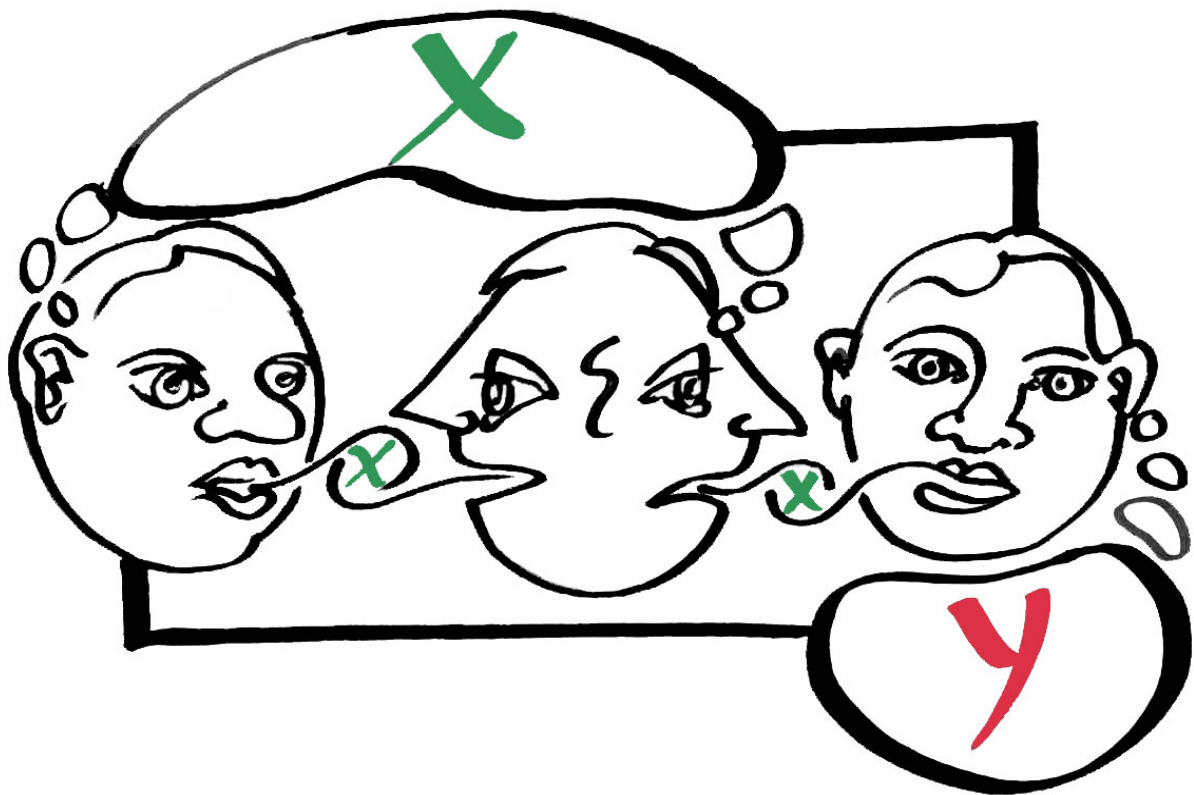


RISK COMMUNICATION IN FORESTRY CONSULTING

- A SURVEY AMONG FORESTRY PROFESSIONALS



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PREFACE

This report is a thesis in Forest Resource Management by Mads Christian Skov, The Southern Sweden Forest Research Centre, Swedish Agricultural University of Science, and Alnarp.

A warm and deeply thank

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Skodsborg, March 2006

Mads Christian Roij Skov

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ABSTRACT

What kind of risk perceptions do forestry professionals communicate to the non-industrial private forest owners in southern Sweden and how do they communicate about risk matters to them?

Based on a semi-structured interview guide and an enquiry, risk communication in forestry consultancy among non-industrial private forest owners (NIPFs) and forestry professionals (FPs) at Skogssällskapet is described in relation to climate change and the consequences of economic forest hazards. Nine FPs were interviewed before the hazardous storm Gudrun.

The semi-structured interviews focused on the forest consultancy scenario when FPs meet the NIPFs. In accordance to theory on risk communication, this paper shows that an FPs' readiness needs educational tools to confront the NIPF better in a communication approach process.

Furthermore, the survey indicates that these perceptions are, among other things, determined by social interactions. On the basis of these findings, I can derive a number of practical recommendations not just for scientists but also for personnel and institutions working in higher education and in the field of forest extension services.

The results show among other things that it is possible to influence and give proposals for the FP's. In many cases it will take two years to digest before the implementations may be carried out in practise.

Finally, the report observes an interesting and noticeable fact which most of the FPs have expressed: Lack of time seems to be crucial for their ways of handling risk communication in forest consultancy. In a stressful situation, unrealistic expectations on technical solutions, like computer based information systems, can arise simultaneously, as the time for personal meetings and reflection diminishes.

Key words: Risk communication, risk perception, uncertainty, decision-making, interview, strategy, NIPF owners and forestry

1. INTRODUCTION

This chapter gives an introduction to risk communication as one of the main themes in this thesis. Secondly, the objectives of the thesis will be presented. Thirdly, I try to give a definition of risk communication according to four theorists, including a communication model. Finally, the summary will more specifically describe which theoretical aspects are the most appropriate to use.

FPs exist to provide information and alternatives to choose from in a decision situation. In any decision making scenario the decision maker also needs information about uncertainties and risk management strategies. FPs are trained to provide services which help NIPFs better to attain their sustainable forest management (SFM) objectives while ensuring the long-term integrity of the forest resource.

Today's forestry varies from commercial forestry toward multiple-use forestry such as sporting estates, recreational- and social values and entertainment. Many demands are arising on forests, from the large number of interests and multiple-use SFM and this is becoming the normal practise. These requirements give a challenge to the FP not only including knowledge of silviculture and economics, but also sociological skills in order to take into account all the demands and to deal in a satisfactory manner with the variety of interests NIPFs may have.

1.1 THE OBJECTIVES OF THE THESIS

The over all objectives of the work presented in this thesis concern achieving better ways of improving forest consultancy and finding out more about the consulting scenarios when forestry professionals consult NIPFs. To meet these objectives, the thesis aim is to answer the question:

What kind of risk perceptions do forestry professionals communicate to the non- industrial private forest owners in southern Sweden and how do they communicate about risk matters to them?

1.2 RISK AND SPREADING RISK

In literature risk matters occur in different definitions. The most common one is the daily term which aim is to calculate the probability of a negative incident hits.

Human beings often reflect like this: - Could that have been avoided?

Not only nature is an uncertain factor like cases of hazardous storm events. Storm damage is, however, a constant risk, rather than an unforeseeable event. Forestry itself sometimes needs to strengthen the readiness in order to meet risks and not suddenly be in a crisis situation where the consultancy approach decreases in quality, also due to the fact that unpredictable events may cause a great impact to the economic circumstances.

1.3 HAZARD STORMS

During the last couple of years a series of major wind damage events from violent storms have taken place in the forest sector. These events have caused great disruption in planned management, economic losses from higher logging costs et cetera.

The hazard storm Gudrun that hit Southern Sweden on the night of January 8th 2005 caused the worst damage to these forests in recent time. According to the first estimation made by The Swedish Forest Administration approximately 70 million cubic metres were wind thrown or damaged. This almost corresponds to an annually harvest for the entire Sweden. Approximately 75-80 % of the damaged trees were Norway spruce (*Picea abies*), 15% were Scots pine (*Pinus sylvestris*) and the remaining were deciduous trees (Ref). The Swedish Forest Association undertook measurements.

In the initial stage, the organization focussed primarily on the information versus NIPFs and the public. The prime considerations were the dangers of being in the area and working in the storm felled forest areas. However, the storm and in particular the reaction to it assumed that there is a need for exploring ways of improving risk communication in order to make the NIPFs and the FPs more prepared for these kind of situations in the future.

1.4 COMMUNICATION

Communication means: Doing things together and it is a word derived from Latin – *communis*. In 1928, a Briton named I.E. Richards (Gyldendal 2001) developed the theory that communication exists when an individual is influenced by another individual in a way that both parts are influenced by a uniform experience. Furthermore, communication is about cooperation, meaning that you are trying to create better conditions for one another. Unfortunately, people of today communicate in a way, which increases the distance between them. Thereby it diminishes the motivation and possibilities that own interlocutor and therefore is being more cooperative. This means that there is a great task for the consultancy function and the FPs where it is important to communicate more frequently.

Nowadays, Internet, medias, forest fairs, networks; newsletters are essential to FPs as information roads to reach their NIPFs. Today's communication technology allows large amounts of technical and scientific information to be exchanged rapidly between forest industries, partners and stakeholder groups. This is helpful when dealing with problems and solutions that may be similar in a number of areas in Sweden.

Target organizations such as Foreningen Skogen, Skogforsk and the popular science writing are published. This is mainly in forestry press like Aktivt Skogsbruk, FaktaSkog Skog&Forskning, SkogsEko, SkogLand, SkogsVärden, ViSkogsägare, continuously providing forest related information sources. Based on oral statements these information channels and papers mentioned above are often not readily available or accessible for everyone, nor do they meet the required standards in terms of quality or quantity.

Another problem is the fact that scientific and technical information is not always exploited or compiled appropriately, even though it may be highly relevant. Information is often accessible only in a limited number of places. This means that a user may discover it after it has become out of date and new scientific knowledge have merged. Thus, links, communication and exchange of information between all actors in the forestry sector need to be strengthened, both formally and informally one FP stated.

Equally important is the flow of knowledge in reverse to the scientists through collaborative research. Many NIPFs enhance biodiversity and minimise risk while maintaining a SFM and

producing high quality of commercial timber. This recognition is leading to a new kind of research that brings forestry, ecology and social sciences together in a synergistic way. In this way, development and cooperation will learn from good examples of existing practices and other point of views, on the assumption that absolute answers does not exists, whether it comes from the practical or the scientific field of knowledge.

Based on oral statement it is a challenge to communicate research to non-scientific audience. The Valley of Death (Björk 2004) is a metaphor of the sometimes-deep gorge dividing the world of forest business and the world of forest research. To strengthen this two-way enterprise it is an educational challenge. Hence, it needs a great commitment and concern from both disciplines, practioners and forest research.

But a factor for crucial success is a sufficient supply of time, which unfortunately often may be a problem in today's forest organisations (Björk 2004). As mentioned further in this survey lack of time is a part of the main issue especially when forest organisations rationalize and decreasing the work staff. In that context it is important to notice risk matters and the risk communication approach versus employees.

1.5 IF SOMEBODY HAD THE ANSWER, WOULD WE THEN HAVE RISKS?

Risks are an integral part of forest life. It spans from the level of working safety, accidents and employment to corporate asset depreciation, production, inflation, foreign exchange rates, timber trading, health et cetera. It is an essential element in the entire forest business. Each time a businessperson takes a decision regarding an investment - such as the purchase of goods or services, an advertisement, a promotional program, a new product, or any other business decision - risk is involved.

According to United Nations umbrella organization for international labour, ILO (1996), - a risk is defined as follows:

“A risk situation occurs when you are required to make a choice between two or more alternatives whose potential outcomes are uncertain and must be subjectively evaluated. A risk situation involves potential success and potential loss. The greater the possible loss or profit, the greater the risk involved”

In the literature several risk definitions occur. The most common is the probability that a *negative* incident happens. The reverse tendency is the word “chance” which means a probability that a *positive* incident happens. The larger the probability of a negative incident is, the bigger the risk.

It is important to note the fact that in every decision situation uncertainty is involved. This uncertainty arises from lack of knowledge (epistemic uncertainty, Blenow&Sallnäs 2002) and from a *true* uncertainty about the outcome.

General causes for uncertainty are inflation, changes in technology, productivity and prices, false estimates of the rated logging capacity, time needed for the running-in periods, political, social, and business environment. Sometimes NIPFs face risks with no chance of profit and the best they can hope for in such scenarios is an outcome without any loss.

The media plays an important role in risk communication and the formation of public views, not only by providing information but also by bringing issues to the attention of the public, even creating a sense of urgency. The traditional view is that the public see estimates of risk as uncontrollable however; this may no longer be true, given a view, which has mutual understanding as its goal. A communication proposes a two-way exchange of information. As a result, participatory values shape the way risk communication is done.

The issue will not solve all problems or resolve all conflict on issues. On the other hand, poor or absent communication will almost certainly lead to a failure to manage risk effectively.

In accordance, two essential components of risk communication are *trust* and *perception* (Renn & Levine 1991).

Achieving trust is the pivotal focus of risk communication, which is assumed problematic for all FPs and forest extension services as the NIPFs, tends to see government as a less than trusted source of information. Perception, which emerges from a combination of complex factors, is an area under constant study. The NIPFs seldom agree in their risk perceptions.

1.6 THEORY

There are different theories on risk communication.

Professor, Ulrich Nitsch, at SLU, has developed a model in the field of environmental communication – the relevance model. The model shows how to communicate in a relevant context. This model described below is used before in a cooperation project established between The National Danish Advisory Centre, The Danish Institute of Agricultural and Fisheries Economics and five local Advisory centres aimed at delivering strategic consultation to Danish farm managers.

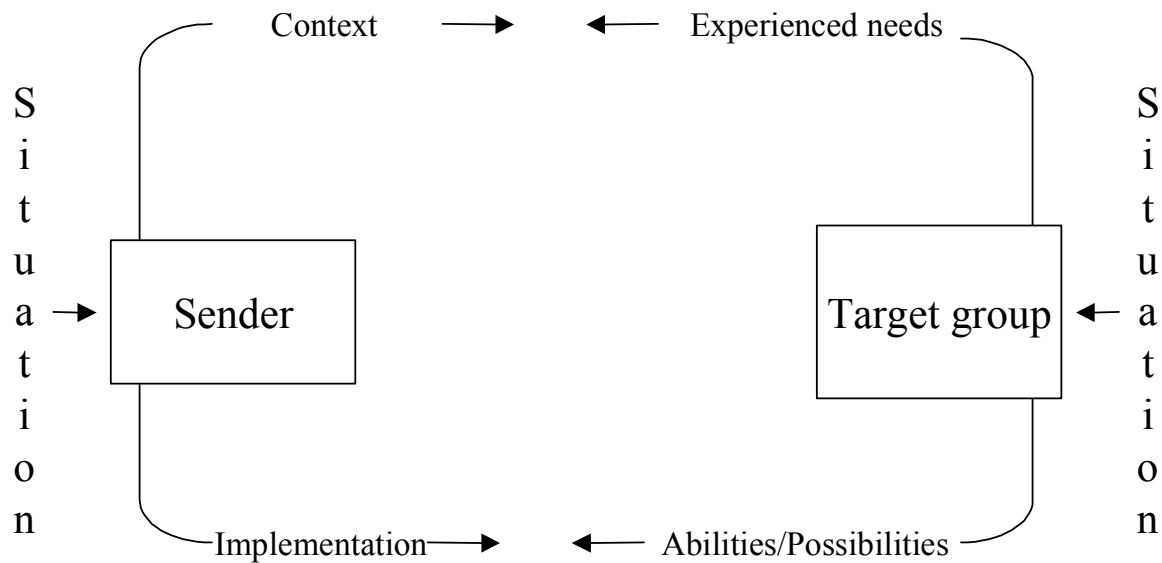
Two preconditions have to be fulfilled in The Relevance model before a communication can be:

First of all the context of the information must be addressed to the target group and its needs. It means that the sender have to take part in the act and know all about how the target group experience his situation and the needs they may have (fig.1).

Secondly is that the information have to be available in a way that it contributes to the target groups own qualifications and possibilities to participate. In these qualifications and possibilities all those aspects are relevant for the availability; time, place, expenses and methods (Nitsch 1998)

Today there aren't any implementation strategies or tools to facilitate the right consultancy and communication approach vs. NIPFs. However, it can with great certainty be pointed out that the people in the consultancy business are hardly ever occupied with the basic arguments for the preparation of the basis for decisions referred to practitioners and in this context NIPFs. Without such arguments within the consultancy business there is a risk that the implementation is build only upon *ad hoc* principles. For that reason, it seems that there is a need for qualified message for requirements that NIPFs may need for strategic communication approach. This makes it appropriate to use the model below.

Relevance Model as shown in fig. 1 below:



The figure shows that a NIPFs demand for advice in general can be classified in two types. One type of demand is about NIPFs experienced demand and another demand is concerning qualifications. Furthermore, from the figure, it can be concluded that the consulting design has to match NIPFs qualifications or abilities.

Peter M. Sandman presents another theory. According to Sandman (1994) the common state of humankind vis-à-vis risk is apathy; it seems that most people are apathetic about risks in general. Therefore, it is difficult to arouse their concern and when they are concerned it is a task to calm them down again.

The latter of looking at risk communication assumes that it is a one-way enterprise where the receiver is warned or reassured and a source to do the warning. Further, Sandman claims that being an acceptable assumption; at least three other interconnected assumptions must be approved:

- ➡ The messenger knows more about the risk than the receiver
- ➡ The messenger has the receiver's interest at heart
- ➡ The messenger's recommendations are based on real information

Real information means not just values or preferences. In many risk communication interactions these specifications are not satisfied. Whilst by help information about, e.g., SFM issues may demand a lot of different effort in time and engagement.

Ulrich Nitsch has in his research focussed on how effective you may promote environmental information.

About the content in the model according to Nitsch (1990):

If the messenger's own information has to reach the target group the content has to be relevant to the target groups' abilities to be involved. One of the main courses why it is difficult to fulfil these basic conditions is that sender and target group live in different surroundings and work with different matters. It gives them different experiences about reality and about what is important.

In order to understand risk communication, it is also important to understand the field of *risk analysis*, rather than the field of *communication* per se. Since risk communication has a limited basis in the communications theory the area of communications is a subject to limited focus of risk management. The leading psychologist and researcher in the field of decision making, Baruch Fischhoff, summarizes the evolution of risk communication during the last 20 years (Baruch 1995). He suggests an eight-stage chronology in this development. Each stage is characterized by a communication strategy that practitioners see as effective, and each stage builds on its predecessor and does not replace them.

Developmental stages in risk communication

- All we have to do is get the numbers right;
- All we have to do is tell them the numbers;
- All we have to do is explain what we mean by the numbers;
- All we have to do is show them that they have accepted similar risks in the past;
- All we have to do is show them that it's a good deal for them;
- All we have to do is treat them nice;
- All we have to do is make them partners; and
- All of the above

Baruch Fischhoff (1995)

Finally, risk communication is described by Renn as an interactive process, exchange of information and opinions among individuals, groups and institutions. Renn (1998) describes two main elements of risk communication:

- Informing (changing knowledge)
- Persuading (changing attitude/behaviour) and consulting

Nevertheless, Renn suggests that risk communication is:

1. To make sure that all receivers of the message are able and capable of understanding the meaning of the messages they receive.
2. To persuade receivers of a message to change their attitudes or their behaviour with respect to a specific cause or class of risks.
3. The interactive exchange of information and opinions concerning risk among risk assessors, risk managers and other interested parties (with one objective being the achievement of better understanding of risk and risk related issues and decisions).

Several practitioners in risk communication may agree that effective risk communication will not cure all problems, and maybe it will not avoid certain conflicts. On the other hand poor or absent risk communication definitely leads to mistakes on how to manage risks efficient. However, the participative approaches in risk communication may lead to better consensus but cannot be guaranteed. Three essential components of risk communication include *trust*; *perception* and finally the important factors that create public perception are described as *dread values* (Sandman 1987).

1.7 SUMMING UP

In summary, it is clear that these scientists perceive risks differently. Nitsch sees risk communication as a meeting between sender and the target group, as shown in his model in figure 1.

Sandman perceives risk communication as a one-way enterprise where the messenger has the knowledge (epistemic), the receiver's interest and the real information about the risk.

Fischhoff has an eight-stage chronological communication strategy. In accordance, each step does not replace one or another.

Finally, Renn makes up risk communication as two elements where the consulting part has to change the receiver's attitude and knowledge in the communication process.

2. MATERIALS AND METHODS

In this part the chosen empirical method is described. Furthermore, the aim is to show research design, data method, and data collection method, chosen Skogssällskapet and FPs (respondents), data processing and interview method of the thesis.

2.1 METHOD

The data collection method in this thesis is a qualitative interview method. To meet the objectives, semi structured interviews and a questionnaire were held and given to FPs at Skogssällskapet, a Swedish forest extension service. The semi-structured interview is a method where the interview is controlled, based on an interview guide but with open-ended questions (Hogback 2002). This kind of interview method gives the FP the opportunities, to tell about his expertise with NIPF owners.

The advantages of the semi-structured interview are that the method helps to avoid the so-called bias mistake with guided questions, where the interviewer's views are coming through.

An interviewer needs to possess the ability to listen closely to the FP and in some shape be influenced by several things such as the relation interview vs. the FP. This means if both parties are capable of creating comfortable atmosphere during the interview process, the interview becomes effective. However, both parties are influenced by how long time set aside for the interview – are we in a hurry?

In the light of the issues mentioned above, it is in every case the interviewer's responsibility to show a good behaviour in order to do the question technique and behaviour in a uniform and reliable way.

The disadvantages of the qualitative method are as follows:

1. Because of data quantity it is easy to loose the overview of the survey
2. To write the context from the interview from Dictaphone and mind map takes time and demand considerable resources
3. The method challenges the interviewer's objectivity

4. Qualitative analyses and interpretation are demanding because of an almost lack of method literature about how to implement research design. Therefore, it is a challenge for the researcher's creative ability.

2.2 CREATING THE INTERVIEW GUIDE

Before the interview had taken place I, together with Dr. Kristina Blennow, prepared an interview guide in order to ensure a similar structure and contents. It is important that the interview guide is able to be managing as a coarse checklist including the subjects who, according to the task were most interesting and necessary. Afterwards, I did test interviews with several researchers at the forest institution.

The final interview guide and the held sessions included closed and open answer possibilities. Additionally, it was important to inform respondents to which purposes the data will be used. This was done to get comparable answers from each respondent.

The included questionnaire previous used in Blennow&Sallnäs 2002 and Eek 2001, among NIPF owners only in municipalities in Gislaved and Nybro. The answers from this semi-structured interviews and questionnaire were presented as a group where no individual answers could be traced. This information about anonymity was also given to the respondents prior to the interviews.

2.3 CONTACT TO SKOGSSÄLLSKAPET – FINDING THE FORESTRY PROFESSIONALS

With the permission of the district manager nine FPs were chosen. It was decided that the target group for the interviews preferably should cover the same area as in former studies (Eek 2001 and Blennow Sallnäs 2002) since this expands the study area and furthermore in order to be able to compare the studies at a later stage. Thus, seven FPs are working in the southern part of Sweden within district south plus two FPs are working in municipalities in county Småland in southern Sweden.

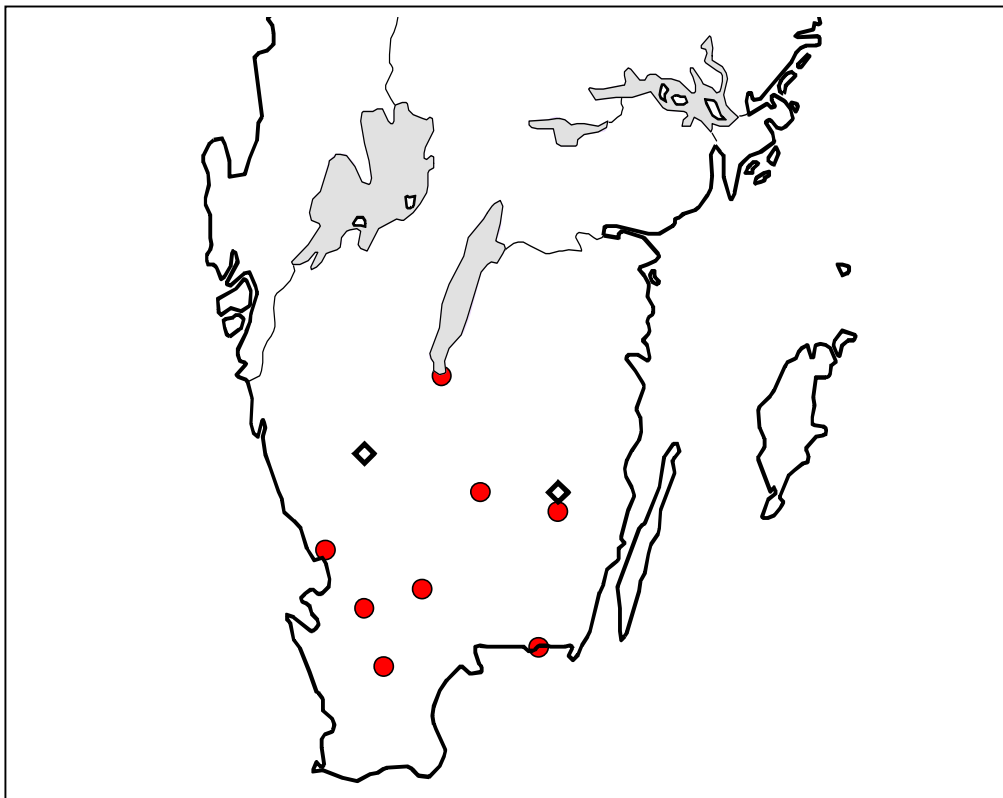
The organization and forest extension service Skogssällskapet is divided in four districts; west, east, south and north. Each district contains of regions with forest professionals who have customer liability for their members of the company Skogssällskapet. In this context district south contains of

region offices in Halmstad, Höör, Jönköping, Karlskrona, Nybro, Osby, Örkeljunga and Växjö where the interviews were held.

In addition, Skogssällskapet was participating in the survey, including one respondent from outside the district. Two FPs were situated at the same location, which gives in total eight visiting places.

The map below shows two previous studies (Blennow&Sallnäs 2002, Eek 2001) areas and district offices of Skogssällskapet and covers the area used for this enquiry and interviews held about risk communication and risk matters in forestry consultancy.

Fig. 1. Locations of FPs at Skogssällskapet region offices = ●
Previous study areas, one in south-west in Gislaved municipality and one in south-east in Nybro municipality (Eek 2001 and Blennow&Sallnäs 2002) = ◻



The fact that only nine FPs were included in the survey can be considered as a weakness. However, the area located above covers approximately the same geographical area than used in (Eek 2001 and Blennow&Sallnäs 2002). Henceforward, the study can be seen as a try to exposure the problem formulation as an ongoing process.

2.4 INTERVIEWS AND QUESTIONNAIRES

The interviews were held March 8th to 12th 2004 with nine FPs at Skogssällskapet in Halmstad, Höör, Jönköping, Karlskrona, Nybro, Osby, Örkeljunga and Växjö.

Table 1. Questions included in the interviews with nine FP at Skogssällskapet

1.	What kind of job description do you have within Skogssällskapet?
2.	What is your duty?
3.	How long have you done practice in sustainable forest management and consultancy?
4.	What degree do you have?
5.	What type of different objectives have you identified at the NIPF owners when you discharge and make the forest management consultancy?
6.	What is the most common objective?
7.	What kind of risks are existing?
8.	To achieve the objectives – what kind of risks exist?
9.	How do you pick up information about risks within the forest management?
10.	How is your communication approach about risk perceptions, and risk matters when you do consultancy with the NIPFs?
11.	How would the debate and discussion about risk matters and perceptions be in future?
12.	Some scientist claim that effects caused by the assumed climate change ought to e g create a warmer climate. Does that affect your decision-making in your forest consultancy?

The interviews were designed to last approximately one and a half hours. The interviews were held at the offices of the Skogssällskapet except from two FPs, who were visited at their private residence where they had their offices.

Table 2. Hazards listed in the questionnaire (Table 1) and abbreviations used in the text

Hazard	Abbreviation
Increasing real estate costs	
Increasing interest rates	
Increasing harvesting costs	
Falling timber prices	
Frost heaving	
Damage on plants in regeneration by large herbivore browsing	Browsing damage
Damage on plants in regeneration by pine weevil (<i>Hylobius abietis</i>)	Damage by pine weevil
Damage on plants in regeneration by voles (<i>Microtus</i> species)	Damage by vole
Damage on plants in regeneration by frost	Frost damage
Damage to standing trees by spruce bark beetle (<i>Ips typographicus</i>)	Damage by spruce bark beetle
Damage to standing trees by wind	Wind damage
Damage to standing trees by snow	Snow damage
Damage to standing trees because of high resin flow	High resin flow
Damage to standing trees by root rot	Root rot

A Dictaphone and mind mapping technique were used during the interviews. Mind mapping is a method to make notes in a more visual way. It replaces the less efficient method of linear note taking with a method based on a simple pattern that visualize thoughts in effort to structure and organize ideas. In this method, the main topic is put in the centre and is developed in branch topics. These branches are then further developed in the subtopics, which are put as sub branches.

In the sub branches, the topic is divided into parts, specified and presented in more detail. Sub-branches can also hold additional information, or some ideas formed by association. Moreover, there are conventional graphical signs that can be added to the topics to evaluate the ideas or show the attributes of the topics. This results in a clear graphical representation of the ideas or items of information and relations between them in the form of a mind map. Further, *mind mapping* can also reinforce the ideas by using graphics, colours, figures and connections. The main advantage of mind maps, in comparison with ordinary lists and tables, is that a mind map provides a view of the whole. You see the entire structure of the topic presented - that leads to better understanding, and you may discover new ideas and approaches.

The Dictaphone was operative for data storing as a secondary help and to support the use of the *mind mapping* method. The intention was to avoid bi-lingual misunderstandings, Danish (mother tongue of the author/interviewer) vs. Swedish language.

2.5 STATISTICAL DATA ANALYSIS

In the analysis of the results I have compared all nine FPs and how their answers were deviated very little. By each calamity I have summed up the rank numbers that the different FPs have given. Next I have divided the numbers of FPs.

Calamities with lowest number reply to the estimation that caused the biggest economic risk. Every answer was given 1-5 and calamities with no ranging number got 10.

The non-parametric Friedman test was used to test for differences between hazards and in terms of assigned ranks and in terms of risk assessments made. Since each FP ranked only five hazards in each question, the remaining hazards were assigned ranks according to:

$$rank = n_{rank} + \frac{(n_{tot} - n_{rank})}{2}$$

Where *rank* is the assigned rank, n_{rank} is the number of hazards available for ranking (Blennow&Sallnäs 2002).

2.6 DATA VALIDITY

For each FP it is not transparent what kind of approach they choose. It is obvious that they work maintain a policy along those lines made from the forest extension service Skogssällskapet. Some questions could contain several contingencies, so a prepared filter question for possible outcomes was constructed. I.e., “if the answer is no: Why not”, “How many times a year”, “Have you ever done it”.

Having in-depth interviews are more appropriate than representative samples. When only a few FPs are interviewed it is more important to choose the FPs for their competence rather than just their representativeness. In this context it is important to choose FPs who are easily to talk to, understand the information needed, and are positive in helping with the study. In all circumstances it was met. The FPs were the key elements and if I had not convinced them to cooperate in an honest and

trustful way the result could not be reliable. Hence, it is important to be flexible and prepared for unexpected changes; which in this case did not happen. Sometimes it occurred that the result ended up in a different way than I had planned. In some cases it was more interesting to move the objectives away from the paper, so to speak.

3. RESULTS

In this chapter a summary of the interviews and the questionnaire will be presented. The results will be shown according to the order in the questionnaire and will be described how the FPs undertake the forest consultancy approach in the forest extension service positions.

3.1 FOREST PROFESSIONALS WITHIN SKOGSSÄLLSKAPET (QUESTION 1-4, TABLE 1, PP. 19)

The FPs included in the study have an average of nine years of duty in Skogssällskapet and have been working since graduation within the forest sector for 19 years. The FPs were all men and their forest degrees are Master of Science in Forestry, Bachelor of Science in Forestry or Skogstekniker. The FPs have all different and specific tasks to do in their consultancies. Their works consist of implementation of the SFM yield concept with responsibilities to integrate goals such as commercial timber production, hunt, social or recreational values.

The FPs see them as the key personnel in Skogssällskapet, because they act as salesmen and give knowledgeable information about how to manage forestland.

3.2 NIPF OWNERS FOREST OBJECTIVES (QUESTION 5-6, TABLE 1, PP 19)

The FPs stated that strategic decisions are made with larger NIPFs (>100 hectares forest land). The survey reveals that 95 % of the NIPFs think about economic issues and 5 % have other tasks and values. Thus, small scales NIPFs have other objectives, such as hunt and social values. In general, it seems that a forest ownership and the satisfaction for nature itself is his or hers *free scope*.

Further, the results show that berries, fungi and forest walks have a higher value for small scale NIPFs rather than commercial timber production have. A tiny clique sees forestry as a capital replacement but the general objectives are long term SFM.

The aim is to make economic value. This may be specified in a pattern change in the tree species composition (*Pseudotsuga menziesii*), different provenance (frost resistance), and silviculture treatment or right age distribution.

One FP claims that it is a must to get to know the NIPF well. The intention is to influence a NIPF to make progress in forestal issues.

Another FP claims that it is a huge task to manage the NIPFs own reflections for the near future.

As a FP you have a huge influence. Proposals said today will in many cases take two years to digest before you may see the implementations of your own consultancy and ideas (stated by one of the FPs).

In this context it is like a *detective* to get a good grasp in those thoughts and ideas. Another FP said that if he has other objectives than the NIPF owner and does not succeed in his own consultancy and communicate in a short perspective. Moreover, he confirms that he has to update his knowledge successively.

3.3 ASPECTS OF RISK COMMUNICATION (QUESTION 7, TABLE 1, PP. 19)

In a wider perspective, this survey shows that economic changes may reflect a new order in the communication approach. By consolidation, the risk communication such as messages about decreasing wood prices does not frighten the FP if it is delivered in right time, the FP continues.

Economic cost benefits such as planting, thinning, harvesting or road preparation are difficult subjects to discuss when meeting the NIPFs. Often they see the NIPF owner one time or twice every year (stated by one FP).

Today's NIPFs live in urban areas (LRF Konsult). The longer distance from the forest estate, the lesser understandings for the daily routines they have. In general the NIPFs schedules their day very tight and even during holidays they have set up a daily program. It is a reality and the FP have to adapt and learn how to cope with it .One of the NIPFs live abroad and visits his estate ones a year during the moose hunt and occasionally during summertime.

One of the FP's thought that by increasing the knowledge and forestry skills to his NIPFs, it decreases the risk matters in relation to the communication approach. If, e.g. a NIPF sits in Stockholm or abroad and some problem occurs. Meeting NIPFs at their forest estates are also more convenient. Afterwards it is much easier to communicate with them over the phone in case urgent

issues such as wind damage have to be discussed. It creates better results when they can visualize the meeting scenario from some month ago because they have been there. The possibility to show up and meet with everybody when needed is rather difficult today.

If you live at the forest estate you are an integral part of the unified whole. Living in the city of Stockholm it may be difficult for a NIPF to adapt local knowledge and transfer practice advice during a talk over the phone, when he or she quite seldom is at the forest estate in person. Further, he assumes that in urban life, it is difficult to integrate a broadness and commitment, e.g. in November for the NIPF living hundreds of miles away, when some forest stands are ready to be harvested and when you have experiences only from the vacation and summertime when the sun were shining - what did we do last and what can we do better next (stated by one FP)?

Some NIPFs are adapting the FPs' ideas directly and others need time to digest thoughts and ideas:

The risk in the consultancy work is that some subjects are controversial and the advice you may give does not functioning in practice (stated by one of the respondents).

There is a need for better efficiency in practice, several FPs stated.

A lot of forest stands are unmanaged. Some are well managed but in general it can be better. There is a lack of skilled forest workers and also lack of knowledge (stated by one of the respondents).

If the expertise and know-how were available, values present and well managed, it would not be difficult to find labour to the forestry sector, one FP said.

Before something is changing, a loss of values and forest increment increases when pre-commercial thinning is postponed one or two years.

At least due to digital FMPs it has been much easier to follow projects and many NIPFs manage the tasks appropriate. Unfortunately, it is not many who are able to do so, he continues.

A further aspect mentioned in the survey by a FP clarifies that existing NIPFs and the forest sector in general today undergo a pressure from the non-governmental organizations (NGOs) lobbyists and other stakeholders than ever before. In that context, one FP meant that the legislative power changes fast the agendas in order to seek their voter's sympathy. Equally, in another interview, one FP told that he would not hope that the forestry sector in the future would adapt the same shape as the EU agricultural subsidy system.

3.4 HOW TO SPREAD RISKS? (QUESTION 8-10, TABLE 1, PP. 19)

The survey shows that it is from time to time a concern due to lack of time when NIPFs at their forest estate and take them for a forest walk. They haven't got time and the FP mean that they are time optimist. Two or three meetings with the NIPFs are held annually. Here, the FP discusses with the NIPF what is lucrative especially for his forest:

Actually, it has to be congruous with the SFM and the estimations in the budget scheme.

Further, it has to be agreed with the NIPFs' personal economy. (Stated by one FP)

During the consultancy, it is important to be clear and understandable in the forest topics and be open-minded. If a NIPF owner wants to plant beech (*Fagus sylvatica*) or other specie composition. Here there might be a risk factor or a risk perception, and then a discussion will occur.

3.5 STRATEGIC PLANNING (QUESTION 8-10, TABLE 1, PP 19)

A possibility is to make the NIPFs convinced, by increasing their understandings and be honest and reliable in the forest consultancy. Do not only show what is positive and relevant but also take up issues that are less positive and appropriate. This means even issues that bring happiness, risks and disturbances. It is a task having open dialogues with the NIPFs. Take the time to explain what to do next. Therefore, a good communication is a realistic talk, the FP added.

Sometimes a NIPF wants to clear fell in order to get more income from the forest stands right now.

Sometimes it might not be appropriate (stated by one FP).

Try riding in the same direction in a hard and straightforward down-to-earth-manner. Sometimes it is appropriate to bring up sensitive questions in punctual care, the FP continued.

*It is important to tell them that it is not possible to do so next year – when it is done it is done
Okay, we take this decision today and you will get this consequence as an outcome
(Stated by one FP).*

3.6 REFLECTIONS AND FUTURE PROSPECTS (QUESTION 11, TABLE 1, 19)

Reflections, about forest consultancy, risk communication, risk management and future aims and goals; the FPs think that forestry will get an increasing value in years to come. The commercial forest industry will on future prospects gain its values within timber production and biomass production. It is the belief that forestry in general will be an increasing recreation and eco-tourism net producer.

The FPs do believe today's forest investors make a good business depending on the net revenue. Strategically, NIPFs are an important stakeholder to manipulate in order to get more vivid discussions on future prospects, which need a higher focus in the organisations and the related forest fields. In order to achieve that, the FPs reflects that third generation NIPFs need more information and specific arguments in their postal and electronic mails. One FP pointed out that in general people's assumptions are not well stated and contrary to the public policy.

3.7 THE ENQUIRY (SEE TABLE 2, 19)

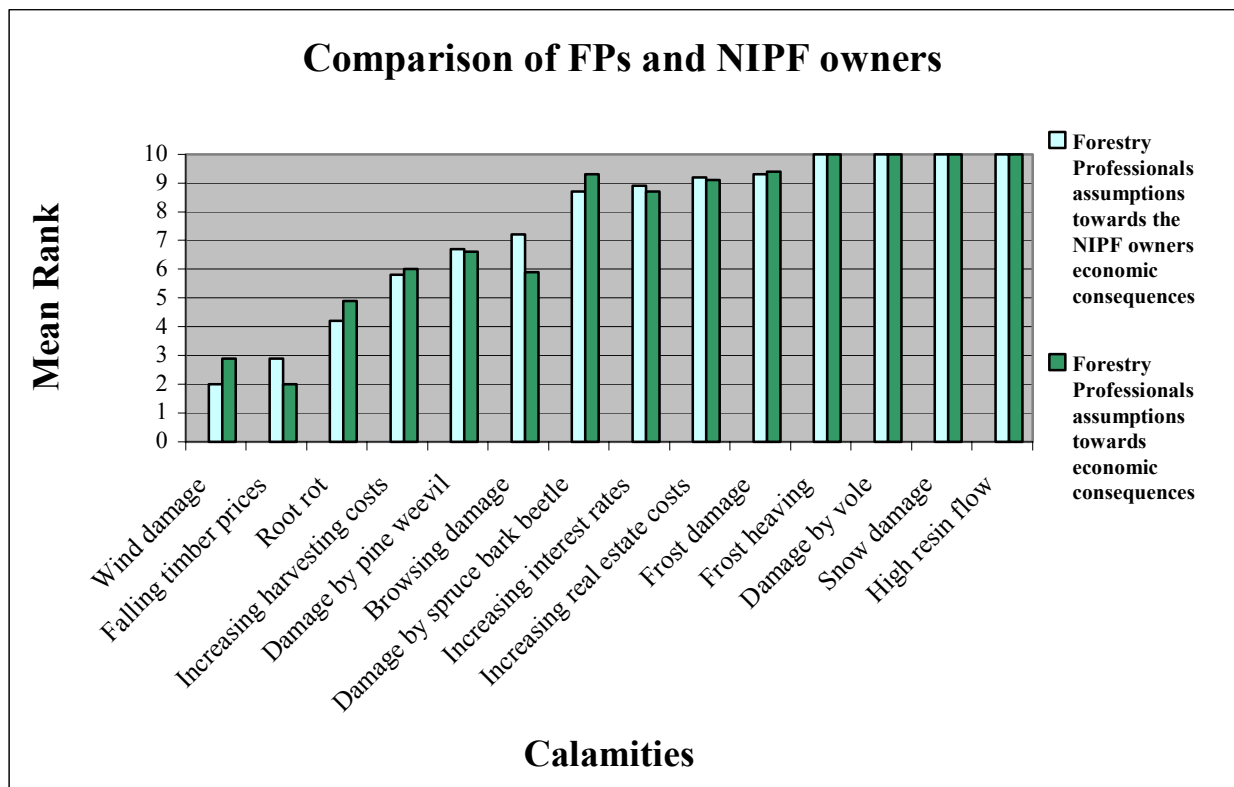
The results from the enquiry show some aspects that emerge from the survey about risk communication and risk matters in forestry consultancy among nine FPs within Skogssällskapet. All nine FPs answered the enquiry. The enquiry was a part of the material based upon former research (Blennow&Sallnäs 2002, Eek 2001).

Ranking is from 1 to 5 where the score 1 was equal to the highest risk and 5 the lowest. The remaining calamities got the ranking score 10 due to the average value among the last scores (6...14). The rating was calamities taken from 14 possible numbers which containing economic risk assessments such as:

Increasing real estate costs, increasing interest rates, increasing harvesting costs, falling timber prices, frost heaving, browsing damage, damage by pine weevil, damage by vole, damage by frost, damage by spruce bark beetle, wind damage, snow damage, high resin flow and root rot.

The FPs feedbacks regarding the NIPFs' risk assessments and calamities were damage by storm as the supreme risk factor. Falling timber prices seems to be the second most important issue in addition to risks in commercial forest production, thirdly root rot, fourthly increasing harvesting costs and finally damage by pine weevil.

Fig. 7.1 Assessment of FPs and NIPFs calamities and economic consequences in comparison.



3.8 ACTIONS TO REMEDY EFFECTS OF CLIMATE CHANGE (QUESTION 12, TABLE 1, PP 19)

By asking the FP if the climate change would affect their way of carrying out the forest consultancy the FPs could choose to answer whether yes, not sure or no influence at all. Five out of nine respondents (55,5 %) answered yes to the question about the scientific claimed climate change

Four out of nine respondents (44,5 %) answered not sure.

3.9 ASSUMPTIONS VERSUS NIPF OWNER'S RISK ASSESSMENT

Based on general reflections from FPs, NIPFs do know the difference between large risks and small ones, and understand the relative size of risk matters rather well (*pre* hazardous storm (Gudrun)).

3.9.1 CLIMATE CHANGE

Reflections about climate change happened sometimes. Further, there were additional doubts if the climate change creates warmer or cooler conditions. Assumptions about increasing the number of deciduous trees were at an exploratory stage when it came to questions about increasing species composition. Nevertheless, the majority of the respondents were highly motivated with change in other tree species composition. Due to this I find it interesting that not more than 55.5 % of the respondents reflected to the scientifically claimed climate change when at time there was an ongoing debate and a scientific emphasize about the issues.

3.9.2 REFLECTIONS OF THE RESULTS

In the Relevance Model, Nitsch (1990) claims:

If the sender's information has to reach the target group the context must be relevant due to the target groups experienced needs. Further, the design has to be relevant due to the target group's own ability to study this. One of the main reasons that it might be difficult to meet these basic terms is that sender and target group are living in different environment and work with different subjects. It gives them different experience about reality and important issues.

An important message in the quotation above is that FPs are working professionally and tactically with the implementation of the strategic consulting and in complete different surroundings and at the same time they think in quite different ways than the NIPFs do. According to Nitsch (1994), the consultants, in general are brought up with the formal rationality, which means that their decision process is characterized, by control, logic thinking and systematic approach. This is different from the NIPFs way of thinking characterized by daily work, experience and tendency to implement experimental initiatives and scientific forestal material into practise.

However, it is not possible to draw any conclusions because of FPs are educated in a science based and academic environment where they are trained to use theoretical methods, they haven't enough communication skills.

If that were the case, the value of the strategic consultancy would be very low. Without any theoretical training the FPs will not have specific knowledge to offer the NIPFs.

The challenge continues more to develop the forest consultancy on the basis of the FPs achieved academic and practical skills to provide a better product for the NIPFs practical demands.

4. CONCLUSIONS AND RECOMMENDATIONS

This study sought to find risk perception and risk communication in forestry consultancy by collecting input based upon semi-structured interviews with nine forestry professionals from Skogssällskapet.

Further it was intended to try to find out what kind of risk perceptions the forestry professionals do communicate to the non- industrial private forest owners in southern Sweden and how they communicate about risk matters to them?

The interview sessions were held before the hazard storm Gudrun. The objectives of the survey were to view what kind of risk perceptions and risk matters, as mentioned, the forestry professionals consult to the non-industrial private forest owners in southern Sweden and how they communicate it?

Today's forest extension services undergo an increasing demand from the customers and forest owners these years. Findings indicated that the majority of forestry professionals were underserved and were not enjoying the bounty of knowledge generated from forest research, etc.

The majority of forestry professionals in this survey need more adequate information from the forest research and scientists before it become out of date.

This must not be forgotten that a process like this is dependent as much on practioners as on scientists. Building bridge across needs a true commitment from both sides. Another factor is a sufficient supply of time.

It was found that barriers existed between research, forestry professionals and non-industrial private forest owners in both oral and written communications. They reported that written information was

too technical and not usable for improving into forest practices. It is recommended that forest extension services invest in appropriate communication avenues to reach their intended audience.

At stake risk communication is functioning generally inappropriate. Experts deliver information's and analysis at cross-purposes *versus* dedicated non-industrial private forest owners. Often has the communication approach been characterized as empty.

On the basis of the above it may give a sense of powerlessness and mistrust.

In this study forestry professionals strongly favoured face-to-face interaction with non-industrial private forest owners. In this context it is appropriate to integrate research-based findings and solving non-industrial private forest owners' problems.

Given the level of interest about risk communication in traditional forestry consultancy approaches, forest extension should expand its forestry programming to include workshops, courses, and field days about mentioned subjects and communicate latest research findings and information's.

The forestry professionals were nine men and all have an average of nine years of duty in Skogssällskapet. They have worked 19 years since graduation in the forestry sector and their forest degrees are Master of Science in Forestry, Bachelor of Science in Forestry or College degree as Skogstekniker.

On behalf of the results it can be conclude that risk perceptions and risk communications among the forestry professionals in southern Sweden are as follows:

4.1 FOREST CONSULTANCY

The forestry professionals see a serious task in manage and establishment of a forest estate. It seems important for them all. Their jobs consist of customer related functions as salesmen, forest managers and consultants, budget and economic responsibilities. Seven of the interviewed work with general forest consultancy. One has half time gamekeeper objectives and half time consultancy. Another one has fulltime gamekeeper function.

Basically the job as a forestry professional is to maintain a long-term sustainable forest management for the customer in Skogssällskapet. Some non-industrial private forest owner may have specific

needs therefore it is important to know them. Even when it is time to give advise about how it is best for the rising generation to be the managing director and owner of the family's forest estate. Many circumstances show the non-industrial forest owner have other objectives than the forestry professional. Risks occur very easily if the forestry professional gives consulting advise in a short perspective and the non-industrial forest owner get short-term economic yield as result. The forestry professional is not updated with own knowledge about economic infrastructures and changes, wood price or forestal calamities. Sometimes non-industrial private forest owners are ignorant about forestry and market because of other personal interests.

4.2 EDUCATIONAL APPROACH

Hence, it is extremely important that the forestry professional does not conclude and anchor the declaration of intents before he have had open dialogues with the non-industrial private forest owners and take time to do so.

Make a good communication like a realistic talk and give an appropriate approach in a down-to-earth-manner

A must is to get to know the non-industrial private forest owners well. A huge task to cope with is their reflections for the near future

Proposals said today will in many cases take two years to digest.

If the forestry professional has other objectives than the non-industrial private forest owner's and does not succeed in his consultancy and communicate in a short perspective, risks may occur.

Risk perceptions and risk matters in the consultancy work are when some subjects are controversial and the advice you may give does not functioning in practice. Another issue is that lots of forest stands are unmanaged. The reason why is that an increased lack of skilled forest workers and practical knowledge doesn't exists.

There is a need for better efficiency and it has to have a much higher priority in the forest organization. That means it is by importance that the forestry professionals are clear and convinced in their educational approach. Realize the consequence of what is negative, positive and relevant to show up front. Several stated that during the interviews they applied for more vivid and better context in the discussions with colleagues and non-industrial forest owners.

Due to best sustainable forest management conditions the purpose of most commercial forestry, and

hence of manipulating spacing, pruning, and determine the length of rotations, it is for all their customers in Skogssällskapet neither the greatest volume, nor the largest size in a given time and the production of material, which will most suitable fit the demands of the wood market but at the same time give the biggest yield and net revenue.

One forestry professionals reflected that particular attention must be paid to the quality of plant, selection of the site and its preparation, the species (climate change) composition chosen, skill in planting, aftercare (weed control), and protection. Neglect of any one can lead to failure of the whole.

To meet those objectives the forestry professional said in own words that they have to bear in mind that this is much easily said than done. Many non-industrial private forest owners have a general idea of what they are trying to achieve but no one can know precisely what market demands will be decades ahead. Besides, non-industrial private forest owner's readiness to adopt recommendations on risk communications and risk matters depends on the objective degree of urgency. Reflections such as: Is it important for me, emerging?

In contrast to this, the more a forestry professional feels (subjectively) affected by the phenomena risk communication and risk perception, the more they will be prepared to accept innovative measures.

Today's forestry extension service differs whether the customer is a municipality, a nobleman, lumberjack or an economist. Besides, commercial forestry large numbers and variety of interests arise in these years. Private and public forests are expected to address many of these aspects, often simultaneously, such as fungi and berries, hiking, biking, hunt or capital replacement. Multiple use forest management requires not only knowledge of silviculture and economics by the forestry professional but also sociological skills. Compromises have to be found between those whose incomes will be affected by the changes and those whose interests are broadly in the achievement of some aesthetic, ethical or other non-monetary objectives.

4.3 LACK OF TIME

Lack of time for non-industrial private forest owners to manage their forest does exist.

It is difficult for the forestry professional to arrange an appointment with the non-industrial private forest owners. In average Skogssällskapet arrange 2-3 meetings annually.

If the meeting is not face-to-face a risk matter will occur. It is difficult to improve implementations right now over the phone when appointments were made (e.g. during summertime). When the forestry professional assume, that his customer's knowledge are anchorage elsewhere.

4.4 INFORMATION GAP

More science-based information before it becomes out of date is needed. Therefore, more visible part of exchanging knowledge between practitioners and the science-based enterprises have to be increased.

Forestry professionals are interested in gaining more knowledge, and appear willing to use more progressive tools to avoid risk matters in their communication with the non-industrial private forest owners.

One of the forestry professionals claims that their own knowledge has to be updated successively in order to meet risk matters and perceptions. Third generation non-industrial private forest owners are more demanding and assumed that they need more in-depth information and specific arguments about risks than ever before. Increasing demand of postal and electronic mails and elaborated reports are common.

In addition, FPs get information's about risks in their forestry consultancy from practical experience, colleagues, medias, timber prices during negotiations with buyers, the international monetary (currency) development and the daily business papers.

Besides, there is a huge information flow via Internet, knowledge exchange with colleagues, seminars and workshops. If the FPs had better time it is assumed that these precautions could elevate in order to increase the awareness of the risk communication in forestry extensions. Policies and legislation changes fast the agendas on environmental and forest issues in order to seek voter's sympathy. It was identified that dissemination of information regarding environmental regulations, conservation issues were problem areas and that they needed more information on how to deal with these issues. The forestry professionals stated also that many of the problems they faced could be avoided if they better understood the regulations so they could implement strategies for compliance. Several forestry professionals expressed interests in knowing more about the results of research conducted by the forest faculties. They requested more communications from faculties regarding research that was written for the forest practitioner.

4.5 CLIMATE CHANGE

Climate change was treated separately from the hazards in the questionnaire. The phenomenon differs from the listed hazards. Due to the results, there were additional doubts if the climate change creates warmer or cooler conditions. Five out of nine respondents (55,5 %) answered yes to the question about the scientific claimed climate change - Four out of nine respondents (44,5 %) were not sure.

Deciduous tree species were at an exploratory stage when it came to questions about increasing deviation in species composition. Since it is a source of uncertainty with this new technology, in relation to the majority of the forestry professionals were highly motivated with change of species composition. As mentioned I find it interesting that not more than 55.5 % of the FPs reflected to the scientific claimed climate change when at time being there is an ongoing debate and a scientific emphasise about the issue.

4.6 REFLECTIONS

During my work I found out that decision support for an active risk communication approach in forestry is a fairly unexplored field. It is needed continuously to calculate with risk matters and right communication approach. Therefore, the ability to communicate effectively in various situations is a tremendous asset to forestry professionals. Communication skills are to some degree, innate abilities for some individuals and lacking in others. Regardless of existing skill levels, all forestry professionals that work in the field of forestry must continue to advance their knowledge and skill levels in communicating with their non-industrial private forest owners.

Strategies on future prospects need a higher focus in the forest extension service.

Forest professionals, scientists and other stakeholders face specific challenges as they communicate technical forestal information.

In some cases, they are writing and speaking to these in newsletters or confront them, *in persona*, about risk perceptions. Whether the objective is to motivate them to take action, calm down when they are enraged, or to educate and inform, there are specific techniques and strategies to effectively communicate and educate regarding issues as mentioned.

To highlight those tasks could be that forest advocacy will examine various communication situations, in which the forestry professionals could find themselves. Emphasis could be placed on preparing them to deal with various situations where skills in meeting non-industrial private forest owners, media relations, conflict and risk resolutions, and group decision-making are necessary.

This adjacent thesis, along with future studies, will hopefully assist in making necessary adjustments to communication criteria's, which can require other aspects of decision support in the field of forest consultancy and extension service.

Last but not least key findings of this study have implications for forest extension services. Karppinen (1998) emphasizes that knowing the values and objectives of non-industrial private forest owners are important especially when matching the supply and contents of extension services with the varying contents of motivations of non-industrial private forest owners and forestry professionals.

Finally, it can be concluded that the consulting design has to match NIPFs qualifications or abilities.

„Vertrauen ist das schönste Wagnis“

(Trust is the finest risk)

Anonymous

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Planeringsinspektör, Norrskog

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Skogsinspektör, Mellanskog

APPENDIX 1:

6.1 Appendix A

Table 1. Questions included in the interviews with nine FP at Skogssällskapet

1.	What kind of job description do you have within Skogssällskapet?
2.	What is your duty?
3.	How long have you done practice in sustainable forest management and consultancy?
4.	What degree do you have?
5.	What type of different objectives have you identified at the NIPF owners when you discharge and make the forest management consultancy?
6.	What is the most common objective?
7.	What kind of risks are existing?
8.	To achieve the objectives – what kind of risks exist?
9.	How do you pick up information about risks within the forest management?

10. How is your communication approach about risk perceptions, and risk matters when you do consultancy with the NIPFs?
 11. How would the debate and discussion about risk matters and perceptions be in future?
 12. Some scientist claim that effects caused by the assumed climate change ought to e g create a warmer climate. Does that affect your decision-making in your forest consultancy?
-

6.1 Appendix B

Bäste Peter Strömberg!

Vid institutionen för sydsvensk skogsvetenskap, SLU, i Alnarp forskar vi bl.a. kring riskhantering inom skogsbruket. Som ett led i detta arbete vil vi närmare undersöka kommunikationen av risk och osäkerhet mellan skogliga rådgivare och privata skogsägare. Vi har diskuterat upplägget både med professor Leif Mattsson och Patrik Alströmer på Östad och vi vill undersöka möjligheterna för att genomföra undersökningen inom Skogssällskapet Region Syd. Undersökningen skall göras som Examensarbete av den blivande skogsingenjören Mads Skov. Avsikten är att undersökningens resultat skall komma till nytta för Skogssällskapet och för de privata skogsägarna.

För undersökningen är tänkt att 7-9 skogliga rådgivare skall skriftligen besvara en enkät som rör riskfaktorer ur ett produktionsperspektiv. De individuella svaren skall sedan ligga till grund för en efterföljande intervju om riskkommunikation. Svaren från intervjuerna kommer att sammanställas och presenteras på ett sådant sätt att den enskilde rådgivaren inte kan identifieras eller kopplas ihop med ett visst svar.

Vi skulle också vara tacksamma för tips på rådgivare att intervjua.

I hopp om att vi väckt Skogssällskapetets intresse.

Med vänlig hälsning,

Skogsstud. Mads Christian Skov

Kristina Blennow

Kristina Blennow (Assoc. Prof.)
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6.2 APPENDIX C

Frågeformulär

A. Rangordna den ekonomiska betydelsen för fem (5) av följande riskfaktorer utifrån hur du bedömer att de privata markägarna tycker. En etta för den riskfaktor som är värst och en femma för den för vilken risken är minst.

—	Stigande fastighetspriser
—	Stigande räntor
—	Ökade drivningskostnader
—	Sjunkande virkespriser
—	Tjällossning
—	Vitbetring på föryngring
—	Snytbaggeskador på föryngring
—	Sorkskador på föryngring
—	Frostskador på föryngring
—	Barkborreskador på stående skog
—	Stormfällning
—	Snöbrott
—	Kådrinning
—	Rotröta

B. Rangordna den ekonomiska betydelsen för fem (5) av följande riskfaktorer utifrån hur du själv bedömer riskerna inom privatskogsbruket. En etta för den riskfaktor som är värst och en femma för den för vilken risken är minst.

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- Stigande fastighetspriser
- Stigande räntor
- Ökade drivningskostnader
- Sjunkande virkespriser
- Tjällossning
- Viltbetning på föryngring
- Snytbaggeskador på föryngring
- Sorkskador på föryngring
- Frostskador på föryngring
- Barkborreskador på stående skog
- Stormfällning
- Snöbrott
- Kådrinning
- Rotröta

C.

Många forskare påstår att vi står inför en klimatförändring som t.ex. skulle ge ett varmare klimat. Påverkar detta Dina beslut idag vid planeringen av Ditt skogsbruk?

Ja Nej

Om ja, hur? _____

Ett stort Tack för att Du tog Dig tid!

APPENDIX 2:

(Covello et al. 1993)

Guideline for talking about risk

- **Be balance and honest;**
- **Focus on specific issue;**
- **Pay attention to what the NIPF owner already knows;**
- **Design to the specific needs for the NIPF**
- **Place the risk in appropriate context;**
- **Contain (at least) the specific information needed to resolve the decisions that NIPF owner face;**
- **Be hierarchically organized so that the NIPF owner who only want answers can find them quickly, and other people who want details also find them;**
- **Be respectful in tone and recognize that the NIPF owner have legitimate feelings as well as thoughts;**

APPENDIX 3:

Forestry professional's free comments

- Information about forestry science is strictly important even at grass-roots level and to NIPF owners with smaller estates.
- Be aware that forestry science shall be deeply rooted in practical forestry
- Sadly and true that forestry science is on a low level.
- Important to communicate with newest result in forestry science and to make connections more frequently to each other even stronger via workshops and excursions.
- Create better communication approach between scientists and the commercial forestry
- Stronger tools to avoid less risk information in the future.
- Forestry professionals are keeping knowledge for themselves because of different regions in Sweden.
- In general risk management and risk communication in forest organisations seems to be an important issue.
- When acting in incalculable environments we have to rely on subjective judgements.