

FINAL REPORT
A PARTICIPATORY METHOD
FOR NEED BASED CAPACITY
DEVELOPMENT PROJECTS AND
PROGRAMMES

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ABSTRACT

**THE THREE-YEAR RESEARCH PROJECT FUNDED BY MSB APPLIES DESIGN
SCIENCE, IN COMBINATION WITH TRADITIONAL SCIENTIFIC INVESTIGATION,
TO DEVELOP A METHOD TO GUIDE THE PLANNING PHASE OF CAPACITY
DEVELOPMENT PROJECTS FOR DISASTER RISK REDUCTION AND CLIMATE
CHANGE ADAPTATION. THE METHOD FACILITATES LOCAL PARTICIPATION
AND OWNERSHIP AS IT BUILDS ON THE STRENGTHS OF THE LOGICAL
FRAMEWORK APPROACH (LFA), WHILE CONTEXTUALISING IT TO SUIT
CAPACITY DEVELOPMENT FOR DISASTER RISK MANAGEMENT AND CLIMATE
CHANGE ADAPTATION.**

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SUMMARY

The terrible impacts of disasters are not evenly distributed in the world and the international community is urging more affluent countries and international organisations to assist less developed countries in strengthening their capacities for disaster risk reduction and climate change adaptation. MSB is active in such capacity development and granted Lund University Centre for Risk Assessment and Management (LUCRAM) research funding in the 2008 competition to address key challenges by designing a participatory method for holistic and systematic analysis of risks and the current capacities of disaster management systems in developing and least developed states.

The three-year research project applies design science in combination with traditional scientific investigation. It draws on established theory and on new descriptive empirical studies in El Salvador, Tajikistan, Sri Lanka, Fiji and South Africa, to inform the arguments behind the criteria to evaluate the method against. It then applies a cyclic design process in which the method is developed, utilised and evaluated in three case studies in South Africa, Botswana and Tanzania. The results from each case study are however not only used for the incremental development of the method as such, but also as input to the planning of actual capacity development projects.

The method facilitates local participation and ownership as it builds on the strengths of the Logical Framework Approach (LFA), while contextualising it to suit capacity development for disaster risk management and climate change adaptation. It builds in other words on the input of a broad range of stakeholders, i.e. beneficiaries, decision-makers, implementers and financiers. The research project focuses on contextualising its three initial steps to suit capacity development for disaster risk management and climate change adaptation, while presenting the contextualised LFA in full.

The method approaches our complex world as a human-environment system with a multitude of key elements and their relationships. This approach does not only facilitate grasping the complexity of dependencies, but also shed light on how to analyse the capacity of the system to manage risk and disasters. Approaching these systems as having purpose, function and form facilitates the construction of a general framework that is applicable in all countries, while facilitating the inclusion of the contextual differences of each. Whereas the risk analysis part of the situation analysis in the method is vital, it seems to be of less importance to MSB as basic risk assessments often have been eroding the interest of partners to invest additional time in that. The rest of the method seems on the other hand to suit MSB well.

The pragmatic design science methodology of this research project has proven to facilitate synergies between the research project and the capacity development agenda of MSB. As the close involvement of MSB programme officers contributes to the research project and the research team contributes to facilitating actual capacity development projects, both method design and capacity development are

strengthened. This close collaboration is viewed as very valuable by the research team, and something to strive for in the future.

Finally, the resulting method for holistic and systematic analysis of risks and the current capacities of disaster risk management systems is designed in the context of developing and least developed states. However, as long as it can be argued that the same design criteria apply to the context of the development of disaster risk management and climate change adaptation capacities in Swedish contexts, it may be useful there as well.

CONTENTS

1. INTRODUCTION	1
1.1. BACKGROUND	1
1.2. PURPOSE AND RESEARCH QUESTIONS	3
2. METHODOLOGY	4
2.1. DESIGNING A SATISFACTORY METHOD	4
2.2. A SCIENTIFIC DESIGN PROCESS	5
2.3. METHODOLOGIES, METHODS AND SOURCES	6
3. RECOUNTING THE RESEARCH PROCESS	7
3.1. SCIENTIFIC PROCESS	7
3.1.1 <i>Defining the purpose and design criteria</i>	7
3.1.2 <i>Develop, utilise and evaluate</i>	8
3.2. ADMINISTRATIVE PROCESS.....	9
3.2.1 <i>Reference group meetings</i>	9
3.2.2 <i>Reporting to MSB</i>	10
4. A SHORT DESCRIPTION OF THE RESULTING METHOD.....	11
4.1. A LOGICAL FRAMEWORK APPROACH.....	11
4.2. ANALYSIS OF PROJECT CONTEXT	12
4.3. STAKEHOLDER ANALYSIS	13
4.4. SITUATION ANALYSIS	14
4.5. OBJECTIVES ANALYSIS	19
4.6. PLAN OF ACTIVITIES	20
4.7. RESOURCE PLANNING	20
4.8. INDICATORS.....	21
4.9. PROJECT RISK ANALYSIS AND MANAGEMENT	21
4.10. ANALYSIS OF ASSUMPTIONS	22
4.11. SUMMARY OF METHOD	22
5. PUBLICATIONS IN PROJECT.....	25
5.1. SCIENTIFIC PUBLICATIONS	25
5.2. COMMISSIONED PUBLICATIONS	26
6. OTHER COMMUNICATION ACTIVITIES	27
6.1. OPEN SEMINARS	27
6.2. INTERNAL MSB SEMINARS	27
6.3. ACADEMIC AND PROFESSIONAL COURSES.....	27
6.4. PRACTICAL APPLICATIONS.....	27
7. FINAL REMARKS	29
8. REFERENCES	31

1. Introduction

This is the final report for the MSB funded research project “A participatory method for need based capacity development projects and programmes”, at Lund University Centre for Risk Assessment and Management (LUCRAM) 2009-2011.

1.1. Background

The terrible impacts of disasters are not evenly distributed in the world. Developing countries are bearing the brunt of the suffering and devastation (Figure 1) (UNDP 2004), threatening sustainable development and the achievement of the Millennium Development Goals (UNDP 2004:9-27; Sachs & McArthur 2005). A growing number of donor agencies are recognising these connections between disaster risk and poverty, and are drafting policies for how to further integrate disaster risk management and climate change adaptation into their official development assistance (e.g. DFID 2006; Danish Ministry of Foreign Affairs 2007). This process is guided by the implementation of the Hyogo Framework for Action 2005-2015 (ISDR 2005), which was adopted by 168 states at the in World Disaster Reduction Conference in 2005, only a few weeks after the Indian Ocean Tsunami. This framework for action, referred to as HFA, declare that its goal to substantially reduce disaster losses requires the development of the capacities of disaster prone countries to reduce and manage disaster risk.

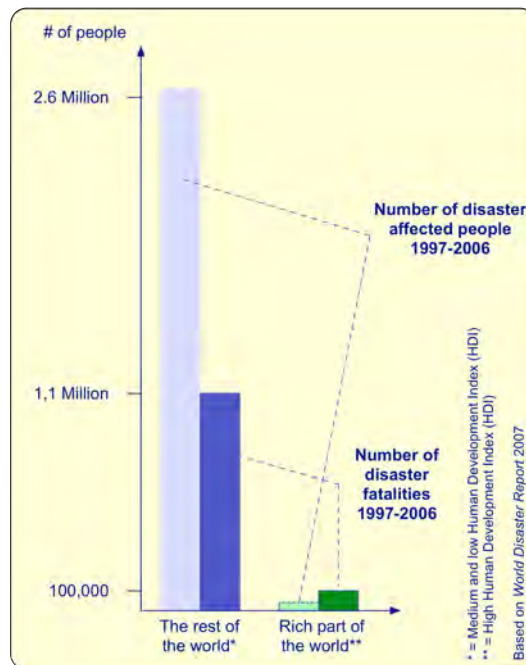


Figure 1. The Disaster statistics 1997-2006 (World Disaster Report, 2007).

The international community is urging more affluent countries and international organisations to assist less developed countries in developing their capacities for disaster risk reduction and climate change adaptation (CADRI 2011). However, not all capacity development efforts by international organisations in this context have resulted in enhanced capacity in the targeted countries (UNDP 2004:76-77; CADRI 2011:7-8). One reason for this is lack of analysis of the relevant risks and initial capacities, within the countries in question, to use as basis for project planning and implementation (Twigg 2004:289; Schulz et al. 2005:7; Becker 2009). Capacity assessment has thus been identified as a vital tool to pursue this capacity development agenda (Lopes & Theisohn 2003; UNDP 2008a; UNDP 2009; CADRI 2011), but seems to be applied to various degrees in the context of disaster risk reduction (CADRI, 2011:7-8).

Another challenge, limiting the success of capacity development efforts in this context, is that disaster risk is a complex issue involving all spheres of society, i.e. the physical and environmental, the social and cultural, the political and the economic (ISDR 2004:16; Wisner et al. 2004:49-84; Boin & McConnell 2007:114-129; Coppola 2007:146-161). This complexity of interdependent factors determining risk has been identified as a major obstacle for effective disaster risk reduction (Perrow, 2008:164-165), requiring more holistic approaches (McEntire et al. 2002; Cochard et al. 2008; Marvin et al. 2009).

MSB is working both bilaterally and multilaterally to support the development of capacities for disaster risk management and climate change adaptation in disaster prone developing countries. Being faced by the challenges of capacity development in this context, MSB granted Lund University Centre for Risk Assessment and Management (LUCRAM) research funding in the 2008 competition. The three-year research project, "A participatory method for need based capacity development projects and programmes", is in other words not done in isolation, but together with MSB and relevant stakeholders of their targeted disaster risk management systems.

The project has thus dual goals, the problem-solving goal of identifying challenges in the targeted disaster management systems (while raising awareness of them amongst stakeholders) and the research goal of designing a participatory method for holistic and systematic analysis of risks and the current capacities of disaster management systems (McKay & Marshall 2001:50-51). This duality of goals has its pitfalls (Rapoport 1970) and balancing active involvement with integrity and critical reflection is fundamental to the process (Greenwood & Levin 2007:64-65). However, such pragmatic approach has a clear benefit, as the credibility and validity of the research can be measured by whether actions that arise from it solve the identified challenges and increase the participants' control over their own situation (Olsen & Lindøe 2004:372).

The research project is implemented by a research team lead by Professor Kurt Petersen, and initially including Associate Professor Per Becker and Associate

Professor/Reader Henrik Tehler. In the final 18 months of the project, Assistant Professor Marcus Abrahamsson has got increasingly involved, and although his contribution has not been funded directly by the project, he has been involved in fieldwork, in developing the method and in utilising it in practice outside the project. Peter Månsson at MSB's Section for International Operations coordinated the research project internally.

1.2. Purpose and research questions

The overall intention of the research project is to facilitate the capacity development work of MSB, by addressing some of the major challenges in the design stage of MSB's international development cooperation projects. The purpose of the project is thus:

“to improve the possibilities to develop sustainable disaster management capacities by generating a participatory method for holistic and systematic analysis of risks and the current capacities of disaster management systems in developing and least developed states”.

To meet this purpose the project applies a design science approach, informed by a set of traditional scientific studies, and answers the following three research questions:

RQ 1: How can disaster management systems be described holistically and systematically?

RQ 2: How can this description be used to holistically and systematically analyse risks and capacities of disaster management systems?

RQ 3: How can the method be designed to ensure local participation and ownership?

2. Methodology

This chapter presents in brief some key issues of design science, the scientific design process applied and the methods and sources used when collecting data for the different studies.

2.1. Designing a satisfactory method

The scientific design of a method necessitates a somewhat different approach than traditional science (March & Smith 1995; Abrahamsson 2009:20). Instead of being mainly concerned with the pursuit of knowledge (Weber 1949; Ravetz 1996; Checkland 1999:50), the focus must be placed on designing a method that must meet some predefined purpose (Simon 1996:4-5, 114; Poser 1998:85-87; Cook & Ferris 2007:173; Abrahamsson 2009:20; Hassel 2010:14-15).

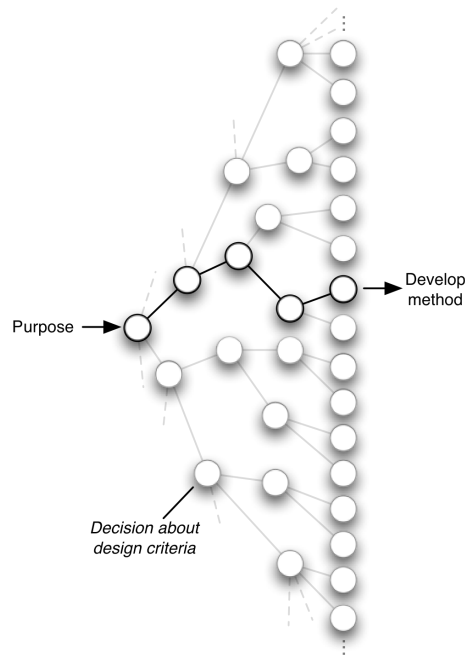


Figure 2. The additive process of establishing design criteria.

The normative focus of this endeavour poses a different challenge than for traditional descriptive research, as normative statements are inferred from value preference and not from empirical observation. This challenge opens up the way for an infinite number of possible methods that could be considered to meet the stated purpose (Figure 2) (Simon 1996:119-120; Poser 1998:86). Just as it is unfeasible to identify all possible methods, it is also unfeasible to design the optimal method (Simon 1996:119-120; Poser 1998:86; Hevner et al. 2004:88-89).

The aim must instead be to design a method that satisfies some predetermined design criteria (Simon 1996:119-121; Abrahamsson 2009:23; Hassel 2010:40). To scientifically develop the framework, we must ensure transparency of both what underlies decisions about design criteria and of the design process itself, so that they are open to scientific scrutiny (Abrahamsson 2009:22-24; Hassel 2010:42-47).

Each decision about a specific design criterion may or may not have implications for other criteria, but the process to establish them can be seen as additive in the sense that each decision determines the path to take through this part of the design process (Figure 2). The set of design criteria is then what the method is evaluated against.

2.2. A scientific design process

Recent applications of design science in similar contexts argue persuasively for an increase in scientific rigour in designing artefacts, the method in this case, when applying a systematic and transparent design process (Abrahamsson 2009:22-24; Hassel 2010:42-47). Normative assumptions regarding purpose and design criteria must be explicitly stated, and the choices directed by those assumptions are justified through logical reasoning (Abrahamsson 2009:22-24; Hassel 2010:42-47). The scientific design process used in this study is developed from these innovative examples (Figure 3).

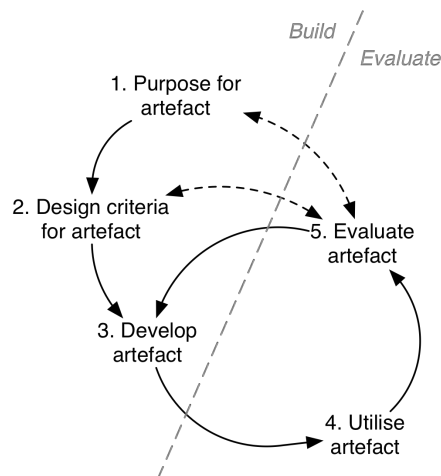


Figure 3. A scientific process for designing artefacts(developed from Abrahamsson 2009:22-24; Hassel 2010:42-47).

The first step in this process is to clearly define the purpose (or purposes) of the artefact (Simon 1990:13; Simon 1996:4-5,114; Cook & Ferris 2007:173-174; Abrahamsson 2009:22; Hassel 2010:43). This purpose is generally described in rather abstract terms and acts like an overall guiding principle for the rest of the design process (Hassel 2010:43). The second step is to define the design criteria that the artefact must meet (Abrahamsson 2009:22; Wieringa 2009:1-2). These

design criteria are normative assumptions about the required function (or functions) of the artefact, which must be appropriately justified through logical reasoning informed by established theory or new empirical research (Hassel 2010:43-44). The third step of the design process is to develop the actual form of the artefact, based on our initial judgements regarding what is needed to meet the design criteria and purpose. The word develop is here used to signify that there may already exist artefacts to improve or build upon. The fourth step of the design process is to utilise the artefact in the intended context, or in a setting that is designed to approximate that context (Ibid.:45). Utilising the artefact in the intended context is vital, as there may be various contextual factors that influence the performance of the artefact (March & Smith 1995:254; Simon 1996:5-6). Moreover, it provides an opportunity to test theories about the context (March & Smith 1995:255). The application of the artefact can therefore cause learning that may inspire modifications in purpose and in design criteria. The fifth step of the design process is to evaluate the performance of the artefact against its design criteria and purpose. If the result of this evaluation is unsatisfactory, either the artefact must be further developed or the purpose and design criteria adjusted. Such adjustments of purpose and design criteria may be constructive if spurred by increased understanding of the context, but not if caused solely by demands to show improvement by reducing the gap between the artefact's actual and desired state (Senge 2006:107-108).

2.3. Methodologies, methods and sources

Both descriptive research, to inform the justifications behind the establishment of key design criteria, and normative research, to build and evaluate the method, involves scientific research methodologies and data collection methods with different strengths and weaknesses. The research methodologies applied in the project are case study research, survey research and design research, and the data-collection methods are structured interviews, semi-structured interviews, focus groups, transect walk and observation. The sources for primary data are mainly people holding public office on different administrative levels, but include also respondents and observations from community level. The primary data comes from Sweden, Tajikistan, Sri Lanka, El Salvador, Fiji, South Africa, Botswana and Tanzania.

3. Recounting the research process

This chapter describes how the research project was implemented over the three years, including both the scientific process and the administrative process.

3.1. Scientific process

3.1.1 Defining the purpose and design criteria

The purpose of the method is to facilitate holistic and systematic analysis of risks and the current capacities of disaster management systems in developing and least developed states, and to involve the stakeholders of those systems in the process. The result of this analysis would then be used as input to the design of capacity development projects and programmes to improve the effectiveness and sustainability of their results.

Although the stated purpose and the context of MSB's work give some guidance on necessary design criteria, substantial literature review and further empirical investigation were needed to inform the normative arguments behind them. The first nine months of 2009 were thus focused on establishing design criteria, forming normative arguments informed by available theory found in an extensive literature review and by new empirical research. During this time the research team analysed data collected in Sri Lanka, Tajikistan and El Salvador before the project started, resulting in two publications. During this time the team also collaborated with a LUCRAM colleague outside the project in the production of another publication, although the data for this study was collected within the scope of another research project. In these first nine months the team also conducted field research in Fiji, leading to two publications so far. Another study in South Africa in 2010 also informed the arguments behind the design criteria and resulted in a publication.

The resulting design criteria that the method must be able to satisfy are:

1. Integrate phenomena on various spatial and temporal scales, as well as structural and functional complexity (systemic);
2. Accommodate different stakeholder values (multi-value);
3. Incorporate a wide range of hazards that may impact what stakeholders value (multi-hazard);
4. Integrate a multitude of factors and processes contributing to the vulnerability of what stakeholders' value to the impact of the hazards (multi-susceptive);
5. Involve various stakeholders across functional, administrative and geographical borders (multi-stakeholder);
6. Integrate several analyses performed by different groups of stakeholders (multi-analysis).

3.1.2 Develop, utilise and evaluate

These six design criteria were then guiding the design of the first embryo of the method. It was found early that the utility of the method by MSB would benefit from integrating it into the Logical Framework Approach (LFA), which is more or less mandatory to use for project planning when applying for funds from most international donor agencies. LFA was also deemed particularly beneficial as it is already including means to facilitate stakeholder participation and ownership, which is an important part of the purpose of the method.

Considering the purpose of the research, its main contribution to LFA is contextualising the situation analysis of LFA to suit capacity development for disaster risk management and climate change adaptation. As the situation analysis can be seen as divided into two parts in this context, the analysis of risk and the analysis of capacity to manage risk, the research team endeavoured to develop a method that include both parts.

A first version of a risk analysis framework that would meet the design criteria was developed and utilised in a case study in South Africa during the last three months of 2009. This was followed by five months analysing the collected data and evaluating how the initial version met the design criteria. The risk analysis framework turned out to satisfy the design criteria to large extent, although challenges of manually managing the vast amount of data were identified. This study led to two publications, out of which a PhD thesis presents the risk analysis framework in detail.

The initial plan was to launch a second case study in the summer of 2010. However, a delay in MSB's decision on which country to focus on caused this case study to be cancelled. The decision of cancelling the case study was taken jointly by MSB and the research team, although the method was presented and partly utilised to guide the work of the research team in Mozambique later that year.

The last part of 2010 was focused on further developing the method and applying it in Botswana. The intention of the research team was initially to utilise the risk analysis framework, as well as the newly developed capacity analysis framework. However, the partners in Botswana had recently commissioned a consultant to produce a national risk assessment, so the research team and MSB agreed to focus on the capacity analysis only. The case study in Botswana was conducted in close collaboration with an MSB Programme Officer, who happened in this case to be the internal project coordinator.

2011 started by analysing the data collected in Botswana, evaluating how the new version of the method met the design criteria and writing a full report to MSB on the results of the case study. The result of the case study was then used by MSB to develop a project proposal for partner driven cooperation with counterparts in Botswana. Although outside the scope of the research project, a member of the research team, Marcus Abrahamsson, supported the development of this proposal. On top of this, Marcus was also involved in developing a regional project for the

Southern African Development Community (SADC), for which the method was applied to guide the work. During this time the framework of the method was also presented on two scientific conferences in Italy and France.

After some minor alterations, based on the evaluation, the method was utilised again in Tanzania. This case study was yet again implemented in close collaboration with an MSB Programme Officer, and included two missions to Tanzania in May-July 2011. As the MSB counterpart had commissioned risk assessments to be implemented earlier, the research team and MSB agreed to use the results of those and focus on the capacity analysis part of the method.

The rest of the summer, after the case study in Tanzania, and early autumn, was then focused on analysing the collected data, evaluating the method against the design criteria and writing a full report to MSB on the results of the case study. The result of this is currently being used by MSB to develop a project proposal for international development cooperation with their counterparts in Tanzania. The last part of 2011 was focused on reporting and presenting the final method for MSB staff at a seminar in Karlstad.

3.2. Administrative process

3.2.1 Reference group meetings

The project has a reference group that has met twice per year, with the exception of the first year when the meeting was held over the phone and the last year when it was not possible to gather the reference group. The internal project coordinator at MSB endorsed these exceptions.

The members of the reference group are:

- Joakim Eriksson, MSB
- Peter Månsson, MSB
- Kurt Petersen, Lund University
- Henrik Tehler, Lund University
- Per Becker, Lund University
- Thomaz Carlzon, Swedish Red Cross
- Flemming Konradsen, University of Copenhagen
- Marianne Jahre, Lund University and BI Norwegian School of Management
- Odd Einar Olsen, University of Stavanger
- Rolf Larsson, Lund University

Having such a multi-disciplinary and geographically dispersed reference group has been invaluable to the project as such, but also made it difficult for the reference group to meet in full. In any case, the research team is very thankful to the

members of the reference group for all advise and support given over the three years.



Figure 4. The location of the members of the reference group.

3.2.2 Reporting to MSB

The contract between MSB and LUCRAM specifies that the research team submits a mid-year report before 31 May and a full-year report before 30 November every year. These reports include a narrative report, a brief progress report and a financial report. The contract also specifies that LUCRAM submits an invoice specifying their costs for the project within 14 days of the report.

The research team has experienced the reporting procedures as straightforward, with the exception of the first full year financial report. That time the level of details was insufficient to explain the exact balance between budget and outcome, which was caused by the research team investing more than budgeted in the project, and Lund University co-funding the excess costs. This issue has since then been addressed, by a more detailed financial overview attached to the full printout from the financial system of Lund University. It has however been unclear if this background information has been easily accessible by the project coordinator at MSB.

4. A short description of the resulting method

This chapter presents a summary of the resulting participatory method for holistic and systematic analysis of risks and the current capacities of disaster risk management systems in developing and least developed states.

4.1. A Logical Framework Approach

The designed method for holistic and systematic analysis of risks and the current capacities of disaster management systems follows Logical Framework Approach (LFA) and builds upon Örtengren's (2003) work in the form of Sida's guidelines for LFA. The LFA methodology is however adapted to suit the particular context of capacity development for disaster risk management and climate change adaptation.

The rationale of the Logical Framework Approach is that there is a current situation that contains some challenges that are deemed undesirable but possible to resolve through purposeful activities. In other words, that there is a current situation that can be turned into a desired situation through the design and implementation of a capacity development project for disaster risk management (Figure 5).

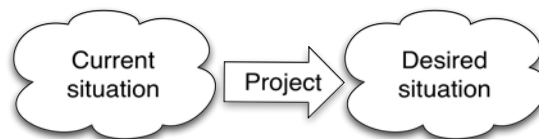


Figure 5. The rationale of LFA.

The version of LFA used is divided into nine steps, three focused on the current situation, one focused on the desired situation and five focused on the project (Figure 6). Thus only the first three steps of the LFA are covered in detail by the research project, but the remaining steps are also presented to guide further work to design effective and sustainable capacity development projects.

For every step of the LFA, one or a few overarching questions are initially presented (in italics) to illuminate the main purpose of that step (based on Ibid.). Thereafter follows more detailed questions to answer for each step, as well as methods and sources to use when answering them.

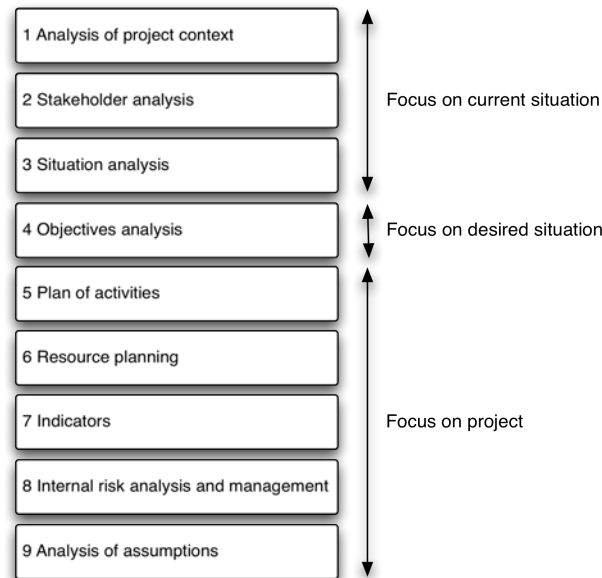


Figure 6. The steps and focus of LFA.

4.2. Analysis of project context

What is the general rationale and context for the project?

When designing a project for capacity development for disaster risk management it is crucial to start the process by contemplating and formulating the general rationale for the project in the first place. Being explicit and transparent about the reasons for the potential project, as well as for engaging in the process of designing it, is important for building trust between stakeholders, for commitment and ultimately for project effectiveness.

It is also important to consider that the notion of “development”, in the concept of capacity development, may carry different meanings to different people involved in the project design process. What is considered an improvement for one stakeholder may not be considered an improvement by another (Ulrich 2000). It is thus essential to think about and present what is to be considered “development” in the particular project.

Finally, it is necessary to identify what contextual factors that may have an effect on the project (Örtengren 2003). Although this initial part of the project design process is restricted to the identification of general factors, there may be a broad range of physical, environmental, political, economical, social and cultural factors to include in the analysis. A common tool to use for such analysis is SWOT analysis, which stands for strengths, weaknesses, opportunities and threats. This acronym is sometimes changed to SWOC, as the idea of challenges may appear

less intimidating than that of threats in the original form. The content and methodology is however unchanged.

This step of the Logical Framework Approach is summarised as the answer to three questions:

1. What is the general rationale for the development of capacities for disaster risk management in the particular context?
2. What different visions of “development” are considered, and how are they reconciled?
3. What are the general physical, environmental, political, economical, social and cultural factors that could affect the project?

4.3. Stakeholder analysis

Who are directly or indirectly influenced by and exert an influence on what takes place in the project?

The second step of the LFA methodology is the stakeholder analysis, which is an identification and analysis of who are directly or indirectly influenced by or influencing the potential capacity development project for disaster risk management. The stakeholders can be divided into beneficiaries, decision-makers, implementers and financiers (Ibid.). A beneficiary, in this framework, is a stakeholder whose interests are served by the project, a decision-maker is a stakeholder in a position to change it, an implementer is realising its activities, results, purpose and goal, and a financier is funding the project.

It is also important to think about and decide who is to be considered an expert, i.e. what knowledge is considered relevant, and where those involved could seek some guarantee that improvement will be achieved by the project. Finally, and for legitimacy, it is also important to attempt to directly involve some stakeholder who argues the case of those who cannot speak for themselves, e.g. marginalised groups, future generations, the environment, etc, and who seeks the empowerment of those affected but not involved.

This step of the Logical Framework Approach is summarised as the answer to four questions:

1. Who are the beneficiary, decision-maker, implementer and financier?
2. Who is considered an expert and what counts (should count) as relevant knowledge?
3. What or who is assumed to be the guarantor of success?
4. Who is witness to the interests of those affected but not involved and what secures their emancipation?

4.4. Situation analysis

What is the current situation? What are the problems in this situation? What are the causes of these problems? What are the effects of these problems?

The situation analysis is an identification and analysis of the problem to be resolved by the project, and thus the reason for its existence. Situation analysis is in other words fundamental as it is impossible to define goal, purpose, results and activities in an effective manner without first describing the current situation which the project is intended to address. Such description is generally guided by questions about what the problems are in the current situation as well as their causes and effects (Ibid.:9-11). Similarly, the more recently emerged process of capacity assessment emphasises the importance of analysing current capacities and capacity needs (UNDP 2008b; UNDP 2008a; UNDP 2009). The challenge is to translate these general approaches to the specific context of capacity development for disaster risk management.

If the goal of disaster risk management is to reduce disaster risk and the goal of capacity development in this context is for individuals, organisations and societies to obtain, strengthen and maintain capacities to do just that (UNDP 2009), two clear areas for analysis of the current situation emerge. Firstly, what current and future risk that the individuals, organisations and societies are up against, and secondly, what capacities they currently have to manage it. The situation analysis for capacity development for disaster risk management involves in other words the analysis of risk and the analysis of capacity to manage risk.

Analysis of risk

There are many frameworks for analysing risk that have been developed over the last four decades or so (e.g. Haimes 1998; Aven 2003). However, analysing risk to inform capacity development for disaster risk management for sustainable development entails additional, and sometimes different, requirements.

The purpose of this part of the method is to guide the analysis of risk for informing efforts to develop capacity for managing risk to facilitate sustainable development. The risk analysis framework can then be summarised as three principles, two tools and a description of how the three principles and two tools are utilised in practice (Figure 7).

Analysing risk starts in other words by explicitly establishing what is valuable and important to protect. This is done with broad participation from various stakeholders. Also important is the facilitating of dialogue by mapping what stakeholders express as valuable, as well as how these valuable elements are related to each other. Wide participation is vital, aspiring the inclusion of women and men, minorities, etc. The result is a system of interdependent elements, which not only guides us in what to have in mind when identifying relevant initiating events but also in how their consequences would spread between elements. Questions 1-3 below are used to guide this part of the analysis (Table 1).

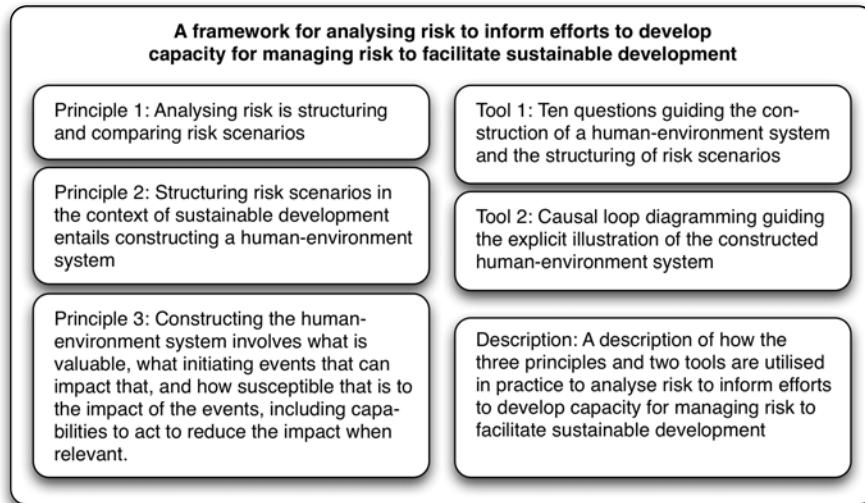


Figure 7. Summary of the framework for analysing risk.

The second step in the analysis is to establish what initiating events are capable of having a negative impact on what has been established as valuable and important to protect. After identifying potential initiating events, it is time to define necessary spatial, temporal and magnitudinal aspects of each. This is done by allowing a definite number of initiating events to represent the entire known collection of possible initiating events.

For each selected initiating event, the contributing factors are identified and included in the system, potentially connecting it to what stakeholders have expressed as valuable and important to protect. Finally, the likelihood of each initiating event is estimated. Questions 4-6 are used to guide this second part of the analysis (Table 1).

The final part of the analysis is to establish how susceptible each valuable element is to the direct or indirect impact of each initiating event. Therefore, for each initiating event that has been identified, it is vital to define how such an event would impact each identified valuable element, including purposeful human activity to reduce the impact where relevant. For each valuable element that may be impacted by a specific initiating event, any contributing factors for its susceptibility, which has not been included in the previous steps, are identified and included in the system. As there is uncertainty in determining what would happen exactly, even given a specific initiating event, it is important to define different potential courses of events and estimate the likelihood of each one happening. After having established the direct consequences of the impact of a specific initiating event on a specific element, it is time to analyse how this consequence would impact the elements dependent on it. Tracing the impact through the system. Questions 7-10 are used to guide this part of the analysis (Table 1).

Establish what is valuable and important to protect

1. What is valuable and important to protect?
 2. Why is it valuable?
 3. Which other elements are valuable in securing that valuable element?
-

Establish which events can have a negative impact on these valuable elements

4. Which events may happen that can have an impact on what human beings value?
 5. Which factors contribute to these events occurring?
 6. How likely is each event to occur?
-

Establish how susceptible these valuable elements are to the impact of the events, including the capability to act to reduce the impact where relevant

7. What can happen to what human beings value, given a specific event, considering actors performing tasks that may influence the outcome where relevant?
 8. Which factors contribute to their susceptibility?
 9. How likely is that to occur?
 10. If it happens, what are the consequences for what human beings value?
-

Table 1. Ten questions for risk analysis.

The result of the risk analysis is a set of risk scenarios that the disaster risk management system must be able to manage to be able to facilitate sustainable development.

Analysis of capacity to manage risk

With a clear picture of what risks that the system for disaster risk management and climate change adaptation is up against, it is time to analyse the current capacities of the system for managing those risks. The concept of capacity is generally defined as “[t]he combination of all the strengths, attributes and resources available within a community, society or organization that can be used to achieve agreed goals” (UNISDR 2009:5). However, to be able to systematically analyse the current capacities for disaster risk management and climate change adaptation, it is vital to concretise what strengths, attributes and resources that contribute to what goal, as well as how to do it.

The purpose of the system for disaster risk management and climate change adaptation is to protect what human beings value, now and in the future, and for doing that the system needs to perform a set of functions. These functions are general for all such systems in the world, but how, by who, with what resources, etc, the functions are done are contextual and varies from country to country. To protect what human beings value, the system for disaster risk management and climate change adaptation must be able to anticipate, recognise, adapt to and learn from threats, accidents, disasters and other disturbances to society. The functions for anticipating such events before they happen are risk assessment and forecasting, and for recognising when they are about to happen, or has happened, are

monitoring and impact assessment. To adapt society to protect what human beings value, we utilise the proactive functions of prevention/mitigation and preparedness, as well as the reactive functions of response to and recovery from actual disasters. Last, but not least, to continuously learn and build an increasingly safe and sustainable society, we need to utilise the function of evaluation and use its results for increasing the effectiveness of the system. These nine functions are not only crucial in themselves, but also largely dependent on each other in such a way that the performance of one function requires the output from another function, e.g. to respond by warning the public to take shelter for a coming cyclone necessitates information from forecasting or monitoring the weather. See figure 8 for an overview of functions and their relations.

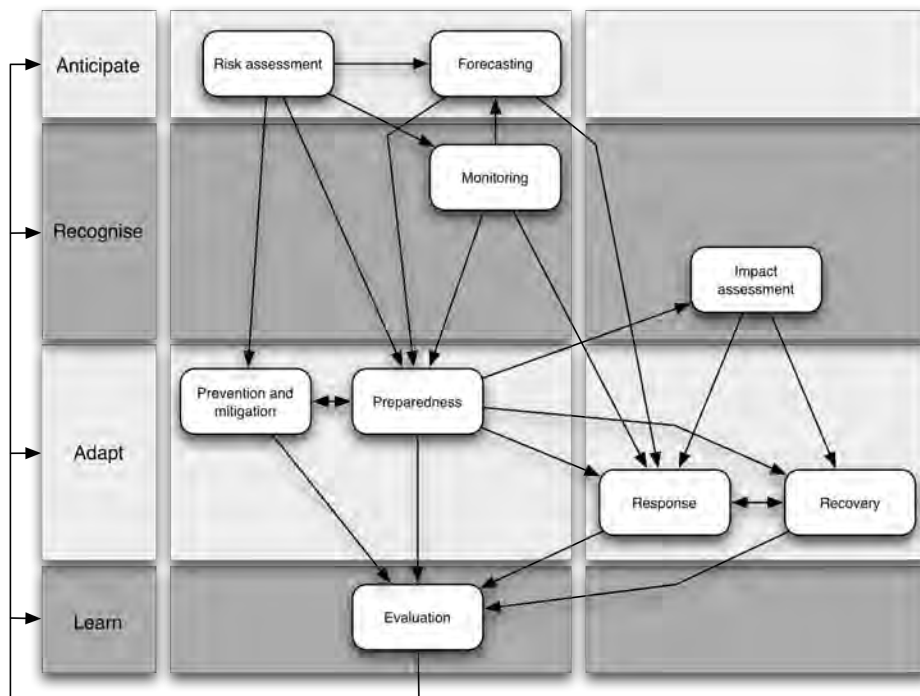


Figure 8. The functions of systems for DRR and CCA.

These nine functions are required for any system for disaster risk management and climate change adaptation in the world (Figure 8). Analysing the capacity for each function in a specific context, however, entails analysing what actually exists in that context in order for each function to work. These factors can generally be categorised under (A) legal and institutional frameworks, (B) system of organisations, (C) organisation or (D) human and material resources (developed from Schulz et al. 2005:32-50). Although there are a large number of potential questions that could be useful to answer to identify and analyse these factors, the

methodology of this scoping study limits them to 22 guiding questions that needs answering for each function (Table 2).

Functions	Levels of factors determining capacity			
	A. Legal and institutional framework	B. System of organisations	C. Organisation	D. Resources
Anticipate 1. Risk assessment 2. Forecasting Recognise 3. Monitoring 4. Impact assessment Adapt 5. Prevention & mitigation 6. Preparedness 7. Response 8. Recovery Learn 9. Evaluation	A.1) Are there any legislation or policy requiring [function]? A.2) Is the utility for [function] stated in legislation or policy? A.3) What stakeholders are identified in legislation or policy as involved in [function]? A.4) Are the legislation or policy stating to whom and how the results of [function] should be disseminated? A.5) Are funds earmarked by legislation or policy for [function]? A.6) Are the legislation or policy implemented? A.7) Are there any values, attitudes, traditions, power situation, beliefs or behaviour influencing [function]?	B.1) What stakeholders and administrative levels are involved in [function]? B.2) Are the responsibilities of stakeholders and administrative levels clearly defined for [function]? B.3) Are interfaces for communication and coordination between stakeholders and administrative levels regarding [function] in place and functioning? B.4) Are interfaces for dissemination, communication, and integration of the output of [function] to stakeholders involved in other functions that depend on the output? B.5) Are interfaces for facilitating coordination between functions in place and functioning?	C.1) What parts of each organisation are involved in [function]? C.2) Are the responsibilities for [function] clearly defined for each involved organisational part? C.3) Are systems for effective collaboration in [function] between the involved organisational parts in place and functioning? C.4) Are there any internal policies for [function] in each involved organisation? C.5) Are these internal policies implemented? C.6) Are interfaces for dissemination, communication, and integration of the output of [function] to parts of the organisation involved in other functions that depend on the output in place and functioning?	D.1) What knowledge and skills on individual level does each involved organisation have for [function]? D.2) What equipment and other material resources does each involved organisation have for [function]? D.3) What funds do each involved organisation has for [function]? D.4) What knowledge, skills and material resources do members of the public have for [function]?

Table 2. Examples of guiding questions for capacity analysis for DRR and CCA.

These guiding questions are not necessarily asked straight out, but needs answering for a comprehensive analysis of capacities for disaster risk management and climate change adaptation.

The situation analysis is based on workshops, meetings, observation and documentation, and is focused on getting a rapid general appreciation of the risks that the system for disaster risk management faces, and on mapping the current capacities of that system for managing these risks. The output of this process is a

holistic and systematic overview of challenges to use as a basis for prioritising key challenges to address in international development cooperation.

This step of the Logical Framework Approach is summarised as the answer to the ten questions in Table 1 and the three following questions:

1. What function is necessary to perform in order to manage the analysed risks?
2. Why is that function necessary to manage the analysed risks and what other functions are necessary to be able to perform that function?
3. What is available in terms of legal and institutional framework, system of organisations, organisation and resources to facilitate the performance of all identified functions?

4.5. Objectives analysis

What is the desired situation? What are the long-term changes needed to reach that situation? What are the direct effects of the project? What are the direct effects of the activities that are implemented within the framework of the project?

The fourth step of the LFA methodology is the objectives analysis, which includes the evaluation of current risks, according to the risk analysis, the evaluation of current capacities to manage risk, according to the capacity analysis, and the formulation of clear project objectives.

The evaluation of risk, in this context, includes a statement of the desired level of risk, or at least of the intention to reduce the current level. Similarly, the evaluation of current capacities to manage risk includes a statement of the desired level of performance, or at least of the intention to increase the level of performance in order to manage the risks at the desired level. The formulation of objectives entails formulating an overall goal (i.e. what the long-term effects of the project are), purpose (i.e. what the direct effects of the project are) and expected results (i.e. what the direct effects of the activities that are implemented within the framework of the project are).

This step of the Logical Framework Approach is summarised as the answer to five questions:

1. What is a desired level of risk?
2. What is a desired level of capacity to manage risk?
3. What is the goal? That is, what are the long-term effects of the project?
4. What are the purposes? That is, what are the direct effects of the project?
5. What are the results? That is, what are the direct effects of the activities that are implemented within the framework of the project?

4.6. Plan of activities

What are the activities needed to generate the results required to reach the purposes and goal of the project?

The fifth step of the LFA methodology is the plan of activities needed to generate the results required to fulfil the purposes and goal of the project. These activities are in other words no ends in themselves, but the means to reach the desired ends as specified in the objectives analysis. It is important to note that projects for capacity development for disaster risk management and climate change adaptation often need to comprise of a mix of activities that are connected and depend on each other for generating the required results. The plan of activities is thus not only a list of activities, but a plan specifying when and in what order the activities need to be implemented.

This step of the Logical Framework Approach is summarised as the answer to three questions:

1. What activities are needed to generate the results required to fulfil the purpose to reach the goal of the project?
2. How are the identified activities dependent on each other?
3. In what internal order are the activities implemented?

4.7. Resource planning

What are the resources needed to implement the project activities?

When having a plan of activities to implement to generate the necessary results to reach the purposes and goal of the project, the next step is resource planning. This is the sixth step of the LFA methodology and entails producing a detailed plan of the resources that need to be allocated and when in order to implement the activities. These resources can include funding, venues, equipment, expertise, etc, and can be in cash or in kind. The co-financing between stakeholders can in other words not only involve direct monetary contributions, but also contributions by covering salary costs of own personnel, making own buildings available as venues for activities, etc. It is however central to specify all contributions in the resource plan, as well as who controls them, as unclear or ambiguous division of responsibilities may hamper effective implementation of the project.

This step of the Logical Framework Approach is summarised as the answer to two questions:

1. What resources are necessary for the implementation of the project activities?
2. What resources are controlled by which stakeholder?

4.8. Indicators

How can the success of each activity, result, purpose and goal be verifiably measured?

Effective capacity development projects for disaster risk management and climate change adaptation necessitate, as all development projects, the possibility to measure its success. The way this is done is to identify indicators that are possible to verifiably measure for all levels of objectives in the objectives analysis, as well as for all activities in the plan of activities. There should in other words be at least as many indicators as there are activities, results, purposes and goals in the project, even if it is suggested to attempt to find several indicators to measure each project result and purpose (Örtengren 2003). These indicators can be measuring quantity and/or quality of what the project intends to achieve, and they must be measured in relation to a specific period of time during which the improvements are intended to take place. To be able to determine if improvements have taken place, it is often necessary to have baseline data to compare with.

Having indicators is not only central for making it possible to measure project effectiveness by following up on its intended improvements, but also as establishing indicators necessitates that project results, purposes and goal are specific, measurable, realistic and time-bound.

This step of the Logical Framework Approach is summarised as the answer to two questions:

1. What is the measure of improvement in terms of quantity and/or quality for each project activity, result, purpose and goal?
2. When is the improvement intended to have taken place?

4.9. Project risk analysis and management

What are the potential external and internal factors that may limit the success of the project and how can these be mitigated?

Capacity development projects for disaster risk management and climate change adaptation often span over several years. Regardless of how well planned a project is, there may be various factors that can negatively impact its effectiveness. These factors can be external to the project, e.g. global economic crisis or political changes, and difficult or impossible for the project stakeholders to reduce. They can also be internal to the project, e.g. staff turnover, and possible to reduce through systematic risk management. As the project risk analysis and management is crucial for determining the viability of any project, the LFA methodology includes the systematic analysis and management of project risks as its eighth step.

This step of the Logical Framework Approach is summarised as the answer to four questions:

1. What can happen that can have a negative impact on the project?

2. How likely is that to happen?
3. If it happens, what are the consequences?
4. What can be done to reduce the likelihood of it happening and/or its consequences?

4.10. Analysis of assumptions

What are the factors influencing the fulfilment of each result, purpose or goal, which the project has limited direct control over but are possible to forecast?

Aside of the project risks, there are physical, environmental, political, economical, social and cultural factors that may affect the project but lie outside the influence of the project stakeholders. These factors also need to be analysed, as the viability of the project depends on the feasibility of the assumptions that the stakeholders make concerning the future state of these factors in relation to the project results, purposes and goal. This analysis forms the last step of the LFA methodology and is called analysis of assumptions. Assumptions that may negatively impact the project if not met may also be considered project risks and dealt with accordingly.

This step of the Logical Framework Approach is summarised as the answer to the question:

1. What are the central assumptions that may influence the project results, purposes and goal?

4.11. Summary of method

The method is summarised as a logical framework approach to capacity development for disaster risk management and climate change adaptation. It builds on the strengths of LFA, while contextualising it to the specific context. It is a development of Sida's version of logical framework approach and follows the same nine steps to facilitate MSB project planning. In addition to descriptions of each of the nine steps, key questions are presented to guide users in what to do.

Although the research project focuses on the first three steps, contributing to improving systematic and holistic analysis of the initial situation in the targeted system, all steps and key questions are summarised in the table below (Table 3).

Analysis of project context

1. What is the general rationale for the development of capacities for disaster risk management in the particular context?
 2. What different visions of "development" are considered, and how are they reconciled?
 3. What are the general physical, environmental, political, economical, social and cultural factors that could affect the project?
-

Stakeholder analysis

1. Who are the beneficiary, decision-maker, implementer and financier?
 2. Who is considered an expert and what counts (should count) as relevant knowledge?
 3. What or who is assumed to be the guarantor of success?
 4. Who is witness to the interests of those affected but not involved and what secures their emancipation?
-

Situation analysis

- Analysis of risk

1. What is valuable and important to protect?
2. Why is it valuable?
3. Which other elements are valuable in securing that valuable element?
4. Which events may happen that can have an impact on what human beings value?
5. Which factors contribute to these events occurring?
6. How likely is each event to occur?
7. What can happen to what human beings value, given a specific event, considering actors performing tasks that may influence the outcome where relevant?
8. Which factors contribute to their susceptibility?
9. How likely is that to occur?
10. If it happens, what are the consequences for what human beings value?

- Analysis of capacity to manage risk

1. What function is necessary to perform in order to manage the analysed risks?
 2. Why is that function necessary to manage the analysed risks and what other functions are necessary to be able to perform that function?
 3. What is available in terms of legal and institutional framework, system of organisations, organisation and resources to facilitate the performance of all identified functions?
-

Objectives analysis

1. What is a desired level of risk?
 2. What is a desired level of capacity to manage risk?
 3. What is the goal? That is, what are the long-term effects of the project?
 4. What are the purposes? That is, what are the direct effects of the project?
 5. What are the results? That is, what are the direct effects of the activities that are implemented within the framework of the project?
-

Plan of activities

1. What activities are needed to generate the results required to fulfil the purpose to reach the goal of the project?
 2. How are the identified activities dependent on each other?
 3. In what internal order are the activities implemented?
-

Resource planning

1. What resources are necessary for the implementation of the project activities?
 2. What resources are controlled by which stakeholder?
-

Indicators

1. What is the measure of improvement in terms of quality and/or quantity for each project activity, result, purpose and goal?
 2. When is the improvement intended to have taken place?
-

Project risk analysis and management

1. What can happen that can have a negative impact on the project?
 2. How likely is that to happen?
 3. If it happens, what are the consequences?
 4. What can be done to reduce the likelihood of it happening and/or its consequences?
-

Analysis of assumptions

1. What are the central assumptions that may influence the project results, purposes and goal?
-

Table 3. Summary of the method.

5. Publications in project

5.1. Scientific publications

- Becker, Per (2009) 'Grasping the hydra: The need for a holistic and systematic approach to disaster risk reduction'. *Jàmhá: Journal of Disaster Risk Studies*, 2(1), 12-24.
- Nilsson, Jerry and Becker, Per (2009). 'What's important? Making what is valuable and worth protecting explicit when performing risk and vulnerability analyses'. *International Journal of Risk Assessment and Management*, 13(3/4), 345-363.
- Becker, Per (2010) *Grasping complexity: Analysing risk for sustainable development*. PhD thesis, Lund: Lund University.
- Becker, Per (2011). 'Whose risks? -Gender and the ranking of hazards'. *Disaster Prevention and Management, An International Journal*, 20(4), 423-433.
- Becker, Per (2011) 'The Importance and Challenges of Anticipation for Community Resilience', in the Proceedings from IDER 2011, 13-14 April 2011, Florence, Italy.
- Becker, Per; Abrahamsson, Marcus and Tehler, Henrik (2011) 'An emergent means to assurgent ends: community resilience for societal safety and sustainability', in the Proceedings from the 4th Symposium on Resilience Engineering, 8-10 June 2011, Sophia Antipolis, France.
- Roth, Ann-Sofie and Becker, Per (2011). 'Challenges to disaster risk reduction: A study of stakeholders' perspectives in Imizamo Yethu, South Africa'. *Jàmhá: Journal of Disaster Risk Studies*, 3(12), 443-452.
- Becker, Per (2011) 'The importance of integrating multiple administrative levels in capacity assessment for disaster risk reduction and climate change adaptation'. forthcoming in *Disaster Prevention and Management, An International Journal*.
- Becker, Per (20XX) 'The importance of explicit discussions of what is valuable in efforts to reduce disaster risk'. submitted to *Asian Journal of Environment and Disaster Management*.
- Becker, Per and Tehler, Henrik (20XX) 'Risk informed capacity development for managing risk to facilitate sustainable development', submitted to *Journal of Contingencies and Crisis Management*.

Scientific publications in progress:

- Becker, Per and Abrahamsson, Marcus (20XX) 'Risk assessment – the missing requisite for disaster risk management in Africa' to be submitted to *Disaster Prevention and Management, An International Journal*.

- Becker, Per and Abrahamsson, Marcus (20XX) 'The problem of assigning ownership of risk, disaster and resilience', to be submitted to Journal of Contingencies and Crisis Management.

5.2. Commissioned publications

- Becker, Per and Abrahamsson, Marcus (2011) Scoping study for partner driven cooperation in disaster risk management between Sweden and Botswana. Lund: Lund University.
- Becker, Per (2011) Scoping study for capacity development in disaster management between Tanzania and Sweden. Lund: Lund University.

Commissioned publications in progress:

- Becker, Per and Abrahamsson, Marcus (2012) Capacity development for disaster risk management and climate change adaptation: a Logical Framework Approach, Stockholm and Karlstad: MSB

6. Other communication activities

This chapter describes different activities communicating the results of the research project, other than the publications above, during the course of the project.

6.1. Open seminars

The research team arranged a seminar in Stockholm concerning the complexity and vulnerability of society, during volcanic ash crisis of 2010 (“Samhällets komplexitet och sårbarhet: i skuggan av vulkanaska”). More than 50 people attended the seminar, coming from the parliament, government, governmental agencies, civil society, private companies and mass media (SVT, SR, DN, etc). This resulted in numerous broadcasts and articles in both general media and popular scientific magazines.

6.2. Internal MSB seminars

The results of the project has been presented and discussed at internal seminars and meetings for MSB staff in Karlstad in 2009 and 2010. The final version of the method was also presented and discussed at an internal seminar for MSB staff in Karlstad in November 2011.

6.3. Academic and professional courses

The new knowledge generated in the project has been integrated into academic courses included into the Master of Disaster Management, with University of Copenhagen (“Introduction and Disaster Management Theories”, ”Disaster Risk Reduction”, “Risk Assessment Methods” and “Risk Reduction and Preparedness”) and into the MSc in Risk Management and Safety Engineering (“Olycks- och Krishantering”). The results of the project has also informed the curriculum and content of professional international training courses in Sweden (MSB’s “DR4” course) South Africa (training for CARE Zambia, UNISDR course for Africa) and Sierra Leone (ToT within the WADM CB project).

6.4. Practical applications

On top of traditional communication activities, the method has been applied in practice in several MSB projects in Africa. It has thus been presented to a whole range of stakeholders from international organisations (UN agencies, Red Cross/Crescent Movement, NGOs) and governmental agencies in Botswana, Tanzania and in the regional context of the Southern African Development Community. These practical applications have lead to real project proposals, with good chances of securing funding and being implemented.

The Botswana case study, and the spin-off Botswana and SADC projects have been supported by Marcus Abrahamsson, who thus has contributed to both further developing the method and communicating it to a wider audience.

7. Final remarks

The research project has designed a participatory method for holistic and systematic analysis of risks and the current capacities of disaster management systems in developing and least developed states. To do so the research team set out with three research questions:

RQ 1: How can disaster management systems be described holistically and systematically?

The method approaches our complex world as a human-environment system with a multitude of key elements and their relationships. This approach does not only facilitate grasping the complexity of dependencies, which obstruct the understanding of risk and how disaster consequences cascade through society, but also elucidate the capacity of the system to manage risk and disasters.

RQ 2: How can this description be used to holistically and systematically analyse risks and capacities of disaster management systems?

Describing the world as a human-environment system makes it not only possible better incorporate complex dependencies when structuring risk scenarios, but makes it possible to identify and analyse general aspects that all disaster management systems in the world requires to perform. Approaching these systems as having purpose, function and form facilitates the construction of a general framework that is applicable in all countries, while facilitating the inclusion of the contextual differences of each. Whereas the risk analysis part of the situation analysis in the method are vital, it seems to be of less importance to MSB as basic risk assessments often have been eroding the interest of partners to invest additional time in that. The rest of the method seems on the other hand to suit MSB well, as it has already been successfully been applied in practice.

RQ 3: How can the method be designed to ensure local participation and ownership?

The method builds on the strengths of the Logical Framework Approach (LFA), while contextualising it to suit capacity development for disaster risk management and climate change adaptation. The entire approach builds in other words on the input of a broad range of stakeholders, i.e. beneficiaries, decision-makers, implementers and financiers. Although it at times lie outside the control of the external partner of capacity development projects to select who should be invited to contribute, the method exhorts broad participation of marginalised groups based on for instance gender, ethnicity, age, etc. It also includes a mechanism for reducing bias in the event of not being able to secure such broad participation (See final point in section 4.3 Stakeholder analysis).

The design science methodology of this research project entails a pragmatic approach to science, which has proven to facilitate synergies between the research project and the capacity development agenda of MSB. As the close involvement of

MSB programme officers contributes to the research project and the research team contributes to facilitating actual capacity development projects, both method design and capacity development are strengthened. This close collaboration is viewed as very valuable by the research team, and something to strive for in the future.

Finally, the resulting method for holistic and systematic analysis of risks and the current capacities of disaster risk management systems is designed in the context of developing and least developed states. However, as long as it can be argued that the same design criteria apply to the context of the development of disaster risk management and climate change adaptation capacities in Swedish contexts, it may be useful there as well.

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