



Safety and security target levels: Opportunities and challenges for risk management and risk communication

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ABSTRACT

This paper reviews a selection of target levels for safety and security in order to identify their common properties. It is accompanied by a brief investigation of several key terms used in risk management. Risk management is used as an umbrella term for the various research areas dealing with multiple hazards, impacts types and measures for dealing with them. The paper draws upon examples and experience from the wider field of disaster risk research and civil protection. A concept which identifies the common properties and content of risk management goals in general is then devised. Normative implications and challenges in applying risk management goals and the use of terminology are discussed. Finally, two main future research areas are briefly outlined: the role and responsibility of the researcher or observer, and the ways of making use of risk management goals in risk communication. This paper provides fundamental information on examples of risk management goals, common properties and risk communication as compiled for and used by certain national authorities in civil protection in Germany. However, its findings may also be useful for fellow researchers within the disaster risk, climate change, vulnerability and resilience community, and for practitioners in the field of risk, and crisis or emergency management. The future applications of these findings will be useful, especially when developing risk management goals for specific user groups and different levels of analysis.

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1. Introduction

A goal can be the starting point for any risk management process or risk analysis. It is hypothesised in this paper that a thorough understanding of the structure of such goals and the implications of terminology can improve the effectiveness of risk management and risk communication. It is also hypothesised that risk knowledge can be communicated in a more focused way by the use of risk goals. Many activities in disaster risk reduction and in civil protection aim at producing more knowledge

about risks. This knowledge might be borne by researchers, governmental institutions, by private sector experts or by technicians dealing with risks. Irrespective of the methods and concepts applied, there is a need to communicate this knowledge in order to instigate action. Especially for complex and holistic problems, the typical outcomes of risk analyses, such as guidelines, reports, numbers, statistics, matrices or maps, are mostly made by experts for experts. There is an inadequate communication of this type of expert knowledge to non-disaster-risk-experts such as managers and politicians, or the people affected by disasters. There is a variety of more problems associated with translating knowledge. Setting standards for disaster related terms, methods and concepts is usually conducted by selected groups of experts. However, people are expert in a certain field, but might

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not be aware of other experts or, the needs of experts in other fields. Even more, some experts could fail to understand the realities the implementer's face. Risk goals might provide a medium for communicating strategic objectives in disaster risk management for multiple stakeholders. However, for risk management and risk communication to be effective, it is necessary to first understand the terminology used and the normative pitfalls. This paper introduces the key terms; presents a brief review of illustrative examples of quantitative and qualitative goals and target levels used in the security, disaster risk and emergency management arena; discusses several normative implications and difficulties, and suggests how risk management goals may be used for risk communication.

Furthermore, it provides an opportunity to integrate areas such as emergency and contingency management, risk management approaches used in the industry and business continuity area, disaster risk science, climate change and natural hazard driven research on vulnerabilities and resilience, critical infrastructure policy, technical and human-induced safety and security studies and, to some extent, social-ecological systems (SES) research on resilience. The field of disaster risk research and management is continuously expanding. Setting goals, the drive to identify thresholds, tipping-points and priorities, and integrative concepts are the leverage points investigated in this paper and are common areas of concern.

1.1. Terms and usage in security and risk management

Risk management is an area with conflicting terms, and there is a widely acknowledged need for a critical reflection of its definitions, core contents, principles and regulation [1,2]. Terminology and definitions are based on etymology, on semantics but also on current use and context [3]. In this section, certain key terms are explained that are necessary for understanding the following text and context. All terms and definitions are suggested out of the authors' own analytical process using the literature sources provided and based on working experience. The normative implications of these terms are discussed in later sections. This section and the paper are based mainly on the German experience and provide a German perspective of disaster management. Although the focus aims at a broader audience and includes examples from other countries, it needs to be recognised that caution should be exercised in transferring or generalising the German experience to other contexts.

'Protection' in Latin, consists of *pro-* 'in front' + *tegere* 'to cover' [39]. 'Civil protection' is a term used to describe non-military activities that are undertaken to provide security to the civilians, that is, non-combatants. During the cold-war, the term 'civil defence' was used in Germany, (German: *Zivilschutz*). Nowadays, it is replaced at the national level by 'civil protection' or, as more directly translated from German, 'protection of the people' (German: *Bevölkerungsschutz*). At the regional level, and for emergency operators such as fire brigades, or other search and rescue operators, the expression 'protection from disasters' (German: *Katastrophenschutz*) is more commonly used. Recently, the expression 'protection of

the people' has been used to summarise previous terms; therefore it will be used throughout the text, when referring to the German context. In other countries, the term 'civil protection' or 'civil defence' has in some cases been replaced by 'civil contingencies' (UK), 'emergency management', 'homeland security' (USA), 'disaster risk reduction' (UN/ISDR) or by other terms.

The term 'safety' is derived from Latin *salvus* 'uninjured, healthy, safe', and is related to *solidus* 'solid', in Greek *holos* 'whole'. The meaning 'not exposed to danger' is attested from late 14th century; and later on, 'free from risk' [39].

The etymology of 'security' can be linked to Latin *securus* 'without care, safe', from *se cura*, from *se* 'free from' + *cura* 'care' and related to 'cure' [39]. However, one must be cautious as there are multiple ways of interpretation possible. For example, *securus* can also mean: 'it takes care of itself'. From 'se=itself' + 'cura=care'. Interestingly, goals or objectives are nested already within the terms protection, safety and security. While protection contains the risk management strategy to protect or cover one thing from another, safety is a strategic goal related to health, and security is related to care being provided. The terms 'safety' and 'security' seem to be correlated, sometimes meaning the same, and there have been various attempts to disentangle them. Attempts at standardisation illustrate that this is also a linguistic challenge, and the terms differ among countries [4]. One observation that corresponds to the above states that safety means protection from 'direct harm' to people, while security means protection from 'indirect harm' via other people [5]. Especially for 'protection' and 'security', a sizable proportion of the measures provided to people by others are covered by this terminology. This observation is interesting for the discussion between passive and self-activating forms of disaster risk paradigms.

'Risk' as a term has been an on-going matter of discussion. In the context of this paper, however, it is related to the disaster risk. The etymology of the term 'risk' seems unclear. It can be traced back to Greek, *rhiza*, 'root' of a mountain or 'basis', probably used in the sense 'difficulty to avoid in the sea'; to Latin, *risicum*, 'cliff'; or to Arabic, *risc*, 'given', 'destiny', 'divine'. [6]: 20, [7]. Finally, 'goal' is a term used in this paper since it expresses a strategic aim. There are synonyms, such as 'aim' or 'objective'. A 'strategy' is understood here as a goal to be achieved by long-term planning, considering available resources. There persists an on-going discussion about an appropriate umbrella term for this type of research. This paper uses 'risk management'; however, the author is aware that other terms, such as 'disaster risk reduction' or 'disaster risk science', and 'risk governance' are being debated. Risk management is used as it is commonly used and understood by many practitioners in civil protection, in business and in science.

1.2. Manage, govern or accept and adapt?

The goals in dealing with risks are diverse, and there is no conclusive list. Goals depend both on the aims and ambitions of those who create the goals and on the trends

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