

DOING THESIS RESEARCH



All the questions you are bound to ask, but never really wanted to know about

Guidelines for doing MSc thesis research within the Masters programme on International Land and Water Management



Alex Bolding, Edwin Rap & Margreet Zwarteveen
Irrigation and Water Engineering Group, Wageningen University
With input from Aad Kessler
Land Degradation and Development Group, Wageningen University
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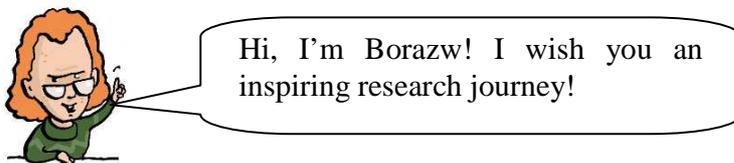
1. Introduction: Doing Thesis Research

What lies in front of you is a collective product that has been developed jointly with students of the Masters programme on International Land and Water Management (MIL) participating in the Research Approaches course given in the 2008-2009 academic year. The manual is meant to provide you with an overview of all the things you are bound to ask, when you engage in MSc thesis research within the MIL programme. As such it seeks to address all the questions that many of you maybe never really wanted to know about. You can use it as a guide or reference document that provides you with suggestions.

This manual consists of two main parts. In the second chapter the process of doing thesis research is highlighted. It provides you with a brief overview of several key aspects of doing thesis research as a learning process, such as where to start, different roles and styles of thesis supervisors, the thesis contract and assessment criteria, the different stages of thesis research and the management of expectations. The process of writing and the suggested contents of a research proposal are the subject of chapter three of this manual. Depending on the research culture and research topic you opt to pursue, different components of the research proposal may receive emphasis.

The manual is based on several other such documents produced for Irrigation and Water Engineering students and for Management of Agricultural Knowledge Systems (MAKS) students at the Wageningen University. Yet, the proof of the pudding is in its eating. So we, the authors, are very much interested in your comments on its taste. If you have critical comments or would like to make suggestions on how to improve different aspects of the manual, please don't hesitate to contact the authors.

The art work in this manual was developed by an Irrigation alumnus who presently operates as a freelance artist, Olivier Rijcken (see <http://oli4rijcken.nl>). He is the creator of your guide and side-kick throughout this manual (pictured below). We acknowledge that Oli4 has done a great job in fusing some physical characteristics of all three authors of this manual into this fictive person, called BORAZW.



The authors: Alex Bolding, Edwin Rap, and Margreet Zwarteveen (with input from Aad Kessler)
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2. The process of thesis research

There are three ways of looking at the process of thesis research. Doing thesis research is about gaining or developing the skills to perform all steps necessary in designing, implementing and presenting scientific research. As such, the process of thesis research represents a *learning process*. Besides a learning process, thesis work also entails a *proof of competence*, showing the outside world that you are capable of performing all steps necessary in undertaking academic research. And finally, thesis work is a *research activity*, that can be judged on its merits from a scientific point of view.

If all is well, the assessment of your thesis work reflects an appreciation of all three aspects of doing thesis research. However, some thesis supervisors have a tendency to value (mark) your efforts on the basis of the end product (the thesis) or the validity of your findings rather than on the skills you acquired during the process of doing thesis research. In such instances it may be good to stress that you wish to be judged on more aspects than just the validity of your findings or the readability of your final thesis. For many of you, your first Masters thesis represents a wholly new experience, drawing on many skills and levels of improvisation that you previously wouldn't have thought yourself capable of performing. In this respect it is useful to note that learning processes are uniquely tied to individuals. Whilst writing an acceptable chapter in English may be easy for some, for others it can be quite a challenge. Equally, for some of you the application of deep statistics to the analysis of your data may be a piece of cake, whilst for others this task forms an essential part of the learning experience. Often it is pretty hard to know beforehand which skills are required to bring your thesis project to a successful conclusion, but in retrospect you will be able to tell exactly what you have learned from it.

In this section about the 'learning process' of doing thesis research, we will highlight some of the steps, joys and bottlenecks that you might experience along the way, and suggest ways of resolving or overcoming these bottlenecks. We will discuss a number of interactions that might occur in the process, in a chronological order. Whilst the pace and nature of your learning process is largely determined by you, the student, the management of the university has put in place several procedures to guide the process. Some of these procedures are 'non-negotiable', like the end terms on which you will be judged, but most of the procedures are amenable to individual interpretation and preference. By highlighting several points of interaction and negotiation, we hope to enable you to articulate a way that works best for you.

2.1 WHERE TO START?

For many students thesis research represents the summit of their study: all the courses that preceded it are like the steps that led you up the hill towards it. Once you scaled the first hill, many of you experience thesis research as yet another, even higher mountain, for which you seem ill-equipped to climb it. Yet it can be done. Hundreds of others have preceded you, and succeeded. The trick is to continue step by step.

A first step involves the identification of an interesting topic and a supervisor who is prepared to guide you. It can also be done the other way around: find an interesting supervisor, who guides you in identifying a topic that carries your interest. For those of you, who have difficulties in finding an interesting research topic, some tips are given in section 3.1 of this guide.

Each of the study groups involved in the MIL programme, has tasked one of its members to provide for thesis student intakes. These staff members can help you find your way towards a supervisor or thesis topic. For IWE, the person to consult is Bert Bruins (bert.bruins@wur.nl); for LDD, you have to contact Prof. Leo Stroosnijder (leo.stroosnijder@wur.nl) and for the specialisation in Integrated Water Management at ESS the contact person is Fons Jaspers (fons.jaspers@wur.nl). Don't hesitate to contact these resource persons, whenever you have questions about your thesis path.



Figure 1 - A MIL student and his thesis project

2.2 SUPERVISORS: ROLES & STYLES

What can you expect from your supervisor? How do you find a supervisor that responds to your needs? What style of supervision suits you? These questions often remain in the air: they are rarely really articulated. Yet they can be crucial for the successful conclusion of a thesis trajectory. We invite you to spend a little time pondering these questions before running off to a particular supervisor. You can of course choose your supervisor on the basis of her/his expertise or geographical focus, but it is equally valid to choose your supervisor on the basis of his/her supervision style or the anticipated match that the two of you make.

Supervisor roles: expert, coach, councillor

A thesis supervisor can take up three different roles simultaneously: that of expert, coach and councillor/consultant. As *expert* your supervisor is expected to contribute to the resolving of issues to do with the content of your thesis (topic). As an expert your supervisor may point out relevant literature or provide you with appropriate data sets. The supervisor also provides expert based feed-back. As *coach* your thesis supervisor plays a role in supporting the process of doing and completing thesis research, providing a listening ear when you concerned about certain issues and motivating you to perform to the best of your abilities. As a *councillor/consultant* your supervisor may provide you with tailor-made advice, based on the problems you face.

These different roles can interfere with each other, and over time role reversals can occur. As an expert, your supervisor can point out relevant literature, and give comments on your initial idea. But as you gain more skills and acquire more knowledge during the process of doing research, it is likely that you will become the expert on your specific topic.

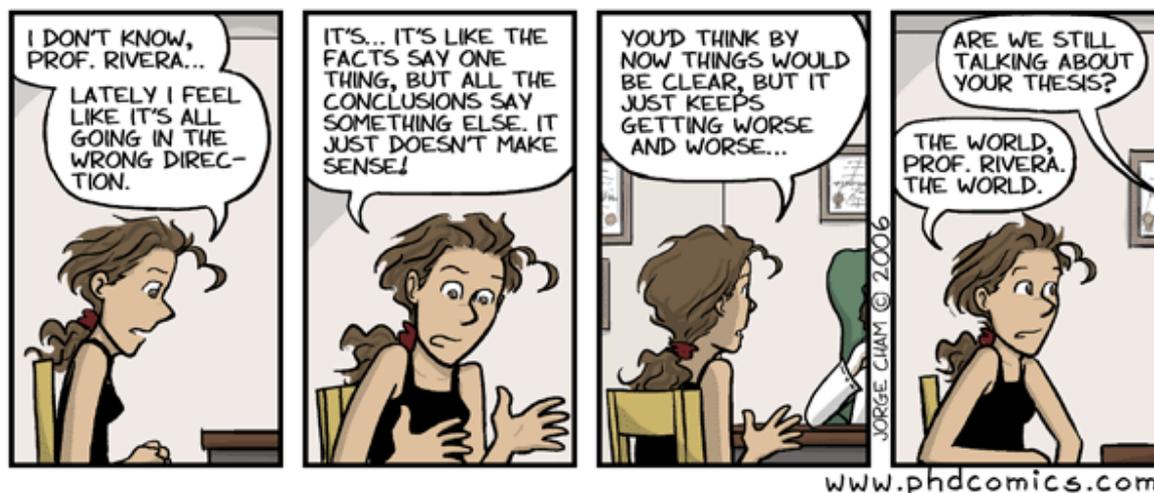


Figure 2: It can be quite difficult to communicate your concerns to your supervisor

Supervision styles

Each person has his own style of interacting and getting the best out of him/her self. This goes for both students and supervisors. Some students like to be taken by the hand by their supervisor at first, before gaining enough confidence to go it alone. Others act independently from day one and can become quite capricious for a supervisor to gauge.



Similarly, supervisors can be either pushy or laid-back. Some are very strict on time keeping and agreements, others are more relaxed and rely on your own sense of due process. Some supervisors are so enthusiastic about their field of work that they can talk on and on, others are reticent in spending too much time with MSc students. Some calibrate their supervision on the attainment of scientific excellence, others adjust their style and pace in accordance with your own learning goals.



Basically, it is up to you to find out which style of interaction works best for you. If you find that the interaction with your supervisor is unsatisfactory it might be because your styles or levels of expectation are out of tune. In such instances, it can help to meta communicate about the process of supervision. There is nothing wrong with indicating whether you are happy or dissatisfied with certain aspects of the supervisory process.



Figure 3- Various types of 'chemistry' between supervisor and student

2.3 ACADEMIC RITUALS: THE CONTRACT AND STIPULATED ASSESSMENT CRITERIA

During the thesis research process there are a number of moments of stipulated interaction between you and your supervisor, involving acts of an administrative nature. You can call them rituals, and some supervisors treat them as such, but these can be turned into useful steps during which you co-define the nature of your own research process or outcomes.

Once you and your supervisor have agreed on a thesis topic and supervisory team, you can draft the *thesis contract*. Normally the contract is signed after you have finished your research proposal, but before you go off to the field or Laboratory. In this written agreement you formally decide on the title and planning of your thesis work, supervisory arrangements, use of facilities, type and style of reporting, special arrangements of an individual nature (f.i. in case you are affected by a physical disability) and how the thesis will be assessed.

In the thesis planning section you agree on a starting and anticipated finishing date, as well as a time plan indicating the allocation (in weeks) devoted to research proposal writing, field (or laboratory) work, and thesis writing. It is also allowed to combine your thesis research with another thesis or internship. At IWE it is also possible to do a joint thesis research together with a fellow student.

In the supervision section you can agree on the type and intensity of supervision that you need. Particularly in the case of two or more supervisors, or a separate supervisor for the field work phase, you can draft a distribution of roles and responsibilities. These agreements can pertain to the need for field reporting, frequency of meetings during the writing stage, type of feed-back provided by each of the supervisors, etc. In the section on facilities, you can mention agreements on the use of office or laboratory space, access to buildings/computers, and the availability and use of equipment and material.

With regard to the ultimate thesis report, you can make agreements on the language of reporting (normally English, but in exceptional cases Dutch or Spanish can be allowed), the lay out and length of the report, and the format of presentation of results and data. Sometimes, special stipulations are agreed with regard to intellectual property rights and permission to publish by a hosting organisation (companies are notorious for insisting on a veto right with regard to public statements on the content of the research). You can also think about ways to protect your respondents in case you are writing about politically sensitive issues.

The *assessment criteria* for MSc thesis work have been standardized across the Wageningen University and the criteria are presented in the thesis assessment form¹. There are four sets of assessment criteria, pertaining to research competence, the thesis report, colloquium (presentation), and examination (defence). Each of these sets of criteria can be accorded different weight percentages for the final mark. In the thesis contract you can agree on the relative weight of each component beforehand.

¹ See <https://portal.wur.nl/sites/owi/kwaliteitszorg/Policy> Documents and Forms/Thesis assessment form WU UK v9.xls, Education Institute, 9-9-2009.

The most important assessment criteria pertain to research competence and the thesis report itself. Under research competence, the opportunity is offered to give separate marks for (1) commitment and perseverance; (2) initiative and creativity; (3) independence; (4) efficiency in working with data; (5) handling the supervisor's comments and development of research skills; and (6) keeping to the time schedule. Of course you are free to agree with your supervisor on special competences that are not covered by the criteria, but that you consider nevertheless critical for executing good MSc thesis research (for instance, you can think of 'learning a language', which can be critical in remote contexts, or 'mastering particular software', which is critical in data analysis).

Under thesis report criteria, separate marks can be given for (1) the relevance of the research, clearness of goals, and delineation of the research object; (2) the theoretical underpinning, conceptual framework or use of literature; (3) the use of methods and data; (4) the critical reflection on the research performed; (5) clarity of conclusions and relevance of the recommendations; and (6) writing skills (including argumentation style). On this point also you can agree with your supervisor(s) to formulate separate criteria for assessment that you consider important.

2.4 THE DIFFERENT STAGES OF THE PROCESS: THINK-ACT-WRITE

Basically there are three stages in the process of doing MSc thesis research: (1) identifying and elaborating a research proposal (*think*); (2) implementing the research by doing field work or executing an experiment (*act*); and, finally, (3) the actual analysis of the data and presentation of the thesis (*write*).

Each phase draws on different skills and brings its own challenges. Normally, in terms of time allocation about 15% of the total time is spent on developing the research proposal; 40% on executing the field work or experiment; and 45% on analysing the data and writing the thesis report. Of course the time allocation may vary in accordance with the topic and type of research you wish to undertake, so the above mentioned percentages are not cast in concrete. The main reason for giving you these percentages here is to emphasize that it is very important not to underestimate the time it takes to analyse data and to write the report in a concise and clear way. Start with the analysis as early as possible, do not delay until you are back in Wageningen.



Figure 4 - The field can be quite different than expected

This thesis manual focuses almost exclusively on the first phase of thesis research: the development of a good research proposal. In section 3.1.2 you can read why it is worthwhile to develop a research proposal. However, many students experience once they arrive in the field to implement their research, that the field is quite different than assumed in their proposal. This is a normal phenomenon. Good research proposals always need to be calibrated and adjusted to the actual field situation, whether it is because of a lack of proper equipment to undertake the envisaged measurements or because other issues to do with your research topic prove to be more

relevant to study than the ones you proposed. It is advisable to send at least one update on your research (re)focus to your supervisor in Wageningen to avoid a difference of perception on what you are actually researching. Within the LDD group it is customary to send a final version of the proposal within one month after arrival at the research site; this allows for sufficient time to get familiarized with the local situation, do some field visits and discuss with your local supervisor.

The final phase of thesis work, that of data analysis and writing, can prove quite tough. Writers' block does not only occur amongst professional writers, graduate students are also prone to it as the figure below shows. When you don't know where to start, a good practice is to draft a thesis outline and start writing a chapter you find exciting to write. It can also be very helpful to first put all the data you have collected in a good overview, then start analysing what from your point of view can be derived from these data (don't forget to pick up your original proposal again!) and finally discuss this with your supervisor, either in Wageningen or at your research site. Often a good discussion of your main results and tentative interpretation of these can provide you with a boost and additional motivation to get going.

If you have difficulties with analysing a particular phenomenon or part of your thesis research, it may help if you explain the issue at hand in simple terms ('Jip en Janneke taal') to perfect outsiders (like your flat mates or strangers you happen to meet and talk with in a train). Often, the very act of trying to explain your problem to others who are not involved in your research helps to structure your argument. A final advice: making an abstract or explaining in a few sentences what your thesis is about and what the main message is, can also structure your thoughts and reveal the coherence between results-discussion-conclusions.

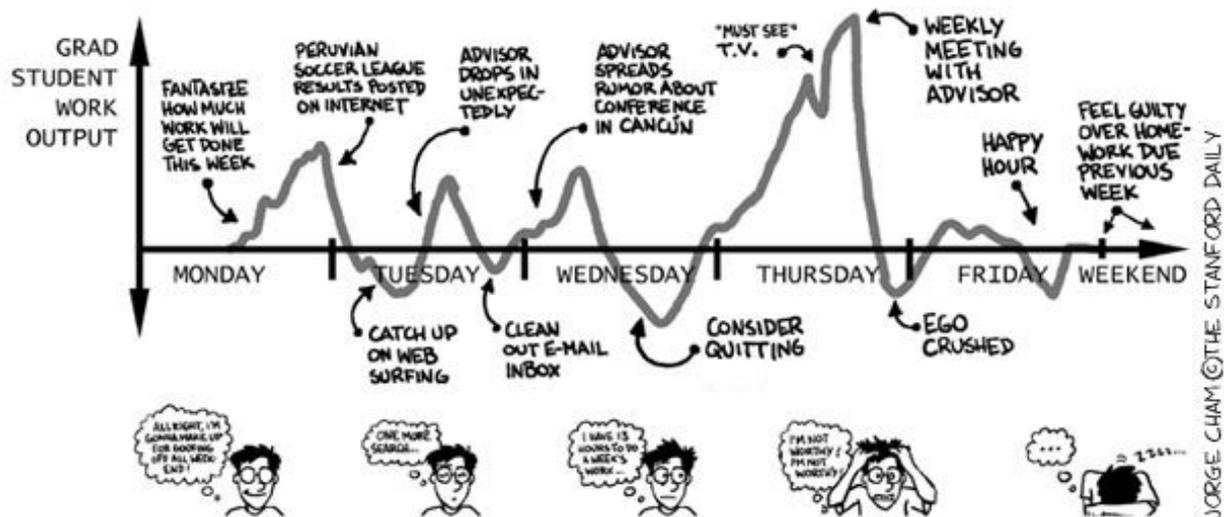


Figure 5: Work output during the writing phase is subject to frequent peaks and drops

2.5 MANAGEMENT OF EXPECTATIONS: THE MERITS OF MODESTY

An important, but often underestimated aspect of a successful thesis trajectory, is the art of ‘managing expectations’. The trick here, is not to make things bigger than they are, whilst seeking to explicitly express desires, obligations and responsibilities. This applies to all persons who play a role in your thesis research process: supervisors, local government officials, farmers, and yourself. In the above text we already highlighted some critical moments where the management of expectations is called for.



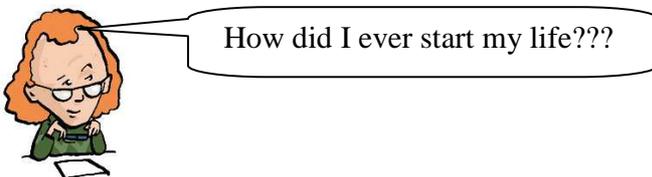
Figure 6: Managing expectations is a critical skill for any aspiring researcher

3. The Research Proposal

3.1 THE PROCESS OF WRITING A RESEARCH PROPOSAL

3.1.1 How to start?

Where can you start your research? For some of you this is a big question provoking anxiety and apprehension. The good news is that you have already started. By taking up these guidelines you have begun to think about your research proposal and how you can write it. That's a good start and from now on you are just so many steps away from presenting your thesis and finishing your MIL-degree. With a reasonable bit of healthy thinking, solid work and persistence you can make this into a useful learning experience resulting in a thesis that you are proud of.



Others instead cannot wait to get on the plane to start their research. They underestimate the first step of writing a research proposal. We want to convince you that the effort you put in writing a research proposal, pays you dividends when you are in the field. A carefully prepared proposal, which is relevant, feasible, consistent and has a clear focus, enables you to work in an effective manner by directing your attention to the most essential information that you need to collect. In addition, a research proposal can help you to evoke the interest of supervisors or other people involved. In some cases a research proposal is used to acquire funding for the research.

But how can you write this proposal and what should be in it? In these guidelines we will give you a lot of ideas, but the most important lesson may be that there is no standard way of doing it. Years ago, when I (ER) was writing a manual for MAKS, I had the nice job of interviewing a whole range of supervisors about this topic. My most striking finding was that they all said something different, each supervisor had his or her own preferred way of doing things (Rap, 1997 a, b). I found this a liberating insight: there is no standard way of writing a research proposal, there is no single blue-print on what a proposal should look like, so I can find my own way of writing it, with the help of others.

However, to suggest that you are free to do as you please is exaggerated. You write your proposal for a certain audience, so you have to satisfy its expectations. The most direct audience is of course your supervisor. He/she will certainly have ideas about what a research proposal should look like, so you need to discuss your way of doing the proposal with him/her. Further, there are certain conventions about what should be in a research proposal, related to the research culture that you, your supervisor and department work in. Now, if it is true that the objective of writing a research proposal is convincing your audience that this is an interesting and worthwhile research whilst drawing their support into your project, you'd better respect some of those conventions. In these guidelines we have listed the most important of these. Using them is part of the proof of competence that a thesis also is.

3.1.2 Why write a research proposal?

Developing a research proposal is one of the first steps in the research process and the proposal also is the first tangible output of your research. A good research proposal provides you with an identifiable problem, a tentative hypothesis or proposition, a road map of necessary evidences, and at least some ideas about how and where that evidence can be located and generated. To leave the warm and cuddly academic groves of Wageningen for the field without having thought carefully through all such matters is to invite catastrophe, or at least more confusion and anxiety - which is where most people are when they start thinking about a thesis topic. A proposal, then, has the merit of identifying a hypothesis or a hunch or an argument or a paradox to be explained. A brief definition of a research proposal is that it is a text that links in a more or less formal way theory, method and evidence. More elaborately we could say that in a proposal a question or problem is theorized in such a way that it generates needs for knowledge or evidence on the one side, and a series of means (methods) for generating, locating and assessing this knowledge or evidence on the other.

Why it is important to produce a sound research proposal? A proposal's most overt function is to persuade others that your research project shines with the three kinds of merit all disciplines value, namely, conceptual innovation, methodological rigor, and rich, substantive content. More in detail:

1. For one, developing a research proposal forces you to clearly articulate and express your own ideas and plans. Writing those down in a structured manner is one good way to improve their logic and coherence and to identify gaps or inconsistencies. It helps you to establish whether what you want to do makes sense, and whether it is at all do-able and realistic in terms of time and funding. Writing a research proposal is also an exercise in making your own assumptions, biases and perspective as explicit as possible.² You use the proposal to show your theoretical positioning and your relationship to past work.
2. Secondly, a research proposal serves as a 'guide' when you actually do research. Especially when your research involves a longer-term stay in a field situation, the risks of getting carried away with whatever is the talk-of-the-day (or whatever captures your own imagination) are huge. You may end up feeling lost, or wondering why you are doing what you are doing and why you are where and who you are. In such a situation, your research proposal can be a source of consolation; it can help you to get back on track and to remind you of what you set out to do. It may also help you realize that your original plans need to be revised or adjusted to new insights about the nature of the problem you are studying.
3. Lastly, a research proposal serves to *justify* your research activity towards the outside world; it allows you to communicate and discuss your ideas with others. If the research is part of your MSc or PhD trajectory, your proposal for instance serves to convince your supervisors of the (scientific) relevance and feasibility of your research so that you gain approval to proceed with the actual research. Through the proposal you also show your

² See for instance Donna Haraway (1988) for an explanation of why this is important. Sayer expresses it as follows: "To make judgments about the world it helps considerably if we have some idea of the nature of the relationship between ourselves and that which we seek to understand" (Sayer, 1992:12).

own competence and ability as a researcher. When a research is developed on the basis of a specific request or problem identified as part of a development or larger research project, you can also use the proposal to discuss whether what you want to do, and how you want to do it, is compatible with the expectations of the party who formulated the request or problem. Sometimes a proposal is also written to obtain funding, or to be admitted to an academic institution.

Elaborating a sound research proposal is never a wasted effort. An additional advantage to the above mentioned three merits of a research proposal, you can use the background and conceptual analysis provided in the proposal for the initial chapters of your thesis, giving you a head start during the writing stage of your thesis research.

3.1.3 Writing the research proposal

Whatever type of research you choose to do, whether it is experimental, model-building, field, or literature research, your research will consist of roughly three phases:

1. start: writing a research proposal
2. middle: implementation of the research
3. final: data analysis, thesis writing and presentation

Writing a research proposal is thus the first crucial step in the entire process of doing research. Some students set out with the ambition to solve all the problems in the world. Writing down your ideas might help you to realize that this is not feasible within the limited time that you have and with the particular kind of activity that research is, namely a practice to generate knowledge on a specific topic. Since it is also impossible to do research on the entire world, writing a research proposal will help you to confine your attention to a limited set of empirical relations that are researchable and therefore knowable. It is good to realize that this research proposal will, during the later stages of your research, be of much help in deciding what to look for (and what not), analyzing what you find, and presenting your data in the form of a thesis. Or to put it in another way, large parts of what you think of and write now will be useful for your final MSc. thesis. In this sense, you are gaining time.

In writing the research proposal there are two clear phases that consist of a number of iterative activities. In **the first phase** you try to clarify, substantiate and narrow down a *research idea* that often results in a concise description of one or two A4 pages in which you present a short and concise outline of your research project. This phase consists of three steps that you tackle in one or more iterations:

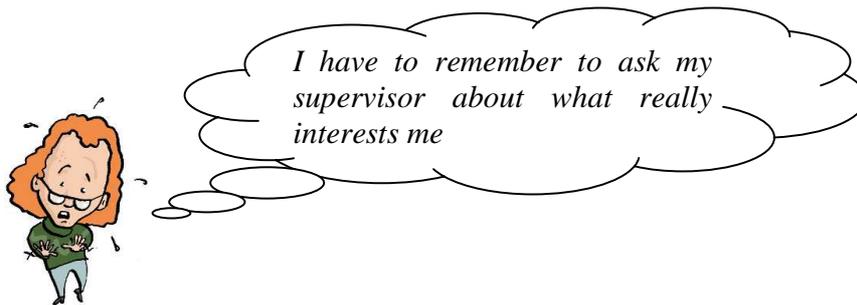
- a. Defining your topic
- b. Searching for information and literature
- c. Narrowing down your topic

During **the second phase** you elaborate the *research proposal* using the same steps to systematically and iteratively address all the components of a research proposal which are presented in section 3.2

Phase 1: Formulating your research idea in 1-2 pages

a. Defining your topic

Your own personal interest is probably the first point where you could start to think about your research topic. Of course, it is important what your supervisor, mother, or boss think of you(r work), but they do not have to live the consequences. For a good part of the coming year you will work hard on this topic, so it better be something that interests you. One way to find out about your personal interest is to reflect on the past years of BSc. and MSc. courses and think of what topic made you really enthusiastic or which lecturer or student talked about a certain issue that really inspired you to think and discuss more? Sometimes you too easily assume that you know nothing, but you have already learned a great deal in your studies and it is important to re-visit that and consider what kind of topic best suits you. You are by now a world expert on what kind of themes interest you most. Also, you have gained considerable experience with several research methods and therefore have an intuitive idea about what you prefer to do. It is likely that you have a preference for a quantitative or qualitative approach to either the physical or human aspects of land and water management or for a combination of those. This might then motivate you to select a topic that will help you further develop your skills in modelling, design, experimental, survey, interview or participant observation type of work.



Or perhaps you saw a call for thesis students on a topic that intrigued you or a method which you want to work with. These calls are often circulated in newsletters, on announcement boards or websites. Both the LDD and IWE group make regular announcements on their respective websites on available thesis opportunities. Please consult one of the following websites:

<http://www.ldd.wur.nl/UK/education/MSc+Thesis/Current+LDD+thesis+topics/default.htm>

<http://www.iwe.wur.nl/UK/education/MSc+thesis+opportunities/>

For those interested in an IWRM topic, you can consult a lever arch file with possible thesis topics that Fons Jaspers has. Of course IWRM related thesis research is also undertaken under the auspices of the LDD and IWE group.

If this does not help you, you could ask yourself the question where you see yourself in about five years and what you would like to learn in the research to help you get there. Some of you already have professional attachments or ambitions, and they therefore know the continent, country, or even the institute in which they want to do their research, which influences them in taking a certain topic as a starting point. Then there are people who are really triggered by reading a nice article or book and want to continue working along this line. They search for a topic or supervisor who can help them with this. It is of course a good idea to discuss your ideas, or the lack of them, with the student advisor of your MSc programme. Such a discussion might

also help you to organize your thoughts and find a suitable supervisor for what you want to do. Let's say that in this way you manage to identify a research topic, a location and a supervisor who will guide you in the process.

Once you have an idea for a research topic, there are several techniques available for ordering your thoughts and developing a sharper idea of your topic. We will discuss three of them. None of these is the best one, the idea is that you use one that works for you or combine several. It depends also on how you like to learn and stimulate your thinking process, alone or in a group and with words, images or numbers. The first technique - the brainstorm/mind-mapping- works mostly with visual information, i.e. images and drawings, whilst the second and third - SPQR & discussion/letter - work more with verbal information, i.e. words and concepts. Another technique that works with numerical data, graphs, formulas or models, is not yet discussed here.

1. A brainstorm/mind mapping

At this stage it is useful to brainstorm about this in order to explore the relations that are at stake but also to generate enthusiasm for the topic. You can use both words and images. This depends on whether you prefer to express your ideas verbally or visually. Try both and see what you find most useful.

One way is to identify key-words, based on what you already know about the subject and what you find interesting or exciting about it. You can jot these key-words on paper cards, so that you can shift them around. Now the next step is to think about the relations between these key-words. Are there causal relations, do some key-words belong to the same group of phenomena, are these phenomena of a different scale & order, do some things belong to the context of your topic?

If you shift around the key-word cards on a white paper, you might actually start to draw the relations that you are thinking of in the form of arrows, dotted or striped lines, plusses or minuses, lightning signs, smileys or whatever image helps you to visualize what kind of relations these are, positive, negative or neutral. This might stimulate you to make several new versions in which you re-order the images and concepts according to what you find the most logical or causal order. More and more, you will find the conceptual relation of your interest at the centre of your drawing, which can take the form of a web or of a hierarchy (see examples below). You will be forced to make some decisions here at what you would really like to focus on and what is beyond the scope of an MSc thesis research.

This brain storm technique is called 'mind mapping' or 'concept mapping'. It helps you to summarise what is your key interest/question, and what you already know about the topic (see Alan Barker and Firoze Manji *Writing for Change* (2000), which is a

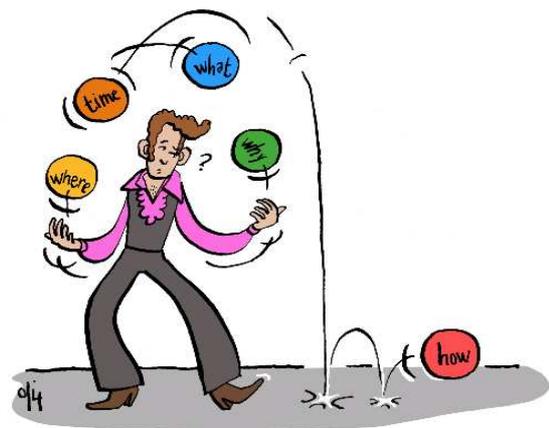
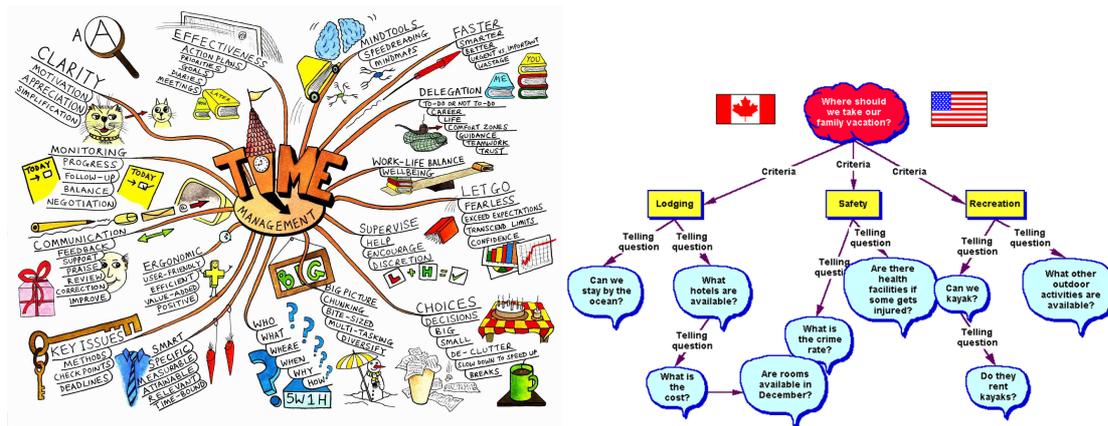


Figure 7: A brain storm can be quite a juggling act

CD-ROM based package for learning writing skills. It also has a useful and openly accessible website: <http://www.fahamu.org/WFCEng/>.

You could actually also use such techniques in a group, which will provide you with a rich and free association around the topic. In the end, you can use a clear concept map in your proposal to visualize the conceptual relations that you discuss, thus making them understandable.

It will also help you to start to describe the different relations that you think are essential for the proposal.



Sources: <http://viewpointorange.com/wp-content/uploads/2010/05/Mind-mapping-training.jpg>; www.graphic.org

Another approach might be to work with text from the start. Write a brainstorm text or an essay on what you find interesting or exciting about the problem, which dimensions you think the topic has, where you want to do research, etc. After this exercise in free-writing try to formulate your interest in the form of a research question or problem.

2. The SPQR

A way to subsequently use these preliminary ideas and concepts for the research proposal, is the SPQR³ technique:

- Describe the **SITUATION**
- Explain what the **PROBLEM** is
- Formulate your **QUESTION** about it
- Explain how you will **RESPOND**

Write one or two A4s on your topic and think about how these different elements are related and whether that makes sense. This might be the basis for a presentation and a discussion in a group of colleagues or friends. They will generate questions about your topic and how you formulate it.

³ SPQR is Latin and means: **Senatus Populusque Romanus** ('The Senate and the People of Rome'), which was the official name of the Roman empire and was used on public buildings, flags, coins and official letters. You can for instance still see it on stone signposts along the more than 1500 years old Roman roads in Northern Portugal that ultimately lead to Rome.

You could then rethink it and take an improved version to your supervisors, to see what they think about it. You will get comments on all kind of aspects of what you propose: how you phrase things, what kind of literature might be relevant to read and get a better understanding of the problem, the suitability and scope of your question, the feasibility of what you want to study and the researchability of the issues that you raise. These are usually meant not as criticism of what you want to do, but as inputs to improve your proposal.

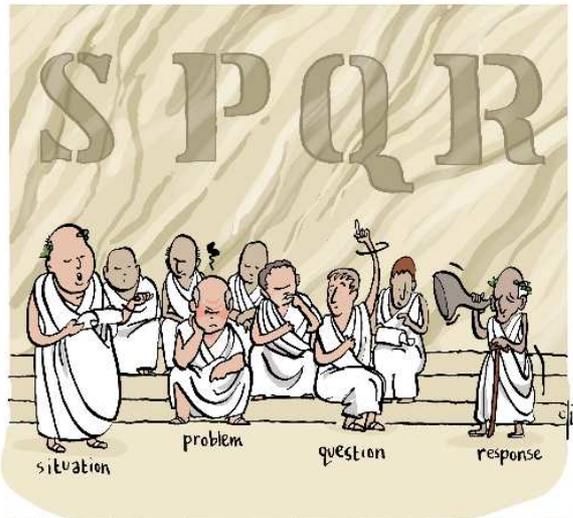


Figure 8: SPQR – Even the Romans practised it

The advantage of the SPQR is that, without knowing, you now have a start for some key-components of the research proposal:

- Situation → Background
- Problem → Problem Statement
- Question → Research Question
- Response → Research Methodology

It is possible to use these elements also as the central elements of your introduction.

3. Discuss with or write a letter to your significant others

Some researchers are reluctant to discuss their ideas with others before they are ‘perfect’. This is understandable but mostly counterproductive, because you can benefit from other people’s fresh way of looking at things, their experience, knowledge and suggestions that you generate by involving them. They might also correct you on aspects such as style of writing or language use, for which supervisors or reviewers tend to have no time. Even outsiders can sometimes have illuminating comments on the clarity of your text, because they do not know the particular terminology and because they force you to explain something in very simple words. This often makes you aware of what you really wanted to say. An additional technique to organise your thoughts, bring it down to its essence, and get it on paper is to write a letter to your grandmother or a good friend in which you are explaining what you are going to do and what your doubts are.

So try to create an environment in which you can discuss and re-work your ideas. You are not the only person struggling with these issues. Perhaps we can learn something from arts students, designers, or architects here. Besides physically making art or a design, as part of the design process, they have to talk about their work, during formal presentations, but even in their free time when they are among friends. In this way they are socialized and trained to talk about their own work, get ideas and feedback from bystanders on how to improve their design, and learn how to promote or defend it and find good arguments for that. The positive effect of sharing your passion or frustration with a topic is that you mobilize people to think with you and learn to formulate your ideas. What you are doing in writing a research proposal is like perfecting a sculpture.

b. Searching for information, ideas and literature

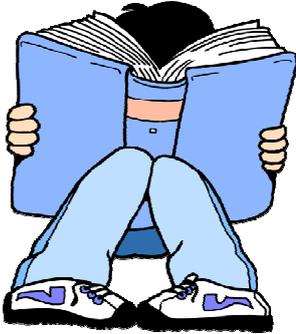
Once you have a general idea about the direction of your research, you can start searching for information, ideas and literature pertaining to your research topic. This process is a puzzle that can help you to get a clear picture about what problem exactly you want to research and whether this will result in new knowledge, insights, techniques or data. There are formal and informal sources to consult.

A first formal source of information and ideas is of course your supervisor. Ask your supervisor and other people knowledgeable about the topic to suggest some essential literature, ideas and information. But you should also certainly not leave it at that, because your supervisor might not necessarily be an expert or have a fragmented knowledge of what is written.

A second source is a literature review, which is an important element of academic research. Different types of literature can be read to define your research topic/question more precisely. A common beginning is to start reading literature that gives more *information* on the topic that interests you. This will add to what you already know, and focus your interest. The point is not to read too little but also not too much. Of course, the library now offers several incredibly useful search engines such as the Web of Science, Scopus and the freely accessible 'scholar.google.com'. Another useful search method, that our university administrators are ignorant about, is to simply stroll along a book shelf in the library that is of your thematical interest. You often find new unexpected titles that turn out to be most useful. For example, when thinking about research methods this method is very practical, because by looking at the section with research methodology guides and glancing through them, you quickly see what you can use and what you like. Of course, you run the risk to be spotted by your friends and be stereotyped as hopelessly out of fashion: walking around with books. But hey, this is not a fashion statement.

Informal sources stem from the insight that basically everybody can be your informant. You should not underestimate the useful information you can get from people you already know or get to know by chance. They can tell you something relevant about an aspect of the question or bring you on an idea that you did not think about. Of course, lecturers, researchers, students and others at the university can be helpful as a resource person, but also people from outside the mafia may have useful information or contacts. This information can become very useful if you record it in some way. For those who have a short-term memory, it is important to write down these things

right away. It can be helpful to keep a notebook at hand to write down these small ideas. This notebook can become a true companion during the entire research.



Source: www.barnstable.k12.ma.us



Source: storms.typepad.com

The nice thing about just starting up a research is that you are still open to different ways of seeing the topic and can include ideas that your supervisor never thought about. This is one of the ways in which innovation in science can come about. So do make use of all the skills that you have gained earlier to find literature in the library or at the internet. You might come up with things that surprise even your supervisor. In this sense, a critical and independent mindset should be appreciated⁴.

Reading on the topic you will find out that you are not the first to ask questions about it and to give explanations for (an element of) the problem you study. Apart from looking for information on your topic you should also be on the look out for the different *approaches for explaining* the phenomena you are reading about. This is a start for identifying the different *theoretical or conceptual* frameworks that are used to study the topic. Of course you have to make a selection of the pile of literature that you find, to keep it manageable. Make a realistic estimation of what you can read and then make a selection of different approaches.

A critical ability to assess the reliability of the collected information and its source is key⁵. The internet as a medium offers great advantages. It is a wonderful tool to find general background information, but also to track scientific articles and books that are relevant to your topic. However, but internet as a source also has to be treated with some caution. Not every source of information is reliable. On open web pages you do not always have a way of knowing the source and its method of acquiring the information is. Any fool can put something on the internet, so be very critical on selecting only information that has a reliable scientific or professional origin. To quote Wikipedia or a similar web page you thus run the risk of being as credible as when referring to your grandfather. You can of course also judge the information itself and get a feel for the quality of data, data collection, analysis and argumentation offered. Of course, you then

⁴ It appears difficult to translate the Dutch word 'eigenwijs' to the English language, opinionated or stubborn perhaps, but in the Dutch context that 'can be' something positive. This should be understood in the context of an anti-authoritarian tradition, that many foreigners find most peculiar. This shows how differently skills and attitudes can be appreciated culturally.

⁵ Reliability of data or information depends on how stable the measurement, or the particular method of collecting this data, is. "It means that when you apply the same procedure for measuring something, you will end up with the same result if nothing else has changed that could influence that" (King et al. 1994:25 in Hancké, 2009:90).

need to assess the suitability of the material for your topic, the questions you have and the theoretical and methodological entrance point you would like to take. This will ensure that you start working on the basis of a restricted set of relevant, valid and suitable literature.

c. Narrowing down your topic

After having brainstormed and opened up to many different ideas, the writing of a research proposal will partly function as a necessary process of closure. The advantage of this narrowing down is that you develop a more precise and delimited research focus. As it is impossible to research the entire world, it is necessary to draw boundaries around what you want to look at. As a consequence your research proposal will become more clear and feasible. You can narrow down a research topic in several manners. For example:

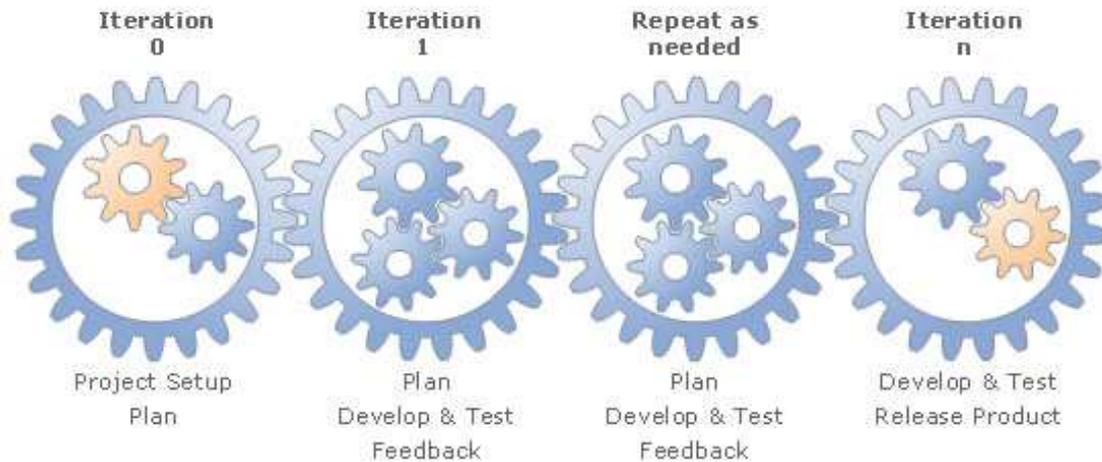
- **Iteration:** By switching between different research proposal components, you are able to narrow down your focus on the specific aspect of an overall problem that you really want to understand.
- **Define the unit(s) of analysis:** The unit of analysis of your study is the main entity that, or in which, you will research a topic to be able to reach certain conclusions (e.g. an irrigation system, erosion infrastructure, a river basin, a policy, an experiment, a group, a model, a region, etc.).
- **Geographical and thematic delineation:** A research question has to be delineated in geographical and thematic terms. Such boundaries will help to make clear what falls outside of the scope of your study.
- **Applying concepts:** The key-concepts have to be used in the formulation of the research question in order to clarify the perspective with which it will be studied and to narrow down its focus.

Phase 2: Elaborating your full proposal

Once you have concluded your first iterations of defining-substantiating-focusing your research idea you will end up with a one or two pager in which you have concisely elaborated the situation, problem, question/purpose and response making up your research idea. It is advisable to discuss this research idea with your supervisor(s) to ensure that you all agree on the focus and framing of your thesis research.

The next phase is to convert this research idea into a fully fledged research proposal. Writing a research proposal is an *iterative and a reflexive process*, comparable to the design process of an engineer or an architect. You cannot write your proposal from A to Z. It is hardly ever a linear process in which you write the components in a fixed order. You move forward and backward, and again forward, whilst you reflect on what the steps that you have taken imply for the steps you are still to take. In writing you alternate between different components and adapt these in relation to each other and according to new insights that you gain through reading or discussions. Several times you will have to start again, throw away old segments of the text, and re-write or re-organise complete sections. If carried out well, this is not a loss of time, but an indication of the growth of coherence of the proposal, which is a cumulative process. Sometimes it will be

necessary to read newly acquired literature, use information of other sources and adopt fresh ideas. The idea is that by bringing the different components in line with each other you improve the consistency of the research proposal.



Source: www.itbusinessnet.com

The process of actually writing the research proposal always consists of several rounds. Each round builds on the previous one, and corrections can be processed in order to improve the next draft. For example, you start out with writing two or three components (if applicable on the basis of your SPQR), e.g. the background, research objectives and problem statement. On the basis of this first draft you receive comments of a reviewer. In the second round you re-write these original components in line with the comments and new ideas you have had. After this you write two new components, e.g. the main research question and the concepts and theories section. In a third round, you could focus more on how to divide your research question up in workable and researchable pieces. The sub-research questions and the methodology will help you with that. In the final round you complete all the missing parts. The process of writing, receiving comments, and revising components repeats itself until you finalise your research proposal in deliberation with your supervisor.

3.2 THE CONTENTS OF A RESEARCH PROPOSAL: OVERVIEW OF THE DIFFERENT COMPONENTS

A normal research proposal has the form of a text of about twenty pages. In it, you explain **WHAT** you want to study (the object of your research); **WHY** you want to study it (the purpose or objective(s) of your research) and **HOW** you intend to go about doing this (which includes concepts, theories as well as methodology). In the broad view of Andrew Sayer, this 'how' covers "the clarification of modes of explanation and understanding, the nature of abstraction, as well as the familiar subjects of research design and methods of analysis. The terrain of the discussion is therefore the overlap between method, social theory and philosophy of social science." (Sayer, 1992:3)

These three elements of the research are closely interlinked (see fig. ..); if one of the them (purpose, object or theory-methodology) changes, the others will also have to change. Or: your choice of concepts, theories and methodologies will strongly depend on WHAT you want to study and WHY. For instance, if your intention is to study the drinking water supply system in Chimoio, Mozambique (WHAT - research object) it matters a great deal in terms of conceptualization and methodology if your primary interest or objective (WHY - purpose) is to assess whether the supplied drinking water is safe and healthy; whether you set out to establish the (financial) performance of the drinking water supply agency or whether you want to find out about differences in access to drinking water. In the first case, you'll make use of theories about the linkages between the quality of drinking water – in terms of a variety of indicators – and human health, and your methodologies will consist of ways to assess this quality at various points of delivery, or of various sources. In the second case, you'll primarily look at costs and incomes of the drinking water company. Your theoretical inspiration may come from the discussion about whose responsibility the supply of drinking water should be: that of governments, private companies or civil society. In the third case, you'll look for theories that help assessing and explaining differential access to drinking water, and your methodologies will rely on ways to identify relevant categories of users in terms of their access to water.

Keeping in mind this interrelatedness of research object, purpose (or objective) and theory-concepts-methodology is important because it serves as a warning against the celebration of some theories and methods as intrinsically better than others. Although most researchers have a more or less strong preference for certain theories and methods, such a preference can never be defended on the basis of their strength *as such*, but should always be related to a particular research object, linked to a particular research objective.

[insert figure of triangle object – purpose – method here]

What does a sound research proposal consist of? The form and the organization of a proposal are matters of taste, but in choosing a particular form it may help to bear in mind that every proposal reader constantly scans for clear answers to three questions:

- (1) What new knowledge will the research generate?
- (2) Why is this worth knowing? And
- (3) Will the conclusions of the proposed research be valid?

The kind of proposal you write and the order in which you place the different components will (among others) depend on the type of research you do, on the research tradition and culture you identify with, on what your supervisor expects of you and on your own preferred ways of doing things. Do not hesitate to find out within your department, and directly from your supervisor, about the expectations.

The following description of the contents and components of a research proposal, therefore, should not be followed in a strict and literal sense. Rather, it is meant to provide a general idea of what a proposal could consist of. You can use it as a check-list when designing and developing your own text. A general advice in writing the proposal is to show confidence and eagerness, for instance by using the *I-form* and active verbs, a concise style, and positive phrasing. For instance,

if you intend to study how conflicts and competition over water occur, the sentence: “I select a densely populated area in a closed river basin”, is better and preferable to the sentence: “A choice is made for a densely populated area in a closed river basin”.

Like any good text, a research proposal starts with a short introduction which serves to capture the attention of the readers and entices them to also read the remainder of your text. It serves to show that your research is important and worthwhile. After this introduction, the proposal first sets out to provide the context of the study in a section that is called *background*. The background section more or less logically ends in a short statement of your research problem, the *problem statement* in which you indicate WHAT you seek to explain, describe, measure or test. This is followed by the *objectives or purpose* of your research in which you explain to the readers WHY you want to do this. You make your problem statement academically intelligible by clearly defining your main concepts, and by explaining which theoretical perspective(s) you adopt in the first part of the HOW section: your *theoretical (or conceptual) framework*. Often this section is also used to provide a review of the academic or scientific debates about the topic, and to situate yourself and your research in these debates. The remainder of the research proposal should be dedicated to the second part of the HOW section: the *main research question* and the *sub-questions*. The main research question is operationalised by formulating *sub-questions*. The third part of the HOW section, the *research methodology*, describes how you will answer the sub-questions. The last step – and 4th part of the HOW section – of operationalising the main research question consists of presenting a *planning or time line*. The last component of a research proposal is the *bibliography*, listing the literature referred in the text. A final, optional, feature is the budget that you require to actually undertake the research.

A research proposal thus consists of the following components:

1. Title page & Table of Contents
2. Introduction
3. Background of the research
4. Problem statement
5. Purpose or objectives
6. Concepts and Theories
7. Main research question(s)
8. Sub-questions
9. Research methodology
10. Plan of Work
11. Bibliography
- (12.) Budget

It should be emphasized here once again that the sequence of the components 3-8 is not fixed. Depending on the topic of your research and personal preferences (of yourself and of your supervisor) it can be more logical to merge for instance the purpose of your research in the introduction, describe concepts and theories after the sub-questions section, place your problem statement just before the main research question, etc. Feel free to do it your own way, but make sure that all components are included in the proposal. In what follows, we describe each of these components in further detail.

1 The Title Page and The Table Of Contents

The first page of the proposal is the title page. It contains:

- the title (and sub-title) of the proposal.
- your name, student number, and course code (indicating the number of ECTS)
- the status of the proposal (e.g. first draft)
- month and year in which the proposal was written
- the institution under whose auspices the paper was prepared
- the name(s) of your supervisor(s)

2 Introduction

The main purpose of the introduction is to entice the reader to read the rest of the proposal; it is an invitation to accompany you on your academic quest. A good introduction captures the imagination and interest of the readers, and predisposes them favourably towards the rest of the proposal. It is therefore important that the introduction is attractive, to the point and informative. One good way of immediately catching the attention of the reader is to start with a slightly provocative statement, and of placing your research topic in a currently 'hot' debate. Questions that are clearly posed are an excellent way to begin an introduction: Are private companies better water managers than public agencies? Was the decline in agricultural productivity in Mali in the last decade the result of land degradation? Are water managers necessarily male? These should not be rhetorical questions; they have effect precisely because the answer is far from obvious.

Stating your central point, hypothesis, or interpretation is also a good way to begin: Population growth coupled with loss of arable land poses a threat to North African food security in the next decade; The main cause of low agricultural productivity and rural poverty in Peru is that farmers do not have individual titles to their land and water resources; The success of the new Water Law in South Africa primarily depends on the collaboration of white farmers. Obviously some projects are too complex and some conceptualizations too subtle for such telegraphic messages to capture. Sometimes only step-by-step argumentation can define the central problem. But even if you adopt this strategy, do not fail to leave the reader with something to remember: some message that will remain and that will distinguish your research from many others.

Some examples of well written first paragraphs of introductions are given below.

“Dawn, and as the sun breaks through the piercing chill of night on the plain outside Korem it lights up a biblical famine, now, in the twentieth century.” With these words, journalist Michael Buerk announced the famine in the Horn of Africa in October 1984 and set into motion a huge response, foremost consisting of food aid for the starving people of Ethiopia. Ever since, emergency appeals have invited massive food aid, targeted to more than five million Ethiopians annually (GoE, 2004:1). Ironically, throughout this period, food security in Ethiopia has been declining. The country has remained among the most food-insecure in the world with nearly half of the population being undernourished (WFP 2006:3-6). Government, donors and I/NGOs all agree that decades of interventions have not led to sustainable assets at household or community level (Sharp et al, 2003:129-139; Raisin, 2002; GoE, 2004:1).

(From the proposal submitted to NWO-WOTRO by Prof. Hilhorst and prof. van Dijk in 2007, “Linking food aid and food security in Ethiopia”).

Since 2004 a group of Dutch investors is participating in the water management of Matagalpa, a middle-sized city in the mountains of Nicaragua. The polluted wastewater of coffee growers upstream, combined with erosion due to deforestation in the area, threatens the drinking water supply of the increasing urban population. Mainly affected are two big rivers that have their origin in this watershed and of which about 40% of the water for Matagalpa is extracted; the Molino Norte and the San Francisco. Through input of knowledge, technology and money the Dutch cooperate with local partners to decrease the vulnerability of the watershed.

(From the MSc thesis research proposal of Maria Le Grand, “An Analysis of the Communication on Implementing Integrated Water Resource Management (IWRM) as a Component of a Dutch Investment Project in Matagalpa, Nicaragua”, September 2007)

You can also use the introduction to explain your personal fascination with the topic: what about it do you find interesting, problematic, attractive, challenging, depressing or maddening? Writing an introduction can become easier when making use of the already explained four elements: S, P, Q, R. (See Barker and Manji (2000) and p. 14-15 of this document).

You always end your introduction with an outline of the remainder of the text.

3 Background⁶

In the background of the research proposal, you sketch the context of your research in terms of science and in terms of climate, geography, ecology, politics etc. However, in some cases you can also merge the background with your introduction. The background section helps to further familiarize the reader with your plans, while it also serves as a funnel to zoom in on your problem definition, objectives and main research question. Together, these three elements of the research proposal reflect some of the important choices you have to make about the scope, direction and framing of your research. How and what you write in the background partly depends on the objectives of your study; the *why(s)* of your research co-determine what you need to explain in the background. This is why it helps to already have a first idea about your objectives when writing the background. For instance, if you want to assist a Dutch NGO working in Nicaragua with the development of a watershed development monitoring system, you’ll use the background to explain why a monitoring system is required and for whom. It may include a brief review of other or previous watershed development monitoring systems, and an assessment of how these are functioning and why a better system is deemed necessary. If, instead, you want to assess the institutional performance of watershed development efforts in Nicaragua in view of a number of relevant indicators, your background will zoom in on what watershed development means and how it can be measured. You’ll maybe compare different ways of assessing institutional performance, and discuss their relative merits and weaknesses.

⁶ The background is also sometimes called: problem situation, problem description, or problem context.

Writing a background therefore needs some critical judgment on what is and what isn't interesting and useful information. Very general information, such as on the geographical location of your research area, its neighbouring countries or its recent political history, may not be needed to clarify and explain what you want to study and why. The background section is not usually very long – 2-3 pages should be sufficient. Do not expect to write a good background section in just a few hours when you have just started thinking about your research, and do not stick with your first version. The ability to write a succinct, clear and attractive background requires that you really know what you want to do and why, and such knowledge usually comes after a process of some time in which you reflect, ponder, deliberate and brood. Takes this time, and allow your insights to evolve and progress!

You can also use the background to show how and why *you* are interested in this particular topic (your personal curiosity or intellectual journey), to indicate *how* (from which and whose perspective, using which theoretical or methodological angles) you intend approaching it, and how your approach is different or similar to that of others. As such, the background reiterates the significance of your research either in terms of science or in terms of helping solve larger societal problems; it points out how the proposed research will contribute to existing knowledge and why this is important. Some supervisors expect to see the results of your literature review in the background, while others will advise you to incorporate this in the theoretical framework. Discuss this with your own supervisor.

Below, we give a more elaborate description of each of the possible elements of the background of a research proposal.

3.1 Regional background

Here, you provide an outline of the national, regional and/or local setting in which your research problem is situated (a region, an irrigation scheme, an extension programme, a project) and you justify this choice of region or area. Why there? Why is this area interesting? What does this have to do with your research objectives? You can use different types of ethnographic, historical, geographical, or demographical information about the area to provide a preliminary understanding of why and how this problem came into being in this area, or to point out why this area is particularly interesting regarding the manifestation of your research topic. Very general (macro-geographical) numerical data are often not so useful. Do not include such data, unless they enlighten the nature and background of the problem.

3.2 Development policy and - political background

In this part of the background, you place your research in its political or policy context. A starting-point for much research of ILW students is a specific land-or water management problem. It is important to realize that a land-and water management problem *is NOT* the same as a research problem. The land-and water management problem provides the broad context of the research, and the wish to contribute to solving it is often part of its objectives. By itself, research will never solve land and water management problems. What it can do is providing a specific piece of insight into (a part of) the problem. In other words: a land-and water management problem is a societal or developmental problem, whereas your research problem is a knowledge

problem. This distinction becomes less clear with action research, where attempts to solve a particular problem form part of the research methodology.

When explaining the context of the problem you want to help solving with your research, there is merit in reflecting on *whose* problem it is. Often, you as a researcher do not experience or feel the identified land and water management problems. And, problems are usually identified by previous researchers, policy makers or development institutions. You can use the background to show your critical awareness of *who* formulated the problem and from which and whose perspective.

Research often not just involves a critical questioning of existing knowledge about a problem, but also of institutional approaches towards solving it, and of the involved institutions and agencies (or other actors) in the specific policy or intervention arena in which your problem is situated. In your background, you could therefore include a brief discussion of the place and role of these approaches and actors, of intervening agencies and development institutions, their development politics, policy agendas and strategies.

Your research may for instance be concerned with the privatization of drinking water management. The development background of this topic is that the costs of water management are considered too high for the public budget, which is why there is pressure from lending agencies to turn some management tasks over to civil society organizations and private companies. But will private companies not be primarily guided by profit making motives, and is profit making compatible with serving those who are least able to pay? Will companies also connect the more remote areas to drinking water, even when this implies a considerable increase in their costs and is not be directly profitable? And who are actually participating in and represented by existing or newly formed civil society organizations? Are there other ways to decrease the costs of water management without sacrificing the quality of the delivered services? In the background, you'll have to spell out these political dilemmas, as well as provide a short sketch of the policy environment and of relevant actors and interest groups. Who is promoting privatization, and why?

Another example is a research concerned with the costs of land degradation. In the background of such research, you'll have to explain the political and policy context of land degradation. One pertinent policy and political question that may for instance come up is the question of who is, or can be, held accountable for land degradation. Can land degradation be attributed to (the behaviour) of specific people, and if so can they be held accountable for their damaging behaviour? Or is it a problem of the whims and fancies of 'nature'? And who, as a consequence, can be expected to invest in or pay for land reclamation and conservation practices? Is this a public responsibility, or is it the responsibility of those with titles to the land?

Questions such as these form the heart of land-and water management debates in which many different actors with diverging interests are involved, and provide also the policy and political background of your own study. In the background section, you show that you know about these often contentious political and policy debates. You also use it to start positioning yourself in these debates. With whom, or with which policy or theory, do you identify (most), and why?

3.3 *Scientific background*

It is essential that the proposal summarizes the current state of knowledge and provides an up-to-date, comprehensive bibliography. Both should be precise and succinct. You do not need to provide a review of all the available literature, but a good proposal does include a focused overview of the specific body or bodies of knowledge to which you will add. How have other researchers approached and studied the problem you intend to look at? What do you consider the strengths and weaknesses of their approaches? How will your approach be different or similar to what is already done? This review can be part of the background; some researchers use the background section to present this synopsis of relevant academic literature on the topic. However, others prefer doing it in the section on concepts and theories. This is not just a matter of taste; it also depends on the type of research you do and on the importance of conceptualization. For instance, if your research involves a modelling exercise, it may be more logical to include the literature review in the background.

3.4 *Personal commitment (optional)*

You can also use the background section to explain why you are personally intrigued or motivated by the problem or topic you intend to work on. This is optional here because it is often also included in section 5 (objectives or purpose of the research) or in the introduction. Revealing your personal motivation or sources of intellectual curiosity, explaining what it is that intrigues or fascinates you about a topic or why you are concerned about it, often is an important step towards clarifying and justifying your theoretical and methodological choices. For instance, for a student interested in researching why farmers in Andalucía in the South of Spain wanted to replace their old surface irrigation system with a new drip irrigation system, it was relevant to explain the source of her interest. She was enchanted with the beauty of the old system, with its old canals transporting softly murmuring rivulets of water through sweet-scented orange orchards in a mildly undulating landscape. That this system had Moorish origins, and had remained more or less unchanged for centuries, somehow added to her romantic ideas about rural life and fostered dreams of the possibility of secluded islands of peace and quiet in hectic modern times. Putting this to words helped clarifying to herself and the reader that she regretted the disappearance of the old system. It also helped making explicit that her own thinking about the topic was structured by dichotomies with modernity, progress, rationality (etc) on the one hand and tradition, conservation, emotion (etc) on the other. Through this discovery, and through her review of literature, she started realizing that discursively framing the introduction of new technologies in mutually exclusive binary categories not just characterized her own thinking and sentiments, but was typical of how most people normally react to technological change. She then decided to make the search for the discursive and cultural categories that people use to make sense of such change the explicit topic of her research.

4 Problem Statement

The problem statement of a research proposal consists of a few, concise sentences in which you define your research problem. You use it to further zoom in on and delimit what you want to do. Where the introduction and background sketch the general contours of your research topic and approach, you use the problem statement for clearly specifying the boundaries of your

investigation. The problem statement explains as precisely as possible what your research will accomplish in terms of furthering knowledge or in terms of contributing to solving technical or societal problems. In specifying the limits of your research, the problem statement also defines what you will NOT do.

Problem statements of research proposals often indicate a gap between a current situation and a desired future situation, in terms of knowledge. Another typical aspect of problem statements is that they are often concerned with *cause* and *effect*. For instance: “Although the Nepal Government has adopted a quota system to increase female participation in water users’ organizations, the effects of this system on the degree and nature of women’s involvement in water management are not known.” Or: “It is unknown whether there is a difference in erodibility between a loam soil ploughed once and a loam soil ploughed twice”.

Many students have a tendency to formulate the problem statement in too general or broad terms. For instance, the following problem statement: “There is not enough knowledge about the costs of soil degradation” is too general. It does not explain whether you are interested in producing knowledge about the costs of soil degradation to farmers, or to governments, or to the national economy. Nor does it tell whether your research is going to contribute to generic knowledge about costs of soil degradation by developing a methodology for assessing and measuring such costs, or whether instead it consist of a case study in a specific area to empirically establish what these costs could be. The problem statement also does not indicate whether you are interested in all possible forms of land degradation, or just in a specific form of land degradation. A better problem statement would then for instance be: “There is no generally applicable methodology for assessing the costs of various forms of land degradation in terms of decreases in agricultural productivity at the level of national economies.”

5 Purpose/objectives

With the (research) objectives, you explain WHY you want to do this research. Which land and water management problem will your research contribute to solving? What are the expected outcomes of your research? For whom will your research outcomes make a difference, or matter? To which theories, bodies of knowledge or academic debates will your research contribute? The objectives thus provide the justification of your research. There are different types of objectives or purposes, and an oft-used distinction is that between development objectives (or societal relevance), scientific or academic objectives and personal objectives. All of them however refer to what your research is contributing to. We discuss each of these in more detail below.

5.1 Development objectives (or societal relevance)

Contributing to solving land and water management problems is an important justification of most ILW studies. Yet, by itself most research does not solve those problems; research only helps to create a better understanding of (the causes of) problems or the effectiveness of solutions. It is therefore important not to make exaggerated claims and promises for instance about how your research will help end hunger and poverty in the world, but to instead formulate your development objectives with a sense of modesty and realism.

5.2 *Scientific or academic objectives*

All research somehow wants to generate knowledge or information about a specific topic of problem. Scientific or academic objectives indicate to which theories, debates or methodologies your research will contribute, clarify what new insights it will generate about a problem, or explain which new interpretations of a situation the research sets out to provide. These objectives provide the scientific justification of your research, and show why it is scientifically relevant or innovative. With your scientific objectives you also indicate what type of knowledge you will produce through your research. Is your research exploratory or descriptive? Or is it instead explanatory? Or does it set out to make predictions about the future?

5.3 *Personal objectives*

You may also want to specify what you yourself want to achieve or gain by doing this research, for instance in terms of skills or competences, or in terms of improving your career perspectives, or realizing a long cherished dream of visiting a particular country, or writing a scientific text or article, or... Making your own expectations explicit is useful, and may also help you in making some research choices. Not all personal objectives are relevant to include in the proposal, however. “I want to learn how to do research” is for instance a bit too obvious and general as a personal objective, whereas “I want to visit my grandmother” can be a nice additional reason to go somewhere, but is not very likely to be of immediate interest to most of the readers of your proposal.

6 Concepts and theories

The section on concepts and theories often includes a review of the different approaches and definitions that apply to the research problem. You can use this review to discuss the merits and drawbacks of different ways of defining key terms and of different theoretical approaches in view of your objectives. With which authors do you agree and why? With whom do you disagree? Such a discussion serves to select and justify your own definitions and choice of theories, and also helps to intellectually situate yourself in academic debates. You may discover that there are no good definitions or theories available to tackle your specific research problem. In such a situation, you can use your critique of existing theories and definitions to come up with new ones that better serve your purpose.

For many of you, the need to precisely define your object of study, and to clearly explain your theoretical perspective, may seem a rather burdensome task the use of which is not immediately apparent. For some, having to develop a conceptual or theoretical framework may even be a source of anxiety and frustration. “I just want to go to the field and observe what is happening” is an oft heard assertion, while many students also somehow feel that what and how they see and do in their research is so self-evident that it does not require much explanation. To take away some of this anxiety, and to lighten the burden of conceptualization, it may help to simply consider this section as consisting of two important tasks: (1) Define your main concepts; (2) Explain how these concepts relate to each other. In the section 9, methodology, you then continue with how the *application* of these concepts and theories to your particular research question.

The actual importance of conceptualization and of explicit theorizing depends on the type of research you do. If your research consists of measurements in controlled (quasi-) laboratory settings in which most variables are known, an accurate description of these settings and variables can (partly) substitute for conceptualization. And if you do a modelling exercise, your emphasis will lie more on describing the assumptions employed in the model. Also in these cases it is important to describe and explain the main concepts that you use during your research, i.e. make explicit what you exactly mean by using certain terminology (particularly the concepts used in your research questions, see sections 7 and 8).

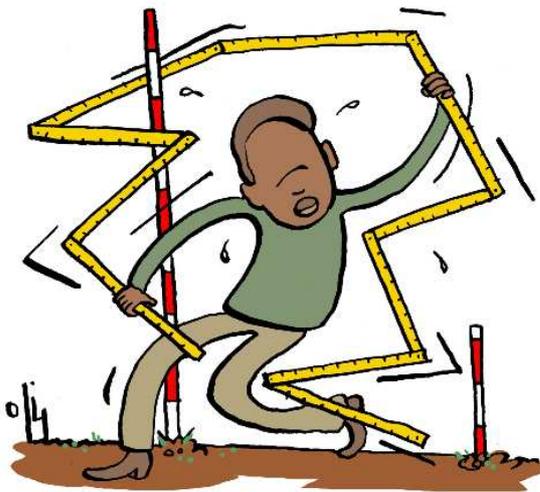


Figure 9: MIL student struggling with his conceptual framework

Yet, much ILW research deals with attempts to understand actual land-and water management situations in the field. Such situations are intrinsically *complex*, which means that they have many different contributing factors and underlying causes. Land and water allocation and management involve often contradictory and complex, or ‘wicked’, problems. Causes and effects of its use and management, and costs and benefits are separated over space and time or hard to see, involving multiple stakeholders at different scales and coordination across political boundaries. Wicked problems are clusters of interrelated problems, characterized by high levels of uncertainty and a diversity of competing values and decision stakes. Typically, ‘knowing’ and representing wicked problems, let alone proposing solutions, is a highly controversial matter in which many different accounts of reality compete with each other (Wester et al., 2004).

What this means is that ILW realities can not be observed in their totality; research necessarily only deals with a limited aspect of reality. And, because much of it takes place in *real life* situations, it is impossible to isolate some causal mechanisms and factors. In real life, it is also difficult to avoid unwanted interferences or circumstances that are likely to affect the nature of your observations and measurements, such as for instance a political insurgency or extra-ordinary weather conditions. How then, to know which mechanisms and factors matter more or most, and how to establish whether what you have observed is typical or exceptional? And perhaps more fundamentally, how to know what to look for in the first place? It is with the help of your conceptual framework and through your choice of theories that you make and justify such decisions. In a way, with your conceptual framework you create a mental laboratory – a model -

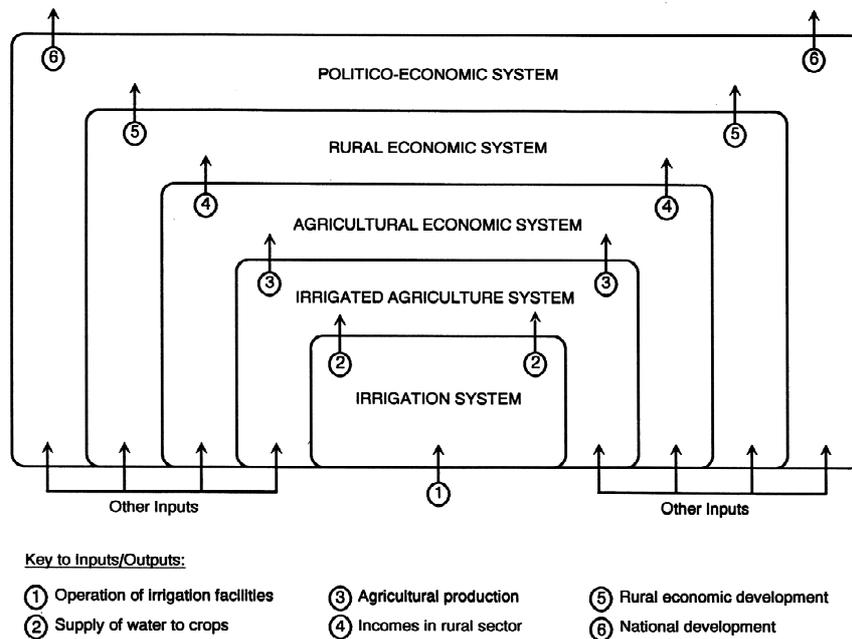
of the reality you are investigating, allowing you to isolate certain phenomena, observations and causal mechanisms from others through choosing specific modes of abstraction and modes of explanation and understanding (and not others).

Much in ILW research therefore depends on the initial definition of the field of study, and on the conceptualization of the key research objects.⁷ What, then, is a conceptual framework? A *conceptual framework* consists of a statement of theoretical principles that guide logical and systematic development of a research design, a specified policy, or an approach to problem solving. A good framework helps you determine what to observe, describe and explain of your research object, and provides you with criteria for recognizing which phenomena to consider as deviant and in need of explanation. Conceptual frameworks thus act like maps that give coherence to empirical inquiry. Because conceptual frameworks are potentially so close to empirical inquiry, they take different forms depending upon the research question or problem. The frameworks are always linked to particular research purposes (exploration, description, gauging, decision making, explanation, prediction). When purpose and framework are aligned, it becomes easier to make your choice of methodology.

A logical way to start developing your conceptual framework is by defining the key terms of your problem statement or main research question. These are your ‘concepts’. “A concept is a word or set of words that expresses a general idea concerning the nature of something or the relations between things, often providing a category for the classification of phenomena. Concepts provide a means of ordering the vast diversity of empirical phenomena, are essential in the process of generalizing, and form the basis of language. However, concepts are not inherent in nature itself, waiting to be discovered, as it were. Concepts, including scientific concepts, are mental constructs reflecting a certain point of view and focusing upon certain aspects of phenomena while ignoring others. Therefore, the concepts a person uses have an important effect upon his perceptions of reality. Scientific concepts form part of scientific theory.” (Theodorson and Theodorson, 1969: 68)

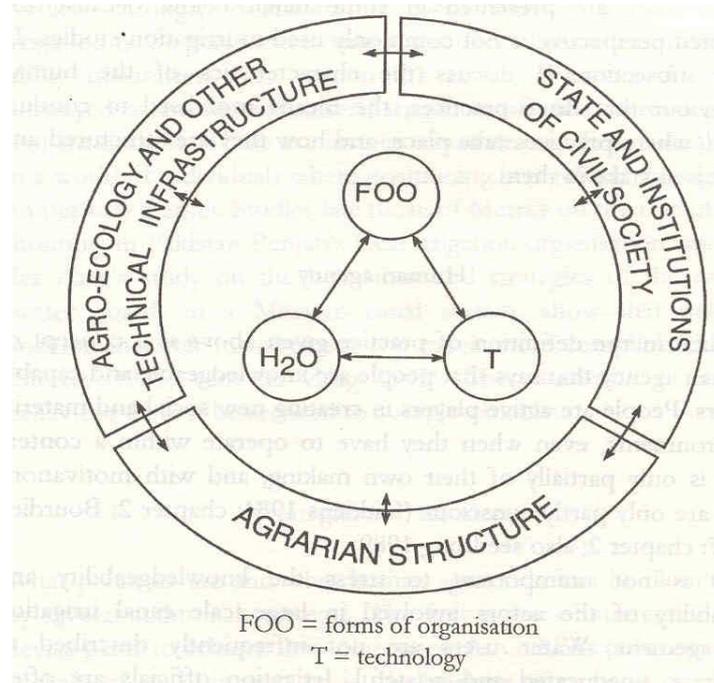
Consider for instance the differences between the ways of defining and representing an irrigation system by Small and Svendsen (1992) as compared to Mollinga (1998).

⁷ Not all researchers and scientists attach the same importance to conceptualization, and to an explicit conceptual framework. Different views about how reality can be known often lie at the basis of such differences, with the difference between epistemological positivism and post-positivism forming the major dividing line.



(Small and Svendsen, 1992)

These are two entirely different ways of conceptualizing and defining an irrigation system. The first, by Small and Svendsen is a conceptualization that compares an irrigation system to a machine which transforms inputs (the operation of irrigation facilities) into outputs (the supply of water to crops). It places the irrigation system at the centre of the observed reality; it is a system centred definition. The conceptualization shows an identification with those who design and manage or operate the system. This is logical given its purpose: it is meant to help assessing how irrigation managers can improve their work – how they can get the best out of irrigation systems. Since the only thing managers can manipulate – by operating the system – is the supply of water to crops, this is the only relationship that is represented as linking the irrigation system to the wider environment. Small and Svendsen define an irrigation system as follows: “a set of physical and social elements employed (1) to acquire water from a naturally concentrated source (such as a natural channel, depression, drainage way, or aquifer); (2) to facilitate and control the movement of water from this source to fields or other areas devoted to the production of agricultural crops or other desirable plants; and (3) to disperse the water into the root zone of these areas.” (Small and Svendsen, 1992:3). Small and Svendsen developed their conceptualization with the purpose of establishing a framework to compare and understand the performance of irrigation systems across countries and times. They explicitly note that they do not aim to identify factors that explain particular levels of performance (Small and Svendsen, 1992:1).



(Mollinga, 1998)

The conceptualization of Mollinga, instead, pictures an irrigation system as the dynamic interaction between people, water and technology – without giving one of these three more prominence than the other. He defines an irrigation system “as a labor process with the objective to bring water from A to B in order to grow agricultural crops” (Mollinga, 1998:16). This definition stems from a wish to analyse water distribution practices in a particular system, the Tungabhadra Left Bank Canal. Mollinga’s objective is to “understand what is happening in canal irrigation in South India in order to address the question how these systems can develop into more efficient and equitable operations.” His conceptualization is less system centred, and also does not start from an a priori identification with the managers as the ones who decide and control all that happens in a system – and thus as THE entry-point for improvement. Instead, Mollinga posits that water control is *contested*, explicitly theorizes its process dimensions, and identifies different dimensions of water control (technical, organizational and socio-economic/political).

The two definitions and conceptualizations of an irrigation system differ significantly in what they see as (how Small and Svendsen call it) “the nature of irrigation”. Where Small and Svendsen take managerial or operator’s control as a given, Mollinga wants a definition that allows for questioning and analyzing how control works. Where Small and Svendsen are only interested in what comes out of the system (because they want to assess its performance), Mollinga is interested in “the system in context” to understand how it actually functions in everyday life. Such differences in WHAT an irrigation system IS – what is the nature of irrigation – are called *ontological* differences. The example illustrates that it matters how you define your key terms and concepts in terms of what they allow you to see, observe and explain. What do you need to answer your specific research question?

Concepts most often do not come in isolation, but form part of a larger model, theory, discourse or framework for understanding reality. A good definition of a concept then requires an explanation of the larger theoretical story or model of which it is an element. For instance, your definition of water rights will be different when you choose a theoretical framework or perspective derived from new-institutionalism, common property resource management or empowerment thinking. In the first case, your definition is likely to be prescriptive, seeing water rights as the necessary legal complement to institutions and technological infrastructure for efficient and effective water distribution (Rosegrant and Binswanger, 1994). In the second case, you'll focus on the property aspect of water rights, and will understand it as a "claim to a benefit (or income) stream" (Bromley, 1992:4). In the third case, your definition will define water rights as (reflecting) social relations of power (Roth, 1998).

Also because concepts often are part of larger theoretical approaches, if you use concepts derived from different theories or discourses you should make sure that these are internally consistent. Not all concepts can be easily 'married' or combined. Although eclecticism (picking and choosing bits and pieces of different theories) is a much practiced phenomenon in ILW research, a bit of caution when blending concepts and approaches is warranted. How do your different concepts relate to each other?

7 Main Research Question(s)

The main research question is one of the most important sentences of your research proposal. Formulating a main research question involves translating your problem statement into a researchable question. Doing this forces you to be as specific as possible about what you want to find out, study, examine, describe, test or measure. Research questions need to be concise and clear and they usually indicate the topic, the period (which historical time period does the research cover) and location (which region, country, watershed..) of the research.

Often, your choice of terms in your research question follows logically from your conceptual framework and choice of theories. Consider for instance, the following research question:

"How did the interactions in the 20th century between the hydrocracy, water infrastructure development and water users in the Lerma Chapala basin in central Mexico recursively lead to water overexploitation, the articulation of water reforms between 1990 and 2005 and the reordering of modes of water control?" (Wester, 2008: 17)

The formulation of the question already shows many of the conceptual and theoretical choices of the author. Words like *hydrocracy*, *articulation of water reforms*, *reordering of modes of water control* carry theoretical meaning and are chosen precisely because of that reason: they indicate that the author looks at water management and reform in a specific way.

Particularly in MSc research proposals we recommend to make research questions as concise and comprehensible as possible: this not only forces you to be specific and focus very well on the final expected outcome or message of your research, but also helps the proposal reader to quickly understand what you are aiming at. Two examples are:

“How is social capital related to sustained activity of Landcare groups under changing levels of external support in Claveria, Southern Philippines?”

“How sensitive is the LISEM erosion model in predicting soil loss caused by land use changes in small scale catchments?”

The main research question should be answerable through your research. Many ILW researchers have the tendency to formulate research questions in a ‘how to?’ form, because they want to use their research results for improving existing situations, and because they often already have a more or less clear idea about what a possible solution or improvement entails. This is so, because much ILW research is closely linked to ILW policies. Examples of such questions are: “How to improve the effectiveness of water management in the Mahaweli irrigation system in Sri Lanka?”, or “How to increase the adoption rate of soil conservation methods among farmers in the Ngenge watershed in Uganda?” Thus formulating a research question is problematic, because it suggests that you know what will happen in the future. The question is about a future situation (an improvement that will happen) that cannot be empirically observed or studied. What you can observe or study is what happens now, or what has happened in the past. A better way of formulating these questions would for instance be: “How does water management in the Mahaweli irrigation system in Sri Lanka in the past 5 years compare to the guidelines for IWRM as formulated by the GWP?” Or: “Was water management in the Mahaweli irrigation system in Sri Lanka effective over the last 5 years?” Or, in the case of the second example: “Why have so few farmers adopted soil conservation methods in the Ngenge watershed in Uganda over the last 3 years?”. In other words, although your research objective may be contributing to solving a problem, it is better not to formulate your research question in the form of a search for an improvement. Focus on description and explanation, rather than on advice.

Another pitfall with research questions is that they are too broad or too narrow. It is important that the question is answerable within the time available, and with the means (budget, instruments, etc.) available.

In case you are planning to undertake a design-oriented thesis or the calibration of an existing model in a new context, it might be wise to refrain from formulating a research question in the first place. In such instances a well formulated research objective may suffice (see box 7.1)

Box 7.1: Research question or research objective?

In some cases it is more suitable to formulate a main research objective instead of a main research question. This is particularly the case in non-curiosity driven research, or research that focuses on solving a certain (technical) problem (i.e. studies with a specific requested output such as some modelling studies or design projects). Hence, you may also opt to formulate a main research objective when you consider that this describes the exact output of your study in a more straight forward manner. Some examples of main research objectives are:

Evaluate the accuracy and assumptions underlying the evapotranspiration component of a simple water balance model.

(in this case it would be not correct to say “What is the accuracy and what are the underlying assumptions...etc.” because the word evaluate captures better what the research is really about)

Design and validate an erosion / sediment delivery model for the Kapchorwa catchment in Uganda, using GIS and based on existing erosion and runoff data.

(this main research objective cannot be rephrased into a question, as it refers to a tangible output, and not to theoretical relationship that should be scrutinized)

To simulate the effect of forest fires on runoff and erosion by means of the LISEM- and the Disturbed WEPP model, in a specific catchment in Portugal.

(this is more straight-forward than asking “What is the effect of forest fires on runoff and erosion in a specific catchment in Portugal, based on a simulation performed by LISEM- and the Disturbed WEPP model”)

8 Sub-questions

With the sub-questions, you operationalize your main research question. The sub-questions indicate how you are going to conduct your research. Taken together, the sub-questions produce an answer to your main research question. This is crucial: the sub-questions must show a clear coherence and taken together cover the main research question or objective. How you divide your main research question into sub questions depends on your conceptual framework and approach: which levels, components, regions, actors, etc. are relevant for your research? What do you need to observe, measure, test, describe? What will you be looking for? Sub-questions are, in other words, *conceptually* inspired and do not consist of lists of all the questions you will include in your surveys, questionnaires or interviews, or of all the measurements you will do.

Sub-questions are useful in two other ways. First, they inform your methodological plan in the sense that each sub-question engages with particular data sets, that you will have to collect or generate in order to satisfactory answer the question. In your methodology you can link each sub-question to a particular mix of data collection methods. Second, sub-questions allow you to thematically or chronologically split the task at hand. Often sub-questions become guiding questions to tackle separate chapters constituting your thesis. In that sense sub-questions can be used to structure the outline of your thesis.

9 Research Methodology

The research methodology explains how you will collect and analyze data in order to answer the main research question, and more explicitly the specific research questions. It details how you set-up the research and combine different methods to get the required information. This requires a further operationalisation of the research questions and the conceptual framework, by making the conceptually formulated sub-questions researchable.

A well-elaborated research methodology contains the following elements:

- a design
- research methods
- a strategy of data collection, management and analysis

More than the exact words or order of these elements, what matters is that you show that you have thought well about how to build up the research and have a practical idea of how to do it.

9.1 The design

A research design comprises the overall approach with which you collect your data. This approach integrates the different methods that you use in a consistent whole, in order to ensure that there is a connection between the kinds of information that you collect.

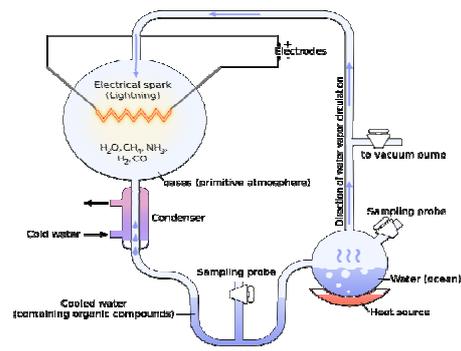
To give you an idea, there are a variety of possible research designs that you could choose. These are a few:

- Experimental research at a research station or in a laboratory
- Literature research
- Survey research
- Model creation or model testing, evaluation and calibration
- Case study research
- Comparative research



Case study research

Source: voter.engr.uconn.edu



Experimental research

Source: commons.wikimedia.org

Several additional choices are important to mention here

⊗ Unit of analysis: What is the entity that you will do research on? In general you can answer this question by asking yourself: What is it a experiment/model/case of? For example: an experiment of moisture measurement techniques in the plant root zone of irrigated crops, a model of erosion in a sub-catchment in South Ethiopia or a case study of the multiple water use between different sectors in Northern Peru.

⊗ Sampling strategy: How will you select the units you will do research on and with what objective in mind?

- Number of units of research; Do you choose for a very thorough investigation of a small number of units or a more superficial but encompassing research of a larger number of units? Is that based on the aim of statistical generalization from a sample to a larger population? Do you aim for other forms of generalization, for example theoretical generalization? Or are there other ways in which your findings are transportable from one to another context?
- Types of units; Are individuals, social networks, technologies, policies, river basins, or plants the central units of your research? On which grounds do you select them?

⊗ Boundaries; How are the boundaries of these units of analysis defined? For example, if case-studies are to be used, it should be clarified what is the unit of their study and how it is confined. The case has to be delineated in geographical and thematical terms. This makes the research feasible given the time limits and what is possible to research.

⊗ Quantitative/qualitative data collection

⊗ Stages in the research: According to which steps do you want to get to grips with the research questions in the field or in the laboratory and collect the information that you need? What does this imply for the decisions which you have to take in the beginning of field research and which ones do you postpone?

In addition to these choices, the following is important: The design should be clearly related to the research questions, it should enable the most feasible and efficient way of answering these through doing research.

9.2 *Research methods*

A research method is a technique to collect data or a tool to gather empirical material. Some examples of research methods are interviews, observations, measurements, experiments, model testing techniques, etc. Research methods are generally selected in view of the design, the theory and concepts, and the research questions. In an absolute sense there are no data collection methods that are superior to others, but they can be more or less appropriate in view of the theoretical and methodological approach with which you have chosen to study a particular topic (Denscombe, 1998).

The design of a study often already presupposes the choice for certain research methods within particular research traditions. For example, surveys are usually carried out through the use of questionnaires, experiments rely on observations and measurements, and case studies often combine interviews and observations. In a similar way, the choice of working with particular theories and concepts may already suggest what are commonly used methods for such research.



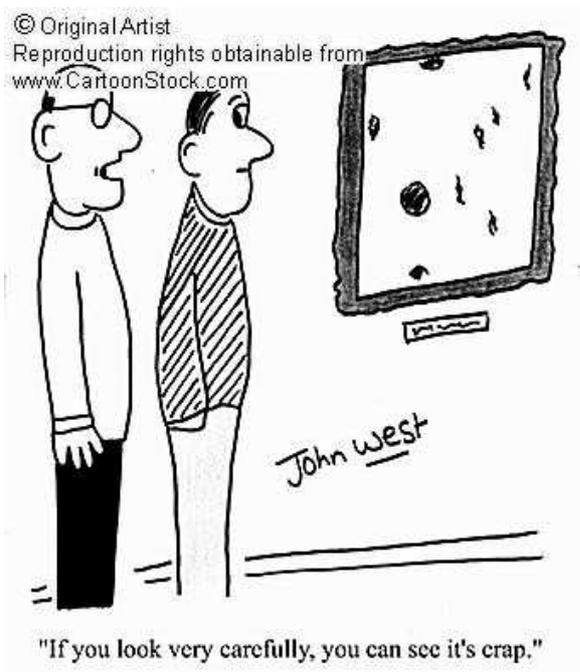
Figure 10: MIL student collecting data

Operationalisation is the explicit description of how you will measure the main concepts used in research questions; i.e. how to make them tangible and researchable. For instance; when your research involves “adoption” of certain LWM practices, what are the indicators you will use for measuring “adoption”? This means that you have to explain how these concepts will be used in practice to study particular phenomena, and what kind of research material you have to collect to say something useful about the issues that they point at. This is where many proposals go wrong. Concepts are not translated from an abstract theoretical level to an operational level, so that you can gather empirical material about them. For example, if you use a broad definition of Integrated Water Resources Management (IWRM) and do not specify which type of integration you are especially interested in and through which methods you want to study that, you will have difficulties to do research on how it is applied in practice. If you decide to look at the integration between different water use sectors in a watershed, you can decide to measure the quantity and quality of their water use and/or interview representatives from these groups. When the operationalisation is carefully done, it becomes clear what the researcher is going to do in terms of actual data collection.

In other words operationalisation is about being practical, focusing on what you are really going to do. When the concepts in a sub research question have been made researchable, it is possible to determine which type of information is required for answering this question (information requirements). Subsequently, you assess which method is the most suitable for generating this particular sort of material. In this manner, you determine for every sub research question, which research methods you need.

9.3 Strategy of data collection, management and analysis

The strategy of data collection is basically how you will build up the research in stages using different research methods. Consider in which sequence and pattern it is most efficient to apply the various methods and collect the research material. For example, will you first start with questionnaires among water users and then do a select number of semi-structured interviews with water user leaders or policy makers, or is it better do it the other way around? Perhaps you decide that besides doing interviews of water users it is also important to observe their actual water use behaviour through a form of participant observation. You will need to explain the reasoning behind organizing your research in this way. This will also help you to reflect whether the research design fits with the type and organisation of methods that you have chosen.



The use of observation

How will you store your data? Of course this depends on the kind of data that you are collecting. If you are working with GIS data this will be different from interviews. When and how do you inscribe your data? At the time and spot of collection itself or after some time when you are in the position to put them in a file or on paper? In the case of measurements, it is now becoming easier, in a context with electricity, to store and process your data immediately in a laptop computer, but when you are doing qualitative observations and interviews, it may be necessary to jot down short notes in a notebook and elaborate them afterwards in your daily field-notes or interview records. Besides recording what primary data your research produces, it may be useful to follow and record your own actions. In a lab experiment you use a logbook, whilst in more qualitative studies you keep a diary of your experiences in 'the field'.

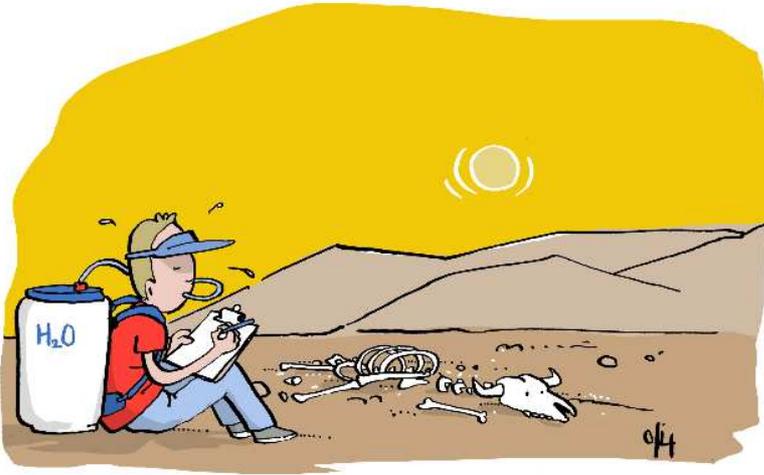


Figure 11: MIL Student on his field work, making observations

It might be necessary to devise a system to number or organize your data, so that you can later easily find a particular record. In the beginning you feel that you can still oversee what data you have collected, but when the research has progressed and particularly during the analysis it is helpful to have an ordered data management system. Hence, it is very important that the data you obtained are stored in a uniform and accessible manner (e.g. tables, databases, excel-sheets, day reports for example diaries, field-notes with memos, etc.). It is not necessary to detail all of these choices in your research proposal, but you have to show that you know and have thought about what you are doing.

How will you analyse your data? For many this is still an abstract question, but you can think for example on how you want to make sense of them and use them in your thesis. Another consideration is the kind of software that you want to use to analysis your data. If you are using a statistical method, a programme like SPSS might be useful. In the case you want to code your data in terms of existing or emerging categories to organize your material, you can use different qualitative data analysis programmes like for example Kwalitan, NVivo, or ATLAS.

3.3 RESEARCH CULTURES AND THE IMPORTANCE OF DIFFERENT COMPONENTS

Within the MIL programme at least three different research cultures are practised, roughly labelled here as (1) modelling; (2) policy relevant research; and (3) realist empirical case study research. Each of these cultures is underpinned by different science perceptions which are accompanied by favoured use of certain theories and methods.

With regard to the development of your research proposal this has a number of practical implications. For instance if you engage in physical or empirical modelling research, the need for an elaborate conceptual or theoretical framework is often not there. Yet it is pivotal that you craft a careful methodological strategy in your proposal paying tribute to the feasibility of, and need for, collecting data that fit your model.