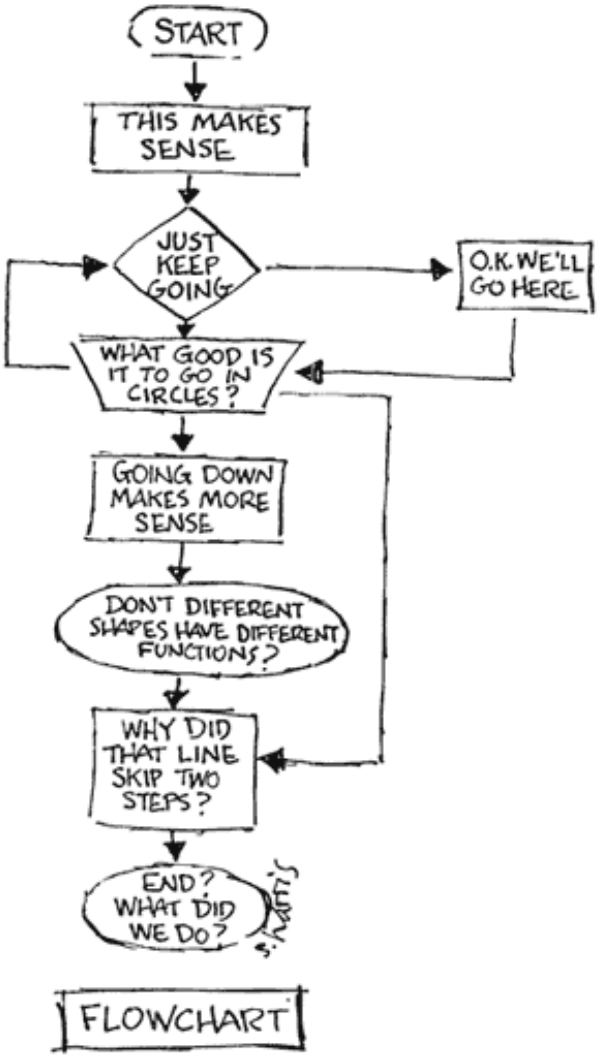
Land Use Planning Group

Guidelines MSc-thesis research Land Use Planning (LUP)



February 2015

WAGENINGEN UNIVERSITY
WAGENINGEN UR

Wageningen, February 2015

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CONTENTS

1 INTRODUCTION

1.1 MSc-thesis: the crown of higher academic education

Writing an MSc-thesis is often considered the crown of higher academic education. And indeed, the importance of the thesis work is also reflected by the prominent role the thesis plays within the whole MSc-program. After completing introductory and specific courses in the educational program, the MSc-thesis offers the challenge to set up and carry out a scientific research project in - for the students - an almost fully self-responsible manner. This challenge includes:

- Assuring the adequate delineation and definition of the research topic.
- Building a sound theoretical framework for orientation of the research.
- Formulating research questions that are informed by the scientific problem at hand and the theoretical concepts presented
- Collecting and analysing (secondary) data in a systematic and verifiable manner, for planning students often including case study research.
- Presenting the results comprehensibly.
- Drawing valid conclusions based on a critical discussion of the results.
- Showing the potential contribution of the research to the theoretical reconstruction of the topic.

A great deal of independence is expected from the student in preparing the MSc-thesis, starting with defining a topic. The role of the supervisor is to guide the learning process. The grading of the MSc thesis is a feedback on the student's scientific training progress and the quality of the thesis report.
This guideline provides an outline of the common steps and procedures for preparing an MSc-thesis Land Use Planning. It takes its departure from the general information and terms of reference for preparing an MSc-thesis at Wageningen University (see the study handbook). Under certain conditions (e.g. participating in larger projects) it might be necessary to make specific arrangements that differ from the regular procedures. In these cases please contact your supervisor and the MSc-thesis contact person in an early stage to make the necessary arrangements.
The remainder of this introduction chapter deals with the basic scientific and administrative preconditions to start the preparation of the MSc-thesis. In chapter 2 the content and phases in the MSc-thesis process are described. Chapter 3 focuses on the administrative aspects for a successful start and completion of the MSc-thesis, including the thesis agreement, costs, grading and other administrative procedures.

1.2 What is a scientific masterpiece?

Epistemology of science
The question "what is science?" is a fundamental question with many incompatible answers evolving over time. A separate discipline has even been formed dealing only with this question, namely the epistemology/philosophy of science (or, if you want: the science about science). These "Guidelines" will not provide a comprehensive overview on the different epistemological approaches (such as positivism, hermeneutics, critical rationalism, etc.). Many excellent introductory textbooks on the epistemology of sci-

ence are available to orient the student on this question, some of which were also discussed in the course “Advanced planning research methods”. Nor does this guideline favour any one approach over another. However, it is argued here that the researcher must be clear about his or her own understanding of what science is within the different epistemological approaches and clarify his/her own position, as this determines to a large extent the logic and also sequence of, and role of theory in, the research process. References to relevant textbooks are presented in Chapter 4.

Science and research

A thing that is often confusing for students who are starting with their thesis is the use of the terms “science” and “research”. For clarification: similar to any definition, definitions of “science” or “research” do not represent a truth, but reflect different interpretations, which are seen as suitable for the respective situation. In this guideline it is argued, that science and research both aim at a deeper understanding of, or insight into phenomena in the real world. *Research,* in this understanding, aims at empirically assessing and depicting the real world phenomena in a systematic, consistent and comprehensive manner. Research questions are therefore mainly formulated as what, who, and how-questions (e.g., Who are participating in a collaborative planning process? How do different stakeholders participate, what are effects of such participation). Different research methods can be used for the purpose of answering such research questions (see also paragraph 1.4). *Science* aims at explaining empirical phenomena through a process of theoretical reconstruction of the phenomena at stake. Scientific questions are therefore first and foremost why questions, searching for explanations for the empirical reality (e.g., why do people enjoy recreating in forest landscapes?). However, also within its process of theoretical reconstruction science relies to a variable degree on research. An MSc researcher is aware of the different types of possible questions, understands their relationship to different types of research (e.g. qualitative or quantitative), and knows to distinguish research questions from other questions (such as “how can” questions, which are not recommended because they are mostly not research questions).

Scientific standards

Independent from which understanding of science and research has been chosen, broad agreement exists on major scientific standards, although the quality criteria for qualitative, interpretive research differ for those used for quantitative, theory-testing research. Therefore, the following scientific standards should also be applied (and to be proven) by the student in the thesis:

- The thesis must be reliable / theory-based. Theories in this respect can be understood as sets of explanation systems or concepts for observable phenomena in the real world. The students’ departure in gaining an understanding of empirical phenomena must be taken from existing theoretical literature. The student is furthermore expected to discuss and to reflect his or her findings against the existing theoretical literature as well as empirical literature. Theoretical literature claims to contain explanation systems for real world phenomena, whereas empirical literature is characterised by its descriptive focus of cases and situations.
- The thesis must be verifiable. This is only possible if a clear line of argumentation through the existing theoretical and empirical literature is given, and the underlying assumptions are made explicit. Ideally, also the original data, e.g. interview reports, field measurements, and so on, should be included in the work (usually as an appendix) to allow the reader to verify the drawn conclusions.

Science is always at least partially subjective, as science in itself is a social activity carried out by human beings. However, this fact should never lead to the rejection of the call for scientific objectivity. Scientific objectivity thereby does not result out of a fictive unconditional assumption, but out of the clear exemplification and reflection of the conditions and assumptions underlying the research process.

- The thesis must be in principle replicable. It should (at least in principle) be possible to repeat the empirical part, thereby leading to similar results and conclusions. This is only possible if the methods for data collection and for data analysis are clearly described and if the work process is as much as unbiased and reflective as possible.

1.3 Basic requirements and necessary skills

For the successful completion of an MSc-thesis a specific knowledge level and mastery of certain skills are basic requirements. This means that students normally should start to work on their MSc-thesis only after they have obtained at least 20 credits within the MSc-program (and after the Academic Orientation), with an adequate coverage of relevant courses in the field of land-use planning. It is also recommended that students start with the MSc thesis after completing their internship.
Students in the MLP program should have finished the Atelier Landscape Architecture and Planning and the course Advanced Planning Research Methods successfully before they can start with the MSc thesis. Students in the MUE program should have taken the course Planning Theory, Reflections on Spatial Planning Practices and Planning for Urban Quality of Life for a major thesis (36 ECTS) or the course Planning Theory and one other planning course for a minor thesis (24 ECTS). In general, knowledge of theory and methodology of planning and methodology of research are assumed as basis at the beginning of the thesis work. It is the student's own responsibility to acquire the necessary knowledge and skills in time before starting with the thesis.

1.4 Types of research

The thesis should be conducted on a graduate level and written for the MSc Land-Use Planning programme. This requires that the thesis should be more than a description. It should have an adequate theoretical as well as informational base. The analytical voice of the researcher should resonate clearly. The topic cannot be trivial or superficial. It should, of course, be achievable and reflect the interests of the student. It must be original work, not a copy of a report of an institute or another organisation. It should be relevant to both the field of spatial planning and to the student's own goals. It should be substantive, a real contribution to the understanding of a significant set of issues. It must also be realistic in scope, so that it can be completed with the resources available. The most common type of MSc thesis research in Land Use Planning is case study research. Case study research is an empirical study of a set of issues related to a particular institution, activity, land use, cultural setting, area or region. The course LUP-34306 Advanced Planning Research Methods will especially elaborate on case study research and related research methods and techniques.
All thesis research should have a theoretical component. However, with adequate library resources a thesis research may be primarily a theoretical analysis, critique or documentary study of past developments. But a theoretical-analytical thesis research

is more common for a minor thesis, as the major thesis usually includes a case study component.

2 STEPS IN THE MSC-THESIS PREPARATION

2.1 Selection of a topic and supervisors

The first step in working on the MSc-thesis Land Use Planning is the selection of a theme and topic and a supervisor. The website http://www.lup.wur.nl can be used to search for a topic. You can use the information on the staff page, to identify the kind of research and publications scientific staff members are engaged in, the research page to identify the main research themes of the group and the education page for more information on the various topics of research within the main research themes of the Land Use Planning group. The main research themes are:

- Landscape governance
- Sustainable food planning
- Ecological network planning
- Landscape adaption to climate change

A student can decide to contact a LUP staff member directly, based on the information at the website. However, it is also possible to make an appointment with the MSc-thesis contact person for a first exploratory discussion. The final decision to accept the specific topic of an MSc-thesis is always taken by the supervisor. The first supervisor of the MSc-thesis LUP has to be an assistant, associate or full professor of the Land Use Planning group. A second supervisor can be a PhD student or postdoc LUP, a staff member of another group of Wageningen UR, or a member of an external organization such as a governmental or research organization or consultancy agency.

In some cases it might be helpful to combine the MSc-thesis work with (short) stay in the area of research. This holds particularly true for MSc-research which is partly done outside the Netherlands, such as a case study involving planning practices in other countries. A practical period usually focuses on gathering empirical data and information, such as field visits and interviews with local stakeholders. All arrangements must be settled by the student in time before the start of the thesis work and must be agreed upon by the supervisor. However, be aware that the Land Use Planning group has no regular funds available to support students with travel and accommodation costs (see also Section 3.3).

2.2 Preparation of a research proposal

After the selection of a topic the next step in the thesis work is the preparation of a consistent and comprehensive research proposal of 5 to 6 pages. The thesis proposal is a product of a process of preparatory research around the theme that will be developed. Students must become familiar with the theoretical problems, the historical context and the empirical details of the theme to be able to define, in precise terms, what it is that will be studied and how it will be studied. As many researchers have shown, a main challenge of research is to specifically define the research questions. It is necessary to understand and incorporate existing scientific knowledge, departing from the actual problem, to be able to enhance scientific knowledge. Given its importance, this step might require up to 20% of the total thesis preparation time.

A research proposal generally consists of the following parts:

a) **Introduction:** The first part of the proposal provides an overview of problems or issues leading to a delineation of the research topic and a motivation for the selection of the topic and a first delineation or rough formulation of questions. Consequently, this section requires your first, rough outline of the relevant literature. The background of the topic area at times is given in the introduction along with an overall purpose of the research.

b) **Problem description:** The next part gives a clear delineation of the problem field, finally resulting in a concise problem statement. If done in a sound way, this implicitly and explicitly reflects the social and scientific relevance of the selected research topic. To be able to develop a clear problem statement, a preliminary investigation must be carried out to establish a sufficiently profound knowledge base to pose the concrete problems that will be researched. This includes a concise review of the theoretical and empirical literature, which is most relevant to the topic, which also ensures that the topic has not already been exhausted by other researchers. The literature review ends up with a problem statement.

c) **Research objective and research questions:** Following the problem statement, the scientific objective of the research should be clearly stated. Given the fact that scientific research aims at the process of theoretical reconstruction of the topic at stake (in the sense of providing explanation systems), scientific objectives are very often expressed with terms such as to enlighten, to understand, to explore, to determine, to highlight, to verify. It is important that the objective of the research (1) is strictly related to the research topic, that is, that it does not change the focus by introducing elements not already implicit in the topic, and (2) that it exhausts the topic completely, that is, it does not leave out any object or relation already posited.
   A research objective should, on the one hand, be determined by the challenge to deepen theoretical knowledge, analytical capacities and techniques and methods of planning, and, on the other hand, by pragmatic reasons, such as available time, actual research conditions (e.g., availability of resource persons, political events, tourist season), and the capacity of the student.
   Subsequently, the research objective should be translated into research questions, that are the questions that need to be answered in order to fulfil the research objective. In this respect, the research questions operationalize the research topic. However, the research questions should not be mixed up with the operationalization of the research topic in a methodologically coherent manner for data collection (e.g., the questions in a structured interview) in the later stage of the research process (see step ‘carrying out the research’).

d) **Theoretical framework**: The theoretical framework acts as a partial guide for the selection of the phenomena, which will come under study. It is a matter of fact that different theoretical frameworks emphasise different phenomena as those, which are most important, thereby giving direction to the overall thesis work. In other words, the theoretical framework guides the student in his or her approach to the theoretical reconstruction of the topic. The main body of the theoretical framework

is generally included in the final report as Chapter 2, directly following the introduction chapter.

To be qualified as scientific research, theoretical categories are used which demarcate the research within a specific discipline and school of thought or paradigm. In the exposition of the theoretical framework, the main theoretical categories/concepts should be described, along with their relations to the substantive areas under investigation. It is important to keep in mind that the theoretical framework should be an argumentation of the student through existing theories and concepts, finally resulting in the students' own conceptual model (often summarised in form of an analysis or evaluation framework at the end of the theoretical framework). Working out the theoretical framework is therefore a creative act, rather than a descriptive exercise through existing literature.

The rationale along with existing theories and theoretical concepts in developing the theoretical framework should always be done against the background of the research objective and research questions. Even though almost everything seems to be connected with each other, the research objective and research questions help in determining which theories and concepts are relevant for the students' thesis research and which are not. And at the same time it becomes clear that developing a research proposal is not so much a strict linear, chronological, but rather an iterative process (in the sense of a dialectical movement between concrete reality and theory) with several 'working' versions before finally writing the definitive proposal. A comprehensive review on existing theoretical and empirical literature thereby forms the indispensable basis to come from the pre-scientific understanding (on which the selection of the topic was based) to a deeper theoretical understanding of the topic (which is needed to actually start writing the real thesis proposal).

As has been said: developing the theoretical framework is a creative act, rather than a descriptive exercise. If there are debates around the definition of concepts or their application, the major insights in the debate should be laid out, showing the differences and similarities and finally, how the student will incorporate them into his/her research. Also if the direct application of concepts and theories is not possible to the chosen topic (e.g., because the theory is about decision-making in organisations, whereas the focus of the work might lay on individual decision-making), it should be pointed out how they have been adapted by the student respectively.

The theoretical framework, and its condensed expression in form of the conceptual model, acts as a map to identify those concepts in the empirical complexity of the real world, which have been found to be relevant so far by theoretical and empirical literature. It is obvious that the theoretical framework is the business card of the student with regard to the scientific standards. Investing time and energy in preparing a good, and analytically sharp theoretical framework is therefore always helpful, and can help to save a lot of problems and obstacles afterwards.

The theoretical framework facilitates the formulation of a more focused (than in the introduction), theoretically informed set of research questions that serve as a guidance for the research.

e) **Research methodology:** With the theoretical framework the student indicates *which* concepts are important to be looked at in answering the research questions. In this part of the proposal it should be explained *how* these concepts will be identified and assessed empirically. Methodology in general is then nothing else but

the science about methods and instruments for the assessment of the real world, or more technically, the generation of data. The function of the methodology part within the research proposal (and later in the thesis report) is to specify reliability (theory based), validity and principle replicability. The methodology part therefore completes the students' business card with regard to scientific standards.

Setting up a sound methodological framework requires building up an argument about the following points:

- Identify the **character of the thesis work**: for example, is it an explorative or comparative, or interpretative, or analytical study? Is a case study approach chosen to exemplify a certain real world phenomena or does the thesis work aim at being representative for them? It is obvious that with the selection of the topic and the formulation of the problem statement the student already implicitly provides answers to many of these questions. However, only in making them explicit, the student allows for the discussion of his work, as the students' assumptions and logical framework can be empathised.

- Design the **data collection** and **data analysis**: this step requires arguing about and providing an answer to the following questions:

  (1) What is seen as *data* and from which sources of information (e.g., maps, documents, individuals, and institutions) will they be derived? Data can take on the quality of primary data (that is, generated by the researcher) as well as that of secondary data (new analysis of data generated by earlier research).

  (2) What are the criteria for determining and delineating the sources of information (e.g. Who will be interviewed? Why those policy documents and not the others? Why selecting this case study and not another?). The answers to these questions are partially dependent on whether qualitative or quantitative research methods are chosen (see next question).

  (3) What *methods* and *instruments* are employed to derive the data from the sources of information? The selection of adequate methods depends on the sources of information, which are seen as relevant to find answers to the posed research questions. Here the student has to argue why a certain method is most appropriate for the research topic at stake. As no single method is really suitable to fully capture the complexity of real world phenomena, very often a combination of different methods will be applied to assess the *same* phenomena in order not to miss important information and to fulfil the requirements of validity and reliability.

  (4) It should be pointed out that methods and instruments are necessary for the *data collection* (that is, to come from theory to data) as well as for *data analysis* (that is, to come from data to theory).

f) **Working plan and time scheme:** The research proposal finally should be completed by a comprehensive working plan, indicating the necessary steps in carrying out the research, as well as their logical order. The different steps in writing the

MSc-thesis should be distributed in a feasible manner over the available time period (usually 6 months for the major thesis LUP-80436 of 36 ECTS or 4 months for the minor thesis LUP-80424 of 24 ECTS). The student should also agree with the supervisor about the frequency of contacts as well as the deadlines for delivering certain parts of the thesis proposal or report. (See also paragraph 3.1)
Preparing the working plan implies additionally to elaborate a financial plan, such as costs for travel, mailing costs, field assistance (e.g. for translation) etc. The general necessity of financial means to carry out the thesis work needs to be discussed and agreed between student and supervisor before the actual thesis work (usually, the students pay the costs related to the thesis work themselves).

Besides, two other aspects must be dealt with:

- The relevance of the study - such as social, theoretical, policy and management oriented relevance - must be discussed.
- Limitations - what barriers and or constraints do you expect in the process of conducting the research?

2.3 Giving a start colloquium

The phase of writing a proposal is concluded by a presentation of the proposal to fellow MSc students and LUP staff members in a colloquium. In this colloquium you will present an outline of your research plans and ask your fellow students for their ideas on parts of the research process that you have got questions about and their feedback on your proposal in general.

Topics to be addressed in the colloquium:

1. Background of the thesis and its scientific interest
2. The scientific objective(s) of the thesis project
3. The most relevant theories (concepts) and what they entail and mean for your research project
4. The types of information you need and how you are going to obtain that information by applying your research methods
5. A clarification of the methodology and related methods that you will use
6. How information to be generated in your research will relate to the objective of your research project
7. Questions to peer-students

2.4 Carrying out the research

When carrying out the research special attention should be given to organisational and safety aspects, especially when working abroad. Possible economic, social and technical constrains (e.g. restricted or expensive data, holidays of interviewees) should be taken into account as much as possible in advance of the research work. If unforeseeable circumstances do occur, the research plan should be adapted after consultation with the supervisor respectively.
In any case, the student has to respect social, cultural and interpersonal norms and standards. This holds particularly true for privacy aspects of organisations and persons. In any case, it should be avoided that the identity of persons is discernible out of the final text, if not agreed otherwise between the respondents and the researcher. These agreements have to be laid down before information collection.

It is recommended to clearly document all research activities, findings and sources, including also seemingly small details. Analytical skills should be accompanied by organisational accuracy. Experience shows that this can save a lot of time when finally preparing the thesis report.
Also in the phase of carrying out the research it is recommended to keep in close contact with the supervisor. This is the responsibility of the student.

2.5 Writing the thesis report

The research activities should finally result in a comprehensive, consistent and concise thesis report. The thesis report will average approximately 60 to 80 pages, organized in a minimum of four to five chapters (e.g. font Times New Roman, 11 point, and line spacing 1,2). It should be written according to scientific standards and using the possibilities of modern word processors in the layout. In general the following parts structure the thesis report:

- **Title page:** Providing the name and registration number of the student, the full title of the thesis research, the thesis registration number (LUP code) and number of credits (ECTS), the name(s) of the supervisor(s) and examiner / second reviewer, and the full name and address of Wageningen University, Land Use Planning Group.

- **Table of content:** Providing the overview of chapters and paragraphs with the respective page numbers. The outline should also include the summary as well as the list of annexes.

- **Abstract:** Providing a 10 lines abstract, including five keywords.

- **Summary:** Providing a short, but comprehensive summary of the problem, objective, approach and results of the research. The length should not exceed one page. If relevant, also a Dutch summary.

- **Introduction:** This chapter includes a general introduction, the problem description and problem statement, the scientific objective as well as the research questions (see also chapter ‘Research proposal’). It can be completed by a characterisation of the type of work (referring to the first question in the methodology part of the research proposal) and a short outline of the structure of the subsequent chapters.

- **Theoretical framework or literature review:** In this chapter (normally chapter 2) the review of the theoretical and empirical literature, and the reconstruction of the used theoretical concepts will be provided (see also section ‘Research proposal’). The theoretical framework is very often completed by a conceptual model, in which the relations of the relevant concepts (e.g., behaviour, action, values, community) of the applied theories are presented (see also chapter ‘Preparation of a research proposal’).

- **Methods:** (not methodology, as in the proposal, but research design in the case of empirical studies)**:** This part reports on the used information sources, as well as the applied methods and instruments for data collection and data

analysis (see also section ‘Research proposal’). In contrast to the research proposal, where this section is presenting the ambitions and plan, in the final thesis report, however, the situation as it has actually worked (e.g. also problems which occurred) should be presented. If the research has been a case study, circumstances as well as the case should be described here.

- **Results:** In this section the results should be presented in the most objective and comprehensive manner. Mixing results with subjective interpretation and discussion should in any case be avoided. The challenge is to structure the results chapter in such a way, that the research questions are at best addressed. Where appropriate the findings should be illustrated or summarised with tables and figures. Appropriateness means that they provide an added value compared to ordinary text. In any case, tables and figures must thereby be drawn in such a way that they can stand on their own, independent from the surrounding text. Do not forget to include measurements and an explanation of abbreviations. References to tables and figures should be made in the text (e.g., see Table 1 and Figure 2). Note that table captions are given above the table, whereas figure captions are placed below the figure.

- **Discussion:** The discussion section links the own findings, as presented in the result section, with those of others. The challenge here is to argue for and against the findings and the related theoretical concepts. Literature references are therefore again necessary in this section. Furthermore the findings should be discussed in the background of the scientific objective and the research question, as well as in the light of the chosen theoretical framework. In other words, here the problem statement will be answered. It might therefore be helpful to structure the discussion section accordingly. Last but not least, it should also not be forgotten to discuss the extent in which the findings might have been influenced by the chosen methods (e.g., possible shortcomings, and special circumstances).

- **Conclusion:** This section brings together the most important consequences in the students’ perspective of his or her research. These conclusions normally touch on three aspects: a) The scientific objective and the research questions (results), b) Hints for future research on this topic (theoretical framework and methods), c) Practical application of the results (consequences or recommendations for management and policy). The discussion and conclusion section are usually presented together in the final chapter of the report.

- **Bibliography:** In this section a list of all referred literature should be given, sorted in alphabetical order by the last name of the author. The bibliography section (like the theoretical framework) again can be seen as a sort of business card of the researcher. Information given in the bibliography should be complete and accurate. The style for the different types of publications (articles in journals, books, chapters in books etc.) should be consistent. Some researchers prefer to mention information sources, such as policy documents and Internet sources separately. If reference is made to information on the Internet, the complete web-address should be given, as well as the date on which the information has been accessed the latest.

- **Annex/Appendix:** The annex should include information, which can be missed in the direct text body, but is still relevant for the understanding of the research or of important steps of it. This could mean for example the inclusion of the original data, the list of interviewed persons, background information on the study area, interview reports, further detailed statistical analysis, etcetera. Note that also the annex pages should be numbered consistently with the general text.

The presented structure of the different parts at the same time also reflects the standard chapter structure of a scientific report, with the Introduction section forming chapter 1, the theoretical framework, forming chapter 2, and so on. However, different types of research (e.g., theoretical-analytical research) might require a slightly different chapter structure.

A complete final draft of the report should be discussed with the supervisor(s) (and if applicable also with external supervisors) prior to the final colloquium and examination. As soon as the student and the supervisor have discussed and agreed on the draft report, the thesis report can be finalized.

2.6 Giving a final colloquium

After finalizing the thesis report, the student is required to present the major findings of his or her research to an audience. The audience usually includes fellow MSc students, LUP staff members, and other interested people. The length of the presentation should not exceed 30 minutes, followed by 15 minutes for discussion. The presentation should meet the standards for oral presentations, such as clearly addressing the audience with a comprehensive, consistent and logical structure. The colloquium is usually supported by visual tools, such as a PowerPoint presentation.

2.7 Final examination

The objective of the final examination is to reflect on the whole scientific training process, which the student has undergone in preparing the MSc-thesis as well as to place the MSc-thesis within the on-going debates and the larger contexts within the field of spatial planning. Beside the student and the supervisor, the examiner and a second reviewer will also be involved in the final examination. However, the examiner of the MSc thesis, the chair of the Land Use Planning group, is usually not present with the colloquium and final examination, but examines the report and assessment form afterwards. Instead, a second reviewer will take part in the colloquium and examination. The second reviewer can be any other scientific staff member of the Land Use Planning group. The examination usually takes place subsequent to the colloquium. The date for the final colloquium and examination should be arranged at least four weeks in advance. It is the students' responsibility to provide the supervisor and second reviewer with a printed copy of the final MSc-thesis no later than two weeks in advance of the examination.
The examination takes about 1 hour, with about 45 minutes for questions and discussions. Following the questions and discussion, the student will be asked to leave the room for a short while, during which the supervisor and second reviewer will agree upon the tentative grade. The student will then receive oral feedback and the announcement of the tentative grade.

Afterward, the supervisor and second reviewer will fill in the thesis evaluation sheet of the Wageningen Educational Institute. The sheet includes sub-grades for the different aspects of the thesis research and a final grade. The supervisor and second reviewer will sign the form and send it to the examiner together with a copy of the thesis report. The examiner will check the report and evaluation sheet, and sign the sheet if he agrees with the assessment and grade. A signed copy of the evaluation sheet will send to the student afterwards.

The supervisor will take care of the communication of the grade to the secretary of the LUP group. The secretary will upload the grade to the central student administration. It should be noted, however, that the MSc-thesis work can successfully pass only after all administrative issues (see following section) have been completed.

3 ADMINISTRATIVE ISSUES AND GRADING

3.1 MSc-thesis agreement

No MSc-thesis without an agreement! The MSc-thesis officially starts only after the student and the supervisor completed the MSc-thesis agreement (see the annex). In the agreement all aspects with respect to the MSc-work are laid down, such as course requirements, time period (inclusive possible pauses or practical periods), planned research steps, intensity and arrangements with regard to supervision. The idea of the agreement is to provide clarity in advance of the training process, in order to avoid disappointments later on. Not obeying the agreement can lead to the termination of the training process, with a grade below 6 (fail).

The most important formal requirements are:

- The student will have regular meetings with the supervisor, to keep the supervisor updated on the progress of the research and to get feedback on written text. Usually, all draft chapters and other important text, such as lists of interview questions, will being discussed in due course of the research. In subsequent meetings the student has to make clear how he or she dealt with remarks and comments of the supervisor.
- The maximum amount of time that the supervisor(s) invest is 50 hours for a major thesis (36 ECTS) and 40 hours for a minor thesis (24 ECTS). His/her time will be used for reading, meetings and assistance in general.

The procedure for signing the MSc-thesis agreement is as follows:

- Upon start of the research and fixing the topic and supervisor, the student fills in the first page of the thesis agreement. The student delivers this page to the study advisor for signing. Afterward, the student hands in the signed copy of the first page to the supervisor.
- Upon finalizing the research proposal, the remainder of the thesis agreement is filled in and signed by the student, supervisor en examiner. The signed copy and the research proposal are stored at the secretariat of the Land Use Planning group. Copies go to (1) the student, (2) the supervisor, and (3) the MSc-thesis contact person (see Annex 5.1 for names).

3.2 Office space

The Land Use Planning group provides office space for MSc thesis students, but a student may also decide to work at home or to make use of the general facilities at the educational buildings. Students who prefer having office space at the Land Use Planning group can make use of room A 314 at the GAIA building. This room has flexible workplaces with PCs for MSc students LUP.

3.3 Costs associated with carrying out the MSc-research

Preferably, MSc-research should be planned in such a manner, that no project or external funds have to be acquired. In any case it should be tried to rely on existing ad-

ministrative and logistic support as much as possible. Usually, MSc-students have to pay the costs related to the thesis work themselves, with exception of the printed versions of their report (see next section).

3.4 Printing costs

For reproducing (at least) two copies of the final report, the LUP group provides a maximum of € 50,00. The printing costs can only be re-claimed upon delivery of an original receipt. If additional copies of the final thesis report are required (e.g. for organizations which co-operated in the research) that should be paid by the LUP group, approval in advance is needed from the supervisor. A form for refund of the printing costs can be requested at the financial administrator of the LUP group (for names see Annex 5.1).

3.5 Start and final colloquia

The student is responsible for organising the start and final colloquia. See also 2.6 and 2.6. It is the student's responsibility to invite people for the colloquium. Support with distributing the invitation is provided by the secretary of LUP and the email newsletter of Genius Loci (for MLP students). However, it shows that personal invitations usually are the most effective to gather an audience for the colloquium.

3.6 Participation in other MSc-colloquia

MSc-students are expected to participate in other MSc-colloquia meetings additional to their own start and final colloquia. Working on an MSc-thesis can sometimes become a rather lonesome business. The idea of the colloquia is therefore to enhance further discussion and exchange between MSc-students and staff members as well as to train students in oral presentation abilities. Participating in colloquia usually helps to rethink the structure and content of your own research and to improve the quality of your own results.

3.7 Thesis evaluation sheet

Written feedback on the student's performance will be provided through the thesis evaluation sheet of the Educational Institute. The sheet consists of four groups of criteria for judging the quality of a thesis (see Annex 5.3), namely:

- **Research competences** of the student, focusing on a) Commitment and perseverance; b) Initiative and creativity; c) Independence; d) Efficiency in working with data; e) Handling supervisor's comments and development of research skills; and f) Keeping to the time schedule.
- **Thesis report** focusing on a) Relevance research, clearness goals, delineation research; b) Theoretical underpinning, use of literature; c) Use of methods and data; d) Critical reflection on the research performed (discussion); e) Clarity of conclusions and recommendations; and f) Writing skills.
- **Colloquium** (if appropriate) focusing on a) Graphical presentation; and b) Verbal presentation and defence.
- **Examination** focusing at a) Defence of the thesis; and b) Knowledge of study domain.

The sheet also includes some space for additional remarks. The supervisor and examiner / second reviewer will use the evaluation sheet with the final examination to arrive at the final grade. The grade will be clarified by the supervisor and discussed with the student. The student will receive a signed copy of the sheet. The rubric in Annex 5.4 explains how these criteria are used for grading.

3.8 Grading

The grading will be based on the standard grading scale at Wageningen University ranging from 0 to 10, using half grades, with a grade lower than 6 meaning failed (see also the thesis evaluation sheet in the annex). The tentative grade will be announced immediately after the final examination talk. The final grade after completion of the thesis evaluation sheet.

The grade reflects all elements and steps in the preparation of the MSc-thesis, including the colloquium and the final examination talk (see above). However, main emphasis will be given to the research competences and especially the thesis report. The weights used by the LUP group for these four groups are 50% to competences, 40% to the report, 5% to the colloquium and 5% to the final examination.

3.9 Completing the administrative requirements

Before the final grade can be passed on to Wageningen University's central student administration, the student must submit a digital version of the report as a pdf file to the supervisor, for uploading in the library system of the Wageningen University. The supervisor will deliver the evaluation form and the digital version of the report to the secretary of the LUP group.

4 STARTING LITERATURE

The following literature does not intend to provide a complete nor exhaustive overview on helpful and interesting literature when starting an MSc-thesis research. It mainly focuses at standard publications that are easily accessible at the libraries in Wageningen, some of these have been used in prior courses.
More specific literature can be found with the search facilities of the WU library at: http://library.wur.nl/desktop/catalog/. This website also provides a link to browse the wealth of online accessible journals (see also http://www.sciencedirect.com/science). Another entrance to scientific literature is Google Scholar (http://scholar.google.nl/).

4.1 Science and philosophy

Flyvbjerg, B., 1998. *Rationality and power, Democracy in practic*e. The University of Chicago Press, London.

Flyvbjerg, B., 2001. Making social science matter: Why social inquiry fails and how it can succeed again. Cambridge University Press, Cambridge.

Fuller, S., 2000. The governance of science: Ideology and the future of the open society. Open University Press, Buckingham.

Gower, B., 1997. Scientific method: An historical and philosophical introduction. Routledge, London.

Heywood, A., 1994. Political ideas and concepts: An introduction. MacMillan, Basingstoke.

Hollis, M., 1994. The philosophy of social science: An introduction. Cambridge University Press, Cambridge.

Klemke, E.D., R. Hollinger and A.D. Kline, 1998. Introductory readings in the philosophy of science. Prometheus, Amherst, New York.

Losee, J., 2004. Theories of scientific progress: An introduction. Routledge, New York.

Nowotny, H., P. Scott and M. Gibbons, 2001. Re-thinking science: Knowledge and the public in an age of uncertainty. Polity, Cambridge.

Stevenson, L. and H. Byerly, 1995. The many faces of science: An introduction to scientists, values, and society. Westvier, Boulder.

Vries, G. de, 1995. De ontwikkeling van wetenschap: Een inleiding in de wetenschapsfilosofie. Wolters-Noordhoff, Groningen.

4.2 Research methodology

Creswell, J.W., 2009. Research design: Qualitative, quantitative and mixed methods approaches. Sage Publications, Thousand Oaks. Third Edition.

Creswell, J.W., 2007. Qualitative inquiry and research design: Choosing among five approaches. Sage Publications, Thousand Oaks. Second Edition.

Kumar, R., 2011. Research methodology: A step-by-step guide for beginners. Sage Publications, Thousand Oaks. Third Edition.

Verschuren, P. and H. Doorewaard, 2005. Designing a research project. Lemma, Utrecht.

Yin, R.K., 2009. Case study research: Design and methods. Sage Publications, Thousand Oaks. Fourth Edition.

5 ANNEX

5.1 Checklist of actions and responsibilities

Action & Who

- Fixing thesis topic: *Student, supervisor*
- Filling in the first page of the MSc-thesis agreement, signing by study advisor: *Student, study advisor*
- Preparation of research proposal: *Student (supervisor)*
- Approval of research proposal: *Supervisor*
- Arranging date for start colloquium: *Student, supervisor*
- Inviting people for the start colloquium: *Student*
- Filling in the remainder of the MSc-thesis agreement, signing by student, supervisor and examiner: *Student, supervisor, examiner*
- Archiving the agreement and proposal: providing a copy of the agreement to a) student, b) supervisor and c) MSc thesis contact person: *Secretariat*
- Thesis work: *Student*
- Approval of draft thesis: *Supervisor*
- Arranging date for final colloquium and examination: *Student, supervisor*
- Asking second reviewer: *Supervisor*
- Inviting people for the final colloquium: *Student*
- Providing (at least) two printed copies of the final thesis to the supervisor and the second reviewer: *Student*
- Final examination: *Student, supervisor, second reviewer*
- Completing and signing the thesis evaluation form: *Supervisor, second reviewer and examiner*
- Delivering a digital version of the thesis report (pdf), the powerpoint presentation and files with empirical data to the supervisor: *Student*
- Delivering the thesis evaluation form and the digital copy of the thesis report to the secretariat: *Supervisor*
- Administrative finalisation: grades to CSA and delivering digital copy to library: *Secretariat*

Names

MSc thesis contact person	Dr ir Gerrit Jan Carsjens
MSc thesis examiner	Prof dr ir Adri van den Brink
Secretary LUP	Keen-Mun Poon
Financial administrator LUP	Annelies Bruinsma

5.2 Wageningen University Master Thesis Agreement

This Wageningen University (WU) master thesis agreement serves to lay down agreements between a master student and a chair group. The agreement registers rights and duties of both parties and is a further supplementation and elaboration of the Higher Education and Research Act (WHW), Education and Examining Regulations and the Student Charter.

The form has to be completed for each master thesis by the student and a representative of the chair group before the start of the study activities.

Student and representative sign three copies of the form. Both receive a copy. A third one is sent to a representative of the programme: the study advisor mentioned below.

When the agreement is modified the student will receive a copy of the adjusted form.

For complaints on the supervision or assessment the student can appeal to:

- The study advisor for advice and support
- The Examining Board for advice on procedures or an official complaint.
- The Examination Appeals Board.
- A dean or a Confidential advisor for students

For additional information see the **Explanation** on page 4.

1. Information on student and chair group

Student: .....

Study programme: .....

Registration number: .....

Study advisor: .....

Chair group: Land Use Planning (LUP)

Course code: LUP-

Supervisor(s) LUP[1]: .....

Examiner LUP: Prof.dr.ir. A. van den Brink

External supervisor(s): (if so) .....

The student is informed upon the (written) guidelines and rules of the chair group for thesis students: yes/no

2. Prerequisite course(s)

Course code:	.....	Passed:	yes/no
Course code:	.....	Passed:	yes/no

3. Admission to the thesis

Study advisor ..... has stated that the student has met all requirements for starting with this master thesis and that the specified thesis is part of the programme of the student.

[1] The supervisor is also the first reviewer. A second reviewer of the chair group LUP will be identified upon finalizing the thesis report.

4. Title and planning

Title of the thesis project: .....

Date of completion parts of thesis: .....

Date of start: .....

Date of finish: .....

Special arrangements for planning: .....

5. Arrangements on supervision including mid-term evaluation

(Arrangements on the type and intensity of meetings of student and supervisor on role and responsibilities when more supervisors or more chair groups are involved)

6. Arrangements on facilities

(Work place (office/lab), access to buildings and locations. Availability and use of equipment, materials and facilities)

7. Arrangements on report

(Language and lay out, time and format of transfer of results and data, agreements on secrecy of results and publicity of the thesis report)

8. Arrangements for individual situations.

(Circumstances beyond one's control, disability, absence for special reasons, additional double degree arrangements)

9. Assessment

The MSc Thesis assessment form for theses of WU has to be used.

The percentages in the assessment form that will be used are:

Learning outcomes (assessment criteria)	percentage
A. Research competence	50%
B. Thesis report	40%
C. Colloquium	5%
D. Examination	5%

The assessment will be done in week (on) .....

10. Signature

The student agrees to report any relevant change in circumstances which may affect the results of the project to the supervisor.
The student declares to be acquainted with rules and procedures of the chair group and with the assessment form. The chair group declares to have provided the student with all relevant information (including rules, regulations, safety issues).

Wageningen,

	Name	Date	Signature
Student:	.....	.....	.....
Supervisor(s):	.....	.....	.....
2nd Reviewer:	.....	.....	.....
Examiner:	Prof.dr.ir. A. van den Brink	.....	.....

Explanation[2]

1. Information student and chair group
The study advisor has to be asked for advice on the progress of the student and qualification for a master thesis. The study programme (study advisor) has to be informed about the arrangements students want to make for thesis projects in order to establish whether the programme allows the student to take this thesis and to keep record of the student's progress.
The examiner will be the chair holder being responsible for the thesis. The supervisor takes care of daily supervision. A supervisor from an external organization can not have a formal role, and can not be involved in the marking because he is not a qualified lecturer. If more supervisors and chair groups are involved each role should be explained under item 5. WUR employees outside the university section (e.g. researchers) can be regarded as supervisor like a WU lecturer.

2. Prerequisites
Chairs can require a maximum of two prerequisite courses (in total 12 credits) for starting a thesis. These prerequisites have to be published in the study handbook. The student has to pass the exam(s) to gain access to the thesis.

3. Admission to the thesis
The chair group (supervisor, coordinator education) should contact the study advisor personally to be informed about the student being qualified for starting with the master thesis.

4. Description and planning
In general reference can be made to a previously described project proposal of the chair group with subject and type of activities. It is considered very important that the student writes a detailed project description and is aware of all consequences with respect to type of activities, intensity and planning of work. If the student intends to interrupt the project for exams or leave the supervisor should agree in advance.

5. Arrangements on supervision
A supervisor will have his own rules for planning meetings with students, for involvement of co-workers. Especially when more supervisors and chair groups are involved it should be avoided that the student is confronted with conflicting rules and opinions. Only one supervisor should be the focal point for the student. It is strongly recommended to include a (mid-term) moment of evaluation to discuss progress and adjust the agreement if needed.

6. Arrangements on facilities
The chair group takes care of the facilities the student needs. In general it should be assumed that the student is not familiar with the policy concerning priorities for use of equipment and facilities, and is not aware who is in charge of them. It should be explained to

[2]. Please note Department of Social Sciences has a MSc Protocol with Specific Rules and Regulations and the other three Departments aPlease note Department of Social Sciences has a MSc Protocol with Specific Rules and Regulations and the other three Departments an MSc Thesis Guide (final draft as per December 2013).n MSc Thesis Guide (final draft as per December 2013).

the student that arrangements can never be a guarantee for availability and that because of unpredictable circumstances the thesis project may have to be adapted with respect to time planning and/or content. Chair group and student have to find solutions together.

7. Arrangements on report

Specific rules on the lay-out of a report, the transfer of data sets and processed results have to be agreed.

The thesis project can be part of a larger project in which external partners are involved, or in which results may be generated that require confidentially. The university has rules on protection and embargo of scientific results. Thesis reports can be registered with a restriction on disclosure of contents. The examiners and supervisor(s), however, always need a full copy to assess the student.

From October 2009 all master theses have to be uploaded to the Wageningen UR Digital Library through the AIR (Administration Enrolment data and Results). It is up to the involved chair group and student to decide whether the thesis will be made public or not in the Digital Library.

8. Arrangement for individual situations

Students can ask for specific facilities e.g. to work with a disability. Student and chair group can ask study advisor or dean for students for advice. Additional arrangements for Double Degree students can be included here if needed.

9. Assessment procedure

Examining Boards and Board of the Education Institute have decided[3] in 2006 that all chair groups of WU have to use the standard assessment form for theses and two examiners. The chair group can adjust the weight (percentages) of the assessment criteria on the excel-form. The student should be informed on this (item 9 of this agreement).

The completed assessment form for the thesis has to be uploaded to the AIR.

[3] https://portal2.wur.nl/sites/owi/kwaliteitszorg/Policy Documents and Forms/thesis-letter-061102.pdf

5.3 Thesis evaluation sheet

Assessment Form MSc Thesis Wageningen University

Complete the green fields boxed with a single line. Use a point as decimal sign; the default language is English (UK)

Name chair group	Land Use Planning		**Fee Percentage per Chairgroup**	
Name student			LUP	100%
Registration number			Not applicable	0%
Study programme			Not applicable	0%
Specialisation				
Code thesis	LUP-			
Short title thesis				
Country (of fieldwork) 1	CountryName			
2	Not apllicable			
Date examination			**Signature**	
Supervisor chair group				
Supervisor outside chair group (if any)				
Second reviewer/examiner				

	Grading Mark 1-10	Relative weight *	Check
Research competence (30-60%) *		50%	
1 Commitment and perseverance			
2 Initiative and creativity			
3 Independence		0.00	Fail
4 Efficiency in working with data			
5 Handling supervisor's comments and development of research skills			
6 Keeping to the time schedule			
Thesis report (30-60%) *		40%	
1 Relevance research, clearness goals, delineation research			
2 Theoretical underpinning, use of literature			
3 Use of methods and data		0.00	Fail
4 Critical reflection on the research performed (discussion)			
5 Clarity of conclusions and recommendations			
6 Writing skills			
Colloquium (5-10%) *		5%	
1 Graphical presentation			
2 Verbal presentation and defence		0.00	Fail
Oral Defence (5-10%) *		5%	
1 Defence of the thesis			
2 Knowledge of study domain		0.00	Fail

** please choose weights such that their sum is 100.*

TOTAL	0.00	
FINAL GRADE	**FAIL! (partially completed)**	**Fail**

Extensive comments by supervisor and 2nd reviewer/examiner on next page

NOTE: this form, including the signatures, needs to be archived for 7 years for visitation purposes

5.4 Rubric with the thesis evaluation sheet

The rubric with the thesis evaluation sheet is described at the next pages.

Rubric for assessment of MSc-thesis

Author: Arnold F. Moene, Meteorology and Air Quality Group, Wageningen University
Version: 1.1 (December 15, 2010)

Item	Mark for item					
	2-3	**4-5**	**6**	**7**	**8**	**9-10**
1. Research competence (30-60%) *						
1.1. Commitment and perseverance	Student is not motivated. Student escapes work and gives up regularly	Student has little motivation. Tends to be distracted easily. Has given up once or twice	Student is motivated at times, but often, sees the work as a compulsory task. Is distracted from thesis work now and then.	The student is motivated. Overcomes an occasional setback with help of the supervisor.	The student is motivated and/or overcomes an occasional setback on his own and considers the work as his "own" project.	The student is very motivated, goes at length to get the most out of the project. Takes complete control of his own project. Considers setbacks as an extra motivation.
1.2. Initiative and creativity	Student shows no initiative or new ideas at all.	Student picks up some initiatives and/or new ideas suggested by others (e.g. supervisor), but the selection is not motivated.	Student shows some initiative and/or together with the supervisor develops one or two new ideas on minor parts of the research.	Student initiates discussions on new ideas with supervisor and develops one or two own ideas on minor parts of the research.	Student has his own creative ideas on hypothesis formulation, design or data processing.	Innovative research methods and/or data-analysis methods developed. Possibly the scientific problem has been formulated by the student.
1.3. Independence	The student can only perform the project properly after repeated detailed instructions and with direct help from the supervisor.	The student needs frequent instructions and well-defined tasks from the supervisor and the supervisor needs careful checks to see if all tasks have been performed.	The supervisor is the main responsible for setting out the tasks, but the student is able to perform them mostly independently	Student selects and plans the tasks together with the supervisor and performs these tasks on his own	Student plans and performs tasks mostly independently, asks for help from the supervisor when needed.	Student plans and performs tasks independently and organizes his sources of help independently.
	No critical self-reflection at all.	No critical self-reflection at all.	Student is able to reflect on his functioning with the help of the supervisor only.	The student occasionally shows critical self-reflection.	Student actively performs critical self-reflection on some aspects of his functioning	Student actively performs critical self-reflection on various aspects of his own functioning and performance.
1.4. Efficiency in working with data Note: depending on the characteristics of the thesis work, not all three aspects (experimental work, data analysis and model development)	**Experimental work** Student is not able to setup and/or execute an experiment.	Student is able to execute detailed instructions to some extent, but errors are made often, invalidating (part of) the experiment.	Student is able to execute an experiment that has been designed by someone else (without critical assessment of sources of error and uncertainty).	Student is able to execute an experiment that has been designed by someone else. Takes sources of error and uncertainty into account in a qualitative sense.	Student is able to judge the setup of an existing experiment and to include modifications if needed. Takes into account sources of error and uncertainty quantitatively.	Student is able to setup or modify an experiment exactly tailored to answering the research questions. Quantitative consideration of sources of error and uncertainty. Execution of the experiment is flawless.
	Data analysis Student is lost when using data. Is not able to use a spreadsheet program or any	Student is able to organize the data, but is not able to perform checks and/or simple analyses	Student is able to organize data and perform some simple checks; but the way the data are used does not clearly contribute to answering of the	Student is able to organize the data, perform some basic checks and perform basic analyses that contribute to the research question	Student is able to organize the data, perform commonly used checks and perform some advanced analyses on the data	Student is able to organize the data, perform thorough checks and perform advanced and original analyses on the data.

Item	Mark for item					
	2-3	**4-5**	**6**	**7**	**8**	**9-10**
may be relevant and some may be omitted	other appropriate data-processing program.		research questions and/or he is unable to analyze the data independently.			
	Model development Student is not able to make any modification/addition to an existing model.	Student modifies an existing model, but errors occur and persist. No validation.	Student is able to make minor modifications (say a single formula) to an existing model. Superficial validation or no validation at all.	Student is able to make major modifications to an existing model, based on literature. Validation using some basic measures of quality.	Student is able to make major modifications to an existing model, based on literature or own analyses. Validation using appropriate statistical measures.	Student is able to develop a model from scratch, or add an important new part to an existing model. Excellent theoretical basis for modelling as well as use of advanced validation methods.
1.5. Handling supervisor's comments and development of research skills	Student does not pick up suggestions and ideas of the supervisor	The supervisor needs to act as an instructor and/or supervisor needs to suggest solutions for problems	Student incorporates some of the comments of the supervisor, but ignores others without arguments	Student incorporates most or all of the supervisor's comments.	Supervisor's comments are weighed by the student and asked for when needed.	Supervisor's comments are critically weighed by the student and asked for when needed, also from other staff members or students.
	Knowledge and insight of the student (in relation to the prerequisites) is insufficient and the student is not able to take appropriate action to remedy this	There is some progress in the research skills of the student, but suggestions of the supervisor are also ignored occasionally.	The student is able to adopt some skills as they are presented during supervision	The student is able to adopt skills as they are presented during supervision and develops some skills independently as well	The student is able to adopt new skills mostly independently, and asks for assistance from the supervisor if needed.	The student has knowledge and insight on a scientific level, i.e. he explores solutions on his own, increases skills and knowledge where necessary.
1.6. Keeping to the time schedule	Final version of thesis or colloquium more than 50% of the nominal period overdue without a valid reason (force majeure)	Final version of thesis or colloquium at most 50% of the nominal period overdue (without a valid reason).	Final version of thesis or colloquium at most 25% of nominal period overdue (without valid reason)	Final version of thesis or colloquium at most 10% of nominal period overdue (without valid reasons)	Final version of thesis or colloquium at most 5% of nominal period overdue (without good reasons)	Final version of thesis and colloquium finished within planned period (or overdue but with good reason).
	No time schedule made.	No realistic time schedule.	Mostly realistic time schedule, but no timely adjustment of time schedule.	Realistic time schedule, with some adjustments (but not enough or not all in time) in times only.	Realistic time schedule, with timely adjustments. of times only.	Realistic time schedule, with timely adjustments of both time and tasks.
2. Thesis report (30-60%) *						
2.1. Relevance research, clearness goals, delineation research	No link is made to existing research on the topic. No research context is described.	The context of the topic at hand is described in broad terms but there is no link between what is known and what will be researched.	The link between the thesis research and existing research does not go beyond the information provided by the supervisor.	Context of the research is defined well, with input from the student. There is a link between the context and research questions.	Context of the research is defined sharply and to-the-point. Research questions emerge directly from the described context.	Thesis research is positioned sharply in the relevant scientific field. Novelty and innovation of the research are indicated.
	There is no researchable research question and the delineation of the research is	Most research questions are unclear, or not researchable and the delineation of the	At least either the research questions or the delineation of the research are clear	The research questions and the delineation are mostly clear but could have been defined	The research questions are clear and researchable and the delineation is clear.	The research questions are clear and formulated to-the-point and limits of the research

Item	Mark for item					
	2-3	**4-5**	**6**	**7**	**8**	**9-10**
	absent	research is weak		sharper at some points		are well-defined.
2.2. Theoretical underpinning, use of literature	No discussion of underlying theory.	There is some discussion of underlying theory, but the description shows serious errors.	The relevant theory is used, but the description has not been tailored to the research at hand or shows occasional errors.	The relevant theory is used, and the description has been tailored partially successful to the research at hand. Few errors occur.	The relevant theory is used, it is nicely synthesized, and it is successfully tailored to the research at hand.	Clear, complete and coherent overview of relevant theory on the level of an up-to-date review paper. Exactly tailored to the research at hand.
	No peer-reviewed/primary scientific papers in reference list except for those already suggested by the supervisor	Only a couple of peer-reviewed papers in reference list.	Some peer-reviewed papers in reference list but also a significant body of grey literature.	Relevant peer-reviewed papers in reference list but also some grey literature or text books. Some included references less relevant.	Mostly peer-reviewed papers or specialized monographs in reference list. An occasional reference may be less relevant.	Almost exclusively peer-reviewed papers in reference list or specialized monographs (not text books). All papers included are relevant.
2.3. Use of methods and data	No description of methods and/or data.	Research is not reproducible due to insufficient information on data (collection and/or treatment) and analysis methods	Some aspects of the research regarding data-collection, data-treatment, models or the analysis methods are described insufficiently so that that particular aspect of the research is not reproducible.	Description of the data (collection, treatment) or models as well as the analysis methods used is lacking in a number of places so that at most a more or less similar research could be performed.	Description of the data (collection, treatment) or models as well as the analysis methods used is mostly complete, but exact reproduction of the research is not possible due to lack of some details.	Description of the data (collection, treatment) or models as well as the analysis methods is complete and clear so that exact reproduction of the research is possible.
2.4. Critical reflection on the research performed (discussion)	No discussion and/or reflection on the research. Discussion only touches trivial or very general points of criticism.	Only some possible weaknesses and/or weaknesses which are in reality irrelevant or non-existent have been identified.	Most weaknesses in the research are indicated, but impacts on the main results are not weighed relative to each other.	Most weaknesses in the research are indicated and impacts on the main results are weighed relative to each other.	All weaknesses in the research are indicated and weighed relative to each other. Furthermore, (better) alternatives for the methods used are indicated.	Not only all possible weaknesses in the research are indicated, but also it is indicated which weaknesses affect the conclusions most.
	No confrontation with existing literature.	Confrontation with irrelevant existing literature.	Only trivial reflection vis-a-vis existing literature.	Only most obvious conflicts and correspondences with existing literature are identified. The value of the study is described, but it is not related to existing research.	Minor and major conflicts and correspondences with literature are shown. The added value of the research relative to existing literature is identified.	Results are critically confronted with existing literature. In case of conflicts, the relative weight of own results and existing literature is assessed. The contribution of his work to the development of scientific concepts is identified.
2.5. Clarity of conclusions and recommendations	No link between research questions, results and conclusions.	Conclusions are drawn, but in many cases these are only partial answers to the research question. Conclusions merely repeat results.	Conclusions are linked to the research questions, but not all questions are addressed. Some conclusions are not substantiated by results or merely repeat results.	Most conclusions well-linked to research questions and substantiated by results. Conclusions are mostly formulated clearly but with some vagueness in wording.	Clear link between research questions and conclusions. All conclusions substantiated by results. Conclusions are formulated exact.	Clear link between research questions and conclusions. Conclusions substantiated by results. Conclusions are formulated exact and concise. Conclusions are

Item	Mark for item					
	2-3	**4-5**	**6**	**7**	**8**	**9-10**
						grouped/ordered in a logical way.
	No recommendations given.	Recommendations are absent or trivial.	Some recommendations are given, but the link of those to the conclusions is not always clear.	Recommendations are well-linked to the conclusions.	Recommendations are to-the-point, well-linked to the conclusions and original.	Recommendations are to-the-point, well-linked to the conclusions, original and are extensive enough to serve as project description for a new thesis project.
2.6. Writing skills	Thesis is badly structured. In many cases information appears in wrong locations. Level of detail is inappropriate throughout.	Main structure incorrect in some places, and placement of material in different chapters illogical in many places. Level of detail varies widely (information missing, or irrelevant information given).	Main structure is correct, but lower level hierarchy of sections is not logical in places. Some sections have overlapping functions leading to ambiguity in placement of information. Level of detail varies widely (information missing, or irrelevant information given).	Main structure correct, but placement of material in different chapters illogical in places. Level of detail inappropriate in a number of places (irrelevant information given).	Most sections have a clear and unique function. Hierarchy of sections is mostly correct. Ordering of sections is mostly logical. All information occurs at the correct place, with few exceptions. In most places level of detail is appropriate.	Well-structured: each section has a clear and unique function. Hierarchy of sections is correct. Ordering of sections is logical. All information occurs at the correct place. Level of detail is appropriate throughout.
	Formulations in the text are often incorrect/inexact inhibiting a correct interpretation of the text.	Vagueness and/or inexactness in wording occur regularly and it affects the interpretation of the text.	The text is ambiguous in some places but this does not always inhibit a correct interpretation of the text.	Formulations in text are predominantly clear and exact. Thesis could have been written more concisely.	Formulations in text are clear and exact, as well as concise.	*Textual* quality of thesis (or manuscript in the form of a journal paper) is such that it could be acceptable for a pear-reviewed journal.
3. Colloquium (5%) *						
3.1. Graphical presentation	Presentation has no structure.	Presentation has unclear structure.	Presentation is structured, though the audience gets lost in some places.	Presentation has a clear structure with only few exceptions.	Presentation has a clear structure. Mostly a good separation between the main message and side-steps.	Presentation clearly structured, concise and to-the-point. Good separation between the main message and side-steps.
	Unclear lay-out. Unbalanced use of text, graphs, tables or graphics throughout. Too small font size, too many or too few slides.	Lay-out in many places insufficient: too much text and too few graphics (or graphs, tables) or vice verse.	Quality of the layout of the slides is mixed. Inappropriate use of text, tables, graphs and graphics in some places.	Lay-out is mostly clear, with unbalanced use of text, tables, graphs and graphics in few places only.	Lay-out is clear. Appropriate use of text, tables, graphs and graphics.	Lay-out is functional and clear. Clever use of graphs and graphics.
3.2. Verbal presentation and defense	Spoken in such a way that majority of audience could not follow the presentation.	Presentation is uninspired and/or monotonous and/or student reads from slides: attention of audience not captured	Quality of presentation is mixed: sometimes clear, sometimes hard to follow.	Mostly clearly spoken. Perhaps monotonous in some places.	Clearly spoken.	Relaxed and lively though concentrated presentation. Clearly spoken.

Item	Mark for item					
	2-3	**4-5**	**6**	**7**	**8**	**9-10**
	Level of audience not taken into consideration at all.	Level of audience hardly taken intro consideration.	Presentation not at appropriate level of audience.	Level of presentation mostly targeted at audience.	Level of presentation well-targeted at audience. Student is able to adjust to some extent to signals from audience that certain parts are not understood.	Clear take-home message. Level well-targeted at audience. Student is able to adjust to signals from audience that certain parts are not understood.
	Bad timing (way too short or too long).	Timing not well kept (at most 30% deviation from planned time).	Timing not well kept (at most 20% deviation from planned time).	Timing is OK (at most 10% deviation from planned time).	Timing is OK.	Presentation finished well in time.
	Student is not able to answer questions.	Student is able to answer only the simplest questions	Student answers at least half of the questions appropriately.	Student is able to answer nearly all questions in an appropriate way.	Student is able to answer all questions in an appropriate way, although not to-the-point in some cases.	Student is able to give appropriate, clear and to-the-point answers to all questions.
4. Examination (5%) *						
4.1. Defense of the thesis	Student is not able to defend/discuss his thesis. He does not master the contents	The student has difficulty to explain the subject matter of the thesis.	Student is able to defend his thesis. He mostly masters the contents of what he wrote, but for a limited number of items he is not able to explain what he did, or why.	Student is able to defend his thesis. He masters the contents of what he wrote, but not beyond that. Is not able to place thesis in scientific or practical context.	Student is able to defend his thesis, including indications where the work could have been done better. Student is able to place thesis in either scientific or practical context.	Student is able to freely discuss the contents of the thesis and to place the thesis in the context of current scientific literature and practical contexts.
4.2. Knowledge of study domain	Student does not master the most basic knowledge (even below the starting level for the thesis).	The student does not understand all of the subject matter discussed in the thesis.	The student understands the subject matter of the thesis on a textbook level.	The student understands the subject matter of the thesis including the literature used in the thesis.	Student is well on top of subjects discussed in thesis: not only does he understand but he is also aware of current discussions in the literature related to the thesis topic.	Student is well on top of subjects discussed in thesis: not only does he understand but he is also aware of discussions in the literature beyond the topic (but related to) of the thesis.