaved with increased volatility the last few years. This means that it may be more cost-effective for organizations to meet claims out of retained profits than to try to predict how much next year's insurance premiums will be. It is, however, difficult to get the right balance between self-insurance through loss retention and commercial insurance (Ritchie and Marshall, 1993, P.258). Whether to purchase insurance for a particular risk, an organization should not retain more than they can afford to lose, they should not risk a lot for minimal savings, nor should they spend a lot for little protection (Bradley Johnson, 1987, P.71). However, before management consider the possibility of self-insurance they should consider why they should set aside potentially quite large sums of money, perhaps earning only money market interest rates, when the same money could be used to start a new business that would earn a larger return (Ritchie and Marshall, 1993, P.261). If a large claim does arise the cost can be met by the sale of one of the businesses run by the organization and if the claim does not arise, the organization will be wealthier than if it had set up a risk retention fund (Ritchie and Marshall, 1993, P.261).

Based on the discussion above, it is important for managers to work towards ensuring that all major risks are clearly identified and adequately controlled through properly planned risk management measures (Ritchie and Marshall, 1993, P.253). They should therefore not see insurance as more than a final line of defense against loss exposures that they cannot otherwise be defended against (Ritchie and Marshall, 1993, P.253). It is also important to consider the pros and cons for the specific organization before deciding which risk financing techniques to implement.

3.3.4 Decision and implementation

The fourth step is decision and implementation and is about determining the best way to deal with the exposures that have been identified and analyzed (Bradley Johnson, 1987, P.22-23). The matrix below relates the frequency and severity of the exposure to the appropriate treatment. The intent of risk management, outside of avoiding or transferring the exposures completely, is first to reduce the frequency and/or severity of the loss and then to finance the loss appropriately (Bradley Johnson, 1987, P.22-23).

Quadrant A:	Quadrant B:
Low severity Low Frequency	Low severity High Frequency
Retention Loss control	Retention Loss control
Quadrant C:	Quadrant D:
High severity Low Frequency	High severity High Frequency
Insurance Loss control	Avoidance and transfer

Figure 10: Appropriate treatment based on the frequency and severity of the exposure.
(Bradley Johnson, 1987, P.22).

Quadrant A in the figure above is the category of risks that have low severity and low frequency. This quadrant therefore represent risks that the organization can afford to lose and there is no need to spend a lot for little protection. The proper treatment of these risks is therefore to assume responsibility for all or some portion of the potential loss (retention) and loss control (if necessary) which means that they can prevent and/or reduce some of the potential loss.

Quadrant B in the figure above is the category of risks that have low severity and high frequency. Consequently, this quadrant also represent risks that the organization can afford to lose and there is still no need to spend a lot for little protection. The proper treatment of these risks is therefore the same as in quadrant A; to assume responsibility for all or some portion of the potential loss (retention) and loss control either by preventing the potential loss from happening or by reducing it if occurring.

Quadrant C in the figure above is the category of risks that have high severity and low frequency. This quadrant therefore represents risks that potentially have severe losses and the proper treatment is therefore transferring the potential loss to some other party through insurance. Another proper treatment is loss control which is the same for quadrant A and quadrant B.

Quadrant D in the figure above is the category of risks that have high severity and high frequency. This quadrant therefore represents risks that potentially have severe and frequent losses. The proper treatment is therefore to avoid the tasks that represent this risk or transferring the risk to some other party for instance through commercial insurance or contractual agreements.

In Queensland Government implementation guide for risk management there are also suggestions for treatment of risks, or management action (Queensland Government, 2002, P: 9). The figure below relates the risk levels in figure 6 and risk tolerance, or acceptability, to the appropriate management action (Queensland Government, 2002, P: 9).

Risk level	Acceptability	Management action
Low (L)	Acceptable with existing controls	- Ongoing monitoring and review
Moderate (M)	Acceptable with existing controls	- Ongoing monitoring and review - Assign management responsibility for monitoring
High (H)	Unacceptable with existing controls	- Select and implement treatment option - Assign management responsibility for monitoring - Oversight of treatment by senior management
Extreme (E)	Unacceptable with existing controls	- Select and implement treatment option immediately - Assign management responsibility for monitoring - Oversight of treatment by senior management

Figure 11: Suggested risk acceptability criteria and management actions
Source: Queensland Government, 2002, P: 10.
Comparing figure 10 and figure 11 we find that:
- Quadrant A in figure 10 can be compared with risk level low in figure 11
- Quadrant B in figure 10 can be compared with risk level moderate in figure 11
- Quadrant C in figure 10 can be compared with risk level high in figure 11
- Quadrant D in figure 10 can be compared with risk level extreme in figure 11

Risks categorized as Extreme, or similarly in quadrant D, should be assigned a higher priority than risks classified as high, moderate or low (Queensland Government, 2002, P: 10). As we can see in figure 11, proper management action for such risk is to select and implement treatment option immediately. The suitable treatment option, as discussed under quadrant D above, is either to avoid the tasks that represent this risk or transferring the risk to some other party. When this has been decided, the implementation should take place. Management responsibility for monitoring should be assigned as well as the senior management should get an oversight of the treatment (Queensland Government, 2002, P: 10). It is also important to establish a corporate focus for risk management, communicate corporate direction and integrate risk management into existing decision-making structures (Treasury Board of Canada Secretariat, 2004).

In the figure below Futron's risk management implementation roadmap is used to illustrate how risk management practices can be implemented. By following the process, organizations have reasonable assurance of meeting their strategic goals and objectives (Futron #11, 2008).

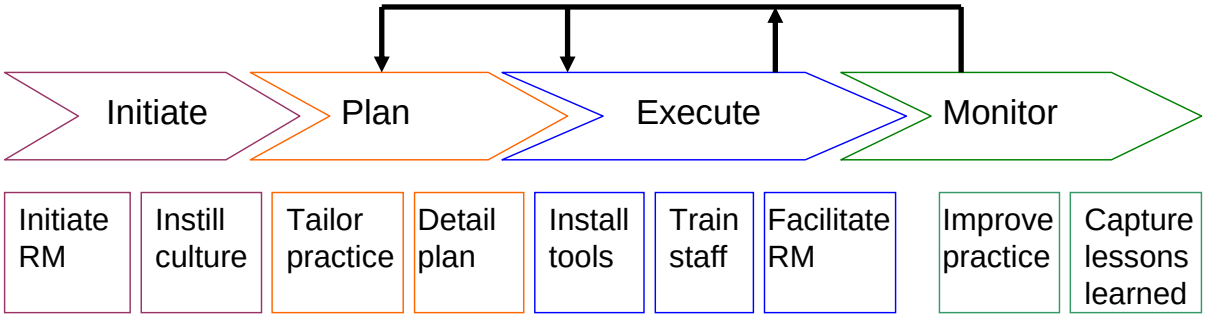

Figure 12: Implementation Roadmap
Source: Adapted from Futron #1, 2008.

The implementation roadmap is illustrating the administrative aspect of risk management which entails instilling the culture, planning of what needs to be done by tailoring what was agreed in the decision process, organizing staff and resources to carry out the plans and finally controlling the program by evaluating its performance and making necessary changes (Bradley Johnson, 1987, P.10).

Initiate:
The first step in implementing risk management is initiating the risk management practice which begins with someone recognizing the benefit and/or the requirement and taking action to ensure that the practice is implemented (Futron #2, 2008). Risk management culture can not be instilled in one process step, but it can provide initial awareness and understanding followed by a desire to use risk management (Futron #3, 2008). This can be accomplished by identifying a team that are involved in the risk management implementation and providing them with necessary training. Effective training includes explanation of risk management, why the organization is adopting it, the outcomes that are expected, and the individual roles and responsibilities. This will enable the team to be change agents within the organization (Futron #3, 2008).

A product of the first step is a risk management implementation plan (Futron #2, 2008). Another product of this step is the generation and communication of the risk management policy. The risk management policy express that the organization intends to consider risk in decision-making, supports the development and implementation of risk management tools, and strives to improve their risk management performance (Futron #3, 2008).

Plan:
The second step in implementing risk management is the risk management implementation plan. Here the risk management practice agreed on in the decision process should be tailored. This means that the organization's success factors should be identified. Success factors are features that have major influence on achievements of the organizations objectives. To identify the success factors you therefore have to identify the goals, objectives, requirements and constraints in advance (Futron #4, 2008). The success factors should be prioritized by analyzing the consequences of non-achievement and threats to achievements. Based on the success factors, key performance indicators can be defined. Key performance indicators are measures of the performance (Futron #4, 2008). Risk categories are identified to determine the most likely sources of risk and risk evaluation will be done to ensure that the significant risks in these areas are targeted like discussed in chapter 3.3.2 and 3.3.3 above.

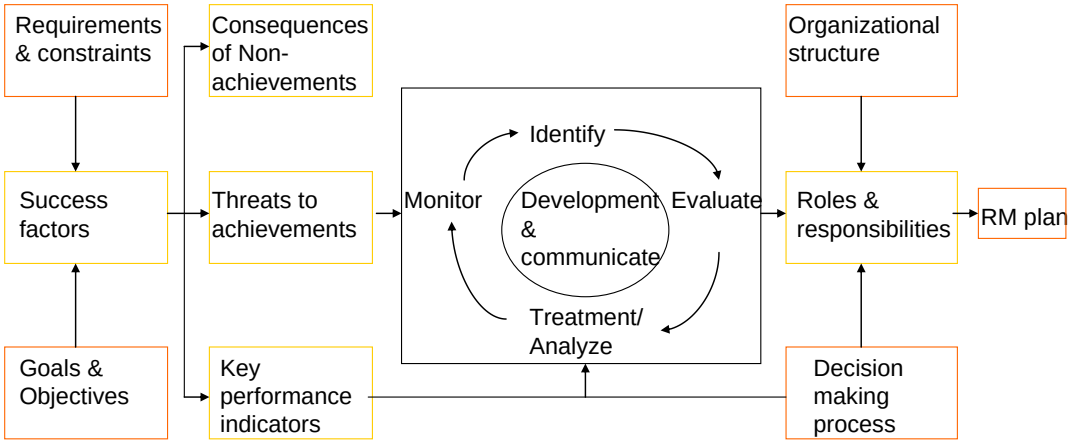

Figure 13: Risk management practice
Source: Adapted from Futron #4, 2008.

The organizational structure is an input in determining and assigning risk management roles and responsibilities. The intent is, according to Futron, to assign responsibility as low in the organization as possible to take advantage of functional expertise, promote ownership and involvement in the risk management practice, and ease the management burden (Futron #4, 2008). The activities should be integrated into the existing decision-making and governance processes in order to achieve efficient practice and to ensure that the impact of change is reduced (Futron #4, 2008).

Execute:
The third step in implementing risk management is executing the plan. Tools that can support the risk management process are important to deploy (Futron #6, 2008). Examples of risk identification tools include questionnaires and analytical tools as mentioned in chapter 3.3.1. Risk evaluation tools may be matrixes that indicate how high the expected risks are, as discussed in chapter 3.3.2. These same tools are also used to indicate proper treatment tools like risk control techniques and risk financing techniques as discussed in chapter 3.3.3.

Once the tools are deployed it is time to provide knowledge and awareness of risk management (Futron #7, 2008). This includes explaining the workforce how to use the processes, methods, and tools, and to stimulate a desire and commitment to perform risk management (Futron #7, 2008). The risk management training should, according to Futron include: risk management terminology, risk management concepts and principles, expected benefits, roles and responsibilities, process elements, and tool application and demonstration (Futron #7, 2008). Facilitating risk management can be important to allow maximum participation, to document and communicate risk and to generate reports among others (Futron #8, 2008). The arrows to and from this step in figure 12: implementation roadmap above indicates feedback in order to either improve the existing execution of the plan or that the plan itself needs adjustments.

The last step in the implementation roadmap, monitor, will be discussed in the next part as it is both the final step in implementing risk management and the last step in the ongoing risk management process.

3.3.5 Monitoring

Once risk management practices are established, there is opportunity to assess the risk management implementation and implement improvements (Futron #9, 2008), which is indicated by the arrow from the last step in figure 12: implementation roadmap. It is therefore beneficial to have ongoing monitoring and conduct assessments at periodic checkpoints. Ongoing monitoring of risk management is the primary indicator of risk management performance. For instance analyzing planned versus actual variance in performance can reveal problem areas that should have been dealt with as risks (Futron #9, 2008). Any practice assessment will identify areas for improvement and it will identify strengths as well (Futron #9, 2008). Monitoring therefore makes it possible to assess how appropriate past decisions have been and to keep up with new loss exposures or circumstances that may dictate new decisions (Bradley Johnson, 1987, P.23). Monitoring may for instance both identify improvements in the plan or finding a better way to execute the plan.

When the risk management implementation is terminated, it is important to capture lessons learned (Futron #5 and #10, 2008). This requires a retrospective examination of the implementation of risk management and documenting successes and shortcomings (Futron #5 and #10, 2008). Capturing archive of plans, training materials, meeting agenda, risk information, and other materials may also be helpful for the organization later. These materials can become reference for future risk management implementation as well as the lessons learned are useful in refining the risk management implementation roadmap (Futron #5 and #10, 2008).

Each organization has to adjust their risk management to their business model and organizational culture which may be a factor that makes it complicated to implement comprehensive risk management successfully *(Strøm and Østreng, 2007: P.50)*. The framework for comprehensive risk management presented above, however, forms the theory's foundation of what needs to be assessed in order to achieve success with risk management.

Even though it is rarely possible to avoid all risks, because firms are rewarded for bearing risk (Merchant and Van der Stede, 2007: P.12), it can be argued that the level of risk in the public sector is lower than in the private sector. The reason for this is that public agencies are not in the same way rewarded for bearing risk and there are for instance a lot more bureaucratic routines and politics than in the private sector which gives implications for level of risk and requirements for comprehensive risk management (SSØ #2:P.11). However, organizations, either private or public, can never avoid all risky activities (Merchant and Van der Stede, 2007: P.12). In reality there are therefore several factors that complicate the risk management process in municipalities compared to private enterprises (SSØ #2:P.11). First of all, municipalities normally have different objectives than private enterprises. They are for instance more concerned with welfare and society issues than making profit and return (SSØ #2:P.11). Secondly, municipalities get resources from taxes to deliver a service which is opposite to private enterprises that deliver a service to generate income (SSØ #2:P.11 and SSØ #7:P.2). Thirdly, municipalities in Norway often have limited competition for the services they deliver and they can not go bankrupt (SSØ #2:P.11 and SSØ #7:P.2). Regulations on Municipalities and Local government adopted 25th of September 1992, chapter 9 paragraph 55 ratify that municipalities can not be filed for bankruptcy or any liability negotiations (Lovdata, 1992). If a municipality by any reason can not pay their debts or liabilities they are covered by the local government and regional development of the central government in Norway (Lovdata, 1992).

The factors mentioned above make comprehensive risk management more complicated because there might for instance be a small coherence between objectives and resources available (Defence stab, 2007, P:6). The objectives can also be difficult to measure and it can therefore be too much focus on explaining variance and on control, rather than on the objectives (Defence stab, 2007, P:6). Lack of competition is another example because this means that there are different incentives for efficient use of resources in municipalities and in private enterprises, because the prices on public services lack information of costs and utility (Defence stab, 2007, P:6).

4. Regulations on Financial Management in the Economic Policy

Regulations on Financial Management in Central Government were adopted by Royal decree 12th of December 2003. This replaces the Financial Regulations for Central Government, adopted by Royal Decree 26th of January 1996. The regulations came into force 1st of January 2004, and the current regulations includes adjustments made latest on 14th of November 2006 (Royal Ministry of Finance, 2008 P.1 and 5). A summary of the regulations on financial management in the economic policy is to be found in appendix 1: Regulations on Financial Management in the economic policy.

The purpose of the regulations on financial management is to ensure that established objectives and performance requirements are achieved, ensure that central government funds are used efficiently and ensure that assets belonging to the central government are properly managed (Royal Ministry of Finance, 2008, P.12). The governance and monitoring shall, however, be adapted to the municipalities' distinctive characteristics as well as to its risk profile and its significance (Royal Ministry of Finance, 2008, P.20). In addition, the management of the municipality shall consider the costs entailed by the actions against the utility and the benefits to be achieved. All actions should therefore ensure relevance and completeness in the risk evaluation (Royal Ministry of Finance, 2008, P.25). In the following chapter, SSØ's method will be presented.

5. SSØ's method of Risk Management

The Norwegian Government Agency for Financial Management (SSØ) was established by the ministry of Finance in 2004. Their mission is to strengthen financial management within the public sector and to make the use of resources more efficient (SSØ #1, 2008). The main purpose is to contribute to efficient use of resources by arranging for good financial management and deliver economic services to public agencies (SSØ# 3, 2007). SSØ administer the economic policy in Norway which means that they interpret the policy, give advice and offer proficiency within financial management. This includes objective and-performance management, risk management, budget and accounting, development of public subsidies, economic analysis and evaluations. SSØ also develop methods and guidance for economic- and enterprise management (SSØ# 3, 2007).

SSØ's method for Risk Management will be presented in the following part. The target group for SSØ's method for risk management is mainly managers on different levels in the agencies and councillors that advice the managers in arranging for risk management. The thought behind the document is that the methodical aspect and definitions may be used by all public agencies (SSØ# 5, 2008).

5.1 Risk Management integrated in the Comprehensive Management

Risk Management should, according to SSØ be a process integrated in the objective and performance management which is developed in such a way that it can identify, evaluate, manage and follow-up risk so that the risk is within an accepted level (SSØ# 5, 2008). This should be exerted in the strategy and plans of the ministry of local government and regional development to give confidence that the objectives will be achieved or that the weaknesses in the preconditions for achieving the planned results are discovered (SSØ# 5, 2008). Risk management will consequently become a tool to solve management challenges in the ministry (SSØ# 5, 2008).

The principle that risk management should be integrated in the objective and performance management accounts for all levels in the central government (SSØ# 5, 2008). This means that the ministry of local government and regional development has to follow the same requirements for risk management as the underlying municipalities. Good risk management, according to SSØ, is also based on a top-down manner which means that the result of the ministry's own risk management will influence risk management in underlying municipalities (SSØ# 5, 2008). The relationship between risk management and objective and performance Management is illustrated in the figure below.

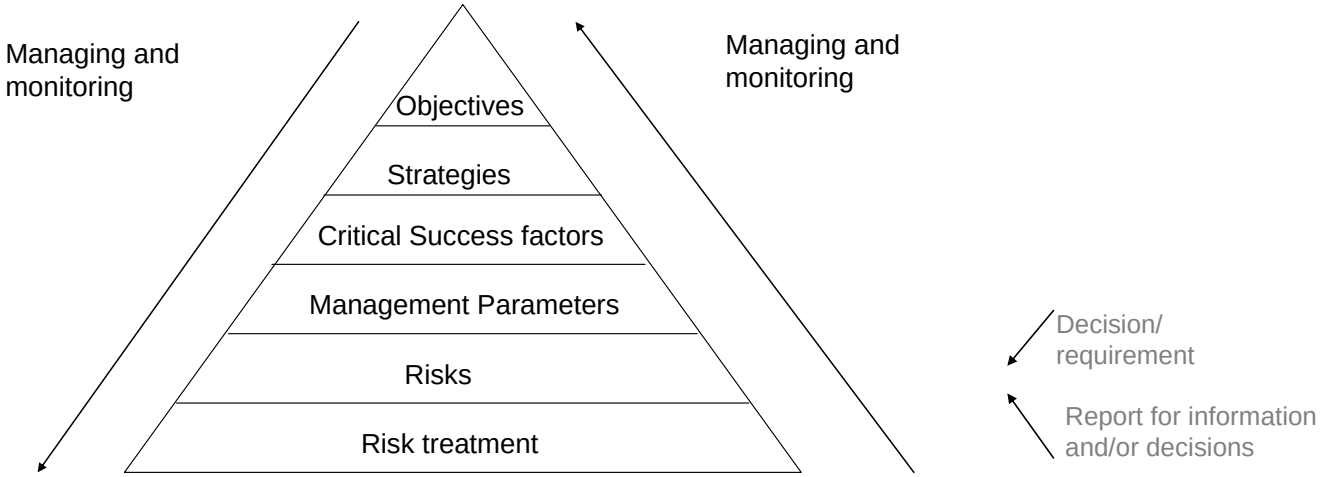

Figure 14: Risk Management and Objective and Performance Management
Source: SSØ# 4, 2005, P: 16.

The starting point for risk management is, according to SSØ, always the objectives and strategies for the specific level in the ministry (SSØ# 4, 2005, P: 16). Some factors in a strategy are more important in order to achieve the objectives. These factors are called critical success factors which in practice are termed risk management. The reason for this is that it is essential to illustrate those factors that are most essential in order to achieve the objectives and that consequently are the starting point for a good risk evaluation (SSØ# 4, 2005, P: 16). The different levels in the ministry have to be aware of the factors so that they will be linked to the strategies. The degree of achievement of the critical success factors will be illustrated through established management parameters (SSØ# 4, 2005, P: 17). Given that there is a relationship between the objectives, strategies, critical success factors and management parameters it will, according to SSØ (SSØ# 4, 2005, P: 17), be possible to identify and evaluate risks that may influence an organization in achieving their objectives. The figure also tries to illustrate that the evaluation of risk treatments are linked to those risks that it is meant to reduce (SSØ# 4, 2005, P: 17). According to SSØ (SSØ# 4, 2005, P: 17) it is possible to achieve a more efficient use of resources by establishing strong relations from objectives to risk treatments. This is because it will strengthen the focus on those factors that are most critical for the Norwegian Parliament, the ministry and the municipality (SSØ# 4, 2005, P: 17). The arrows in the figure above indicate that it is a top-down approach and that there should be established routines which enable feedback and monitoring.

5.2 Risk Management and Internal control – a process

The risk treatment should be integrated in the management and increase the probability of achieving the objectives by identifying risks and activities to reduce the risks (SSØ# 4, 2005, P: 17).

SSØ (SSØ# 4, 2005, P: 18) define risk management as a process integrated in the objectives and performance management which is developed to identify, evaluate, manage and monitor risks so that the risks are within an accepted level. This shall be exerted in strategies and plans and be a process across the ministry of local government and regional development to give confidence that the objectives will be achieved.

5.3 Documentation

There are no specific requirements in the economic policy about type of documentation that is necessary to develop or about the frequency and magnitude of the documentation (SSØ# 4, 2005, P: 20). The municipality can therefore develop the documentation based on how the risks are assessed in the comprehensive management (SSØ# 4, 2005, P: 20). According to SSØ it is therefore the municipality's choice to decide what is necessary for managers on the different levels to be adequately informed to maintain their responsibility and to ensure and monitor performance (SSØ# 4, 2005, P: 20).

5.4 SSØ's method of risk management integrated in the comprehensive management

This part is about the process of managing risks in the objective and performance management presented by SSØ (SSØ# 4, 2005, P: 21). As illustrated in the figure below this method consists of eight steps. According to SSØ (SSØ# 4, 2005, P: 21 and SSØ#8, 2006, P: 26) their method is based on COSO, which is an international known framework, but it is adjusted to the requirements set in the economic policy. This method represents only one of several possible procedures and the ministry of local government and regional development, and municipalities, can therefore choose to use other methods that fulfil the requirements in the economic policy as well (SSØ# 4, 2005, P: 21). The ministry and the municipalities are advised to document their chose of method (SSØ# 4, 2005, P: 21).

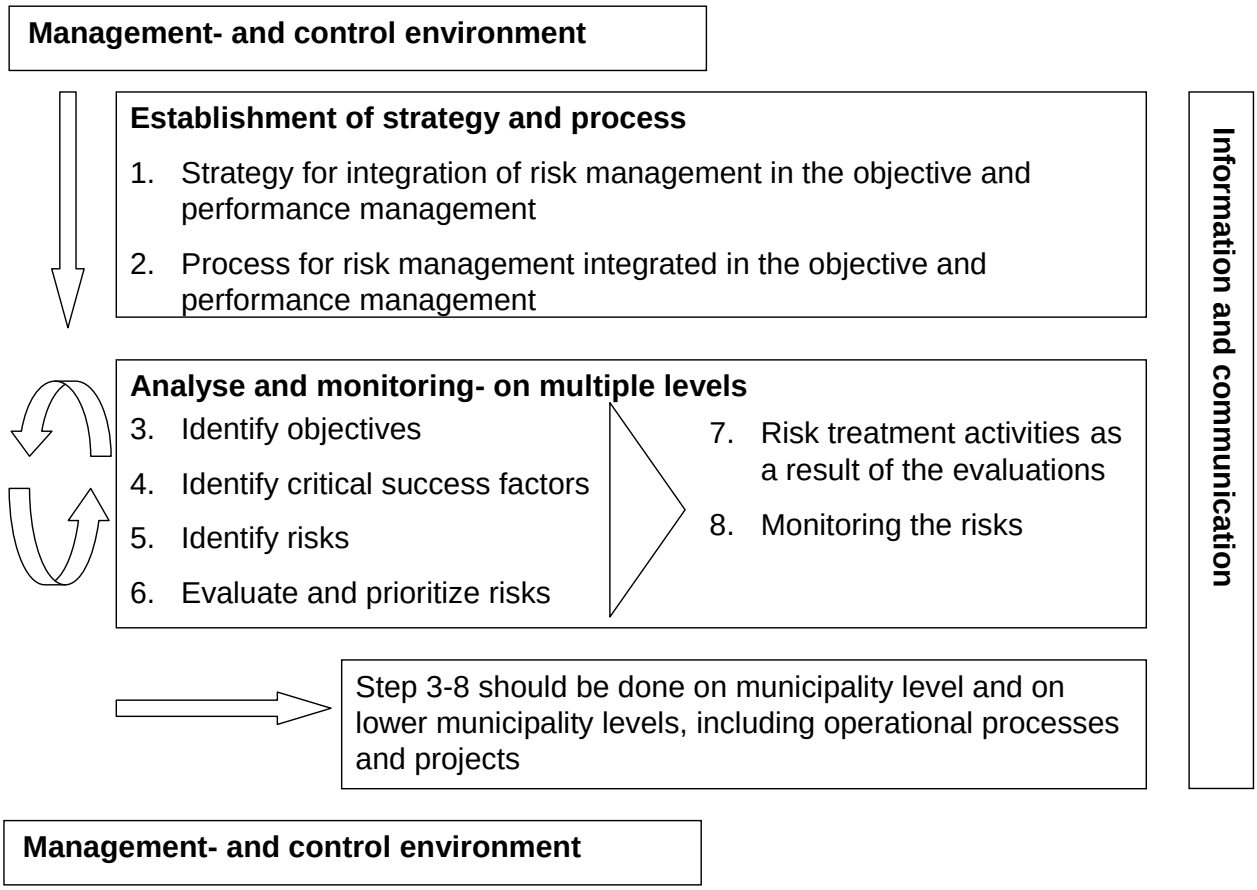

Figure 15: SSØ's method for risk management
Source: SSØ# 4, 2005, P: 21.

Figure 14 Risk Management and Objective and Performance Management and figure 15 SSØ's method for risk management, are related. Figure 14 is more general and is indicating the top-down approach, while figure 15 is more detailed by illustrating the different steps. Figure 15 also indicate a top-down approach, however, at the same time we can see that the first two steps are not covered in the normal feedback process. Step 1 and 2 in figure 15 are being done the first time integration of risk management in objectives and performance management are done and are repeated when or if the process are revised in the specific ministry (SSØ# 4, 2005, P: 21). Steps 3-8 are done as often as the management decides to in their strategy (SSØ# 4, 2005, P: 21). According to SSØ, good management- and control environment and good information and communication are main pillars for good risk management (SSØ# 4, 2005, P: 21). As figure 15 also indicates, risk management should be a process that should be repeated periodically and on all levels (SSØ# 9, 2007, P: 18).

Management- and control environment
Good risk management is dependent on a healthy management and control environment and that the managers are setting a good example for the employees in the municipality (SSØ# 4, 2005, P: 22). Some important factors for management and control are the accepted level of risk, managers' attitude towards efficient risk management, how managers emphasize performance on the different levels in the ministry, organizational structure, how managers delegate responsibility and how managers ensure that all employees understand objectives of the municipality (SSØ# 4, 2005, P: 22).

Information and communication
Good risk management requires information and communication between and within different organizational structures in the ministry. Information and communication is necessary on all levels to identify, evaluate, manage, and follow-up risk in order to ensure that the objectives will be achieved (SSØ# 4, 2005, P: 22). The ministry' systems for management data produce reports with different types of financial data and other information that contribute to control over the municipality. It is therefore important that the management data has good quality and that it is relevant, up to date, correct and accessible for everyone who needs it (SSØ# 4, 2005, P: 22).

Step 1: Strategy for integration of risk management in the objective and performance management
In this step the management should develop a strategy that contributes to an understanding of the purpose with risk management (SSØ# 4, 2005, P: 23). It should show which value risk management will have in relation to the tasks the municipality is prescribed and how risk management should be integrated in the objective and performance management (SSØ# 4, 2005, P: 23). The strategy should include factors such as:

- The purpose with risk management as integrated in the objective and performance management
- The managers role in the implementation and execution
- How the ministry is going to develop a policy for risk management and the main contents of such a policy
- Phases of implementation and milestones; how long it will take until risk management in the municipalities is fully integrated with the management of the ministry in total
- What kind of needs there are for change and competence development in relation to the implementation
- What kind of need there are for changing the culture attached to management of risks.

(SSØ# 4, 2005, P: 24).

Step 2: Process for risk management integrated in the objective and performance management

In this step the ministry should make a list of their activities and processes to decide where to integrate risk management first (SSØ# 4, 2005, P: 24). On a superior level it is natural that risk management is integrated as part of the strategy and planning process. On a subordinate level it is natural that the risk management is done in connection with the development of municipality plans and the like (SSØ# 4, 2005, P: 24). The superior and collective risk analyses should be done before risk analyses are done within the specific municipality areas. This is a so called top-down approach. For bigger municipalities or ministries, however, it can be advantageous that risk analysis within each municipality area is done in advance of the total risk analyses (SSØ# 4, 2005, P: 24). Anyhow it should be created a connection between risk analysis on superior and subordinate levels (SSØ# 4, 2005, P: 24).

In general, risk management should be done at the level which generates the most value. However, on operational levels it is advantageous to implement risk management when the operational processes are being formed. It should be updated when there are essential changes in objectives, in the municipality or in external factors (SSØ# 4, 2005, P: 25). Risk management is also very relevant on projects that the municipality is involved in, especially in projects with considerable magnitude or uncertainty (SSØ# 4, 2005, P: 25). Projects are often managed based on specified objectives within time frames, costs and quality (SSØ# 4, 2005, P: 40). Based on these objectives there are critical success factors and risks (SSØ# 4, 2005, P: 40). In projects it will usually be a greater need for more frequent evaluation and prioritization of risks than in a continuous operational activity (SSØ# 4, 2005, P: 40). Municipalities should therefore develop procedures for how risk management should be integrated in the project methodology they are using (SSØ# 4, 2005, P: 40).

Steps 3-8, which is presented below, are relevant for different municipality levels. There are the same steps that have to be done, but it is a greater concentration of essential factors on higher municipality levels than on the lower levels. The steps presented below are mainly illustrating the superior level.

Step 3: Identify objectives

In this step it is important to identify all objectives in the municipality, both those that are measurable and those who are not (SSØ# 4, 2005, P: 26). This process can result in better quality for the objectives and performance management (SSØ# 4, 2005, P: 26). The superior objectives should be evaluated by the management in order to tell whether they are clearly identified and achievable. The objectives have to be defined before risks can be identified and evaluated (SSØ# 4, 2005, P: 26). The objectives can be divided into three main groups. These are objectives and performance requirements, accounting and financial standards, and follow rules and regulations (SSØ# 4, 2005, P: 26).

Step 4: Identify critical success factors

When the objectives are identified, those factors that are most essential in achieving the objectives should be identified (SSØ# 4, 2005, P: 27). These factors are denoted critical success factors and are characterized by being able to prevent achieving one or several objectives. Well identified critical success factors help the municipality in improving their performance (SSØ# 4, 2005, P: 27). Risk management will be related to those factors that are essential for the municipality in achieving success and it will therefore recognize all

opportunities and risks that may limit the municipality's ability in utilizing those opportunities (SSØ# 4, 2005, P: 27).

The critical success factors should be identified and systematized in such a way that they are related to the objectives that are meant to be achieved (SSØ# 4, 2005, P: 27). On a superior level it is important not to be too detail oriented when the critical success factors are identified (SSØ# 4, 2005, P: 27). Details on lower levels may be covered on the expense of the most essential factors. A detailed description can be given on lower levels where the practical execution of the activities is done (SSØ# 4, 2005, P: 27).

Step 5: Identify risks

When a municipality has identified their objectives and critical success factors, they have also implicitly identified their risks (SSØ# 4, 2005, P: 28). Those factors that have been identified as critical in achieving an objective are also a risk in achieving the objective because these factors are important not to fail accomplishing. (SSØ# 4, 2005, P: 28). SSØ's definition of risk is those factors or incidents that may have a negative influence on achieving objectives. (SSØ# 4, 2005, P: 7).

Different risks may be put in a risk hierarchy (SSØ# 4, 2005, P: 28). This means that risk factors related to each specific critical success factor can be identified on many different levels in the municipality. A risk on municipality level is often related to several risks on lower levels (SSØ# 4, 2005, P: 29). Lower down in the risk hierarchy means that both critical success factors and the related risks are more related to different activities that are essential in achieving success (SSØ# 4, 2005, P: 29).

The process of identifying risks may result in identification of critical success factors that have not been identified earlier (SSØ# 4, 2005, P: 28). According to SSØ it is important to evaluate external as well as internal factors important for achieving the objectives (SSØ# 4, 2005, P: 29). SSØ promote SWOT-analysis as a tool for such an analysis (SSØ# 4, 2005, P: 29). In order to evaluate risks on the superior level it is necessary that the managers have an idea of how the risks on lower levels are managed (SSØ# 4, 2005, P: 29). When risk management is fully integrated in the municipality's objectives and performance management, the managers will have information from risk evaluations on lower levels in the municipality which is the basis for the comprehensive risk evaluation. Based on this information the managers will evaluate the municipality's possibility to achieve the objectives or the risks for not achieving the objectives (SSØ# 4, 2005, P: 29).

Municipalities shall establish management parameters as part of the objective and performance management (SSØ# 4, 2005, P: 31). Risk management can be based on the parameters if they are established with a strong connection to objectives and critical success factors. This means that risks are evaluated based on defined measures for the specific management parameters (SSØ# 4, 2005, P: 31). If the management parameters are not adequately connected with the objectives, or they do not cover the total municipality, this method is not sufficient. Risks connected with the municipality's objectives will not be adequately evaluated and the purpose with risk management is not achievable (SSØ# 4, 2005, P: 31).

Step 6: Evaluate and prioritize risks

Risk evaluations have to be directly linked to the objectives and critical success factors that are established (SSØ# 4, 2005, P: 31). Evaluations about whether a specific risk is high or low

have to be done based on the objective that might be jeopardized. As part of the risk evaluations, the management should make a map over the risks (SSØ# 4, 2005, P: 31) as illustrated in figure 16 below. In this map the probability of the specific risk will be given as well as the consequence of the risk if it takes place.

SSØ (SSØ# 4, 2005, P: 31) mention two central concepts of risk. These are inherent risk and the risk that is remaining after risk treatment activities are implemented. Inherent risk is the degree of risk before any activities that can reduce the risk are considered (SSØ# 4, 2005, P: 31). A challenge when considering the remaining risks are how the risk treatment activities actually works and not how they are meant to work or influence the risks. It is most appropriate to use remaining risk in developing a map over the risks (SSØ# 4, 2005, P: 32).

When risks are being plotted in a map over the risks (so-called risk-map), the probability of each risk is used after risk reducing activities are being implemented. The same is done for the risk consequence. (SSØ# 4, 2005, P: 32-33). Risk consequence refers to the effect a risk may have on achieving an objective. On the probability-axis SSØ suggest a scale starting with rare followed by unlikely, moderate, likely and almost certain (SSØ# 4, 2005, P: 32). On the consequence axis they suggest a scale starting with insignificant followed by minor, moderate, major and catastrophic (SSØ# 4, 2005, P: 33).

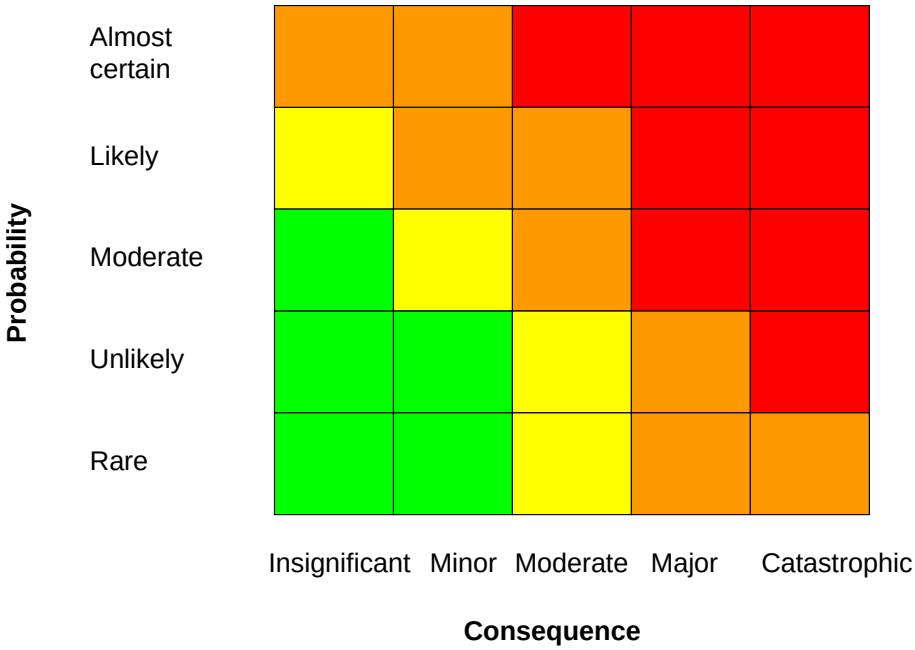

Figure 16: Risk-map
Source: SSØ# 4, 2005, P: 32

SSØ underline the importance of developing a risk-map at the same time as essential plans and strategy processes are being formed (SSØ# 4, 2005, P: 31). According to SSØ this will increase the awareness of different consequences of the strategic choices being made (SSØ# 4, 2005, P: 31).

Step 7: Risk treatment activities as a result of the evaluations
The probability and consequence of risks are important when deciding what kind of risk management that will be chosen (SSØ# 4, 2005, P: 40).

According to SSØ, decisions about risk management can in general be divided into the following categories (SSØ# 4, 2005, P: 41):
- Avoidance: Close down those activities that are source to risk.
- Reduce: Activities that are implemented in order to reduce the probability and/or reduce the consequence of risk.
- Divide/share: Reduce the probability of risk or the consequence of the risk by transferring, or in another way to split the risk with some other party.
- Accept: No activities are implemented in order to influence the probability or consequence of the risks.

When the management has chosen their risk management method they have to identify necessary risk treatment activities that can ensure that they are implemented appropriately according to method and time (SSØ# 4, 2005, P: 41). Risk treatment activities usually consist of two main elements (SSØ# 4, 2005, P: 41). The first element consists of a description of the activity and how it should be implemented. This can be policies, guidance, routine or work descriptions that clarify responsibility and frequency of the activity. The second main element is the actual implementation of the activity as it is described written or oral (SSØ# 4, 2005, P: 41). These risk treatment activities should be done in the municipality in total which means all levels and in all functions.

When making a decision about whether to implement additional risk treatment activities, the management should evaluate what effect the activity will have on the probability of the risks and the consequence of the risks. They should then consider the costs versus the utility of implementing the additional control activities (SSØ# 4, 2005, P: 42). However, because of uncertainty about the future and limited resources there will always be a certain level of remaining risks (SSØ# 4, 2005, P: 43).

Step 8: Monitoring the risks
Risk management has to be monitored and evaluated if it is working over time (SSØ# 4, 2005, P: 47). This will be achieved by having follow-up activities and evaluations, or a combination of both. The management should decide how often there is need for evaluations in order to ensure that the risk management will work efficiently (SSØ# 4, 2005, P: 47). Monitoring and evaluations of risk will give the management good information and the possibility to implement necessary activities on an early stage and it will have a preventative effect (SSØ# 4, 2005, P: 47).

Management parameters that cover all essential factors in the municipality's plans should be developed. Evaluations based on these parameters are an efficient way for the management to get information about their performance and their risks (SSØ# 4, 2005, P: 47).

It can be advantageous to have controllers that will monitor the risks. Common for controllers is that they assist managers by follow-up their area of responsibility. Internal audits can also be used as part of monitoring the risks. They work with international standards which require objectivity in their work. Audits can contribute with ideas on all levels and give suggestions regarding risk management and internal control (SSØ# 4, 2005, P: 49).

The assumptions presented above presents the theory's and SSØ's foundation of what needs to be fulfilled to achieve success with comprehensive risk management. In praxis there are several factors that complicate achieving the assumptions. The analysis in part 4 focus on the

municipalities' methods for risk management and how they implement it in their comprehensive management.

In the table below strengths and weaknesses associated with SSØ's method are listed.

Strengths	**Weaknesses**
- Requirements for risk management integrated in the objective and performance management gives better confidence that risks that may influence performance are identified and that the resources are used more efficiently. - help ease achieving the objectives - ensure that all major risks are clearly identified - Ideally, it also ensures that the government funds are spent in accordance with the regulations set by the Norwegian Parliament. - The requirements ensure participation in the different ministries and in this case, the municipalities.	- The strategies are set by the ministry of local government and regional development, which in theory might be perfectly fine since the municipalities themselves can decide objectives and instruments or tools to use in order to achieve the objectives. However, in reality the funds might not be compatible with the strategies or objectives and performance management set. -The requirements for risk management integrated in the performance and objective management might be a form of detail-management or a form of performance management based on unrealistic strategies. - Feedback and improvements are normally only done in steps 3-8 in SSØ's method and the municipalities can not automatically adjust the strategies. - Little information about risk treatment activities available for different levels of risk. - Little information on how to implement risk management. - Lack of reporting standards and documentation requirements in conjunction with follow-up

Table 1: Strengths and weaknesses associated with SSØ's method

PART 4: EMPIRICAL RESEARCH AND ANALYSIS

This part is divided into two chapters; chapter 6 and 7. Chapter 6 will answer the third sub-question where empirical research about risk management in the municipalities will be conducted and analyzed. The fourth and final sub-question will be addressed in chapter 7 which will analyze to which degree risk management in the municipalities is integrated in the comprehensive management. The figure below illustrates the sub-questions answered in each chapter in this part.

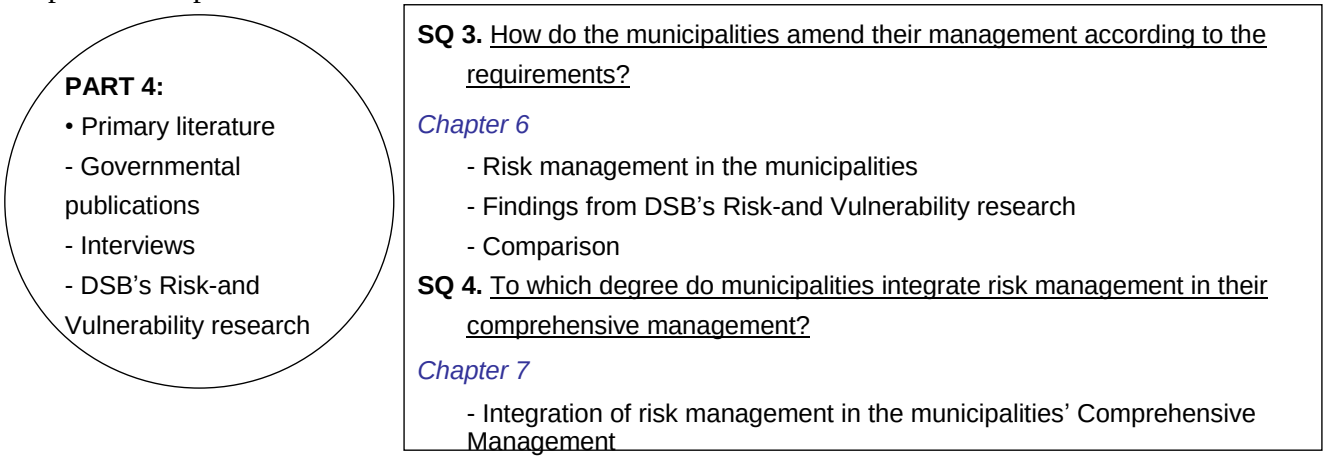

Figure 17: overview of part 4: Empirical research and analysis

6. Risk management in the municipalities

This chapter will give an overview of the findings from the empirical research, which is about how the municipalities implement risk management. This chapter also summarizes the main findings from DSB's risk and vulnerability analysis with relevance for this research, and the main similarities and differences between DSB's findings and the seven municipalities researched will be presented.

6.1 Risk management in seven Norwegian municipalities

Municipalities have many associations about where risk-mapping and precaution is most important. However, there are some that are quite widespread throughout the different municipalities researched. These are fire-, water-, and burglary on the municipalities' own buildings and health-, environment-, and security issues regarding their human resources. Lately there has also been an increase in challenges with the environment, flood, slide, wind and the like. Threats regarding terrorism, illness, water-poisoning etc. have also been given increased attention in the municipality risk management.

There are different situations challenging the superior or comprehensive risk management within a municipality. However, it is rare that those in charge of risk management in each municipality-office/section are able to evaluate their own activities based on for instance preventative actions on a municipality level.

There are seven municipalities researched. These are categorized as big, middle-sized and small in this research. The big municipalities have more than 100.000 inhabitants, the middle-sized municipalities have between 10.000 – 100.000 inhabitants and the small municipalities have less than 10.000 inhabitants. In total in Norway there are nineteen counties which are divided into 430 municipalities (Statens Kartverk, 2008). 5 of these municipalities have more than 100.000 inhabitants, 100 municipalities have between 10.-100.000 inhabitants and 325 municipalities have less than 10.000 inhabitants (Norges Kommunekalender, 2009). The seven municipalities researched have been randomly selected from the three classes mentioned above and mainly from different counties. The seven municipalities therefore only represent a small part of the total number of municipalities in Norway and it is therefore not the purpose to generalize from this sample.

Municipalities with more than 100.000 inhabitants

In the table below the results from interviews and conversations with two municipalities with more than 100.000 inhabitants are summarized. Appendix 2: Findings from the municipalities researched, describes the table below more in detail.

Topics covered	**Municipalities with more than 100.000 inhabitants**	**Municipalities with more than 100.000 inhabitants**
Number of inhabitants	Mun.> 100.000	Mun.> 100.000
City or rural municipality	City, coast	City, coast
Location	South-east	Middle of Norway
Risk Management is conducted in	All office-levels/departments	All office-levels/departments
Risk Management process	Risk management is conducted by project groups often consisting of a few key-persons in the office/department (often managers). External consultants are often involved in the office's assessment of risk identification, probability and consequence	Risk management is conducted by project groups often consisting of a few key-persons in the office/department (often managers). External consultants are often involved in the offices assessment of risk identification, probability and consequence
Risk prioritizing	Based on probability and consequence. Acceptable risk is not cared for in their risk and vulnerability analysis	Based on probability and consequence. Acceptable risk is not cared for in their risk and vulnerability analysis
Risk Management vs. Comprehensive management	The offices/departments are obliged to integrate Risk Management in their comprehensive management. Risk Management is treated as a process where methods about identifying, evaluate and analyse risk is done on how the municipality best can achieve its objectives.	The offices/departments are obliged to integrate Risk Management in their comprehensive management. Risk Management is treated as a process to give an overview to take decisions
Risk identification	Risks are identified on office levels. In a comprehensive view, the main risks for the municipality is fire, water, burglary, health, environment and security issues regarding human resources as well as terrorism and climate.	Risks are identified on office levels. In a comprehensive view, the main risks for the municipality is fire, water, burglary, health, environment and security issues regarding human resources as well as terrorism and climate. Consequences of risks are divided into two: 1: human, environment, economical values and 2: society functions.
Overview of size of damage or loss	Overview in the office levels	Overview in the office levels

Use of critical success factors	Commonly used in the different municipality offices	Commonly used in the different municipality offices
Influence of Risk Management on Financial Management	Monitoring and control of crucial processes has a positive influence on financial crime and malpractices.	Monitoring and control of crucial processes has a positive influence on financial crime and malpractices.
Use of risk map	Risk map is used to identify risks based on probability and consequence. The map indicates which risks to be treated but not how.	Risk map is used to identify risks based on probability and consequence. The map indicates which risks to be treated but not how.
Documentation of Risk Management	Risk Management is documented by risk and vulnerability analysis, control routines for the different positions and internal instructions	Risk Management is documented by risk and vulnerability analysis, control routines for the different positions and internal instructions
Management of risk	Risk Management: Risk avoidance which is the alternative with lower risk, Risk transfer which is transferring the risk to some other party. Risk control which is plans to manage and/or decrease risks	Risk Management: no preset decisions whether the actions for instance should be preventative or reduce the consequence of risk.
Risk control activities	Risk control activities used are loss control through prevention and reduction.	Risk control activities used are loss control through prevention and reduction.
Risk financing activities	Risk financing activities: Retention (both out of own funds and self-insurance), transfer (insurance)	Risk financing activities: Retention and transfer (insurance)
Follow-up activities	Follow-up: Revising the risk management analysis yearly or when crucial changes occur	Follow-up: Revising the risk management analysis yearly or when crucial changes occur

Table 2: Findings from municipalities with more than 100.000 inhabitants

Municipalities with less than 100.000 but above 10.000 inhabitants

In the table below the results from interviews and conversations with two municipalities with more than 10.000 and less than 100.000 inhabitants are summarized. Appendix 2: Findings from the municipalities researched, describes the table below more in detail.

Topics covered	Municipalities with 10.000-100.000 inhabitants	Municipalities with 10.000-100.000 inhabitants
Number of inhabitants	50.000>Mun.>10.000	100.000>Mun.>50.000
City or rural municipality	Coast	City, coast
County	South-East	South
Risk Management is conducted in	Those offices/departments where there are areas representing high risk	All offices levels but only in depth in some areas representing high risk
Risk Management process	Risk management is conducted by project groups often consisting of managers. Risk Management is often consisting of risk and vulnerability analysis where the guidance conducted by DSB is central. Comparative municipalities' risk management method is also often used as a template. External consultants may be used in specific situations where there for instance are need for external expertise	Risk management is conducted by project groups often consisting of managers. External consultants may be used for instance in risk identification, and in probability and consequence assessments
Risk prioritizing	Based on probability and consequence. Acceptable risk is not cared for in their risk and vulnerability analysis	Based on probability and consequence. Acceptable risk is not cared for in their risk and vulnerability analysis
Risk Management vs. Comprehensive management	Risk is identified on office levels and in main areas. The main risks are included in a risk and vulnerability analysis for the municipality.	Risk is identified on office levels and in main areas. The main risks are included in a risk and vulnerability analysis for the municipality.
Risk identification	Risks are identified on office levels. In a comprehensive view, the main risks for the municipality are water and drainage, fire, traffic, vessel, airplane, electronic communication, health and pollution. Consequences of risks are divided into three classes: human, environment and economy.	Risks are identified on office levels. In a comprehensive view, the main risks for the municipality are water and drainage, fire, traffic, vessel, airplane, electronic communication, health and pollution.
Overview of size of damage or loss	Mainly in the office levels.	Mainly in the office levels.
Use of critical success factors	Commonly used in the different municipality offices	Commonly used in the different municipality offices

Influence of Risk Management on Financial Management	Monitoring, internal control and instructions are believed to have a positive influence on financial crime and malpractices.	Internal control and instructions are believed to have a positive influence on financial crime and malpractices.
Use of risk map	Risk map is used to identify risks based on probability and consequence. Purpose to have a link between the risk treatments and the specific risks that it is meant to reduce. The map indicates which risks to be treated but not how.	Risk map is used to identify risks based on probability and consequence. The map indicates which risks to be treated but not how.
Documentation of Risk Management	Risk Management is documented by risk and vulnerability analysis, internal instructions, and requirements by law have been included.	Risk Management is documented by risk and vulnerability analysis, control routines for the different positions, and internal instructions
Management of risk	Risk Management is based on their best practice, no preset decisions whether the actions for instance should be preventative or reduce the consequence of risk. It is also based on experience from other comparative municipalities' risk management	Risk Management is based on their best practice, no preset decisions whether the actions for instance should be preventative or reduce the consequence of risk
Risk control activities	The most used risk control activities are preventative actions and secondly reduction	The most used risk control activities are preventative actions and secondly reduction
Risk financing activities	Risk financing activities: Retention (those risks that are not considered high) and transfer (insurance). Decisions about whether additional risk treatment activities are being implemented are based on evaluations if the action is believed to have a positive effect and can reduce the costs according to the risks. It is mostly implemented if the action also is paid back within 3-5 years.	Risk financing activities: Retention (those risks that are not considered high) and transfer (insurance).

Follow-up activities	Follow-up: Revising the risk management analysis yearly or when crucial changes occur and look at how other municipalities handle similar changes	Follow-up: Revising the risk management analysis yearly or when crucial changes occur

Table 3: Findings from municipalities with 10.000-100.000 inhabitants

<u>Municipalities with less than 10.000 inhabitants</u>

In the table below the results from interviews and conversations with three municipalities with less than 10.000 inhabitants are summarized. Appendix 2: Findings from the municipalities researched, describes the table below more in detail.

Topics covered	**Municipalities with less than 10.000 inhabitants**	**Municipalities with less than 10.000 inhabitants**	**Municipalities with less than 10.000 inhabitants**
Number of inhabitants	Mun.<10.000	Mun.<10.000	Mun.<10.000
City or rural municipality	Rural	Rural	Rural
County	South-East	South-East	South-East
Risk Management is conducted in	Those areas representing high risk, or where there are requirements for Risk Management	Those areas representing high risk, or where there are requirements for Risk Management	Those areas representing high risk, or where there are requirements for Risk Management
Risk Management process	Risk management is starting with organizing the work, analyse, follow-up of the risk management group, political decision, identify areas for follow-up and finally keeping the analysis up to date. Requirements and internal instructions are a central part of the risk management method. The use of external consultants is rare, only in specific situations where external expertise is needed.	Risk management is starting with organizing the work, analyse, follow-up of the risk management group, political decision, identify areas for follow-up and finally keeping the analysis up to date. Requirements and internal instructions are a central part of the risk management method. The use of external consultants is rare, only in specific situations where external expertise is needed.	Risk management is starting with organizing the work, analyse, follow-up of the risk management group, political decision, identify areas for follow-up and finally keeping the analysis up to date. Requirements and internal instructions are a central part of the risk management method. The use of external consultants is rare, only in specific situations where external expertise is needed.
Risk prioritizing	Based on probability and consequence. Only areas at main or high risk are followed-up closely	Based on probability and consequence. Only areas at main or high risk are followed-up closely	Based on probability and consequence. Only areas at main or high risk are followed-up closely
Risk Management vs. Comprehensive management	Risk management is mainly considering the requirements and main or high risks. The size of the municipality does not entail problems in identifying the risks.	Risk management is mainly considering the requirements and main or high risks. The size of the municipality does not entail problems in identifying the risks.	Risk management is mainly considering the requirements and main or high risks. The size of the municipality does not entail problems in identifying the risks.

Risk identification	Main areas at risks are being identified in risk management groups from different offices. In a comprehensive view, the main risks for the municipality are fire, water, burglary, information security, environment and security.	Main areas at risks are being identified in risk management groups from different offices. In a comprehensive view, the main risks for the municipality are fire, water, burglary, information security, environment and security.	Main areas at risks are being identified in risk management groups from different offices. In a comprehensive view, the main risks for the municipality are fire, water, burglary, information security, environment and security.
Overview of size of damage or loss	Mainly in the office levels where the risks occur	Mainly in the office levels where the risks occur	Mainly in the office levels where the risks occur
Use of critical success factors	Critical success factors are used for some key issues	Critical success factors are used for some key issues	Critical success factors are used for some key issues
Influence of Risk Management on Financial Management	Information security and internal instructions are believed to have positive effect on financial management.	Information security and internal instructions are believed to have positive effect on financial management.	Information security and internal instructions are believed to have positive effect on financial management.
Use of risk map	Risk map is used to identify risks based on probability and consequence. The map indicates which risks to be treated but not how.	Risk map is used to identify risks based on probability and consequence. The map indicates which risks to be treated but not how.	Risk map is used to identify risks based on probability and consequence. As an appendix to the risk map, they suggest risk treatments.
Documentation of Risk Management	Risk Management is documented by risk and vulnerability analysis, internal instructions, and requirements by law have been included.	Risk Management is documented by risk and vulnerability analysis, internal instructions, and requirements by law have been included.	Risk Management is documented by risk and vulnerability analysis, internal instructions, and requirements by law have been included.
Management of risk	Risk Management decisions are based on actions that are believed to have a preventative affect on risks, and the municipality's own experience	Risk Management decisions are based on actions that are believed to have a preventative affect on risks, and the municipality's own experience	Risk Management decisions are based on actions that are believed to have a preventative affect on risks, and the municipality's own experience
Risk control activities	The most used risk control activities are preventative actions and secondly reduction	The most used risk control activities are preventative actions and secondly reduction	The most used risk control activities are preventative actions and secondly reduction

Risk financing activities	Risk financing activities: Retention (those risks that are not considered high), requirements by law (some risks should by law be reduced) and transfer (insurance).	Risk financing activities: Retention (those risks that are not considered high), requirements by law (some risks should by law be reduced) and transfer (insurance).	Risk financing activities: Retention (those risks that are not considered high), requirements by law (some risks should by law be reduced) and transfer (insurance).
Follow-up activities	Follow-up: Revising the risk management analysis yearly or when crucial changes occur	Follow-up: Revising the risk management analysis yearly or when crucial changes occur	Follow-up: Revising the risk management analysis yearly or when crucial changes occur

Table 4: Findings from municipalities with less than 10.000 inhabitants

Main commonalities and differences of the municipalities researched

Seven municipalities have been researched and out of these, two of the municipalities have more than 100.000 inhabitants. Both of these are city and coast municipalities. One of them is located in south-east in Norway and the other in the middle of Norway. Two municipalities have between 10.-100.000 inhabitants and both of these are located by the coast and one of them is also a city. The coast and city municipality is located in the south of Norway and the other municipality is located south-east in Norway. Three municipalities have less than 10.000 inhabitants. All of these are rural municipalities and all are located south-east in Norway. The table below summarizes the main commonalities and differences of the municipalities researched.

Topics covered	Commonalities	Differences
Risk Management is conducted in	More than 10.000 inhabitants: Office levels	Less than 10.000 inhabitants: In those areas representing high risk, or where there are requirements for Risk Management by law.
Risk Management process	More than 10.000 inhabitants: Project groups and the use of external consultants are common	Less than 10.000 inhabitants: one process across the municipality and the use of external consultants are rare.
Risk prioritizing	All: Risk is prioritized based on probability and consequence. Acceptable risk is not cared for in their risk and vulnerability analysis.	
Risk Management vs. Comprehensive management	Less than 100.000 inhabitants: Risk and vulnerability analysis for the municipality	More than 100.000 inhabitants: Risk and vulnerability analysis mainly for each municipality office
Risk identification	More than 10.000 inhabitants: Risks are identified on office levels	Less than 10.000 inhabitants: risks are identified based on the main areas at risks from the different offices
Overview of size of damage or loss	All: overview of size of damage or loss in the office levels where the risks occur	
Use of critical success factors	More than 10.000 inhabitants: critical success factors are commonly used	Less than 10.000 inhabitants: critical success factors are not commonly used
Influence of Risk Management on Financial Management	All: monitoring, information security, internal control and instructions are factors that will make it more difficult to conduct financial crime and make it easier to prevent or discover malpractices.	

Use of risk map	All: Risk map is used to identify risks based on probability and consequence.	One municipality with less than 10.000 inhabitants: Risk map is used to identify risks based on probability and consequence. As an appendix to the risk map, they suggest risk treatments.
Documentation of Risk Management	All: executing risk and vulnerability analysis, having control routines for the different positions, including the internal instructions and the requirements set by law.	
Management of risk	More than 10.000 inhabitants: no preset decisions whether the risk management actions for instance should be preventative or reduce the consequence of risk.	Between 10.-100.000 inhabitants: based on past experience and one of these two municipalities says that they try to look at experience from other comparative municipalities. Less than 10.000 inhabitants: based on actions that are believed to have a preventative effect on risks, and on the municipality's own experience.
Risk control activities	All: Prevention and reduction	
Risk financing activities	All: Retention and transfer	
Follow-up activities	All: revising the risk management analysis yearly or when crucial changes occur.	One municipality with 10.-100.000 inhabitants: In addition to revising the risk management analysis yearly or when crucial changes occur they look at how other municipalities handle similar changes.

Table 5: Main commonalities and differences of the municipalities researched.

In the four municipalities with more than 10.000 inhabitants all of them conduct risk management on office levels. The three municipalities with less than 10.000 inhabitants on the other hand, conduct risk management not necessarily on office levels but in those areas representing high risk, or where there are requirements for Risk Management by law.

In the four municipalities with more than 10.000 inhabitants the risk Management process is often partly done by project groups. External consultants are often involved in the office's assessment of for instance risk identification, probability and consequence or when it is need for external expertise. The three municipalities with less than 10.000 inhabitants on the other

hand, have a greater overview on a municipality level and they indicate that they organize the work, follow-up the risk management group, have political decisions, identify areas for follow-up and finally keep the analyse up to date. The approach is quite similar with the municipalities with more than 10.000 inhabitants. The difference is however, that the approach is one similar process in the municipalities with less than 10.000 inhabitants, while in the municipalities with more than 10.000 inhabitants the approach may vary slightly from one municipality office to another. Another difference between the big and middle-sized municipalities to the small municipalities is the use of external consultants; this is not as common in the small municipalities.

All the municipalities researched mention that their risk prioritizing is based on probability and consequence. They all use risk and vulnerability analysis, and they mention that the acceptable risk is not cared for in their risk and vulnerability analysis.

In the municipalities with more than 100.000 inhabitants the offices integrate Risk Management in their comprehensive management of the municipality office. As part of this process each office often develops a risk and vulnerability analysis. In the municipalities with 10.-100.000 inhabitants risk is identified on office levels and the main risks are included in a risk and vulnerability analysis for the municipality. In the municipalities with less than 10.000 inhabitants the main risks for the municipality is identified by the risk management group and included in a risk and vulnerability analysis for the municipality.

In the four municipalities with more than 10.000 inhabitants risks are identified on office levels. In the municipalities with less than 10.000 inhabitants risks are identified based on the main areas at risks from the different offices. There are no clear differences identified in main risks in the municipalities.

All the municipalities keep an overview of size of damage or loss in the office levels where the risks occur. The municipalities with more than 10.000 inhabitants commonly use critical success factors in their risk management method. In the municipalities with less than 10.000 inhabitants this is not as common.

All the seven municipalities researched believe that risk management has a positive influence on financial management. They argue that monitoring, information security, internal control and instructions are factors that will make it more difficult to conduct financial crime and make it easier to prevent or discover malpractices. However, there are not asked for any number of crimes or malpractices discovered or prevented in this research.

All the municipalities researched mention that they, or the offices, commonly use risk map to identify risks and that the risks are identified based on probability and consequence. All, except for one of the municipalities (one municipality with less than 10.000 inhabitants), mention that the risk map does not give any suggestions for risk treatments. This municipality (municipality with less than 10.000 inhabitants) mentions that they commonly include an appendix to the risk map where risk treatments are suggested.

Documentation of risk management in the municipalities is commonly done by executing risk and vulnerability analysis, having control routines for the different positions, including the internal instructions and the requirements set by law.

The municipalities with more than 10.000 inhabitants mention that there are no preset decisions whether the risk management actions for instance should be preventative or reduce the consequence of risk. The two municipalities with 10.-100.000 inhabitants mention that their decisions about risk management actions are based on past experience, their so-called best practice. One of these two municipalities also says that they try to look at experience from other comparative municipalities. The three municipalities with less than 10.000 inhabitants mainly base their risk management on actions that are believed to have a preventative effect on risks, and on the municipality's own experience.

The most used risk control activities in all the seven municipalities researched are prevention and reduction. Risk financing activities applied in all municipalities are retention (out of own funds) and one municipality with more than 100.000 inhabitants also has self-insurance. All municipalities also use transfer through insurance.

The follow-up activities are similar across the municipalities researched. These are revising the risk management analysis yearly or when crucial changes occur, and one municipality with 10.-100.000 inhabitants also say that they look at how other municipalities handle similar changes.

6.2 Findings from DSB's risk and vulnerability analysis

The results from the DSB's research (directorate for social security and precaution) show that the biggest municipalities have a more comprehensive risk management approach than the smaller municipalities. The bigger municipalities (more than 50.000 inhabitants) have also often developed a risk and vulnerability-analysis. 92 percent of the bigger municipalities have developed a risk and vulnerability-analysis. The result from those municipalities with less than 2.000 inhabitants shows that 64% have developed a risk and vulnerability-analysis (Kommuneundersøkinga 2008, P.15). This means that the bigger municipalities have a higher risk and vulnerability activity than the smaller municipalities. Conducting risk and vulnerability analysis enable the municipalities to easier discover critical areas at risk, their vulnerability and what the consequences might be if the risk occurs.

Looking at the different parts of the country, municipalities in the western, eastern and southern –parts of the country have a greater use of risk and vulnerability-analysis and a more comprehensive risk management approach than the municipalities in the middle of the country and in the Northern parts (Kommuneundersøkinga 2008, P.15).

The smaller municipalities, less than 2.000 inhabitants, have as mentioned in general less focus on risk and vulnerability analysis than the bigger municipalities (more than 50.000 inhabitants). These municipalities have, however, more risk management activities within fields such as health-and social services, schools, kindergarten and distribution of electricity than the average of Norwegian municipalities (Kommuneundersøkinga 2008, P.18). This means that instead of focusing on a municipality wide risk and vulnerability analysis they have conducted the analysis on the areas they believe is the most critical in their municipality.

Municipalities with inhabitants between 2.000 and 4.999 have in general less focus on risk and vulnerability analysis than the bigger municipalities (more than 50.000 inhabitants), and they do not have any specific area or field where they focus more on risk management than the average of Norwegian municipalities (Kommuneundersøkinga 2008, P.18).

Municipalities with inhabitants between 5.000 and 9.999 have a higher percentage conducting risk and vulnerability analysis on water and drainage than the average of the municipalities (Kommuneundersøkinga 2008, P.19).

The bigger municipalities with more than 50.000 inhabitants have in general a higher risk and vulnerability activity compared to the smaller municipalities. Nine out of ten municipalities have for instance risk and vulnerability activities within water and drainage and health- and social services. Eight out of ten municipalities also have activities within fire-and rescue services. Seven out of ten municipalities have risk and vulnerability activities regarding incidents caused by the nature (Kommuneundersøkinga 2008, P.18).

In DSB's research they found that there are differences between city-municipalities and rural-municipalities. In all sectors or areas/fields, except for road-and transportation, city-municipalities have a greater Risk and vulnerability activity than the rural municipalities. City-municipalities have better risk and vulnerability coverage on transportation of dangerous products and fire-and rescue services than the rural-municipalities (Kommuneundersøkinga 2008, P.19).

DSB's findings show that 35% of the municipalities have done a risk and vulnerability analysis throughout the municipality sector and the greatest share are represented by the municipalities with more than 50.000 inhabitants (Kommuneundersøkinga 2008, P.22).

Those municipalities who has developed a risk and vulnerability analysis at least one time over the four last years, has been asked questions regarding preventative actions to reduce the consequences of the unwanted incidents that have been described in the risk and vulnerability analysis. These municipalities represent 74% of the total municipalities researched (Kommuneundersøkinga 2008, P.22). Out of the preventative actions used to reduce risk, activities to increase the municipalities' preparedness are most used. Municipality planning is a preventative action that has been increasingly used, according to DSB, since 2007 (Kommuneundersøkinga 2008, P.22).

One out of ten municipalities has not implemented preventative actions to reduce the consequences of unwanted incidents that have been illustrated in the risk and vulnerability analysis (Kommuneundersøkinga 2008, P.23).

According to DSB's findings, several of the municipalities have implemented multiple preventative actions. Many municipalities have implemented risk and vulnerability analysis and implemented actions both by municipality-planning and reduction and/or regulations of municipality area. A municipality plan is the superior and long-term plan in the municipality planning-system. It gives indications of where to use resources, which services that should be offered and the level of these services. It is also indicating use and protection of area. In 2008, 3% of the municipalities have implemented actions both in their plan for preparedness and safety, municipality planning and in the budget (Kommuneundersøkinga 2008, P.23). This means that only a few municipalities have implemented these actions in combination.

Looking at the municipalities that have conducted risk and vulnerability analysis and implemented preventative actions, DSB found that there is a connection between the municipality size and the number of actions. The bigger the municipality, the higher the number of actions implemented. Municipalities with more than 50.000 inhabitants have to a greater extent developed action plans for preparedness and safety and used municipality plans to prevent unwanted incidents (Kommuneundersøkinga 2008, P.23). This does not necessarily mean that there are more actions taken per risk in a municipality with more than 50.000 inhabitants than in municipalities with fewer inhabitants. The number of risks present may for instance be greater in a big municipality compared to smaller municipalities.

One out of ten municipalities thinks that the preventative actions to a great extent have reduced or limited the consequences of risk. 46% of the municipalities think that the preventative actions to a certain extent have contributed to reduce or limit the consequences of risk (Kommuneundersøkinga 2008, P.27). This means that preventative actions are believed to be a contributor to reduce or limit the consequence of risk, but that preventative actions are not enough in itself.

According to DSB, 39% of the municipalities have updated their plan for handling of crises as a result of unwanted incidents. 20% of the municipalities have implemented preventative actions, 18 % have taken actions to increase their preparedness (personnel, equipment, resources etc.). 18% of the municipalities have taken organizational actions like clarifying area of responsibility, distribution of tasks and authorities. Update or implementation of risk and vulnerability analysis have been done in 15 % of the municipalities and 13% of the

municipalities have strengthened their informational preparedness. Increased focus on internal training and practices have been done in 11% of the municipalities while 7% of the municipalities note that they have taken other actions and 2% are not sure. (Kommuneundersøkinga 2008, P.43).

In 32% of the municipalities there are not implemented any actions as a result of unwanted incidents (Kommuneundersøkinga 2008, P.49). 39 % of the municipalities have implemented two or more actions as a result of unwanted incidents, while 20% of the municipalities have implemented three or more actions. The bigger municipalities, municipalities with more than 20.000 inhabitants, have implemented more actions than the smaller municipalities (Kommuneundersøkinga 2008, P.49).

Several municipalities, 62%, have cooperation across the municipality borders for instance on fire-distinguishing services. Those municipalities with more than 20.000 inhabitants have more cooperation across municipality borders than smaller municipalities. City-municipalities also have greater cooperation than rural-municipalities (Kommuneundersøkinga 2008, P.67). Of those municipalities which do not have cooperation across municipality borders, 18% answer that they to a great extent evaluate implementing inter-municipality cooperation. 24% evaluate this to a small degree, while 7% does not evaluate it at all (Kommuneundersøkinga 2008, P.68). These numbers is an indication that the bigger municipalities tend to implement more actions than the smaller municipalities.

According to DSB, those municipalities who has developed a risk and vulnerability analysis at least one time over the four last years, has been asked questions regarding professional support they have received during the work with their risk and vulnerability analysis (Kommuneundersøkinga 2008, P.26-27). In 2008 79% of the municipalities used proficiency and knowledge within the municipality compared to 88% in 2007. In 2008 59% of the municipalities received support from the Chief administrative officer of the county compared to 53% in 2007. DSB's guidance for risk and vulnerability analysis gave support to 56% of the municipalities both in 2008 and 2007. Proficiency and knowledge in other municipalities increased from 2007 from 18% till 22% in 2008. The use of private consultants as support also increased from 2007 till 2008, from 17% to 20%. Other proficiency/expertise and guidance show an increase as well, from 13 % to 19%. Support has also been given from research and graduates, which were 6 % in 2007 and 8% in 2008. The number of municipalities not sure about the support they received shows a decrease from 4% in 2007 to 3% in 2008 (Kommuneundersøkinga 2008, P.26). These numbers indicates that the professional support municipalities have received in their risk and vulnerability analysis in general has increased from 2007 to 2008.

According to DSB, 87% of those municipalities who has developed a risk and vulnerability analysis at least one time over the four last years have implemented exercises or training in handling crises (Kommuneundersøkinga 2008, P.39). Based on this training, 53% of the municipalities have updated their plan on how to handle crisis. One out of five municipalities has implemented organizational actions (like area of responsibility, distribution of tasks, manual of authorities etc.) and updated or implemented risk and vulnerability analysis and/or strengthening of informational preparedness (Kommuneundersøkinga 2008, P.43). This indicates that risk and vulnerability analysis may discover areas that need greater coverage and/or show areas for improvement in the municipalities' risk management.

6.3 Comparison

In this chapter the results from the seven municipalities researched (in chapter 6.1) and the result from DSB's research (in chapter 6.2) are being compared and presented.

Comparing the seven municipalities researched and DSB's findings we can see some similarities. In both the researches there is a link between the size of the municipality and the number of risk management actions taken. The bigger municipalities tend to take more actions than the smaller municipalities.

DSB's research shows that the bigger municipalities (more than 50.000 inhabitants) have a higher risk and vulnerability activity (identification and treatment) than the smaller municipalities. All the seven municipalities researched in chapter 6.1 on the other hand answered that they conduct risk and vulnerability analysis. It is therefore not possible to say that this is line with DSB's findings. However, of the seven municipalities researched only the municipalities with more than 100.000 inhabitants conduct risk and vulnerability analysis on all office levels. Those municipalities with between 10.000 – 100.000 inhabitants conduct risk and vulnerability analysis in those areas or offices believed to represent high risk. In the municipalities with less than 10.000 inhabitants the main risks for the municipality is identified by a risk management group and included in a risk and vulnerability analysis for the municipality. This may therefore be an indication of what DSB found in their research. The smaller municipalities (less than 10.000 inhabitants) do not conduct as thoroughly risk and vulnerability analysis as the bigger municipalities (more than 10.000 inhabitants).

DSB's findings show that there is difference in risk and vulnerability activity between city-municipalities and rural-municipalities. City-municipalities have a greater risk and vulnerability activity than the rural municipalities. Their research also shows that there are differences between the different parts of the country (municipalities in the western, eastern and southern –parts of the country have a greater use of risk and vulnerability-analysis than the municipalities in the middle of the country and in the Northern parts). In the seven municipalities researched it is not possible to say anything about differences between municipalities based on their location in the country because the selection is too small. However, the results from the seven municipalities researched, indicate that the city-municipalities have a greater risk and vulnerability analysis than the rural-municipalities. This, on the other hand, may well be as a result of the size of the municipality (mostly city-municipalities have more inhabitants than the rural-municipalities).

Of the seven municipalities researched we find that the municipalities with more than 10.000 inhabitants often involve external consultants in their risk management. The municipalities with less than 10.000 inhabitants on the other hand, rarely (or only in specific situations) involve external consultants. DSB's findings do not explicitly mention anything about the use of consultants based on municipality size. Their results do, however, indicate that there has been an increase from 2007 to 2008 in the use of professional support (for instance private consultants) in the municipalities' work with risk and vulnerability analysis.

All the seven municipalities researched mention that their risk prioritizing is based on probability and consequence and that the acceptable risk is not cared for in a risk and vulnerability analysis (this risk is retained). DSB's research does not mention anything about how the municipalities prioritize risks, nor does it say which risks, or if all risks, are included in the risk and vulnerability analysis. Linking these findings to the method suggested by SSØ

in part 3 we can identify one difference in the concept of risk. SSØ mention inherent risk and remaining risk in their method and according to their theory, the latter is the most appropriate in developing a map over the risks (SSØ# 4, 2005, P: 32). What we can see from the empirical research of the seven municipalities on the other hand, is that the municipalities mainly develop a map over their most essential risk, namely what SSØ call inherent risk. Based on the inherent risk the seven municipalities implement actions to reduce the risks.

The seven municipalities researched believe that risk management has a positive influence on financial management. The question asked is different from the question asked in DSB's research. DSB asked to which degree preventative actions reduce or limit the consequence of risks. The result indicates that the preventative actions are believed to reduce or limit the consequence of risk. The seven municipalities researched especially mention that monitoring, information security, internal control and instructions are factors that they consider important to avoid financial crime and make it easier to prevent or discover malpractices. Even though the municipalities researched by DSB were only asked about preventative actions, the findings in both researches indicate that the attitude towards risk management is that it has a positive effect on the municipalities' risks. However, non of the researches specify anything about what the effect of risk management has been on for instance cost of risks or number of financial crime or malpractices.

In 32% of the municipalities researched by DSB there are not implemented any actions as a result of unwanted incidents. Of the seven municipalities researched all use risk map to identify risks based on probability and consequence. All the risks included in this map are mainly of such a significance that the municipalities researched aim to reduce the risk. Those risks that are not cared for in the risk map are mainly retained by the municipalities and therefore there are not implemented any actions to reduce these risks.

According to DSB, one out of ten municipalities has not implemented preventative actions to reduce the consequences of unwanted incidents that have been illustrated in the risk and vulnerability analysis. In the seven municipalities researched, all the municipalities have taken preventative actions, but in this research it is not specified if this is for each and every risk identified in the risk map or if they have just taken preventative actions in general. DSB's research show that out of the preventative actions used to reduce risk, activities to increase the municipalities' preparedness are most used and municipality planning is increasingly being used. Examples of preventative actions and actions of preparation applied by the municipalities in DSB's research are organizational actions (like area of responsibility, distribution of tasks, manual of authorities etc.), municipality planning, regulations of municipality area, and informational preparedness. According to the theory discussed in part 3, a proactive risk management strategy means that the controls are designed to prevent problems before the organization suffers any adverse effects on performance. Preventative actions are therefore beneficial. In the seven municipalities researched, the most used risk control activities are prevention and reduction. For instance access control, safety barriers, surveillance, area securing, locks, alarms, video-surveillance, marking equipment, rules, procedure, routines, training, rehearsal, and testing.

In DSB's research risk financing activities are not specified. Risk financing activities applied in the seven municipalities researched are retention (out of own funds), one municipality with more than 100.000 inhabitants also has self-insurance, and transfer through insurance.

In the seven municipalities researched the follow-up activities are revising the risk management analysis yearly or when crucial changes occur. According to DSB's research update or implementation of risk and vulnerability analysis have been done in 15 % of the municipalities.

Comparing the two researches, several similarities can be pointed out. However, since the seven municipalities researched are too small of a sample it is impossible to generalize from this research. The similarities may well be coincidental and the differences may well be explained by the difference in focus and questions asked in the two researches. Comparing the two may still, however, give interesting recommendations for further research.

7. Integration of risk management in the Municipalities' Comprehensive Management

According to the theory identified in chapter 3 (A theoretical perspective of Risk Management) the integration of risk management in the comprehensive management should start with initiation. As we saw in chapter 4 (Regulations on Financial Management in the Economic Policy) there are requirements regarding financial management for the municipality management and there are several laws and regulations saying that municipalities should have plans for handling of crises and have plans for preparedness in different areas. The initiation of risk management in the municipalities is therefore based on these requirements.

The seven municipalities researched in chapter 6.1 (Risk Management in seven municipalities) have integrated risk management plans in the different municipality offices or areas at high risk where there is a team of managers, experts and some employees involved in the process. The plan is often documented in the form of a risk and vulnerability analysis, internal instructions and control routines. The small municipalities (less than 10.000 inhabitants) have integrated risk and vulnerability analyses for different areas representing high risk in their comprehensive management. The middle-sized municipalities (between 10.000 and 100.000 inhabitants) have integrated risk management in the municipality comprehensive management by conducting a risk and vulnerability analysis on office-levels, but only in depth in some main areas. The biggest municipalities (more than 100.000 inhabitants) have integrated a more comprehensive risk management approach than the smaller municipalities by having integrated risk and vulnerability analysis for all municipality offices.

For the bigger municipalities (more than 100.000 inhabitants) researched in chapter 6.1, a comprehensive overview is not easily made without having risk management in place on the subordinate levels. The reason for this is the size of the two municipalities researched and complexity this work entails. These two municipalities therefore conduct risk and vulnerability analysis on all municipality offices. According to SSØ's method of risk management (chapter 5.4) it is advantageous for bigger municipalities that risk analysis within each municipality area is done in advance of the comprehensive or superior analysis (SSØ# 4, 2005, P: 24). It should, however, be a link between risk analysis on a superior and subordinate level (SSØ# 4, 2005, P: 24).

In the bigger municipalities researched in chapter 6.1, the different departments or offices integrate risk management as part of their comprehensive management. Each specific department's management is integrated in the municipality comprehensive management by the objectives and performance requirements set, as well as the financial funds through the municipality budget. This is also in line with SSØ's method (chapter 5.4), arguing that risk management may be integrated with objective and performance management of the municipality if the risks are identified based on the objectives they may affect. According to the two municipalities researched with more than 100.000 inhabitants, their aim is to integrate risk management in the comprehensive management system of the municipality with an objective-based approach.

In the middle-sized and small municipalities researched in chapter 6.1, risk analysis is done on a superior level. The municipality is making a list of activities or areas where risk management activities are necessary. Based on this, they often conduct a risk and

vulnerability analysis in project groups or in the municipality offices to identify the risk consequences and probability.

The risk management method in the seven municipalities (chapter 6.1) is documented in the form of a risk and vulnerability analysis, but the roles are not clearly identified. The roles are often deployed in the internal instructions, in the individual job instructions and authorities, and to some degree in the employees' written promise of secrecy. In the risk management plan those risks that are considered essential are being targeted in a so called risk map, and in the bigger municipalities the municipality offices also often identify critical success-factors for achieving their objectives.

According to SSØ there are critical success factors and risks linked with objectives (SSØ# 4, 2005, P: 40). In SSØ's method, the risks are being prioritized by analyzing the consequences if they occur and the probability of the risks. However, SSØ emphasize to use remaining risk when developing a risk map. Some of the risks are being categorized to determine the most likely sources of risk, for instance fire, water and drainage, big accidents and the like. Even though the risks are evaluated based on their consequence and probability in the seven municipalities researched (chapter 6.1), the risk and vulnerability analysis (mostly) does not imply what the treatment or action should be. Decisions about which actions that should be taken to reduce the risk should be made by looking at the reasons why the risks or unwanted incidents may occur. The risks that are considered acceptable are not included in the municipality risk management method, and they mainly identify inherent risk in their risk map.

In the seven municipalities researched, those risks that are considered to be too high are targeted. The risks are reduced for instance by implementing exercises or training, update of municipality plans, organizational actions, update or implement risk and vulnerability analysis and/or strengthening of municipality preparedness. According to the findings from both the seven municipalities' researched and DSB's findings, there is a link between the municipality size and the number of actions implemented. The bigger the municipality, the higher the number of actions implemented.

Even though there is a connection between the size of the municipalities and the comprehensiveness of the risk management method and number of actions taken in both the seven municipalities researched and DSB's research, all the seven municipalities researched tend to focus more on risk control activities than risk financing activities. The most used risk control activity is loss control either through prevention or reduction, which according to the theory in part 3 is beneficial because this enable a proactive risk management strategy that will reduce the need to use a lot of resources on damages that have already happened. Since municipalities have social interests they tend to focus less on integrating risk of economic loss in their risk management method than what a private company probably would have. A municipality is for instance more concerned about reducing the risk of not being able to deliver crucial services, like for instance health and other emergency-services, during crises than about focusing on how to transfer the cost of this risk if it occurs to some other party. However, this does not mean that the municipalities do not apply risk financing methods. In addition to this, the theory in part 3 mentions that the intent of risk management is first to reduce the frequency and/or consequence of the loss and then to finance the loss appropriately. According to the seven municipalities researched some of the risk financing activities is mostly cared for separately both in the different offices and for instance in political decisions and in the budgeting process. This part of the risk management process is

therefore not as integrated in the municipality risk management method as the risk control activities. Transfer (insurance) and retention is being used in the municipalities researched. Retention is only used in those cases where the risks are not considered essential and these risks are therefore mostly not included in the risk and vulnerability analysis. One of the municipalities researched (municipality with more than 100.000 inhabitants) also mentioned that their municipality has an insurance company that is 100% owned by the municipality. The products offered by this company is insurance solutions within general insurance (non-life insurance), guidance within risk management, guidance within general preparedness, proficiency-development like courses or training within insurance, risk management and general preparedness.

According to the theory identified in chapter 3, once the tools are deployed it is time to provide knowledge and awareness of risk management in order to integrate it with the comprehensive management. This includes explaining the employees how to use the processes, methods, and tools, and to stimulate commitment to perform risk management. According to the municipalities researched by DSB (chapter 6.2), 18% of the municipalities have taken organizational actions like clarifying area of responsibility, distribution of tasks and authorities, 11% has provided internal training as a follow-up of the risk management and 15% have updated or implemented risk and vulnerability analysis. According to SSØ's method (chapter 5.4), risk management should be updated when there are essential changes in objectives, in the municipality or in external factors. The seven municipalities researched (chapter 6.1), revise the risk and vulnerability analysis mainly when major changes have taken place. The bigger municipalities are also trying to identify actions they already have in place, to evaluate if the action has its counterpart in a risk/threat. This way they argue that they are able to discover if the actions have done its purpose and to make adjustments.

According to SSØ's method, risk management should be a process integrated in the objective and performance management which is developed in such a way that it can identify, evaluate, manage and follow-up risk so that the risk is within an accepted level. Even though the seven municipalities researched (in chapter 6.1) have methods for risk identification and actions to reduce the risks, the strength of the integration of risk management in the comprehensive management may be discussed.

Of the seven municipalities researched, the bigger municipalities have a risk management method that is more similar to what the theory (chapter 3) and SSØ (chapter 5.4) suggest than the smaller municipalities. The method in the bigger municipalities in itself is more comprehensive than in the smaller municipalities. The risks are tried identified based on the objectives they might be jeopardized, they use a greater variation of risk treatment activities and they include critical success-factors to mention some. The smaller municipalities identify areas at risk not necessarily directly linked with the objectives, they use less risk treatment activities and the use of success-factors are lacking. The risks are mainly identified based on the threat they represent either to the municipality assets, the people in the society and the like. However, the municipalities have social interests and therefore these risks are important to reduce in order to increase the probability of achieving welfare objectives. The strength of the integration may be discussed as there is no research about what the effect of risk management has been on reducing risk to an acceptable level.

Since there are no specific requirements in the economic policy (chapter 4) about type of documentation that is necessary to develop or about the frequency and magnitude of the documentation, the municipalities can develop the documentation based on how the risks are

assessed in the comprehensive management. The next part, conclusion, opt to discuss if the different municipalities have a comfortable degree of integration of risk management in their comprehensive management and whether they fulfil the requirements set in the economic policy.

PART 5: CONCLUSION

This part is divided into chapter 8 and chapter 9 and is concluding the findings in the thesis and is providing recommendations for further research.

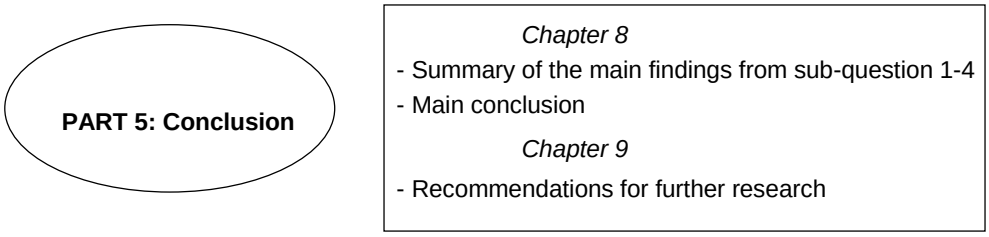

Figure 18: overview of part 5: conclusion

8. Conclusion

This part summarizes the findings from sub-question 1-4 and opts to give a general conclusion.

8.1 Summary of the findings from sub-question 1-4

Sub-question 1: What type of method for risk management can be identified in the theory?

Looking at the theory, risk management is a process which provides confidence that objectives are more likely to be achieved, that future losses are less frequent, less severe and more predictable among other things. Risk management as presented in the theory is not just a process for avoiding risk or just relying on insurance. It is, however, to manage the risks involved in all activities, to adjust the risks according to the risk appetite and based on this maximize opportunities and minimize the adverse effects. Insurance is an important way of transferring risks but it is only a small part of the risk management process. Implementation of risk management is best done by assigning responsibility as low in the organization as possible to take advantage of functional expertise, promote ownership and involvement. This will consequently ease the management burden. A risk management method identified in the theory can be illustrated by the figure below.

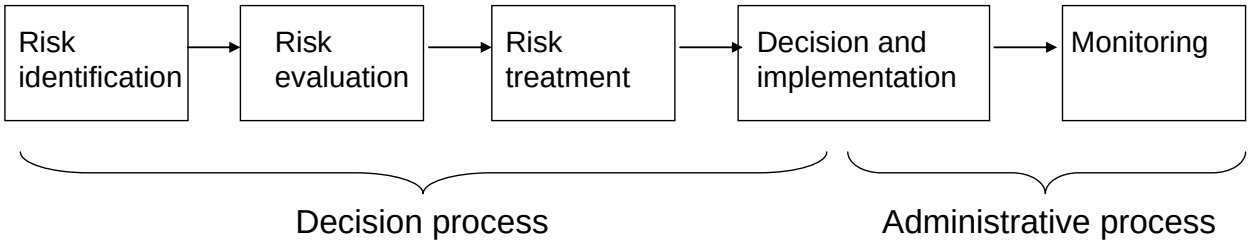

Figure 19: Risk Management method suggested in theory

The decision process is where the risks are identified and based on the evaluation, risk treatment methods are decided. The different risk treatment methods identified in theory can be divided into risk control activities and risk financing activities as illustrated by the figure below.

Risk Control	
Avoidance	Loss control:
	- Loss prevention
	- Loss reduction

Risk Financing	
Retention:	Transfer:
- Pure retention	- Commercial insurance
- Deductibles	
- Borrowing funds	- Contractual agreement
- Pooling	
- Self-insurance	

Figure 20: Risk treatment techniques suggested in the theory

The administrative process is about determining the best way to implement what was agreed on in the decision process. In the administrative process the exposures that have been identified and analyzed are being implemented. The implementation is a four-step process consisting of initiation, planning, execution, and monitoring. Initiating the risk management

practice is about instilling the culture and taking action to ensure that risk management is implemented. The risk management implementation plan is where the practice should be tailored based on the success factors in achieving the objectives. To execute the plan, the risk treatment tools are deployed and the workforce is being trained. The last step in the risk management method is monitoring where necessary adjustment are being done.

Sub-question 2: What is required by the economic policy regarding risk management, and what type of method does SSØ suggest?

In the regulations on Financial Management in Central Government there are policies for financial management in the public sector. These regulations form the economic policy. The purpose is to ensure that the central government funds are spent and revenues are generated efficiently and in accordance with the decisions and premises of the Norwegian Parliament. They should also be managed properly and ensure that established objectives and performance requirements are achieved. To achieve the purpose of the economic policy, several requirements are listed but there are no specific methods for how to fulfil the requirements. Nor are there any specific requirements for frequency or magnitude of documenting risks. The requirements mainly say that governance and monitoring shall be adapted to the municipalities' distinctive characteristics as well as to its risk profile and its significance (Royal Ministry of Finance, 2008, P.20). The management of the municipality shall also consider the costs entailed by the actions against the utility and the benefits to be achieved. All actions should therefore ensure relevance and completeness in the risk evaluation (Royal Ministry of Finance, 2008, P.25).

SSØ are responsible for administering the economic policy which means that they, among other things, develop methods so that public agencies in a best way as possible can fulfil the requirements. The method developed by SSØ therefore fulfils the requirements in the economic policy. Their method is consisting of eight steps which are:
-Step 1: Strategy for integration of risk management in the objective and performance management
- Step 2: Process for risk management integrated in the objective and performance management
- Step 3: Identify objectives
- Step 4: Identify critical success factors
- Step 5: Identify risks
- Step 6: Evaluate and prioritize risks
- Step 7: Risk treatment activities as a result of the evaluations
- Step 8: Monitoring the risks

Risk treatment activities as a result of the risk evaluations identified in the method by SSØ includes avoid, reduce, divide/share and accept. Monitoring the risk, which is the last step, is meant to give the management good information and the possibility to evaluate and perhaps implement necessary activities on an early stage to provide a preventative effect.

Sub-question 3: How do the municipalities amend their management according to the requirements?

The requirements of risk management in the municipalities are regulated in the economic policy. Even though the purpose of the regulations is to ensure that established objectives and performance requirements are achieved and that funds and assets are used efficiently and

properly managed, there are no specific requirements in the economic policy about type of documentation that is necessary to develop. It only says that the governance and monitoring should be adapted to the municipalities' distinctive characteristics as well as to its risk profile and its significance. The costs versus the utility and benefits of the actions should also be evaluated. The aim of this is to ensure relevance and completeness in the risk evaluation. SSØ has developed a method that will help the municipalities in achieving these requirements. However, the municipalities can develop the risk management method and documentation based on how the risks are assessed in their comprehensive management.

According to the findings in the empirical research of the seven municipalities (chapter 6.1), the risk management method differs slightly from municipality to municipality. How the municipalities amend their management according to the requirements therefore also varies from one municipality to another.

According to the economic policy, the municipalities should ensure that established objectives and performance requirements are monitored, that resources are used efficient, that the municipality is run in compliance with applicable laws and regulations. It should also ensure sufficient management information and a proper basis for decisions. The municipalities researched are in general doing this by identifying risks, conducting risk and vulnerability analysis for the essential risks, implementing actions to reduce the risk and revising their analysis. There are, however, differences in how comprehensive this risk management method is in the different municipalities researched.

There is a link between the size of the municipality and number of actions implemented as well as there is a link between the size of the municipality and the comprehensiveness (risk management in all offices vs. risk management in areas representing high risk). The findings show that the bigger the municipality the more actions are being integrated in the municipality management, and the more comprehensive the approach is. All the risks that are identified as having high probability and consequence are being targeted in a risk map and in a risk and vulnerability analysis. The acceptable risks are retained. SSØ's method, on the other hand, suggests that the remaining risk is most appropriate in developing a map over the risks (SSØ# 4, 2005, P: 32).

The municipalities with more than 10.000 inhabitants have integrated the requirements on office or department levels while the municipalities with less than 10.000 inhabitants make the most amendments in the areas representing high potential risk. To specify, the municipalities with less than 10.000 inhabitants conduct risk management and identify risk in areas believed to represent high risk or where there are special requirements. The municipalities with more than 10.000 inhabitants conduct risk management and identify risk in each municipality office. Based on the risks identified, the municipalities with more than 100.000 inhabitants conduct risk and vulnerability analysis for each office, while the municipalities with less than 100.000 inhabitants conduct an overall risk and vulnerability analysis for the municipality/independent of offices. However, the overview of size of damage or loss are kept where the losses occur, namely in the office levels.

It can be argued that the size and complexity of the municipalities influence how they amend their risk management according to the requirements. For municipalities with more than 100.000 inhabitants it might be necessary to for instance identify risks in office levels in order to get an overview of the potential risks present in the municipality. In municipalities with less than 10.000 inhabitants on the other hand, it is easier for one project group to get an

overview of the most essential risks present in their municipality than it would have if the municipality was bigger or more complex. Another argument is that the resources used on risk management should be justified by the benefits and utility to be achieved. This means that in most cases it would not be justifiable for small municipalities to integrate risk and vulnerability analysis in all municipality offices or integrate as many risk reduction actions, as the extra benefits from this probably would be marginal compared to the extra resources used.

The requirements for risk management are regulated in the economic policy and are mostly about internal control (see appendix 1). The requirements says, as mentioned above, that the internal control systems should secure that established objectives and performance requirements are monitored, that the resource use is efficient and the municipality is run in accordance with applicable laws and regulations. The two municipalities researched with more than 100.000 inhabitants opt to integrate each of the offices' risk management in the comprehensive management through the objective and performance requirements set. This is partially being done be identifying critical success-factors for achieving the objectives. The critical success-factors helps identifying essential risks, which are being reduced through risk control and financing activities. The smaller municipalities (less than 100.000) identify areas at risk not necessarily directly linked with the objectives. This does not, however, indicate that they do not monitor their objectives and performance requirements. Essential risks identified, for instance risks that is a treat either to the municipality assets the people in the society and the like, are being reduced by risk control and financing activities. These risks are important to reduce in order to increase the probability of achieving welfare objectives.

The research of the seven municipalities does not aim to identify the objectives and performance requirements of each municipality, nor does it aim to analyze the requirements in the economic policy in detail, or scientifically discover the effect of risk management on reducing risk to an acceptable level. The research does assume that the requirements are beneficial for the municipality risk management and the research therefore opt to discover if the requirements are satisfied and integrated in the comprehensive management of the municipalities researched. The requirements are meant to be adapted to the municipalities' distinctive characteristics as well as to its risk profile and its significance. Risk management should therefore be developed in such a way that it can identify, evaluate, manage and follow-up risk so that the risk is within an accepted level. Acceptable level of risk is, however, subjective.

Even though differences can be found from SSØ's method, all the seven municipalities researched satisfy the requirements as they identify risks based on the probability and consequence of the risks to their municipality, they take action to reduce risk and they have internal controls and instructions as well as follow-up activities. The costs entailed by the actions against the utility and the benefits to be achieved are also considered by retaining insignificant risk and there is an indication that the risk reduction actions, and the comprehensiveness of the risk and vulnerability analyses, are linked with size and complexity of the municipality.

Sub-question 4: To which degree is the municipalities' risk management integrated in their Comprehensive Management?

The municipalities with less than 10.000 inhabitants conduct risk management and identify risk in areas that represent high risk, or where there are special requirements for risk management. The municipalities with more than 10.000 inhabitants conduct risk management

and identify risk in each municipality office. Based on the risks identified, the municipalities with more than 100.000 inhabitants conduct risk and vulnerability analysis for each office, while the municipalities with less than 100.000 inhabitants conduct an overall risk and vulnerability analysis for the municipality/independent of offices. The municipalities with more than 100.000 inhabitants have integrated a more comprehensive risk management approach than the smaller municipalities by having integrated risk and vulnerability analysis for all municipality offices in the comprehensive management.

Those risks that are considered to be too high are targeted in the municipality risk management and are included in a risk map. In the seven municipalities researched, the most used risk control activities are prevention and reduction. The risks are reduced for instance by implementing exercises or training, update of municipality plans, organizational actions, update or implement risk and vulnerability analysis and/or strengthening of municipality preparedness. SSØ's method suggests including the remaining risks in a risk map and not the inherent risk as the seven municipalities do. Even though there is a difference between SSØ's method and what is done in the seven municipalities regarding inherent and remaining risk, a proactive risk management strategy is advised in the theory. This means that even though inherent or remaining risks are identified, the best way to deal with the risk is to prevent the risks before the municipality suffers any adverse effects on performance, thus avoid using resources on risks that already has occurred.

Even though the seven municipalities researched have developed methods for risk identification and actions to reduce the risks, the strength of the integration of risk management in the comprehensive management may be discussed. In the two municipalities with more than 100.000 inhabitants, the municipality offices integrate risk management as part of their comprehensive management by the objectives and performance requirements set, as well as the financial funds through the municipality budget. This means that the risks are tried identified based on the objectives they might jeopardize and they identify critical success-factors. The municipalities with less than 100.000 inhabitants identify areas at risk mainly based on the threat they represent either to the municipality assets, the people in the society and the like. Even though the methods are based on the objectives that might be jeopardized on one side and the threats present on the other side, both methods might be perfectly in line with the municipalities' comprehensive management.

The findings of the seven municipalities researched and DSB's research indicate a link between the municipality size and the number of actions implemented. The bigger the municipality, the higher the number of actions implemented. This does not imply that their risk management is more integrated in the comprehensive management. In order to say something more specific about this, information about number of risks as well as information about the specific municipalities' risk appetite is needed.

The seven municipalities researched have integrated risk management plans in the different municipality offices or areas at high risk where there is a team of managers, experts and some employees involved in the process. The plans are documented in the form of a risk map, risk and vulnerability analysis, internal instructions and control routines. Risk management in the municipalities is mainly revised yearly or when major changes have taken place. The roles of risk management in the comprehensive management are often deployed in the internal instructions, in the individual job instructions and authorities, and to some degree in the employees' written promise of secrecy. Based on this, the seven municipalities have integrated risk management in their comprehensive management. The information obtained

from the research does not, however, give room to discuss which approach is the best or the most integrated.

8.2 General conclusion

Comparing the method identified in the theory and the method suggested by SSØ some conclusions can be drawn. In both methods, risk management may help ease achieving the objectives and there are different risk treatment alternatives listed. In the method suggested by SSØ, there are eight steps where step 5-8 (identify risks, evaluate and prioritize risks, risk treatment activities as a result of the evaluations and monitoring the risks) is quite similar to the steps suggested in the theory. However, in the theory there is more risk treatment techniques suggested than what is listed in SSØ's method. In the method presented by SSØ there is not made any distinction between risk control and risk financing techniques as it is done in the theory. The risk treatment activities suggested by SSØ are: avoid, reduce, divide/share and accept. Avoid is similar with what is suggested under risk control in the theory. Reduce is similar with reduction under loss control in the theory. Divide/share may be compared with some of the risk financing techniques (e.g. pooling) under retention in the theory. Similarly, acceptance is also comparable with some of the risk financing techniques (e.g. pure retention) under retention in the theory.

SSØ do not explicit include prevention or transfer in their method. This means that they for instance do not say anything about commercial insurance or contractual agreements (unless this is covered under what SSØ call "divide/share") or anything about how to prevent risk. Even though insurance does not reduce the risk, it is beneficial because it can help to stabilize and/or lower an organization's risk financing costs. This means that if a municipality is facing high risk but do not want to avoid the risky activity, there is no risk treatment activity suggested by SSØ how to handle that.

Both the theory and SSØ's method argue that it is important to ensure that all major risks are clearly identified, evaluated and adequately controlled. However, the method suggested by SSØ does not suggest anything about which risk treatment activities as a result of the evaluations, to use for the different levels of risks. On the other hand, SSØ emphasize developing a risk map over the remaining risks (the risks remaining after actions to reduce the risks have been implemented) and integrating risk management in the objective and performance management. SSØ are more focused in their approach by mainly consider those risks that may influence objectives and performance. This is not done in the theoretical method. The theoretical method gives more information how to implement risk management than SSØ's method.

Norwegian municipalities are obliged to implement risk management. The economic policy say that the municipalities should ensure that established objectives and performance requirements are monitored, that resources are used efficient and that the municipality is run in compliance with applicable laws and regulations. The seven municipalities researched are in general doing this by identifying risks, conducting risk and vulnerability analysis for the essential risks (inherent risk), implementing actions to reduce the risk and revising their analysis. The resources used are evaluated by considering the costs of adding more actions against the benefits to be achieved. The municipalities are for instance retaining insignificant risks, and municipalities with less than 10.000 inhabitants does not have the same need to conduct risk and vulnerability analysis in each municipality office as bigger and more

complex municipalities have. This indicates similarities with the method suggested by SSØ. DSB's research also show that most municipalities conduct risk and vulnerability analysis.

Risk and vulnerability analyses enable the municipalities to easier discover critical areas at risk, their vulnerability and what the consequences might be if the risk occurs. A risk and vulnerability analysis outlines the basis of the work with risk management in municipalities following this approach. Based on the findings from this analysis, the risks with high consequence and probability are the most critical risks and should therefore be addressed in the municipalities' risk management. Actions are being implemented to reduce these risks. Risks that are within the municipalities' risk appetite, risks that each specific municipality do not identify as having high consequence and probability, are not being addressed. This means that risks such as major fire or water damages are often being addressed while "daily-risks" such as a kindergarten on trip may not be represented as a risk in this context.

The seven municipalities researched have integrated risk management plans in the different municipality offices or areas at high risk and there is a team of managers, experts and some employees involved in the process. The plans are documented in the form of a risk and vulnerability analysis, internal instructions and control routines. However, the analyses used to identify risks do not cover all the risks concerned with the daily municipality activities. Risk management in the municipalities is as mentioned mainly about identifying and preventing unwanted incidents that represents high risk, like huge accidents, flood and the like. It can, on the other hand, be argued that the extra benefits from including daily, or minor, risks in a comprehensive risk management approach probably would be marginal compared to the extra costs. However, many units under a municipality office may well have their own set of rules or guidelines that are not covered in the risk and vulnerability analysis or formally integrated in their risk management method.

SSØ's risk management method is developed to make it easier for the municipalities to implement risk management in their comprehensive management and DSB yearly conducts risk and vulnerability research to indicate the safety of the society and consider the readiness of the municipality to for instance handle crisis when they are doing the ordinary municipality-planning. Even though this research has shown that municipalities use slightly different strategies or approaches for risk management, there are many similarities in their practical risk management. These similarities may be partially explained by the regulations and requirements for risk management and control-routines that accounts for all municipalities in Norway. The similarities may also indicate a "best practice".

The theory presented in part 3 emphasizes the concept of addressing risk holistically in a single integrated framework. In the empirical research in part 4 we can, however, see that even though the aim might be to integrate risk management in the comprehensive management of the municipality, this is not as thoroughly done as suggested in the theory.

The requirements for risk management in the municipalities in Norway give room for interpretation according to the municipalities' characteristics. It is therefore quite easy for a municipality to fulfil these requirements without necessarily having a well documented and understood risk management method. The requirements for risk management in the municipalities in Norway can, however, be said to have a positive influence on the comprehensive management of the municipalities. This is because the requirements increase the awareness of risks. The different methods and theory about the topic, like for instance risk

and vulnerability analysis, are important tools that the municipalities can deploy to prevent or reduce risks.

9. Recommendations

There are requirements for risk management in Norwegian municipalities. The requirements, however, gives room for interpretation according to the municipalities' characteristics and it can therefore quite easily be fulfilled, based for instance on subjective opinions. Despite this, the requirements increase the awareness of risk management and to some degree force the municipality to consider risks in their comprehensive management. However, risk management can serve as a greater advantage if it used more proactively. According to the theory discussed in part 3, a proactive risk management strategy means that the controls are designed to prevent problems before the organization suffers any adverse effects on performance. A proactive risk management strategy is therefore more efficient as it reduces the need to use a lot of resources on damages that have already happened and it will discover developments both due to changes in a municipality's need and changes in threats from the environment. In order for the municipalities to rely on their risk management I would therefore recommend the management to outline their own policy for risk management where they include the objectives of having an updated and proactive risk management strategy. In the municipalities' risk management policy it would be beneficial to include routines for reporting to the management about the results, and risk management performance should be established in order to accomplish the objectives. By doing this, the municipalities might discover that some risk management actions will have an immediate effect, while other actions might take a while and be important in the long run. Long-term planning is therefore important as well. The risk management policy and/or safety policy should help establish areas of responsibility and consequently increase the involvement of the employees in the process.

In the empirical part, a research of seven Norwegian municipalities has been conducted and a small comparison has been made with a research conducted by DSB in Norway. In the comparison several similarities can be pointed out. However, since the seven municipalities researched are too small of a sample it is impossible to generalize from this research. The similarities may well be coincidental and the differences may well be explained by the difference in focus and questions asked in the two researches. It would therefore be interesting to conduct a research of a representative sample of Norwegian municipalities to indicate if a best practice of risk management can be identified. An objective of the research could be to identify if differences can be explained by the size of the municipality or if it is likely to be other factors like for instance different location in the country etc. Conducting a similar research in another European country to see if there are many similarities or differences would also be interesting. A research like this could discover if for instance some institutions are better organized to integrate risk management more efficiently than other, or if some risk management requirements are redundant or quite the opposite, advantageous.

According to the seven municipalities researched some of the risk financing activities is mostly cared for separately both in the different offices and for instance in political decisions and in the budgeting process. This part of the risk management process is therefore not as integrated in the municipality risk management method as the risk control activities. The risk financing activities are only covered on a superficial level in this research. A research of different risk financing activities applied in the Norwegian municipalities and how these are followed-up would be an interesting contribution to the literature of risk management in Norway.

It is important for a manager to know which objectives and processes that is important for the municipality, and knowing how to prioritize these. The manager has responsibility to prioritize and has authority to influence the integration of risk management in the comprehensive management. Knowing, or deciding on, what acceptable risks are is therefore essential. In this research the size of the municipalities seemed to have a connection with the risk and vulnerability activity as well as the number of actions implemented. Is this because the bigger the municipalities are, the more risks are present, or are the bigger municipalities more risk averse or is it just a manner of different methods applied?

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Appendix 1: Regulations on Financial Management in the economic policy

The purpose of the regulations on financial management is defined in section 1 in the Regulations on Financial Management in central government. The purpose is to ensure that the central government funds are spent and revenues are generated in accordance with the decisions and premises of the Norwegian Parliament (Royal Ministry of Finance, 2008). Further, it says that the purpose is to ensure that established objectives and performance requirements are achieved, ensure that central government funds are used efficiently and ensure that assets belonging to the central government are properly managed (Royal Ministry of Finance, 2008, P.12).

Section 4 in the regulation is about basic management principles and says that all ministries shall establish objectives and performance requirements within the framework of disposable resources and premises set by the superior authority (Royal Ministry of Finance, 2008, P.13). The ministries shall also ensure that established objectives and performance requirements are achieved, that resources are used efficient, that the ministry is run in compliance with applicable laws and regulations and ensure sufficient management information and a proper basis for decisions (Royal Ministry of Finance, 2008, P.13).

Section 14 deals with internal control and says that all ministries shall establish systems and routines containing internal controls to ensure that:
"a) financial limits are not exceeded and that expected revenues are received
b) achievement of objectives and results are in a satisfactory relationship to established objectives and performance requirements, and that any substantial variance is prevented, disclosed and corrected to the extent necessary.
c) use of resources is efficient
d) accounts and information on results are reliable and accurate
e) the agency's assets, including real estate, supplies, equipment, securities and other financial assets, are managed in a proper manner
f) financial management is properly organised and is executed in compliance with applicable laws and rules
g) malpractices and financial crime are prevented and disclosed"
(Royal Ministry of Finance, 2008, P.16).

Section 15 is about control of subordinate agencies and says that superior agencies are responsible for ensuring that subordinate agencies outside the central government execute their tasks properly and in compliance with section 14. In this case, it means that the ministry of local government and regional development are responsible for ensuring that the municipalities execute their tasks in compliance with section 14.

The provisions on financial management in central government adopted by the Ministry of Finance on December 12th 2003, with later amendments on December 21st 2005 and on November 14th 2006, include chapters about internal control (Royal Ministry of Finance, 2008, P.19). Chapter 1.3 says that the governance and monitoring shall be adapted to the agencies', or in this case municipalities', distinctive characteristics as well as to its risk profile and its significance (Royal Ministry of Finance, 2008, P.20).

In chapter 1.5.2 it further can be interpreted that the ministry shall ensure that all municipalities have satisfactory internal control systems securing that established objectives and performance requirements are monitored, resource use is efficient and the municipality is run in accordance with applicable laws and regulations (Royal Ministry of Finance, 2008, P.21). The evaluations should be performed to obtain information on efficiency, achievement of objectives and results (Royal Ministry of Finance, 2008, P.21).

Chapter 2.4 about internal control system says that internal controls shall be integrated in the internal management of the municipality and that it shall prevent management failure, errors and deficiencies so that section 14 is fulfilled (Royal Ministry of Finance, 2008, P.16 and P.24). Further, it says that in order to exercise the necessary internal control system the municipality management shall establish systems, routines and measures focusing among others on the following elements:
"a) competence and attitude of management and employees to performance monitoring and control
b) identification of risk factors which may prevent the achievement of objectives of the agency, and corrective measures which may be expected to reasonably reduce the likelihood of non-achievement of objectives
c) quality assurance of the internal management system, including appropriate segregation of duties and productivity in the work processes
d) information routines ensuring that important and reliable information of significance for the achievement of objectives is communicated efficiently
e) routines for handling and storing essential information which ensure confidentiality, integrity and accessibility"
(Royal Ministry of Finance, 2008, P.25).

In addition to the quote above, the internal control system shall also focus on preventing and reveal violation of applicable laws and regulations like manipulation, falsification or alteration of accounting data or other information of results (Royal Ministry of Finance, 2008, P.25). The management of the municipality shall consider the costs entailed by the actions against the utility and the benefits to be achieved. All actions shall ensure relevance and completeness in the risk evaluation (Royal Ministry of Finance, 2008, P.25).

Appendix 2: Findings from the municipalities researched

Municipalities with more than 100.000 inhabitants

In the two municipalities researched with more than 100.000 inhabitants, risk management and risk-vulnerability-analysis is conducted on office-levels, but in addition to this it is also more common with a comprehensive approach. This means that risk management is treated as a systematic and continuing process where methods about identifying, evaluate and analyse risk is done based one how the municipality best can achieve its objectives or to give an overview to take decisions. In this situation, the municipality management considers risk management as a tool to solve management challenges based on vision, objectives and strategy combined with their need to manage and control the municipality. According to the municipalities researched, the aim is to integrate risk management in the comprehensive management system of the municipality with an objective- or decision based approach that also ensures quality. This means that the risk management process should be aligned with the objectives of the municipalities and therefore ensures quality in the process, for instance that a lot of resources are not used to reduce insignificant risks. The strategy does not, however, specify the role of managers in the implementation and execution, nor does it specify phases of implementation and milestones.

The two municipalities researched communicate that it is quite common to engage external consultants or experts to do some parts of the work with risk management. The consultants work together with the different departments under the municipality offices in order to identify risk, the probability of the risk and the consequences if each specific risk occurs. If the probability is high, or likely to occur, and the consequences are serious, action will be taken to reduce the risk. Probability and consequence is also how the risks are being prioritized and added to a list of actions. In the municipalities researched all municipality departments are obliged to integrate risk management in their comprehensive management. The department for construction of health institutions for instance has responsibility for risk management activities regarding the buildings and construction, other departments have responsibility for risk management regarding the services they deliver, like nursing –and healthcare activities, childcare etc. Even though the responsibility is clarified there is rarely any general approach how to deal with the different risks.

In the municipalities there are many sources of risk and each municipality office/section identifies risks within their area. It is therefore difficult for the municipality to identify a few main risks, even though the typical risks mentioned are fire-, water-, burglary-, health-, environment-, and security issues regarding their human resources. Terrorism and climate changes have also gained increased attention lately. Based on this it is therefore a lack of an overall overview of the size or damage or loss on a municipality level. Most of the different municipality sections or offices, however, keep this kind of record but the variations between the offices may be huge. One of the municipalities researched has divided the consequences of risks into two. One is consequences regarding human, environment and economical values, and the second is consequences regarding society functions.

Risk management is important for achievement of objectives and performance because the municipalities have societal interests, for instance that an objective might be to increase welfare, reduce accidents on work etc. On the other hand, it is not an objective for the municipalities' researched to eliminate all probability for unwanted incidents in the society. According to the municipalities, this is not justifiable considering the public economy. The

municipalities therefore do not include risks that they consider acceptable in their risk management method or in their risk and vulnerability analyses. In order for risks to be acceptable, however, they need to fulfil criteria set by the municipality management and be in line with local objectives. This is integrated by looking at internal instructions and municipality plans that often are developed on a municipality- or county level.

After the risks are identified the next step in the risk management process in each municipality section is evaluating different actions that are suitable to reduce the risk, either by reducing the probability of an unwanted incident and/or reduce the consequence if it occurs. There are no preset actions that should be taken to reduce the risk and there is no indication if the actions should be of preventative character and/or if it should be based on reducing the consequence. The decision about which actions that should be taken to reduce the risk is made by looking at the reasons why the risks or unwanted incidents may occur.

The link between strategy, objective and risk management can not said to be strong. The main reason is that risk management mainly is conducted on office levels and not on a municipality level. Even though the aim is to have risk management linked with the municipality strategy, the risks are mainly identified based on the threat they represent either to the municipality assets, the people in the society and the like. The strategy on the other hand, is welfare oriented. Based on this, the evaluation about whether a risk is high or low is therefore not purely based on the objective it might jeopardize. But risk management is still important for achieving the objectives because the objectives are to a certain degree linked with the municipality strategy.

The two municipalities researched with more than 100.000 inhabitants both develop critical success factors for achieving their objectives. For instance in childcare one objective might be to increase the number of places for children in kindergarten. Some of the critical success factors might therefore be a squeezed building-and construction market, limited area, great increase in population, limited access to qualified personnel etc.

Risk management process in the municipality offices imply control and monitoring of crucial processes. This includes for instance financial management and that this is executed in compliance with existing rules and laws. The municipalities also believe that risk management has a positive influence on preventing financial crime and malpractices.

According to the municipalities researched the purpose is to have a link between the risk treatments and the specific risks that it is meant to reduce. However, the strength of this link may be discussed based for instance on the understanding of what exactly causes or lies behind the different risks identified. The municipality offices have developed a map on the risks that they want to reduce. The map gives an overview of which risks that need to be treated but does mainly not give any identification of treatment that should be used, even though there might be a few variations from one municipality office to another.

The accountability/responsibility for risk management is documented in the form of a risk and vulnerability analysis for the different offices in the municipality. The written document is mainly designed by the managers in the offices but quite often the employees have contributed. In this sense the document is understood across the different levels in the municipality and in the different municipality offices. Not all are, however, included and the municipality managers are aware that this might create a distance from the risk management

method outlined. However, as a result of control routines and internal instructions, this is not seen as a big problem.

In one of the municipalities researched they have divided the actions that may be taken to reduce risks into three. The first is risk avoidance. In practice risk avoidance is mainly about looking at the need and choosing those options that gives the lowest risk. The option with the lowest risk can fulfil the requirements set, and be the option with lower efficiency, functionality etc. Secondly is risk transfer which means transferring the risk to some other party. Thirdly is risk control which is plans to manage and/or decrease risks, in practice this means to accept that risk exist, establish plans for how to manage the risk, and lay alternative plans if the risk does not decrease. However, both the municipalities researched tend to focus more on risk control activities than on risk financing activities. The most used risk control activity is what the theory refers to as loss control either through prevention or reduction (see chapter 3.3.3 Risk treatment). One of the municipalities researched, use different categories for risk control activities. They divide between logical/system-technical actions, physical actions and administrative actions. The system technical actions are for instance access control, safety barriers, surveillance, reduction of resources. Physical actions are for instance area securing, locks, alarms, video-surveillance, marking equipment. Administrative actions are for instance rules, procedure, routines, training, rehearsal, testing.

The municipalities are trying to identify actions they already have in place, and they are evaluating if the action has its counterpart in a risk/threat. This way they argue that they are able to discover if the actions have done its purpose.

Need for and benefit of extra risk treatment activities should be well documented and not vary too much from year to year. The budget reserved for risk management in the different sectors is not unlimited. Often the risk actions are financed by the Norwegian state or the county through the budget. There is little focus, or knowledge about, other risk financing methods in the municipalities researched. The main reason for this is that there are mostly specialists working with this part of the risk management method and the municipalities are by law restricted from investing in risky bonds. However, one of the municipalities researched has developed an insurance company that is 100% owned by the municipality. This insurance company offers services and products regarding risk management to the municipality and the companies 100% owned by the municipality. The purpose is to reduce the risk of loss and damage on the environment, properties, health and life. The products entail insurance solutions within general insurance (non-life insurance), guidance within risk management, guidance within general preparedness, proficiency-development like courses or training within insurance, risk management and general preparedness.

The municipalities are aware of the benefits of follow-up activities or evaluations in order to ensure that the risk management will work efficiently and according to the plan and purpose. In many municipality offices this follow-up activity is replaced by revising the risk management analysis yearly, or when crucial changes occur. This is often done by using a risk and vulnerability analysis. Crucial changes in the municipality may imply a change in the assumptions that were made when the risk evaluations taken. New knowledge and results from the experience often gives valuable information for further risk evaluations. Revising the risk management method does not imply that the whole risk analysis is re-evaluated, but that those parts that are relevant for the changes occurred are re-evaluated. The re-evaluations are then often documented as an attachment to the risk analysis. After several re-evaluations or

crucial changes, the municipality offices often see the need to conduct a completely new risk analysis.

Municipalities with less than 100.000 but above 10.000 inhabitants

In the two middle-sized municipalities researched, between 10.000 and 100.000 inhabitants, risk is identified on office levels, but only in depth in some main areas representing high risk or in those offices having high risk, and the main risks are included in a risk and vulnerability analysis for the municipality.

The municipalities researched are focusing on their responsibility for maintaining the safety of the population and the safety within the municipalities' geographical and operational area in their risk management method. The municipalities also focus on their responsibility to ensure that important social functions are operational during crises and catastrophes. This is in line with the fact that municipalities are required by law to have prepared risk management actions in different areas regarding fire-and explosives, pollution, health- and social services etc. This means that risk management is treated as a process where methods about identifying, evaluate and analyse risk is done in depth within a few main areas and more superficial in other areas. The risk management plan is mostly developed in project groups consisting of managers with different background. In one of the municipalities' researched the starting point for the risk management method they use is the guidance for municipality risk and vulnerability analysis conducted by DSB, and sometimes they also use other comparative municipalities' risk management methods as a template for their own. External consultants may be used in specific situations where there for instance is need for external expertise. The other municipality researched use external consultants for instance in risk identification, and in probability and consequence assessments.

Risk is defined as a result of the probability (frequency) and the consequence of unwanted incidents in the middle-sized municipalities. This is according to the municipalities, similar to the guidance developed by DSB. After having defined the reasons that may cause an unwanted incident and the preventative actions already taken, the municipalities have to describe how frequent the incidents approximately may occur. This evaluation is done based on knowledge about the local relations, experience, statistics and other relevant information. When classifying the different risks based on probability and consequence, the middle-sized municipalities use the same method as used in DSB's guidance. Risk probability is divided into four classes. The lowest is risk that has low probability which means that it is unlikely and includes incidents that occur less than one time every fifty years. Next class is moderate which includes incidents that occur one time every ten and every fifty years. Those incidents that are likely occurs one time every year and one time every ten years. Those incidents that are classified as very likely occur more than one time every year. According to the two middle-sized municipalities researched they also use the same consequence-scale as DSB. The consequences can be harmless, entail a certain danger, or be dangerous/essential, critical and disastrous. One of the municipalities researched has made a classification of consequences each risk represent. These are divided into three classes which are human, environment, economy.

The higher probability and consequence a risk represent the higher the need is for reducing the risk. In the middle-sized municipalities researched, risk management through a risk and vulnerability analysis is conducted on the most critical areas of risks. The responsibility is therefore not clearly clarified, but the approach is often done in project groups to get an overview of the risks also across municipality offices. In the middle-sized municipalities they

do not necessary identify all kinds of risks that might be present in the different offices, but often they identify areas of risk. These are water and drainage, fire, traffic, vessel and boat accidents, airplane accidents, electronic communication, health, pollution, electricity, agriculture, climate, rationing, criminality and evacuation. Even though they do not identify all kinds of risks, they have a brief overall overview of the different risks on a municipality level.

Risk management is important for achievement of objectives and performance in some areas where for instance the objective is to have stable water and electricity distribution and reduce the criminality. Both of the middle-sized municipalities researched are coast-municipalities and risk management is therefore quite important to reduce the number of drowning accidents. In other areas the risks are not well identified or are insignificant and do therefore not have essential or direct influence on the objectives. Even though risks are not identified in all different municipality offices, all offices have internal instructions which the municipalities consider as a part of their risk management.

After the risks are identified and the probability and consequences are mapped, actions are being taken. The actions that should be taken are not decided in advance but are being implemented out of best practice with no indication if the actions should be of preventative character and/or if it should be based on reducing the consequence. One of the municipalities researched also say that they may take action based on experience from other comparative municipalities' risk management. Mostly used are, however, preventative actions and secondly reduction. There are requirements by law that already has established a risk management process regarding for instance investments activities. Municipalities are for instance not allowed to invest in risky assets even though this may happen for instance where the risk is not understood (recent example of this is the Terra-securities scandal).

The most used risk financing activity is retention and second is transfer. Risks that are not considered high are retained by the municipality itself, high risks on the other hand are for instance being transferred through insurance. When evaluating whether to implement (additional) risk treatment activities the municipalities researched said they consider the costs versus the utility of implementing the (additional) risk treatment activities. One of the municipalities researched said that additional risk treatment activities are being implemented if the action is believed to have a positive effect and can reduce costs according to the risks. In addition, if the cost of implementing the action is paid back within a period of three to five years it is very often implemented.

Even though risks not always are identified in depth in all offices the risk management process in the municipality offices still imply control and monitoring of crucial processes across the municipality. This is done through internal instructions and understanding of good business attitude and behaviour. They also identify some critical success factors for achieving their objectives. Financial management is for instance not a main area or risk identification in the ordinary risk management process (monitoring, internal instructions and control), but the risk management process is still important in this area because of its positive influence on preventing financial crime and malpractices.

The risks identified are being plotted in a map on the risks where you easily can see the most critical and the not so critical risks. The purpose is to have a link between the risk treatments and the specific risks that it is meant to reduce. The link is rarely based on statistics or the

like, but on what the municipality believes is efficient for instance based on their or other municipalities' experience.

In one of the municipalities' researched the risk management plan is divided into two levels. The first level is where the different documents archived are changed as they are being updated and/or when new risk analyses are conducted. The second level is risk management information on the municipalities' websites, the municipalities' intranet and the like so that the employees have access to the plans. The Risk Management documentation in this municipality consist of an overall risk and vulnerability analysis on a municipality level (brief summary of the different office's risk and vulnerability analysis), internal instructions, and requirements by law have been included. In the other municipality researched, risk Management is documented by risk and vulnerability analysis for the different offices, control routines for the different positions, and internal instructions. Based on the risk and vulnerability analysis, the municipalities develop a plan for management during crises and actions to avoid the unwanted incidents. The purpose is to find arrangements that reduce the risk of unwanted incidents that are unacceptable. This plan is part of the municipalities' comprehensive risk and precaution management. There are also some requirements regarding risk management by law and these requirements is therefore also part of both municipalities' the risk management documentation. The written document is designed by project-groups often consisting of managers with different backgrounds. In this sense the document is understood across the different levels in the municipality, as the managers are responsible to communicate the decisions to the employees.

The municipalities have financial funds through the budget of the Norwegian state and through the county. According to the municipalities they implement risk actions at their best ability given the budget they have. This gives greater understanding of benefits of follow-up activities and/or evaluations in order to ensure that the risk management works efficiently and according to the plan and purpose. The reason is because they have to use the funds efficiently. The follow-up activity often means that they revise the risk management analysis yearly or when crucial changes occur, and one of the municipalities researched also look at how other municipalities handle similar challenges.

<u>Municipalities with less than 10.000 inhabitants</u>
Smaller municipalities, less than 10.000 inhabitants, have developed an internal instruction to maintain safety and to handle some of their risk management. They opt to ensure that their employees get sufficient training regarding safety issues, and on a regular basis they control their own risk and safety condition. They are for instance working to ensure information-safety. This is preventative efforts to ensure that persons not concerned do not get access to confidential information, ensure that persons not concerned do not edit, or destroy information or make it unavailable for those that have legitimate need to use the information. The preventative efforts are mainly written in the internal instruction, for instance that the employees have to sign confidentiality papers and that they receive sufficient training in their work. Other efforts to for instance prevent potential sabotage- and terrorism attacks in physical or electronic form, or preparation for this kind of attack, are also handled in the municipalities' internal instruction. The preventative actions on these kinds of risks are having updated electronic firewalls, antivirus programs and the like.

The municipalities make decisions about reducing risk based on a cost-utility approach. This is done based on the severity and probability of a specific risk, similar to the other municipalities researched with more than 10.000 inhabitants. If the risk is likely or almost

certain and has major or catastrophic severity, then the municipalities researched with less than 10.000 inhabitants will always take action. Risk management assessments and risk-vulnerability analysis is not, however, done in each office or department. Instead there is a more general approach like the internal instructions and more assessments in those areas where the municipality has identified risk to be likely and severe. For instance fire-, water-, and burglary on the municipalities' own buildings and health-, environment-, and security issues regarding their human resources.

The three municipalities researched have developed risk and vulnerability analyses for different areas representing high risk. Based on each risk defined in these analyses they require that action is taken. The actions are, however, not specified any place and is mainly decided based on the best available solutions given at the time being. The record about size of damage or loss is not summarized in an overall overview but in the different sections they occur. The reason is that even though the municipality is relatively small, the accidents/big losses are provisioned for in different areas which is not summarized in a comprehensive overview.

Risk and vulnerability analysis is the basis for preventative actions on one side and planning to be ready for risks that may occur on the other side. This means that it is in general up to the different municipality offices to decide what the plan and action to reduce risk should be, based on the findings from the risk and vulnerability analysis. They are also free to evaluate what the plan should contain and if it is possible to fully or partly prevent the risk or incident to occur.

The risk management method is mostly the same in the three municipalities researched. This method often consists of risk and vulnerability analysis which has been divided into six phases which are organizing the work, analyse, follow-up of the risk management group, political decision, areas for follow-up and keeping the analysis up to date. The risk management group that develops the risk and vulnerability analysis consists of managers from different municipality offices like chief fire officer, chief police officer, officer from the defence, manager for health and social services and the municipality chairman and chief officer to mention some. The financial funds for risk management are one of the things being discussed in the political decision. This is to ensure that the funds are being used efficiently.

The purpose of the risk and vulnerability analysis is to map and evaluate possible incidents that may harm people, environment and the infrastructure. The municipality is therefore analysing what kind of incidents this may be and are planning actions to be taken if it is possible to prevent the risk so that the daily operations can maintain. They also want the municipality risk management to be a basis for planning in the municipality and to increase the awareness and knowledge of the population, politicians and administration. The risk analysis should, according to the two municipalities, be followed-up regularly in order to keep it updated.

In the risk and vulnerability analysis conducted by the risk management group there is a list of different risks that are present and that should be reduced somehow. Based on the risks identified one of the municipalities researched have also listed a few suggestion about how to deal with the different risks, both preventative actions and actions to reduce the consequence. These are only suggestions and are not something that needs to be followed when the findings from the risk and vulnerability analysis actually is being implemented. An example is risk of fire which is reduced by preventative actions like instalment of fire alarms, periodical control

of the technical constructions, information, and tidiness. The consequence of risk may also be reduced by having fire-alarm, evacuation-routines, organizing and having fire distinguishers. Additional actions to reduce the risk are to have fire-rehearsals for the employees, contract with external help, upgrade buildings and the fire-technical construction and having correct fire-distinguisher equipment.

High risks represent a need to take action and in those situations the municipalities researched has developed a map on the risk considering the probability of the specific risk and the consequence of the risk if it takes place. When evaluating whether to implement additional risk treatment activities, the municipalities researched consider the action needed to reduce the risk versus the expectations about the effect of the action (if it will be life-saving etc.). The municipality budget is also a reason why some risk treatment activities may be chosen compared to others. If the expectations about the effect of the different actions do not show any crucial difference, the financial perspective is conclusive.

According to the municipalities researched a purpose with their risk management method is to have monitoring and evaluations that gives good information and the possibility to implement necessary activities on an early stage. If they managed this it would have a preventative effect. However, at the time being the coordination of actions are not optimal and therefore they do not have full benefit from their monitoring and evaluations either. In different areas where risks are identified the risk and vulnerability analysis is a helpful tool, but the coordination of the different actions are still to be improved. The municipalities for instance want that the different sections for life-saving and emergency have an intensified cooperation and coordination. They have taken a few actions to improve this, for instance that the municipality has asked these sections to plan and carry out joint practices for all areas representing high risk. The municipality has also started developing maps over dangerous areas in the municipality regarding flood, slides and the like.

The use of external consultants is rarely used in the risk identification part of the process. It might, however, be specific situations where they want to know the size of the risk and therefore for instance hire external expertise to take measures of the earth to tell the risk of slides and the like.

Risk management is important for achievement of many of the social objectives of the municipality. The risk management process improves critical areas at risk like fire, bigger accidents, pollution, information- and communication technology, flood and contamination to mention some.

The link between strategy, objective and risk management can be discussed based for instance on the coordination of the different actions. However, according to the municipalities the risk management process increases the awareness and knowledge about municipality risk and is therefore having positive effects on financial management, crime and unwanted incidents.