![MSB logo] **Swedish Civil Contingencies Agency**

Research for a Safer Society

New knowledge for future challenges
MSB's research strategy

Research for a Safer Society

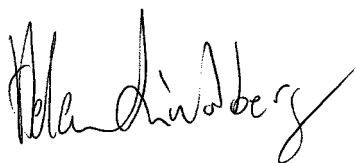New knowledge for future challenges
MSB's research strategy

Preface

MSB works for a safer society in a changing world. Changing opportunities and challenges require new knowledge, learning and research. The research may help us to formulate questions today and discover the knowledge needs of tomorrow. Relevant research-based knowledge in key areas increases our ability to cope with future challenges. This is the background and reason for MSB's mission to direct and fund research in the field of societal security.

But it's not enough just to conduct research and produce new knowledge. This knowledge must also be useful so that it can be of benefit to society. Even if we see our mission as strengthening academic competence in the area, research makes the greatest difference when its findings reach out and can be translated by municipalities, county councils, government authorities or by the private sector and organisations. The knowledge must reach the right audience and beneficiaries to be transformed into new methods, more efficient tools and a change in behaviour - all to increase our ability to prevent and deal with emergencies and disasters.

Research for a Safer Society - New knowledge for future challenges is MSB's research strategy for the period 2014-2018. The strategy presents five areas of research that describe and explain MSB's research focus. To these areas six specific perspectives are added. All research initiatives are geared from the start towards a desired effect.

Using this strategy as a guide MSB designs, assesses and evaluates calls for proposals and research applications. It is our belief that this research strategy will contribute to the production of relevant, research-based and useful knowledge that all actors in the field of societal security will find useful - in our common work for a safer society.

Helena Lindberg
MSB Director-general

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Summary

The aim of this strategy is to clarify MSB's role as a research funder and to describe MSB's research priorities for the period 2014-2018. It also provides the foundation for long-term development of MSB's research funding by describing the research that is of priority and how MSB works with research funding.

In the bill - *Stronger Emergency Management - for Safety's Sake (Bill 2007/08:92)* - the government wrote that MSB must be proactive and focused, support other actors in the field of societal security and develop and follow up work on societal emergency management. To ensure that relevant research is being conducted in the field of societal security MSB has a mandate to direct, order and quality assure research.

MSB shall also communicate research results to the target groups that need them most. Research funded by MSB should support MSB's mission and help the agency to achieve its objectives and vision.

MSB's research focus consists of four elements:

1. Research areas.
2. Specific perspectives.
3. Impact.
4. Basic principles.

The four parts together describe both *what* a research project should contain (subject substance), but also *how* research should be conducted; the process and organisational aspects.

Taken together, the research areas, specific perspectives and impact provide a description of MSB's research priorities. MSB has identified five research areas and added six specific perspectives that run across the research areas. The third element - impact - is about where and how research is intended to provide impact and benefit in the field of societal security.

In the strategy MSB presents ten basic principles. These describe MSB work on its research initiatives and what essentially characterizes MSB-funded research.

The five research areas are:

- Individual and Public Safety.

- Protection against Fire, Accidents and Hazardous Substances.

- Societal Continuity and Resilience.

- Strengthened Emergency Preparedness and Civil Defence.

- Information Security.

All research areas can contain aspects of prevention and management.

The six specific perspectives are:

- EU, International Conditions and Security Policy.

- Gender and Diversity.

- Information and Communication.

- Emergency Response Management.

- Development of Methods and Technology.

- Risks, Threats and Vulnerabilities.

The ten fundamental principles describe how MSB's work with research initiatives will be conducted during the period:

- MSB supports need-based research.

- Transboundary issues are prioritized.

- The nature of a problem determines research structure.

- Innovative thinking and originality are prioritized.

- Scientific quality and benefit will be combined.

- MSB research support is characterized by reciprocity.

- Funds are announced mainly in competition.

- Research findings will be utilized.

- MSB works primarily with larger cohesive research initiatives.

- Synergies with other research funders will be utilized.

MSB's role as a research funder makes it imperative that research findings can be utilized, during the progress of research projects but especially after the completion of projects. One way to further strengthen this is, already when calls for proposals are defined, to specify where in the field of societal security and in what way the research will have an impact. The impact may be in the short term but primarily in the long term.

An overall ambition for MSB's work is, in various ways, to strengthen societal capabilities in relation to societal security. This also applies in general for research initiatives. As research and new knowledge are often prerequisites for capability development, it may be relevant to describe the desired impacts of research in other terms, such as new knowledge about the threats, those who are to respond, governing instruments or tools and methods.

Research results will be disseminated to users, for example, via training courses and practical exercises. Courses that are based on research and experience contribute to a safer society by transmitting knowledge and contributing to increased capability levels.

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Introduction

Research-based knowledge is one of MSB's strategically important resources for the effective provision of knowledge for the entire area of societal security. It is an important prerequisite to meet future threats, risks and challenges and to create a more resilient and more secure society.

MSB is responsible for matters pertaining to civil protection, emergency management, public safety and civil defence, in those instances where no other agency has responsibility. Responsibility refers to action before, during and after an emergency or disaster. Furthermore, MSB should develop and support societal preparedness for emergencies and should be proactive in work on prevention and vulnerability reduction measures, work with coordination between stakeholders to prevent and deal with emergencies, crises and disasters, help to reduce the impact of emergencies and disasters, monitor and evaluate the societal emergency management, and ensure that training and exercises are provided for the agency's field of responsibility.

To ensure that relevant research is conducted in the field of societal security MSB has a mandate to direct, order and ensure the quality of research. The agency should also communicate research findings with the target groups that need them most. MSB funded research should support MSB's mission and help to meet its vision and goals. The basis of MSB priorities in this strategy can be found in MSB's instruction and appropriation documents. These documents clarify MSB's core tasks and priorities[1].

Two important conditions for research funding at MSB, in order to contribute to an effective provision of knowledge, are a good ability to identify needs or problems in the field as a starting point for research, and evaluation of completed research initiatives. It is further important that there is a connection to knowledge and capability-increasing activities such as development, training and exercises.

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1. Svensk författningssamling 2008: 1002. Förordning (2008: 1002) med instruktion för *Myndigheten för samhällsskydd och beredskap.* Regeringen, Försvarsdepartementet. Regleringsbrev för budgetåret 2013 avseende *Myndigheten för samhällsskydd och beredskap.*

1. The Purpose and Disposition of the Research Strategy

The purpose of this strategy is to clarify MSB's role as a research funder and to describe MSB's direction for research during the period 2014-2018. Describing the type of research that is a priority and how MSB works with research funding also constitute part of the foundation for the long-term development of MSB's research funding.

Sweden, the Nordic countries, EU and indeed the rest of the world are facing major and complex challenges with regards to the safety of individuals and society as a whole. This means that no single agent or single societal area has sufficient knowledge or resources to independently respond to the research needs that exist. MSB therefore believes that it is important to make widely known the priorities and activities to all stakeholders, including end users, in the field of societal security. With this research strategy MSB is looking to increase both the support for and the impact of its research funding, via unambiguous priorities, transparent and possible to monitor and evaluate.

1.1 Disposition

This research strategy consists of a summary, an introduction and two larger text-blocks. The first block concerns the starting points for the focus of MSB's research funding. The second block describes the actual focus.

After the introduction follows the block that concerns itself with starting points. An overview of societal trends is provided to place MSB and its research in context. The selection of societal development trends in this chapter is based on a number of key documents for MSB and for the focus of the area[2].

There is a section in chapter three that describes MSB's ambitions as a research funder and also experiences of the research programme that preceded this strategy.

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2. Svensk författningssamling 2008: 1002. Förordning (2008:1002) med instruktion för *Myndigheten för samhällsskydd och beredskap*; Regeringen, Försvarsdepartementet, *Regleringsbrev för budgetåret 2013 avseende Myndigheten för samhällsskydd och beredskap*; Myndigheten för samhällsskydd och beredskap, *Framtida utveckling som kan påverka arbetet med samhällsskydd och beredskap*, MSB 383 - Mars 2012; *MSB:s långsiktiga strategiska analys – genomfört och planerat arbete*, Dnr. 2009:8495; *Framtida utveckling som kan påverka arbetet med samhällsskydd och beredskap*, MSB 383 - Mars 2012; *Risker och förmågor 2012 – Redovisning av regeringsuppdrag om nationell riskbedömning respektive bedömning av krisberedskapsförmåga*, MSB 545; MSB, (2013), *Övergripande utmaningar för samhällsskydd och beredskap*; MSB, (2009), *En strategi för förstärkningsresurser*, Dnr. 2009-10825; Regeringen. *Svenska framtidsutmaningar. Slutrapport från regeringens Framtidskommission.* Ds 2013:19; Regeringen. *Vägval i en globaliserad värld – Försvarsberedningens omvärldsanalys.* Ds 2013:33.

Following on from this is a description of the actual focus of MSB research. The focusing is made up of four elements: research areas, special perspectives, impact and fundamental principles. The significance of these is briefly defined in chapter four, which also describes how they relate to each other. Each element is then described in more detail in its own chapter.

Chapters five to eight describe in more detail what MSB will prioritize. Chapter five outlines a number of priority research areas. To these are added specific perspectives that may be relevant to all fields of research. These are described in chapter six. Finally, the intention is also to specify where and how a research initiative is intended to provide benefit and impact in the field of societal security. This is described in chapter seven.

The concluding chapter eight presents how MSB wishes to conduct its research in the form of ten basic principles.

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Starting points

This block reports on a number of development trends, experience of research funding, and the focusing and development work that are relevant to the field of societal security, and which is of particular importance for MSB's research priorities.

2. Societal Trends

The starting point for MSB's analyses is that development in various societal sectors may have implications for the field of societal security in many different ways[3]. The role of research is to raise, formulate, and study questions which cannot be answered on the basis of current knowledge, and which are characterized by high degree of uncertainty. A general tendency is that society has become increasingly inter-connected, at all levels, which creates risk scenarios that are character-ized by complexity, uncertainty and ambiguity[4].

A causal relationship between an event and its effect can be complex and difficult to identify. Sometimes there are huge uncertainties because scientific data is non-existent or limited. In other cases, data might exist but the risks are interpreted differently by individuals and communities because of differing viewpoints and values. Ambiguity in assessments can be increased when there is a time lag between the event and its effect. One example of this is climate change, the conse-quences of which will only be identifiable in the future.

All these types of situations can lead to a need to study how the vulne-rable can be protected by creating resilience, in other words, a capa-city for resistance and recovery. The examples of overall development trends discussed are based on MSB's work with long-term strategic analyses[5]. The selection was made based on the issues that are deemed to be of particular relevance to the research.

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3. Myndigheten för samhällsskydd och beredskap, *Framtida utveckling som kan påverka arbetet med samhällsskydd och beredskap*, MSB 383 - Mars 2012.
4. Renn O., Klinke A., van Asselt M., (2011), Coping with Complexity, Uncertainty and Ambiguity in Risk Governance: A Synthesis, AMBIO 40:231-246.
5. *MSB:s långsiktiga strategiska analys – genomfört och planerat arbete*, Dnr. 2009:8495; *Framtida utveckling som kan påverka arbetet med samhällsskydd och beredskap*, MSB 383 - Mars 2012; *Risker och förmågor 2012 – Redovisning av regeringsuppdrag om nationell riskbedömning respektive bedömning av krisbered-skapsförmåga,* MSB 545.

2.1 Technological Development and Increased Technological Dependency

Technology is developing rapidly, which can create both new challenges and new solutions in the field of societal security. New technologies can, for example, provide opportunities for the early warning and better management of natural disasters or new systems for monitoring and alerting, as well as communication that facilitates more effective collaboration. Not least, development in information and communications technology has had a large impact on the running of vital societal functions, both in terms of interaction between relevant organisations and between those and the public.

Technological developments can also create challenges in terms of the emergence of new vulnerabilities or ethical questions. Greater monitoring capabilities must for example be weighed against privacy needs. One particular aspect related to technology development is that society is becoming more and more dependent on technical systems that are interconnected with each other. Vital societal functions like food and drinking water supply, electronic communications, energy supply, payment systems, transport, and medical care are all susceptible to breakdowns. A greater degree of remote control systems in these activities further increases vulnerability.

Most indications are that the technical components of vital societal functions will continue to increase, both in terms of general dependencies and specific applications. Today we see a rapid development in areas such as materials, energy, information and communications technology, as well as biotechnology, which may create new conditions in society in many different ways. These new conditions need to be studied, particularly from a risk and vulnerability perspective.

2.2 A More Complex Structuring of Society

Several previous public sectors have been deregulated and are increasingly being run by private operators. This often leads to a more fragmented and diversified operating and ownership structure. While simultaneously, society's technical and resource dependencies are on the increase. Overall, this affects the government's options for controlling, directing and coordinating societal safety[6].

Many dependencies among a range of societal activities raise questions about how entities in the field of societal security can best

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6.   MSB, (2013), *Övergripande utmaningar för samhällsskydd och beredskap*, s. 18-19.

collaborate regarding various resource types. This also includes major questions about the use of non-profit resources, defence resources, systems in the EU for extra resources and international assistance resources[7].

2.3 Increased Dependence on Critical Flows

Societal and technological development entails an increased dependency on functioning flows. There is constant pressure to streamline operations; and technological developments offer new opportunities for this. Many flows today are globalized, time-critical and to varying degrees integrated with each other. This applies to physical transportation as well as energy and information flows of various kinds. In many cases this leads to increased social vulnerability. Disruptions in one part of a sector can quickly lead to unexpected disruptions in another sector or in another country. For operators with responsibility for vital societal functions, there exists therefore a need to understand the dependency chains and consequences of disruptions, as well as how different types of measures, such as continuity management and prevention, can mitigate disruptions once they occur.

2.4 Environmental and Climate Change

The climate is changing all over the world. In Sweden, over the next few decades, we may expect changes in temperature and precipitation patterns, as well as a change in the frequency and magnitude of natural events, such as increased flood risks, torrential rains, landslides, heat waves and forest fires. In the longer term is also expected a rise in sea level along the coasts of Sweden[8]. This development will place increased demands on society's ability to withstand and manage different kinds of climatical impact, in Sweden and internationally. It is important to point out climate change doesn't just pose new risks; it also intensifies and deepens existing risks. For example, municipalities are already having problems with preventing and managing those natural events with negative consequences for existing buildings, infrastructure and other essential services.

Emissions of greenhouse gases are a factor affecting the climate and the environment. Environmental changes can also be caused by other factors, such as maritime oil spills or releases of chemicals.

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7. MSB, (2013), *Övergripande utmaningar för samhällsskydd och beredskap*, s. 57; MSB, (2009), *En strategi för förstärkningsresurser*, Dnr. 2009–10825.
8. MSB, *Framtida utveckling som kan påverka arbetet med samhällsskydd och beredskap*, MSB 383 - Mars 2012, s. 52-56.

Climate and environmental changes, individually and collectively, are all significant to the field of societal security. Directly significant through new risks for natural disasters and indirectly through new diseases, a higher risk of infection and disease transmission through food, and more and more widespread flooding[9].

2.5 Increased Risk of Contagious Diseases

There are currently indications of an increased risk of infection. There are several factors behind such a risk, including new travelling patterns, a large international trade in plants, animals and food, climate change and, not least, an increasing incidence of antibiotic-resistant bacteria. Sweden has been relatively spared from this type of infection, but the problems are increasing. There are bacteria in other parts of the world that are resistant to almost all antibiotics. The societal implications of increasing antibiotic resistance can be noticeable when the ability to treat disease deteriorates and the medical care sector struggles to reach the expectations of the treatment of infections and safety during operations[10].

In a future where this trend becomes real, and even accelerates, it can have serious consequences for the safety of society and then also become relevant for the societal security field.

2.6 Demographic Changes

Demographic changes include trends in the composition of the population, migration, housing and to some extent technological developments. The challenge in the field of societal security is that the level of protection and safety should be able to be maintained nationwide even in the event of changing demographic and economic conditions.

One important demographic factor is that the percentage of elderly in the population is expected to increase in coming decades[11]. This change is significant in several respects, not least because the elderly are at risk of more severe heat waves and diseases. In general, both the number and type of accidents vary between age groups. We are also seeing a change in housing patterns in Sweden. For several decades, the population in the cities has been increasing at the expense of

9. MSB, *Framtida utveckling som kan påverka arbetet med samhällsskydd och beredskap*, MSB 383 - Mars 2012, s. 52-56.
10. MSB, *Framtida utveckling*, s. 41; MSB, *PM avseende resistens mot antibiotika och antivirala preparat*, publicerat i rapporten MSB:s långsiktiga strategiska analys – genomfört och planerat arbete, Dnr 2009:8495.
11. MSB, *Framtida utveckling*, s. 37.

many smaller and rural communities[12]. Urbanization and population growth, particularly in Sweden's three largest metropolitan regions: Stockholm-Mälardalen, Öresund, and Västra Götaland entail changes in conditions in the field of societal security. Densely built-up cities can, for example, contain more complex risk environments, while more depopulated rural areas lead to vulnerabilities in terms of the greater distances to vital societal functions.

2.7 Security and Defence Policy Development

As indicated earlier, MSB and the field of societal security must relate Sweden and Swedish developments to developments in other countries[13].

Another example of such an environment-dependent issue is the development of security and defence policy. The Defence Drafting Committee points to the importance, in this context, of having taking the broad perspective on security and international trends in order to create protection against potential future crises and incidents[14]. This is of relevance, among other things, for the societal security field and the need for cooperation between civilian sectors and the military. It also affects MSB's work on international operations. The development of various forms of threat, often with antagonistic motives, such as information and cyber security, and the connection to CBRNE are also of interest. These are examples of questions that MSB continually monitors in order to assess the influence of developments on future research needs.

3. MSB as a Research Funder

In the government bill: *Stronger emergency management - for safety's sake (2007/08: 92)*, it is stated that MSB should be proactive and focused, support other entities in the field of societal security and develop and follow up work on societal emergency management. The Government further states in its letter: *Societal emergency management - stronger collaboration for increased security (Skr. 2009/10: 124)* that research, for specific issues in-house or in national or international collaboration, enables enhanced security. The research lays the groundwork to be able to provide advice and support to operators who are active in the societal security field and providing quality training and education.

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12. MSB, *Framtida utveckling*, s. 38.
13. Regeringen. *Svenska framtidsutmaningar. Slutrapport från regeringens Framtidskommission. Ds 2013:19. s. 256, ff.*
14. Regeringen. *Vägval i en globaliserad värld – Försvarsberedningens omvärldsanalys.* Ds 2013:33. s. 222.

Research helps to formulate relevant questions today and makes us better prepared for identifying future knowledge requirements. In the search for new knowledge, insight often comes about regarding previously unknown threats and risks, but also opportunities. Research also contributes to the supply of competence in the form of access to experts.

Of major importance for MSB's role is the agency's focus on needs-based research. Needs-based research refers to research based on a prioritized problem or issue in a field or sector. The research initiative itself and the increase of knowledge that is accordingly deemed appropriate can contain elements of both basic and applied research.

MSB has been funding research since it was formed and believes that a research based supply of knowledge will continue to be of central and strategic importance for MSB and for development in the field of societal security as a whole. MSB's strategic role as a research funder in this area will continue into the future.

The research aims at a long-term build-up of scientific knowledge in MSB's area of responsibility. It complements a necessary experience-based knowledge which is more immediately applicable.

3.1 MSB's experience as a research funder

Since MSB was formed in 2009 it has funded research in a number of scientific disciplines, such as social science, natural science, engineering, health, and behavioral science. As research requires a long-term commitment and work, it is important to remember that MSB research is based on results and experience from the ÖCB, SEMA[15] and the SRSA. These authorities had allocated research funds and conducted research.

Funding has taken various forms. Individual research initiatives have sought answers to a given problem, whereas so-called framework research programmes[16] have been more comprehensive and designed around a particular theme. Competence and structure initiatives have been carried out in the form of support for research environments connected to a specific institution[17] and to individual researchers as post-doctoral support. In addition, MSB has also funded programme

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15. ÖCB (Swedish Agency for Civil Emergency Planning), SEMA (Swedish Emergency Management Agency).
16. An example of large frameowrk research programme is PRIVAD, which is run by Faculty of Engineering, LTH.
17. Institution that the MSB support are Security Arena in Lindholmen, Göteborg; CRISMART and CATS at the Defence College; and CARER at Linköping University.

partnerships with other actors[18]. The purpose of these different forms of funding was to create the conditions both for sustainability and flexibility in research initiatives.

In MSB's first research programme (2011-2013) a wealth of knowledge needs was identified, from general challenges in the field of societal security to user-close technical applications. The challenge for MSB as a relatively small research funder, but with broad responsibility for the provision of knowledge within the agency's remit has been to create a balance between the desire to be comprehensive and to create a focus in research initiatives. One way to create focus, in addition to support for research environments, has been to work with thematic calls that address a particular issue or theme. The majority of advertised funds, however, have been allocated by open calls, where applications for research funding within the entire area could be submitted.

Aside from a desire to identify different types of research-need, there was at the time of the creation of MSB a general objective to clarify and strengthen the field of societal security as an area for research. This was achieved by focusing on the aforementioned research environments and programme work, but also via active collaboration with researchers in order to achieve communication and dissemination of research findings.

One conclusion of this is that the different calls and funding arrangements and the variety of individual projects have contributed to width and dynamism in the research field. But it has also made it difficult to obtain an overview of the breakdown of disciplines and fields of knowledge within research initiatives as well as their possible synergies and relationships to each other.

MSB has taken an active role as a research funder, particularly with regard to monitoring and communication of research findings. A positive effect has been that MSB has created active dialogues with the research community, thereby strengthening the conditions for the dissemination and utilization of research results.

That a newly formed agency initially takes a holistic approach to its operational area is both necessary and important. Past experience however, means that with this strategy MSB will be aiming for greater transparency of MSB's fundamental priorities with respect to the focusing and funding of research.

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18. For example, the cooperation agreements with the US and its DHS (Department of Homeland Security), Baltic Sea Cooperation with BONUS, Nordic cooperation with Nordforsk and cooperation with Brandforsk.

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Focusing Research

In the role of a research funding authority MSB aims to constantly have a current picture of where the most important needs of knowledge enhancement exist and where research-based knowledge can be put to best use. When these needs for knowledge enhancement have been identified MSB uses a structure consisting of four elements to design and prioritize research.

4. The Four Elements of the Strategy

MSB's focus of research consists of four elements:

1. Research areas.

2. Specific perspectives.

3. Impact.

4. Basic principles.

The four elements together describe both *what* a research project should contain (subject substance), but also *how* research should be conducted; the process and organisational aspects.

Taken together, *the research areas*, *specific perspectives* and *basic principles* provide a description of MSB's research priorities. MSB has identified five research areas and added six specific perspectives to these that run across the research areas. The third element - *impact* - is about where and how research is intended to provide effects and benefits in the field of societal security.

In the strategy MSB presents ten *basic principles*, which describe MSB's work on research initiatives and what essentially characterizes MSB-funded research.

The following diagram shows the relationship between the four elements:

FIVE RESEARCH AREAS
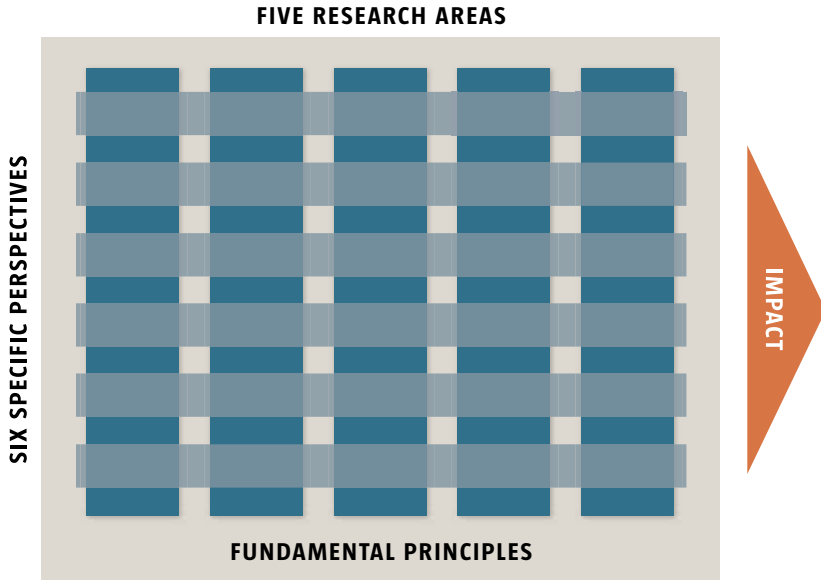
Figure 1. The four elements of MSB's research strategy.

The four elements together constitute the focus for research funding that MSB will base the work upon during the period 2014-2018. The focus provides support for the many priorities that need to be made around research initiatives. It can also be used as a guide, based on an identified problem area or need, to establish a call with an interesting and relevant research composition.

By systematically considering and making choices amongst the elements the model supports the focus of research in a dynamic manner. The dynamics are in the fact that a research initiative in this model is initially assessed based on each individual element and then weighed up together in an overall assessment.

The following questions, which can be asked in connection with the forming of research initiatives, illustrate how the elements are used.

1. Which area of research does the initiative correspond to and in what way will it complement existing knowledge and the research portfolio?

2. How are the specific perspectives touched upon and included?

3. What impact, type of result or benefit is assessed that the research initiative will provide, in the short term and beyond, and in what areas of the societal security field?
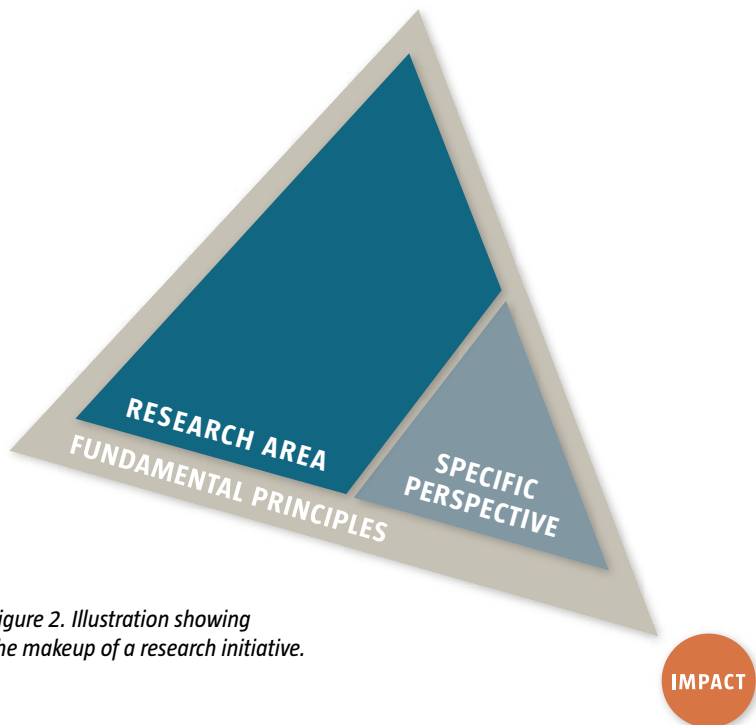
Figure 2. Illustration showing the makeup of a research initiative.

The figure above shows how a research initiative, for example an announcement of research funds, is constructed. The call consists of a research area, and one or more specific perspectives. It is focused towards an impact - result or benefit - in the field of societal security. As a foundation for all MSB's research initiatives are the basic principles.

5. Research Areas

MSB wants to create clarity around what constitutes the core of MSB's role in the development of research-based knowledge. Research is divided into five general areas, which help to describe and explain MSB's research focus.

The five research areas are:

- Individual and Public Safety.
- Protection against Fire, Accidents and Hazardous Substances.
- Societal Continuity and Resilience.
- Strengthened Emergency Preparedness and Civil Defence.
- Information Security.

All research areas can contain aspects of prevention and management.

5.1 Individual and Public Safety

The development of work and understanding of *Individual and public safety* comprise an important focus for achieving a safer society. That this is one of the five research areas arises from MSB's mandate. Several of the described trends (see chapter three) also create a need for new knowledge, for example, about the consequences of demographical changes and the risk of increased contamination. Research in the field can contain aspects of perception, behavior and development of supporting structures, facilities and activities.

5.2 Protection against Fire, Accidents and Hazardous Substances

One of society's fundamental responsibilities is protection against *Fire, accidents and hazardous substances*[19]. This area focuses on the development of knowledge, which in various ways strengthens society's protection. Relevant aspects include, for example, an understanding of man in this context, the consequences of undesirable events, intentional as well as unintentional, and the opportunities and resources available for strengthening protection. That this is one of MSB's research areas also arises from MSB's mandate.

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19. Hazardous substances refers to risks with chemical, biological, radioactive, nuclear and explosive materials (CBRNE). Many of these substances are used everyday in society, for example in process engineering industries. The ongoing management of hazardous substances as an emergency risk is in focus at MSB. Hazardous substances can also pose a threat to society if they are used during example antagonistic attacks. Within the framework of this research strategy MSB will focus on hazardous substances both from a risk and a threat perspective.

5.3 Societal Continuity and Resilience

Guaranteeing vital societal functions is a task that involves many sectors and policies. MSB has entitled this research area *Societal continuity and resilience*. It contains questions which concern the protection of vital societal functions, critical infrastructure, natural disasters and climate change, as well as sustainability from a societal security perspective. This research also covers issues related to community building, critical flows and supply, ownership, control, responsibility and inspection issues. The increasing complexity of social structure and the dependence on working flows need to be addressed through more research.

5.4 Strengthened Emergency Preparedness and Civil Defence

The area *Strengthened emergency preparedness and civil defence* will strengthen societal capabilities for dealing with serious extraordinary events that risk leading to society being unable to function with its ordinary resources, structures or organisation. In such situations, prioritization between activities can become a reality. Issues involved, for example, are knowledge of particularly serious threats and risks, responsibilities, organisation and structure, resources, and methods to try and strengthen these aspects, for example through exercises. Of great importance during the strategy's period of validity is the work on renewing and enhancing civil defence.

5.5 Information Security

Information security refers to the protection of information from various perspectives, such as maintaining the proper level of confidentiality, integrity, traceability and availability. Information security has become an increasingly important area in pace with the rapidly increasing dependence on information management in virtually all areas of society. Major incidents leading to longer disruptions, but also to information leaking out or being changed, demonstrates the vulnerabilities that exist and the difficulty to uphold vital societal functions while maintaining the trust of the general public. Research on information security must include many perspectives; technical as well as cultural, social, legal and economic. This area also has a special connection to criminal activity, of both a national and international character.

6. Specific perspectives to consider

In addition to the research areas MSB wishes to highlight a number of specific perspectives of particular interest. Characteristic of these

perspectives is that they can be relevant to all fields of research and as such become transverse. The above reported research areas should be examined, preferably at the start of a research initiative, with regard to the specific perspectives.

The following specific perspectives apply for the period of validity:

- EU, International Conditions and Security Policy.

- Gender and Diversity.

- Information and Communication.

- Emergency Response Management.

- Development of Methods and Technology.

- Risks, Threats and Vulnerabilities.

6.1 EU, International Conditions and Security Policy

Societal security in general and research in this area in particular have a transnational dimension, which must be considered in MSB's research initiatives. Research is needed that covers both national and international perspectives. For international perspectives the Nordic countries and the EU are of particular interest. Research issues in the field may involve, for example, dynamics and driving forces or the effects of EU cooperation and EU integration. Another aspect of the international dimension is the connection to knowledge resources outside Sweden.

6.2 Gender and Diversity

The issues of gender and diversity are always present. An understanding of societal security should encompass all of society and all of the population. It is therefore important to question prevailing perspectives and conditions. The views and needs of all groups in society must be respected. Human rights, democratic values and gender equality all need to be strengthened. For MSB to be effective in its official work active work must be conducted in order to reach the entire population.

6.3 Information and Communication

The ability to manage emergencies and disasters rests on our understanding of information and communication as tools and resources in decision-making and to reach out to and have an effect on people. Emergency management skills are largely the ability to communicate

effectively and credibly. This applies within municipalities, counties and authorities, but especially with the general public. Collaboration and coordination demand thoughtful communication strategies. A successful emergency management capability requires knowledge about these mechanisms.

6.4 Emergency Response Management

In situations where society is under pressure or threat, we know how important response management is. Although the knowledge of the management of emergencies has evolved and long been in focus, there still arise problems and challenges for the ability to respond, which require further research.

6.5 Development of Methods and Technology

An important opportunity to convert research is to lay the foundation for new or enhanced methods, technology or products. It may be relevant in this context to seek collaboration with industry and business to strengthen the dissemination and application of results. Other priority issues from a method and technology perspective are national risk and capability assessment, as well as the continuous work of risk and vulnerability analyses.

6.6 Risks, Threats and Vulnerabilities

Risks and threats is an area which is constantly changing. New threats and risks arise, known risks can occur in new contexts and linked to these new vulnerabilities are created. It is important for MSB to find ways to be prepared for and work towards hitherto unknown or unpredictable threats.

7. Research Impact

MSB's role as a research funder makes it imperative that research findings can be utilized, during the progress of research projects but especially after the completion of projects. One way to further strengthen this is, as soon as the calls go out and the project starts, to specify where in the field of societal security and in what way the research will have an impact. This may be in the short term but primarily in the long term[20].

An overall ambition for MSB's work is, in various ways, to strengthen societal capabilities in relation to societal security. This also applies

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20. A tool for describing effects is found in the description of the societal security field in chapter four.

in general for research initiatives. As research and new knowledge are often prerequisites for capability development, it may be relevant to describe the desired impacts of research in other terms, such as new knowledge about that which poses the threats, those who are to respond, governing instruments, or tools and methods.

For research to be useful, and thus produce the desired impact, the results must be put to use in society. This may, for example, be in the form of new materials and products or through new legislation, policies and standards; but also through new working methods or changes in behavior.

From MSB's own operation research findings can be disseminated to end-users via, for example, MSB's training activities. Courses that are based on research and tried and tested experience contribute to a safer society by imparting knowledge and contributing to increased capability.

Exercises are another MSB activity that can contribute to bring research results to end-users. Research findings may also provide a basis for exercises. Training and exercises are also useful for identifying important problems and challenges that can form the basis for future research initiatives.

8. Basic Principles for Research Funding

In addition to the research areas, perspectives and impact, MSB identified a number of basic principles. Together with the other elements these principles form the foundation both for the preparation of calls and received applications, and also for the implementation and monitoring of projects. The basic principles guide MSB research for the period 2014-2018.

The principles have been drawn up mainly from MSB's own experiences and insight into previous research initiatives and from MSB's values - open, competent and proactive.

8.1 MSB supports need-based research

Need-based research refers to MSB research that starts with identified problems, challenges or issues in the societal security field and which contributes to greater understanding and/or solutions to problems. Need-based research may contain elements of both fundamental and applied research.

Research that MSB supports should have a clear connection to knowledge needs within MSB's remit, as described in the instructions, regulations and other governing documents for MSB operation, which also include future challenges. MSB will endeavour to ensure that researchers, public authorities, other stakeholders and end-users are involved in various ways from early problem identification to assessment of user needs.

8.2 Transboundary issues are prioritized

The need for knowledge enhancement in the field of societal security may exist even if no clear owner of the problem can be identified. This may, for example, include new threats, risks or vulnerabilities which may fall through the cracks in administrative structures, or insidious types of threats, risks and vulnerabilities identified as lying in the future and therefore with no obvious responsibility. This can also apply to cross-sector challenges, basic societal functions and complex interdependencies. Another example of the need for knowledge enhancement relates to societal systems, which are currently divided between various sectors and responsible entities, and where the effects of interdependencies and complex interaction between vital societal functions and critical infrastructure can give rise to unexpected events with a multi-systemic impact.

Research with a transnational focus is also prioritized by virtue of MSB's official mission on responsibilities for civil protection (public safety), emergency management and civil defence, in those instances where no other authority has responsibility.

8.3 The nature of a problem determines research structure

The problem in question within a given research initiative should determine the type of research that is needed. For MSB it is of secondary importance how the project is structured or if it has an interdisciplinary or scientific composition. Research composition, as well as its theoretical and methodological character, is determined by the nature of the need or the challenge as well as the current status of research. What is important is that research responds to a need within MSB's area of responsibility without sacrificing scientific quality.

Many of the knowledge needs that MSB wishes to fulfil via the research that it funds are of such a character that they can be illuminated from many various perspectives. MSB views this generally as a strength -

when a given problem area can be highlighted from several scientific perspectives - but does not consider that this necessarily needs to occur within the same project.

8.4 Innovative thinking and originality are prioritized

Research is an activity where definite results can never fully be predicted or promised. In addition, MSB's remit is of such a character that the unexpected and new, which cannot be predicted within current knowledge and interpretive frameworks, plays a crucial role in how well MSB can meet society's expectations. It is important for MSB to support creative and innovative projects even if the possible outcome is more uncertain than usual. In order to create room for new insight MSB gives priority, in its research support, on innovation and originality.

8.5 Scientific quality and benefit will be combined

It is important for MSB that high standards of scientific quality and utility should be combined. An assessment of scientific quality is carried out by researchers reviewing applications from other researchers. Added to this process is a review of utility, which consists of both need and relevance. A problem or query can be of very high priority and relevant in, for example, operational activities, but the need to create a research initiative need not always be of equal priority. Maybe the requisite knowledge is already available, and therefore an alternative knowledge-enhancement measure to research might be more effective.

Weighing up scientific quality and utility is part of MSB's ambition to identify research of the greatest potential. If only one assessment perspective is used there is a risk of potentially interesting research ideas being discarded. Established research initiatives should always have a basis in the field of research and be assessed as important and of priority, based on benefit, to the area. In situations where two research applications are assessed equally in terms of need and relevance, scientific quality should be prioritized.

8.6 MSB research support is characterized by reciprocity

To create good opportunities for knowledge enhancement MSB intends to establish long-term and trusting relationships with research practitioners. For this reason funding will mainly be for multi-annual research projects, wherein dialogue between researchers, clients and users is a natural feature. A requirement may also be that the partici-

pating researchers devote a minimum period of work to the project, so as to prevent fragmentation. The principal researchers may also be expected, during a project, to be able to provide preliminary results or to act as experts.

MSB's objective is to be an active research funder, even during the execution of the projects that have been granted funds. This includes, among other things, that MSB follows the work of projects and arranges opportunities for knowledge sharing.

8.7 Funds are announced mainly in competition

MSB's research funds are distributed mainly in a competition after the announcement. MSB may however reserve a small budget for testing concepts or initiating activities or research, which after consideration as part of MSB's ordinary preparation may be granted funds continuously.

8.8 Research findings will be utilized

MSB will develop the ability to use research findings in, for example, training, evaluation, exercises and development; but also via networking and by linking-up research and researchers with operations and entities in the field of societal security.

MSB takes particular responsibility for research communication and also requires researchers to contribute to this. Projects should emphasize communication and contact with users who can benefit from research findings. Projects must describe how cooperation with other researchers, users and other stakeholders is organised. Applications must also have a plan for both scientific and wider dissemination.

8.9 MSB works primarily with larger cohesive research initiatives

With the aim to support research and knowledge enhancement in the best way, MSB will primarily announce its research funds or support within coherent and/or thematic areas. MSB's assessment is that more coherent and long-term research initiatives or environments have a greater chance of developing good results. The chances for the societal security area transforming research results are then also assessed as being greater.

8.10 Synergies with other research funders will be utilized

The overall ambition of working jointly with other research funders is to optimize the use of resources via coordination that is based on

each funder's specific focus and ability, as well as the synergies that cooperation can bring about.

Important for MSB is to create the best opportunities possible for knowledge enhancement in the areas where MSB operates and provides research funding. Initiatives with MSB as the main funder, where other entities have a designated responsibility, should only occur in exceptional circumstances and after particular consideration and dialogue. However, co-funding and joint calls with other funders in related fields can occur.

As research needs are sometimes financially demanding, it is important that calls, to a reasonable degree, are jointly planned and coordinated with other research funders.

On an international level MSB places priority on Nordic cooperation with, for example, NordForsk, work on the EU Framework Programme for Research and Innovation - "Horizon 2020" - current cooperation agreements with the United States via the Department of Homeland Security (DHS) and cooperation with Canada[21].

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21. Cooperation in Horizon 2020, with particular focus on the societal challenge "Secure societies" is in line with the priorities identified nationally in the field of societal security. The DHS agreement allows for cooperation in areas where the United States and Sweden together can strengthen their capability to manage threats and risks.

Research-based knowledge is required in order to meet future challenges in the field of societal security. MSB's mission is to focus and commission research that contributes to that knowledge. "Research for a Safer Society" is MSB's research strategy. It lays the foundation for MSB's research initiatives for the period 2014-2018.

This strategy identifies and describes five key research areas. Added to these are six perspectives and a number of basic principles. Together, they are the components of research, the impact of which will contribute to a safer society.