TACTIC

TOOLS, METHODS AND TRAINING FOR COMMUNITIES AND SOCIETY TO BETTER PREPARE FOR A CRISIS

Report on the long-term learning framework for a multi-hazard context

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Preamble

The overall aim of the **TACTIC** project is to increase preparedness to large-scale and cross-border disasters amongst communities and societies in Europe. Therefore TACTIC based its work on the state-of-the-art literature related to risk perception and preparedness, developed a self-assessment both for organisations responsible for managing such different risks as flooding, earthquakes, terrorism and epidemics as well as the general public exposed to these hazards. It also created a catalogue of good practices in education and communication. Rather than taking a top-down approach to preparedness, TACTIC pursues a collaborative project strategy by including different user and stakeholder groups in the development, testing and validation of tools and materials throughout the project by conducting four case studies focusing on terrorism, floods, pandemics and earthquakes. This ensures that the outcomes of the project reflects the needs of end users and ensures that the project's outcomes have a life span after the project has officially ended.

All these findings and outputs are presented in an online learning platform which aims to ensure the sustainability of the use of the projects outcomes after the project has come to an end.

The online platform can be accessed by following this link: https://www.tacticproject.eu/tosap/

This document provides an overview about the key results of the single steps and outcomes in the context of a long-term learning framework.

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1 Intention and scope of this report

This report summarizes the main outputs of the TACTIC project and provides also an overview on the collaborative research process in four different case studies engaging with different hazards (i.e. floods, epidemic, earthquakes and terrorism). At the same time it will also be the basis for a handbook that organisations as well as interested members of the general public may use when they want to engage more thoroughly with risk communication, community preparedness and social learning processes.

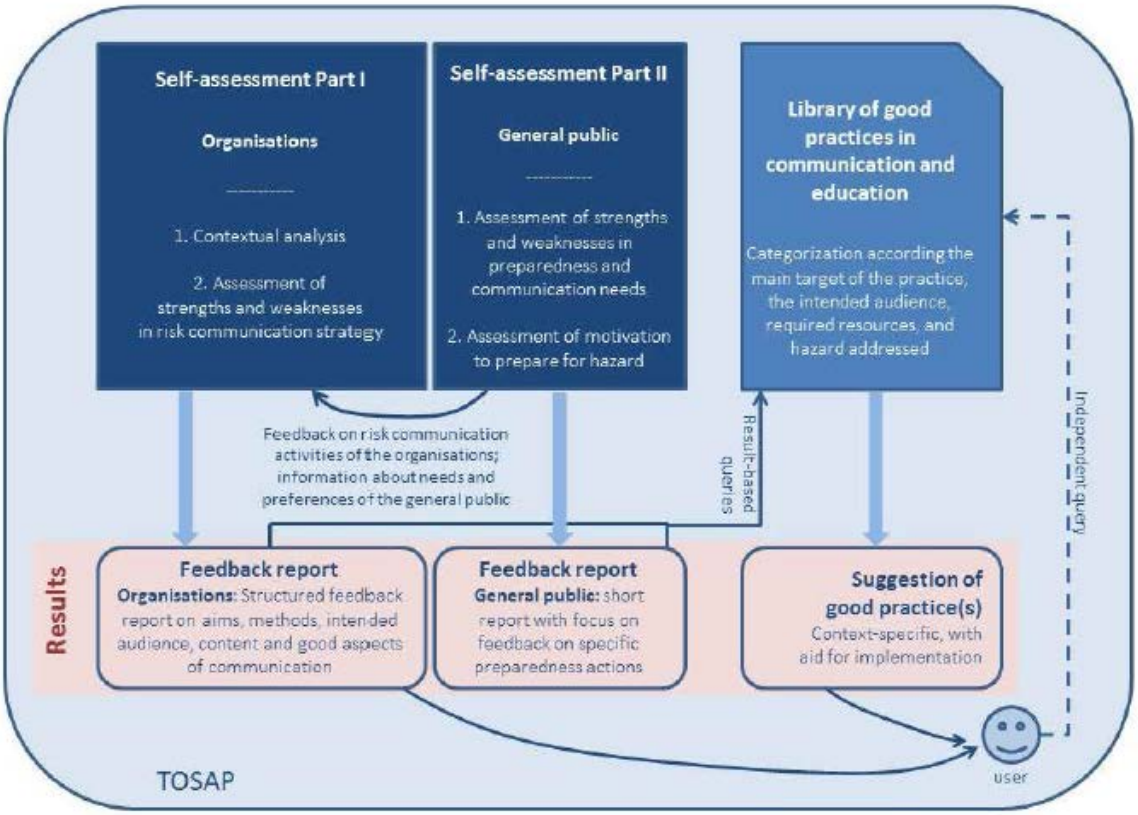
This report is based on a two year transdisciplinary research process that aimed at developing outcomes in close collaboration with stakeholders working and involved in the field of disaster risk management both operationally as well as on the policy-level. Therefore, TACTIC selected four case studies from across Europe, representing different types of crisis and disasters and allowing the consortium to take into account different kinds of preparedness activities and strategies in order to develop a multi-hazard approach to risk communication and community preparedness. More specifically, we focused on:

- Terrorism: Countries across Europe, including European Union Member States have past experiences of acts of terrorism. Whilst some attacks were aligned to a single country, such as the 2011 attacks in Norway which saw approximately 75 people killed and another 75 injured, some acts of terrorism were large-scale in nature, whilst others led to long-term cross-border effects (World Terrorism Database, 2012). Examples of such acts of terror within Europe include a series of what appeared to be large-scale co-ordinated attacks on Madrid_s (Spain) transport network in March 2004 which resulted in 191 fatalities and approximately 1800 injured individuals and the more recent attacks in Paris.
- Floods are the most costly disasters (EEA 2010) in Europe. Although floods are quite common in many parts of Europe, they still pose a profound challenge to emergency and risk management agencies particularly with regard to increasing preparedness and risk communication. This is particularly true in the large-scale river basins that run through different national (and regional) territories.
- Epidemics: This case study used the Foot and Mouth Disease (FMD) crisis in 2001 as the reference event from which to learn how to prepare for and respond to similarly complex threats. Foot and Mouth Disease is an acute infectious disease which spreads very quickly if not controlled and represents an enormous challenge for communities' preparedness.
- Earthquakes: The 1999, 17 August Marmara and 12 November Düzce Earthquakes in Turkey caused massive devastation which has been a turning point for the realisation of the vital importance of community involvement in disaster risk management. The 1999 earthquakes devastated the highly industrialised and densely populated urban areas in Turkey and led to 18,000 deaths, and left 44,000 people severely injured. Many residential, commercial buildings, bridges, motorways and infrastructure were damaged. Thus, following the earthquake major attempts at legislative change, structural mitigation and community involvement initiatives have been instituted (e.g. increase in non-governmental organisations getting involved in mitigation and preparedness, formation of neighbourhood volunteer groups, various community awareness and training programs).

More specifically, TACTIC as developed the following key outputs (see Figure 1):

- A self-assessment for organisations engaged in the management of floods, earthquakes, terrorism and/or epidemics. This self-assessment allows responsible organisations to (re-)assess their risk communication activities and develop a comprehensive risk communication strategy (see Deliverable 2.2 for more details).
- Based on the outcomes of the assessment, organisations will receive a feedback report that outlines their strengths as well as the aspects that could be improved in the future. To do this, organisations are also provided with good practices that organisations might consult to learn more from other examples (see Deliverable 3.2 for more details).
- Therefore we created a library of good practices that is organized according to pre-defined criteria that allows organisations not only to search the library for these criteria, it is also a way of linking specific practices with the specific needs of organisations (see Deliverable 3.2 for more details).
- A self-assessment for the general public, which is exposed to the risk of flooding, earthquakes, terrorism and epidemics. This self-assessment, which we labelled as preparedness-check for the general public allows residents facing different risks to assess their own preparedness including the provision of a short feedback report and selected links to useful websites. Additionally, the preparedness assessment also allows responsible organisations to evaluate how effective their communication activities are and how they influence residents' knowledge, motivation, networks, etc. As a result organisation can also re-evaluate established risk communication practices and reflect upon what they might need to adapt, revise or substitute by alternative, more suitable practices (see Deliverable 2.2 and 3.2 for more details).

Figure 1: Single products developed by TACTIC and how they are interlinked



- An overall framework presented in this document that allows communities at risk to develop their preparedness capacities by evaluating their overall social learning processes and that outlines general principles of how the interaction between organisations and the general public should be organized.

If you want to use any of the assessment, please visit our website and the platform.

https://www.tacticproject.eu/tosap/

2 An introduction: Risk communication as a means for social learning for increasing community preparedness

Increasing preparedness is a complex task that involves multiple stakeholders and is ideally organized in an iterative manner. Simply providing information by means of a flood hazard map, encouraging home-owners exposed to earthquake risks to build earthquake resistant homes or demanding farmers to develop an emergency management plan in case of epidemic event might threaten their livestock, will not be sufficient to actually make individuals and communities more prepared to deal with the impact of large-scale or even cross-border disasters. Also the characteristics associated with terrorism (e.g., uncertainty and the human intention to induce fear) pose challenges for risk managers responsible for communicating risk information about terrorism. All this, at the least, is suggested by decades of research on risk perception, preparedness, risk communication and social learning.

In this chapter we will engage with three concepts more thoroughly, that is “social learning”, “risk communication” and “community preparedness” by outlining the cornerstones of a strategic framework that aims at increasing communities’ preparedness to both large-scale and cross-border disasters through risk communication.

2.1 Social learning

TACTIC defines social learning in the context of disaster risk management as a long-term process that considers learning explicitly as an active social practice that:

- Is interactive and based on engagement,
- Is reflective and ideally iterative and based on the idea of loop-learning,
- Aims at enhancing the capacity of actors to both participate in decision-making processes and to prepare for future disasters, and
- Is directed towards transformation and overcoming existing organizational and institutional barriers.

Social learning as an interactive process

Social learning goes beyond individual learning in a social context and beyond the simple transfer of information from a sender to a receiver aiming at generating new insights or skills. The term social learning rather refers to a process that evolves “with the input of various actors (including those at the community level)” (Pelling et al., 2015, 2) and is thus a deeply “collective and communicative” social activity. It may lead to a number of new social outcomes, skills and knowledge (Muro and Jeffrey, 2008, 330) but may also relate to the negation of identities and established values. As an implication, social learning is based on the interaction of various actors and their reflections about how to change their interrelation or the interrelations with their environment. Keen et al. therefore

suggest that social learning "is the collective action and reflection that occurs among different individuals and groups as they work to improve the management of human and environmental interrelations" (2005, 4). TACTIC has developed an approach as well as an online platform that aims at stimulating and facilitating exchange and interaction within a structured framework that allows the identification of strength and potential weakness with regard to risk communication as well as with regard to community preparedness. Generally, people can interact in many different ways. Interaction may occur on a face-to-face basis (i.e. two individuals are interacting), through larger collective network structures in which different actors are embedded (i.e. members of two organisations are interacting, or a group of well networked residents is interacting with an organisation) as well as through technologically assisted interactions (i.e. social media, online based learning platforms), a point that is particularly relevant for TACTIC and its online platform. Learning itself can also take place in different forms including through the transmission of information that aims at generating new skills and knowledge or through more deliberative forms aiming at an exchange of ideas and arguments (see Reed et al., 2010). Rist et al. (2007, 23) therefore we conceptualize social learning as a process "where different actors can deliberate and negotiate rules, norms and power relations".

Social learning as a reflective and iterative process

Social learning is a cyclical process that includes different steps, such as interpretations of current or past situations, development of new ideas, designing new strategies or measures, implementing agreed upon steps, as well as the review and evaluation of past decisions in order to adapt and revise established patterns (McCarthy et al., 2011). In this sense, it is an iterative process that is based on reflection and sharing of experience and ideas (Keen et al., 2005). McCarthy et al. (2011) summarise various definitions of social learning by understanding it as an "on-going, adaptive process of knowledge creation that is scaled-up from individuals though social interactions fostered by critical reflection and the synthesis of a variety of knowledge types that result in changes to social structures (e.g. organizational mandates, policies, social norms)" (cited in Pelling et al. 2015, 5). As this document highlights and explicates, increasing preparedness through risk communication is also ideally organised as a iterative and deeply reflective process that includes various steps an organisations or community should go through. Generally, the idea of understanding social learning as an reflective and iterative process is most prominently established, particularly in adaptive and risk management, in the theory of loop-learning; a theory that tries to capture the deepth of reflections and learning processes (see also social learning as transformation).

Social learning and transformation

As an implication of the previous argument social learning is in some cases not simply about improving the status quo, it is also about fundamental changes in social networks, established stocks of knowledge and skills as well as in the wider societal and institutional structures, a point that is captured by Argyris and Schön (1978) in their learning loop theory. As Pelling et al. (2015) outline, single-loop learning describes the correction and amendment of specific organizational instruments which usually simply includes the definition of alternative strategies to reach a well-established aim. Double-loop learning is more fundamental as it is not so much concerned with how to reach established goals, but rather challenges these goals and objectives by questioning established values and policies, and aims at changing the behaviour of actors. Triple loop learning is concerned with underlying governance norms and protocols that influence and shape processes with regard to single- and double-loop learning: "The learning process thus affects the underlying governance system and critically challenges the role of human agency in individual and collective learning processes" (ibid., 6-7) and hence connects the learning processes within a political context.

Social learning and capacities

Social learning is based on certain capacities and at the same time aims to enhance capacities. In this sense, social learning is also grounded, at least to some extent, on the idea of 'capacity-building' and its "earlier ideas concerning participation, empowerment, civil society, and social movement" (Eade, 2005, 10). In this understanding, the process of learning is not meant to be a one-way process, but rather a process that underlines the importance of developing skills and competences to solve problems in a participative manner (Kuhlicke et al., 2012). This also implies that all members of a community should have "the right, and the capacity, to organise and challenge authority in order to create a society that is not based on exploitation and oppression" (Eade 2005, 11). Social learning is hence also concerned with stimulating a process that increases the autonomy and agency of individuals and communities. Thus, it is a process which aims at encouraging community members to take "local ownership" of the agenda, rather than simply responding to an externally defined requirement or deficit (Nunn, 2007, 470) and is hence concerned with enhancing the self-efficacy of community members (see also Cheney et al. 2014). We will more specifically outline, which capacities need to be addressed to increase communities' ability to better prepare for different hazards.

TACTIC's approach to social learning

As this short outline highlights, social learning, risk communication and community preparedness are closely interrelated, as social learning is a deeply interactive and communicative activity that is ideally based on some kind of two-way exchange taking place on the personal or the supra-individual level and includes the transmission of information as well as more deliberative forms of exchange. Furthermore, social learning is an iterative process that aims to initiate both incremental as well as more fundamental learning processes. It is based on and tries to enhance, the capacities of individuals as well as collective actors involved in the process and thus also has a transformative potential in order to increase community preparedness in the long-run. For putting these general ideas into practice, TACTIC developed a framework for evaluating the very practice of social learning. More details are provided in chapter 6. Table 1 highlights the principles just outlined and indicates some indicators on how to evaluate social learning processes.

Table 1: Principles and indicators of social learning

Principles	Indicators
Interaction	• Number of involved stakeholders • Number of different types of stakeholders and organisations represented
Reflective and iterative	• Target group • Involvement of target group • Intensity of involvement • Iterative involvement
Capacity enhancing	• Knowledge • Motivation • Networks • Responsibility & ownership • Resource
Transformative	• New strategies/measures to reach established goals • New goals and objectives • New governance norms and protocols

2.2 Risk communication

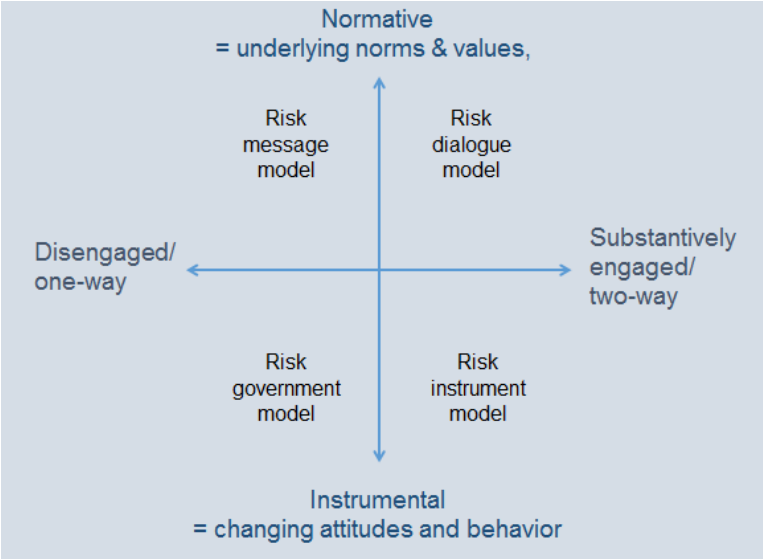
Risk communication plays an increasingly important role in actions dedicated to increase preparedness for different types of large-scale crises. Due to a broad shift that is taking place throughout Europe which places responsibility for preparedness actions in the hands of members of the community (Wachinger et al., 2014; Walker et al., 2014) as well as an increasing public concern about hazards and risks which means that potentially affected people are expected to have the "right-to-know" as well as the right to participate in decisions related to the management of those risks, communicative activities are gaining relevance.

According to Wardman (2008) risk communication follows different rationales and takes place in different forms (see also Demeritt and Nobert, 2014). Many communicative activities are following a rather instrumentalist rationale intending to change behavior or attitudes; others are rather concerned with normative questions and touch upon engaging with underlying norms and values that underpin for example established governance and decision-making structures. At the same time, risk communication can take place in a disengaged, one-way manner as well as in a more engaged, two-way manner. Based upon these two dimensions four different ideal types of risk communication can be identified (see also Figure 2; based on: Demeritt & Nobert, 2014; Wardman, 2008). These ideal types not only underpinned the work of TACTIC, they also suggest different ways to increase community preparedness through risk communication. Risk communication can aim at:

- Getting a message across in order to increase preparedness by focusing on the transmission of information from sender to receiver without distortion, bias or misunderstanding (risk message model);

- Changing attitudes and behaviour of recipients by understanding risk communication as a consciously used instrument in order to increase people's preparedness (risk instrument model);
- Instrumentalist, normative as well as substantive rationales by establishing a more participatory, two-way exchange that blurs the sharp distinction between senders and recipients (or between "experts" and "lay-people") forming the basis of the two previously outlined risk communication models (risk dialogue model);
- Shaping and influencing individual choices and self-regulation in order to increase preparedness by new forms of reflexivity and well-reasoned conduct (risk government model).

Figure 2: Different models of risk communication



Source: based on Wardman, 2008 and Demerit & Nobert, 2014

Risk message model

This type of risk communication is concerned with "transmitting risk information without distortion, bias or misunderstanding" (Demeritt and Nobert 2014, 315). Fundamentally, this model is based on the idea that responsible organisations should be transparent about how they assess risks, what kind of outcomes risk assessments generate and how risks are managed. Still citizens need to be able to understand and 'decode" information in order to understand this kind of information. Quite often, this approach is associated with the so-called deficit model as experts are assumed to hold superior knowledge that simply needs to be communicated to the less educated and less informed public. This type of risk communication is rooted in information theory and the encoder-decoder model of signal transmission as first articulated by Shannon and Weaver (1949; cited in Demeritt and Nobert 2014, 315). Risk maps are one example of this type of risk communication. By designing risk maps in a way that they are intuitively understandable, the sender tries to encode the message in such a manner to increase the likelihood that the receiver will be able to decode the message and draw his or her own conclusion on what to do to increase preparedness (Meyer et al., 2012).

Figure 3: The encoder-decoder model of signal transmission

Risk instrument model

This type of risk communication goes beyond making sure that the transmitted message is understood: it aims at actively changing people's behaviour and is hence more strategic in achieving this goal by paying closer attention to the "interactions between information, attitudes, and behaviour" (Demeritt and Nobert 2014, 317). While the risk message model is based upon the assumption that good communication should inform and not actively influence the decision made by residents at risk, the instrument model takes into account the individual factors that shape risk perception and preparedness. Also as a result of the increasing prominence of this risk communication model, many empirical studies have focused on gaining a better understanding of the factors that motivate individuals to take responsibility and action in order to increase their preparedness (Shreve et al., 2014). This type of communication may take many different forms: Quite common are informal ways of achieving an instrumental goal by using printed booklets or brochures that encourage residents at risk to undertake certain behaviours or to adopt certain measures to increase their preparedness (see Figure 3). TACTIC has collected a multitude of such examples and has archived them in its library of good practices, which can be accessed through the online platform. However, also more formalised ways of trying to change people's habits are increasingly established. Governmental bodies, for instance, emphasise the need for individual citizens to take responsibility. In Saxony (Germany), the role of citizens in flood risk management is not only seen as being a central cornerstone of the state's flood protection strategy, citizens are also required to take precautionary actions by law in Germany to increase their preparedness (Ueberham et al., 2016).

Figure 4: Two examples of the risk instrument risk communication model

http://www.fema.gov/media-library-data/1420417719892-b9b41636569f3c41eea88e70ddfae2e2/FEMA528.pdf

http://www.fib-bund.de/Inhalt/Themen/Hochwasser/2015-03_Hochwasserschutzfibel_final_bf_CPS_red_Onlinefassung.pdf

Risk dialogue model

In the risk dialogue model the distinction between senders and recipients or between certified risk experts on the one hand and at risk lay-public on the other hand is blurring, at least in principle, as dialogical forms of exchange are based on the assumption that both certified experts as well as representatives of the general public have a say in the decision-making process. The Oxford English Dictionary, for instance, defines participation as “to have a share in” or “to take part in,” thereby emphasising the rights of individuals and the choices that they make in order to participate (Mathbor, 2008, 8). The way in which participatory processes are set up and conducted depends also on the purpose of the process itself. A common typology is based on the argument of Fiorino (1990) who, in addition to seeing participation as a fundamental democratic right, distinguishes between a substantive and an instrumentalist rationale for participatory processes (Stirling, 2006). The substantive rationale usually aims at increasing the breadth and depth of knowledge that contributes to a decision, as participation allows for the inclusion of tacit or local knowledge that can improve the quality of risk assessments, risk maps as well as of the management process itself (see Meyer et al. 2012). By following an instrumentalist rationale, participatory processes may contribute to building trust between actors from the public and administration and may also contribute to raising people’s awareness and motivation for taking actions to mitigate the impacts of hazards (see Wachinger et al. 2013). The relevance of dialogical forms of communication is also highlighted by many national and European legalisations (Höppner et al., 2012).

Risk government model

Also communication within the risk government model is aimed at changing behaviours and attitudes but it does so in a less instrumentalist and explicitly persuasive manner. While the instrument model is opaque about its intention, the government model relies on a much more reflexive approach to changing behaviour that diffuses more intuitively into a society “often through logics of individual choice and self-discipline, rather than explaining new norms of conduct as being imposed from above

through coercion" (Demeritt & Nobert 2014, 321). Hence, it is aimed at self-regulation and self-discipline instead of providing an externally-set norm to which individuals should adapt and adopt. In many European countries, insurance companies, for instance, offer more affordable insurance premiums if clients voluntarily participate in regular preventive medical check-ups and, by doing this, aim at activating individuals' personal risk awareness and making them take into account the negative consequences of smoking or excessive life-style choices; thus, creating awareness of their own choices and decisions and the negative consequences they might have for their own lives.

TACTIC's approach to risk communication

As the previous section highlights, risk communication can have quite different rationales; it can be guided by instrumentalist interests as in the risk instrument model or the risk government model or can be inspired and guided by more normative, value and norm-driven motives as in the risk dialogue model. At the same time, communicating about risks can either happen in a distant one-way setting with an emphasis on information provision; it may also involve a more engaged two-way approach that aims at exchanging attitudes on underlying values and norms. In order to put these general considerations into a more practical context, TACTIC developed a strategic approach to risk communication that is based on different steps such as defining the goals and audiences of risk communication activities, as well as identifying appropriate methods for achieving these goals; a point we return to in chapter 4.

2.3 Community preparedness

Engaging with the concept of "community preparedness" requires us to specify the meaning of the two concepts each associated with many different meanings. Preparedness, as Shreve et al. (2014) state in TACTIC Deliverable 1.1, is a term that could easily be defined with one word, "readiness", or a simple phrase, "the state of being prepared". At the same time, it prompts a multitude of different meanings when contextualised for a specific type of event (see Shreve et al. for an overview). As a starting point, TACTIC therefore adopted the UN's Office for Disaster Risk Reduction (UNISDR) definition of preparedness (see Table 2).

Table 2: TACTIC's definition of preparedness based on UNISDR (2007)

Concept	Definition
Preparedness	• "The knowledge and capacities developed by governments, professional response and recovery organizations, communities and individuals to effectively anticipate, respond to, and recover from, the impacts of likely, imminent or current hazard events or conditions." • https://www.unisdr.org/we/inform/terminology#letter-p

Source: UNISDR, 2007 (https://www.unisdr.org/we/inform/terminology#letter-)

UNISDR's definition of preparedness reflects key concepts such as knowledge, capacities, and levels of action and interaction, e.g. between individuals, communities, organisations, and governments, that have been found to be influential in increasing preparedness by disaster researchers and practitioners as evidenced in the scientific literature (to be discussed below). Additionally, the UNISDR definition is globally recognized and commonly referenced in international policy

documents. In a second step, participants at the October 2014 TACTIC workshop on good practices in disaster preparedness further discussed the concept of preparedness and agreed upon five components that are suggested to comprise preparedness (Begg et al., 2014b) and are described in more detail in Table 3.

Table 3: Components of Preparedness

Components	Definition
Knowledge	• Is communicated through information about the hazard and the actions required to prevent, respond to and mitigate its potential consequences
Motivation	• Is related to the willingness to address hazard-related risks and act upon them as well as the feeling of self-efficacy to actually be able to reduce hazard-related damages through one's own action and decisions. Motivation is required to increase the likelihood of preparedness actions being taken and sustained
Networks	• Is concerned with possessing and exploiting social capital as well as social trust in other actors. Networks facilitate collective effort, which is likely to result in sustainable preparedness actions.
Responsibilities	• Relate to how duties are distributed between public/individual and private actors as well as how this distribution is perceived, in addition to being able to participate in decision and policy-making processes
Resources	• Include financial (land, physical material, buildings etc.) and human (e.g., personnel and skills) and provide the means to be able to know and act, be motivated, and establish networks.

Source: Begg et al. 2014

There is broad consensus that preparedness should take place and is most effective on the level of communities. Yet, "community" is a concept far from self-evident; there are 'geographical communities' (for example, a whole village or an urban neighbourhood), 'communities of circumstance' (which emerge by chance or due to structural features, such as school classes) and 'communities of interest' (which come into being due to a stated interest or legitimate stake in a certain issue). Communities might exist for a very long time or be a temporary network. Moreover, each community (of whatever type) should not be understood as one single actor, as members of a community are neither homogeneous nor do they have one single interest or view on a certain issue. Rather, local and other types of community are characterised by internal social differentiation and a number of diverse interests. Issues like social conflicts, social inequity and social exclusion need to be taken into account when considering communities. When using the term "community" in this document, we always mean "local communities". This includes residents at risk, actors from the voluntary sector as well as private actors (e.g. local companies) but also organisational actors from responsible agencies and administrations. Local communities might be independent territorial units or parts of larger settlements, such as neighbourhoods within a city.

TACTIC's approach to community preparedness

In summary, community preparedness describes the capacities (i.e. knowledge, motivation, networks, responsibilities and resources) of a community including its residents, the voluntary sector, private actors (e.g. local companies), and organisational actors from responsible organisations to effectively anticipate, respond to, and recover from, the impacts of likely, imminent or current hazard events or conditions.

2.4 Bringing it together: Risk communication as a means for social learning for increasing community preparedness

Based on the previous arguments, **TACTIC** understands social learning as a social practice that is ideally interactive, iterative, directed towards transformation and aim at enhancing the capacities of both responsible organisations as well as individual people exposed to various risks to prepare for future disasters on the level of communities. Risk communication is a central means for achieving this goal; it can follow different rationales (e.g. instrumental, dialogical etc.), follow different aims and rely on different methods, a point we will elaborate more in the following chapters.

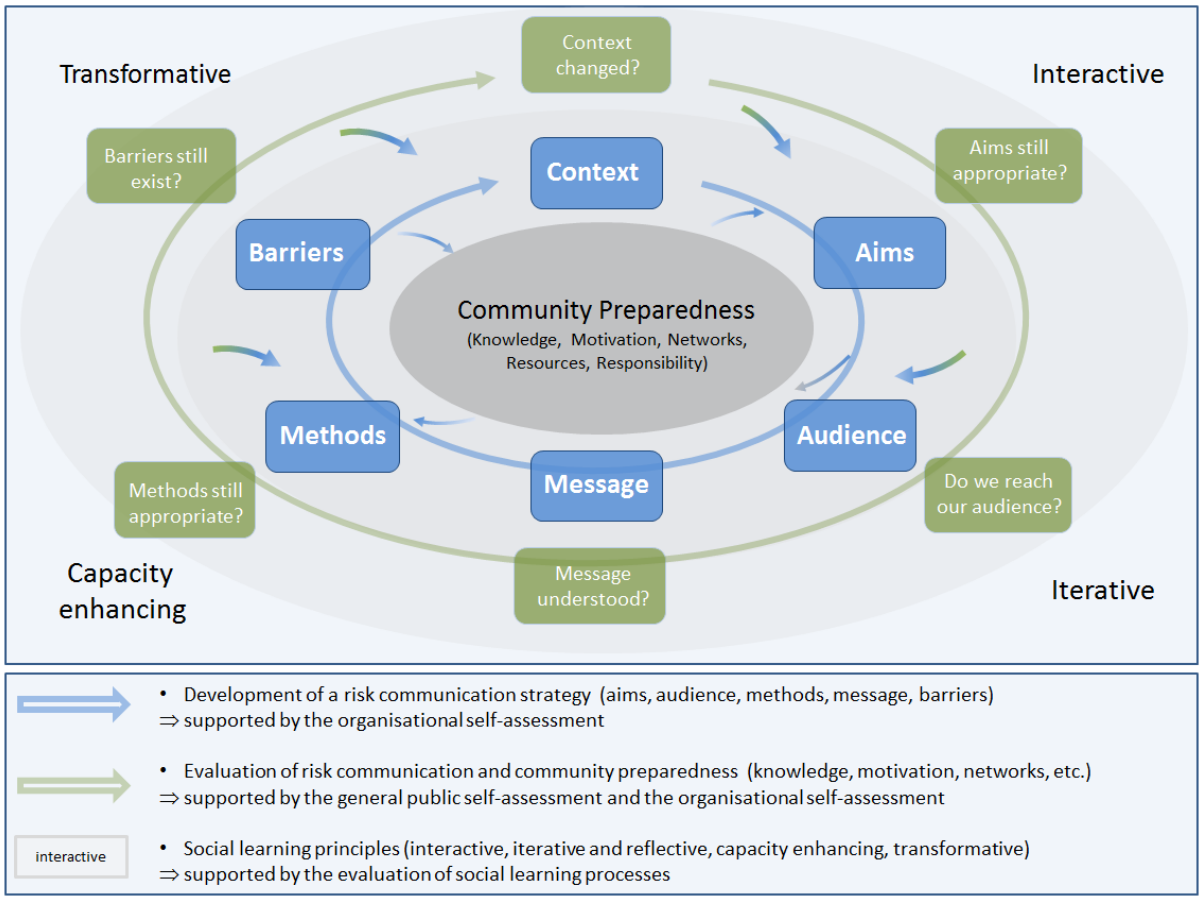
To stimulate and guide social learning in the manner outlined above, TACTIC has developed an online platform that includes different self-assessments, feedback reports as well as a comprehensive library of good practice. All the single outcomes aim at supporting communities at risk to increase their preparedness. The general guide in the sense of a handbook is provided in this document. More specifically, this online platform includes (see also Figure 5 for an overview):

- A self-assessment for organisations engaged in the management of floods, earthquakes, terrorism and/or epidemics. This self-assessment allows responsible organisations to (re-)assess their own risk communication activities and develop a comprehensive risk communication strategy. The platform provides organisations with a feedback report that outlines, based on their answers to the assessment, their strengths as well as the aspects that could be improved in the future. To do this, organisations are also provided with good practices that organisations might consult to learn more from other examples;
- A self-assessment for the general public, which is exposed to the risk of flooding, earthquakes, terrorism and epidemics. This self-assessment, which we labelled as preparedness-check for the general public has two objectives. On the one hand, it allows residents facing different risks to assess their own preparedness in the sense of a preparedness check including the provision of a short feedback report and selected links to useful websites where additional information is provided on relevant preparedness activities. Additionally, the preparedness assessment also allows responsible organisations to evaluate how effective their communication activities are and how they influence residents' knowledge, motivation, networks, etc. As a result organisation can also re-evaluate established risk communication practices and reflect upon what they might need to adapt, revise or substitute by alternative, more suitable practices;
- An evaluation of overall social learning processes that allows different stakeholders involved in risk management activities to assess whether the overall process is interactive, iterative and reflective, whether it sufficiently directed towards enhancing capacities of actors to both

engage in the process and to better prepare for future crises situations and whether it is leading to incremental or transformative changes.

Figure 5 provides an overview of the single products and processes upon which TACTIC's social learning is based.

Figure 5: Framework for social learning by means of risk communication for increase community preparedness



All the self-assessments, as well as the library of good practices are openly accessible and the assessments are provided in English, Turkish, Polish and German.

If you want to have a look at the online platform, please go to:

https://www.tacticproject.eu/tosap/

3 TACTIC as process and outcome (including its evaluation)

The outcomes and arguments presented in this document as well as the ones presented in Deliverables 2.2 and 3.1 and the ones presented in the online platform are based on a two year project defined to a large extent by a close and intense interaction with stakeholders in four different case studies across Europe. In this chapter we outline the process of developing the final outcomes as well as some indicators on how the process as well as its final outcomes were received by potential users.

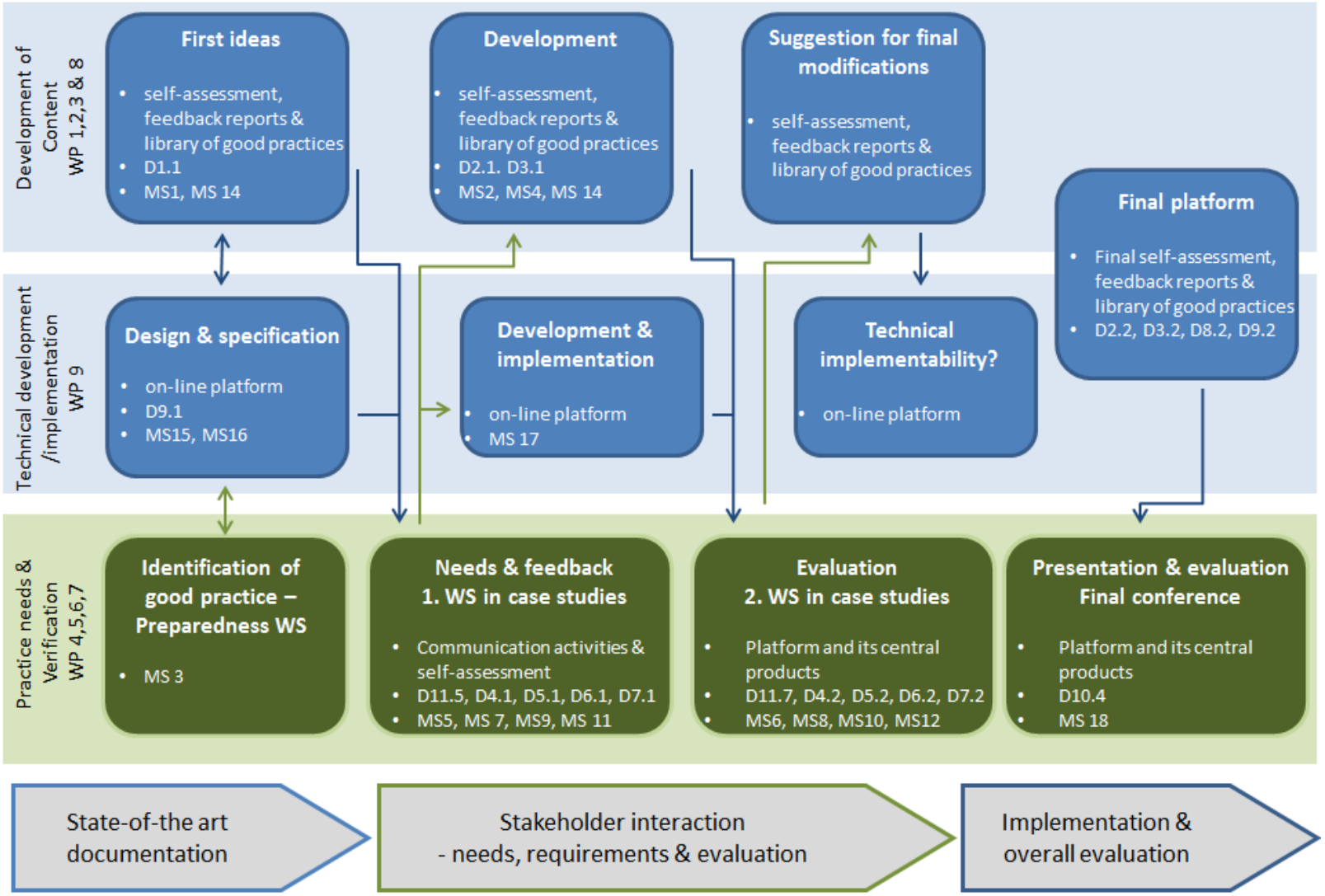
3.1 The process of co-production within the context of TACTIC

Generally, TACTIC included three different phases (see Figure 6). During the first phase, TACTIC was engaged with documenting the state-of-the-art by doing desk-based research and by conducting interviews with experts and scientists. The aim was to identify and better understand the pathways from risk perception to preparedness. This was mainly done in "WP 1 - risk perception and preparedness" and resulted in a high-level document providing a unique cross-hazard perspective on how risk perception and other factors shape preparedness of individual and communities to the risk of terrorism, flooding, epidemics and earthquakes. In "WP 3 – preparedness and communication and education material and practices" we focused on reviewing existing preparedness programs and practices and identified good practices of communication and education which were presented to participants of a workshop. At the same time, the technical requirements for the online platform were specified. This initial phase concluded in PM 8 with the products outlined in Products developed during the first phase of TACTIC (see Table 4).

Table 4: Products developed during the first phase of TACTIC

Name of product	Description of content
D1.1 Report on risk perception and preparedness	• Literature review on risk perception and preparedness
MS 1 First draft version of the community audit (WP 2)	• General idea and architecture of the self-assessment
MS 14 First draft of the long-term learning framework for a multi-hazard context (WP8)	• General idea how the different components to be developed (i.e. self-assessment, feedback report, library of good practices) are interlinked
MS 15 Specification of the TACTIC online training and audit platform	• Description of technical specifications necessary to develop the online platform
MS 16 First skeleton of the TACTIC online training and audit platform	• Technical details of the overall architecture of the online platform
D9.1 Design and specification of the TACTIC online training and audit platform	• This includes the implementation of MS15 and MS16

Figure 6: The different steps of co-production – interaction between science, technical development and stakeholders



The products outlined in Table 4 provided the basis for both intensive stakeholder interaction processes in the second phase of TACTIC as well as a close interaction between thematic advancements in WPs 2 and 3 and technical development in WP 9 "Online training and audit platform". As stated above, a central means to ensure close interaction with stakeholders was the organisation of two workshops in each of the four case studies in order to develop, test and validate outcomes in a collaborative and co-productive manner. The single workshops as well as the overall approach in the case studies followed a similar rationale: After an initial phase aiming at exploring the different governance contexts and mapping networks and learning needs, a first version of the self-assessment was presented in order to receive feedback from each of the case studies. Furthermore, the needs of participating stakeholders with regards to communication practices were addressed and taken into account. During a second workshop conducted in each of the case studies, the self-assessment for organisations and the general public were presented and evaluated with regard to different criteria (see section 3.4). During this phase the interaction between the rather thematically oriented work packages (WPs 2 and 3), the Work packages responsible for organizing the workshops (WPs 4-7) and the stakeholder process and the technical development of the platform (WP9) were particularly intense. While it was initially foreseen we would evaluate the process and the intermediate outcomes by means of the online survey, we decided to restrict the evaluation to the single workshop interaction as we received rich and profound feedback during the workshops that helped us considerably to shape the outputs in a way that would make sure we meet the demands and needs of the stakeholders we interacted with.

Table 5 provides an overview of the central outputs of the second phase of TACTIC.

Table 5: Central Products developed during the second phase of TACTIC

Name of product	Description of content
D2.1 First outline of the participatory community preparedness assessment	• Key components and topics of the organisational self-assessment and the self-assessment for the general public
D3.1 First outline on preparedness communication and education practices and materials	• Outline of central aspects of risk communication as well as criteria for defining "good practices" in the context of TACTIC
D4.1 Short report on "Workshop 1 – case study terrorism"	• Summary of key insights from the first workshop on terrorism including needs and demands
D5.1 Short report on "Workshop 1 – case study flooding in Central Europe"	• Summary of key insights from the first workshop on flooding including needs and demands
D6.1 Short report on "Workshop 1 – case study epidemics in the UK"	• Summary of key insights from the first workshop on epidemics including needs and demands
D7.1 Short report on "Workshop 1 – case study earthquakes in Turkey"	• Summary of key insights from the first workshop on earthquakes including needs and demands
MS17 Implementation of first	• First version of the online platform to be presented to

version of TACTIC online platform	stakeholders during the second round of workshops
D4.2 Short report on "Workshop 2 – case study terrorism"	• Summary of key insights from the second workshop on terrorism including evaluation of online platform
D5.2 Short report on "Workshop 2 – case study flooding in Central Europe"	• Summary of key insights from the second workshop on flooding including evaluation of online platform
D6.2 Short report on "Workshop 2 – case study epidemics in the UK"	• Summary of key insights from the second workshop on epidemics including evaluation of online platform
D7.2 Short report on "Workshop 2 – case study earthquakes in Turkey"	• Summary of key insights from the second workshop on earthquakes including evaluation of online platform
D 11.7 Summary of case study reports	• Summary of the key insights generated by the workshops including a detailed feedback overview and how the consortium responds to it

During the final phase of TACTIC we focused our efforts on further consolidating our main output, which included the development of a final version of the two sets of self-assessments, one for organizations, one for the general public, the consolidation of the feedback reports, the final implementation of the library of good practices as well as the consolidation of the long-term learning framework presented in this document. This included also an overall summary of the evaluation of the single steps as well as the overall outcome. Great efforts were also undertaken in producing a final version of the web-based platform to present the central outcomes of the project by means of a practical and interactive user interface that will be used and remain accessible after the end of the project. We therefore translated our central output and made them available in our case study languages; that is English, German, Turkish and Polish. This shall ensure that the platform will be used beyond the duration of the project and hence ensure the sustainability of TACTIC's outputs.

Table 6: Central Products developed during the final phase of TACTIC

Name of product	Description of content
D2.2 Report on the participatory community preparedness assessment	• Final version of the two sets of self-assessment for organisations and member of the general public
D3.2 Report on preparedness communication and education practices and materials	• Final version of risk communication activities and practices including feedback report for organisations and the general public as well as criteria for choosing practices from the "library of good practices"
D8.2 Report on the long-term learning framework for a multi-hazard context	• Final version of the overall approach of TACTIC including key components of social learning, a overview about central aspects of community preparedness (including components and indicators) as well as risk communication (including indicators on central steps to be taken to develop a communication strategy)
D9.2 TACTIC online platform	• Final version of the interactive online learning platform including self-assessment, feedback reports and library of good practices as well as related documents and introductions (available in English, Turkish, Polish and German)
D10.4 Conference report and briefing paper	• Topics of the final conference, thematic introduction to TACTIC, overview on participants

3.2 Evaluation indicators for the process and outcomes of TACTIC

Based on the principles of social learning, TACTIC developed a set of indicators that were used to evaluate the quality of both the process of co-producing knowledge as well as of its central outcomes (see Table 7). In this evaluation we focus on three aspects in particular

- The general form and quantity of interaction
- The intensity of interaction including the degree of reflection and iteration through the process of co-production
- The final outcomes developed by the project

The evaluation results are provided in Table 11.

Table 7: Principles and indicators for a self-evaluation of TACTIC

Principles	Indicators
Interaction (general frame)	
Number of involved stakeholders	• Overall number of stakeholder involved
Number of different types of stakeholders and organisations represented	• Diversity of institutional backgrounds participating in the processes
Reflection and iteration (process of co-production)	
Definition of roles of different stakeholders involved	• Roles are clearly defined and communicated to stakeholders • Roles are defined but not communicated • Roles are neither defined nor communicated
Indication of intensity of involvement of stakeholders	• Informing the target group (least advanced) • Consulting the target groups (more advanced) • Involving the target group in the design (even more advanced) • Involving the target group in the decision-making process (most advanced)
Number of different types of interaction	• E.g. online conference, online discussion, conferences, interviews, workshops
Iteration of interaction	• Once during the process • Twice • Three times
Outcomes	
Internal evaluation of outcomes	• Expected outcomes are clearly defined and achieved • Expected outcomes are clearly defined but only partially achieved • Expected outcomes are clearly defined but not achieved • Expected outcomes are neither clearly defined nor achieved
Evaluation of outcome by external stakeholders	• "Very useful" to "not useful at all"
Sustainability of outcomes	• Outcomes will sustain after the end of the process • Outcomes will not sustain after the end of process

3.3 Stakeholder interaction: Knowledge transfer from science to practice and from practice to science

TACTIC itself was organised as a transdisciplinary research process that aimed at developing its central outcome in close collaboration with stakeholders working and involved in the field of disaster risk management both operationally as well as on the policy-level. Therefore, **TACTIC** selected four case studies from across Europe, representing different types of crisis and disasters and allowing the consortium to take into account different kinds of preparedness activities and strategies. All of the case studies have experienced actual or potential large-scale and/or cross-border disasters and crises. In the case studies, **TACTIC** relied on established relationships with various stakeholders that were further enhanced throughout the project by creating and facilitating new relationships with stakeholders working in the different contexts. The collaboration with stakeholder was based on interviews, email exchange as well as on intensive interaction with workshop participants before, during and following 8 workshops that were organised in TACTIC's four case studies.

During the TACTIC project we interacted directly with a minimum of 250 stakeholders. In total, 160 external stakeholders participated in 8 eight workshops in the case studies. In addition, a thematically focused workshop was organized with scientists and high-level policy-makers aiming at identifying criteria for and good practices of increasing preparedness on the community level. In this workshop 12 external participants were involved. In its final stage, a conference with more than 80 stakeholders from across Europe was organized in which the final outcomes and key insights from TACTIC were presented to a larger audience of stakeholders from across Europe. In addition, stakeholders were reached through the consortium's participation in external events and through the dissemination activities on the TACTIC website and social media.

Throughout the workshops the group of stakeholders was enlarged. As Table 8 illustrates, the stakeholders involved have very diverse institutional backgrounds. While the majority of participants were governmental representatives as well as non-governmental representatives, we also involved representatives from academia, first-responders, journalists, students, religious representatives as well as stakeholders working in small and medium-sized enterprises. Since governmental organisations are the main potential users of the platform as they are in most European countries responsible for risk communication and for enhancing preparedness they are the largest group involved in TACTIC.

Table 8: Number of participants by hazard type and type of stakeholder

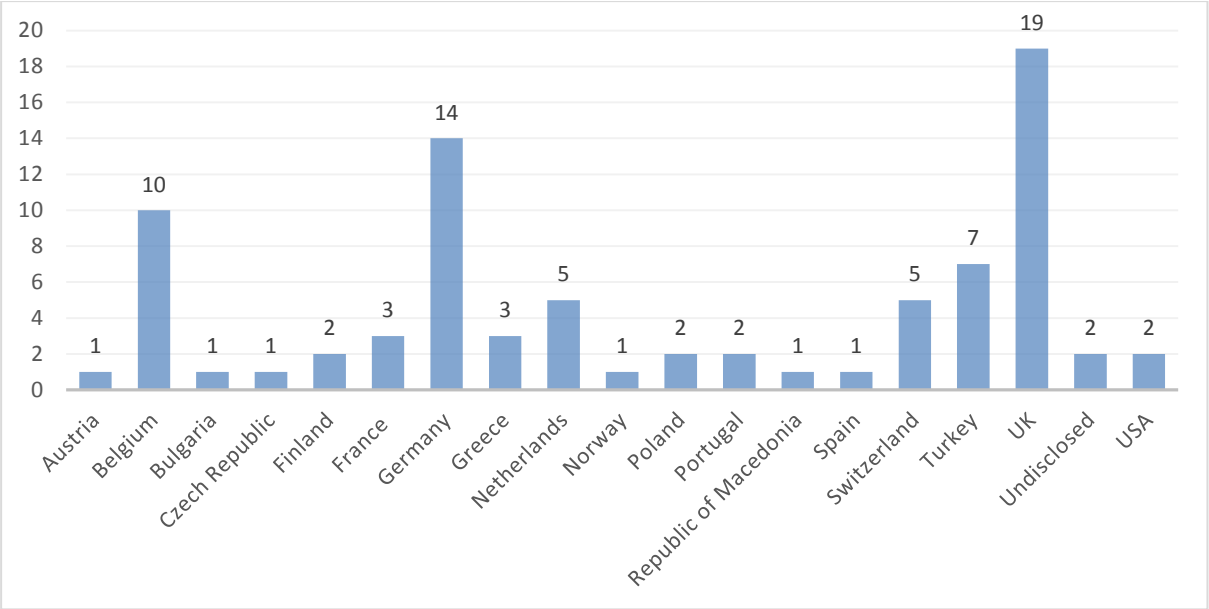
	Terrorism	Floods	Epidemics	Earthquake	Total
Governmental representatives	6	37	5	27	**75**
First-responders	3	1	5	3	**12**
Non-governmental organizations	10	4	22	4	**40**
Small and Medium sized enterprises	1	0	0	2	**3**
Academics (without consortium members)	5	2	3	4	**14**
Religious representatives	0	0		4	**4**
Journalists	1	0	4		**5**
Students	0	0		7	**7**
Total	**26**	**44**	**39**	**51**	**160**

Stakeholders were predominantly involved in the development and design of the self-assessments as well as the feedback reports within two workshops conducted within 12 months as well as through pre-workshop interviews that aimed at better understanding current practices of risk communication and building preparedness communities exposed to different hazards.

In addition, to the workshops in the case studies an initial thematically focused workshop was organized in WP 3 aimed at identifying criteria for good practices in disaster risk preparedness programs and communication as well as education activities. Twelve external stakeholders were invited to participate. While this workshop was directed towards an academic audience (8 stakeholders), policy-makers, and representatives of governmental bodies as well as non-governmental organisations participated (4 stakeholders).

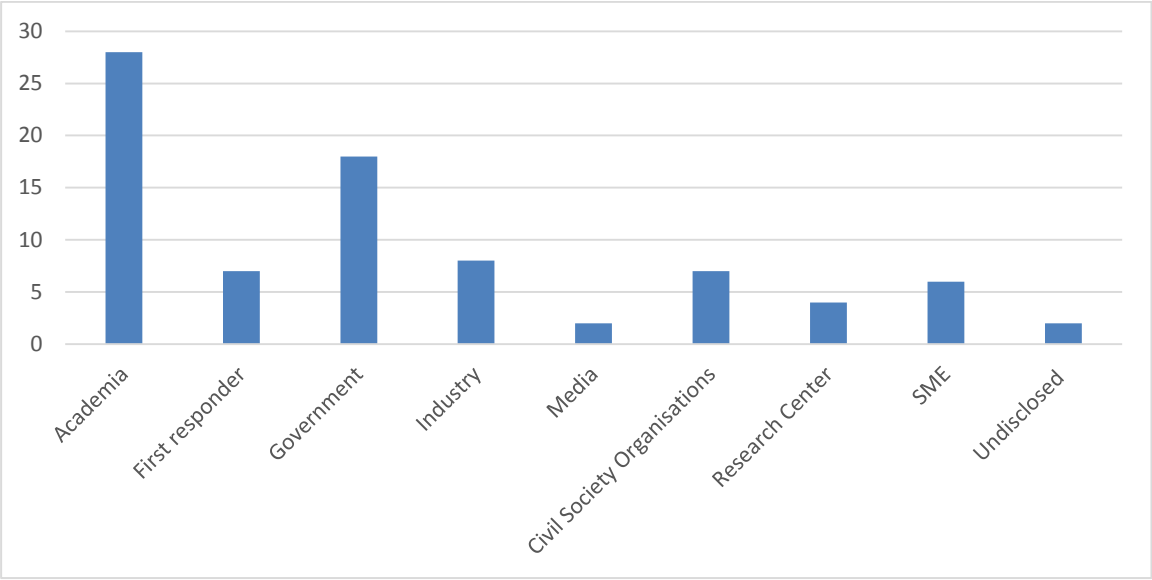
TACTIC presented its final outputs as well as central empirical findings at its final conference in Brussels, which was jointly organized with the POP-Alert project (See Deliverable 10.4 for a more detailed overview). In total, there were more than 80 persons from 18 countries who participated in the TACTIC and POP-ALERT conference. As the figure shows, countries from across Europe were represented, in addition to two participants attending from the United States of America (USA).

Figure 7: Conference participants by country



The conference participants also represented different types of stakeholder category as illustrated in Figure 8. All except one (the general public) of the stakeholder categories targeted by TACTIC were represented. During the conference, the final outcomes were presented to a larger audience during the final conference, which also included a feedback on the usability of the products developed.

Figure 8: Conference participants by stakeholder category



Intensive stakeholder interaction was hence a central characteristic of TACTIC. This involved two workshops organized in each of the case studies.

3.4 Reflection and interaction: the process of co-production

As stated above, a central means to ensure close interaction with stakeholders was the organisation of two workshops in each of the four case studies. The single workshops as well as the overall approach in the case studies followed a similar rationale: After an initial phase aimed at exploring the different governance contexts and the mapping of networks and learning needs, a first version of the self-assessment was presented in order to receive feedback from each of the case studies. Furthermore, the needs with regard to communication practices were addressed. During a second workshop conducted in each of the case studies, the self-assessment for organisations and the general public which had been further developed were presented and evaluated with regard to different criteria (see section 3.4).

Expectations of stakeholders and feedback on usability and technical aspects

While during the first round of workshops only the general architecture of the online platform and its products was presented to stakeholders, we were able to present during the second rounds of workshops a comprehensive draft version of the online platform. To take into consideration stakeholders' expectations and their feedback on technical aspects and the overall usability of the online platform, qualitative Indicators were developed for evaluating the online platform during the case study workshops. It comprised the following questions that were asked by project members to the participants of the workshops testing the online platform during the workshops:

Figure 9: Topics and questions addressed for receiving feedback on the first comprehensive draft of the online platform

Topic	Questions
Expectations	• What do you expect from the tool? • Do you have any experiences with similar tools? • How important is receiving feedback on your risk communication/ suggestions how you can improve your risk communication for you?
Using the self-assessment	• Is the question understandable, reasonable, and/or relevant? • Are the answers/respond categories understandable, reasonable, and/or relevant? • Is something missing?
Overall impression	• Comprehensibleness • Applicability • Expenditure of time • Design • Functionality • Suggestions for reflection • Importance of single topics/themes • Rigor • Suggestion for improvement

Feedback was collected during all case study workshops and was used to improve the platform. Table 9 outlines the expectations as expressed by stakeholders during the workshop before the online platform was presented and a qualitative interpretation of whether the expectations were fulfilled by the platform based on the feedback we obtained during and after we went with stakeholders through the singe components of the platform. In addition, we also reason why the platform could not meet all expectations expressed by stakeholders.

Table 9: Expectations as expressed by stakeholder with regard to the organisational self-assessment and the feedback report

• Identifying communication gaps between organisations and the public. Does an organisation reach its audience? It the "message" coming across? Where are weaknesses and shortcomings in current risk communication practices?
• Offering something more than emergency manuals that some organisations already use by providing specific feedback on how to improve risk communication
• To be directed to helpful resources (e.g., where to go to learn about first aid) and good practices that other organisations use already
• Being provided with recommendations on what to do to increase preparedness
• To learn about communicating with social media as many participants were looking for guidance on how to best use it.
• Some participants were also interested in learning about how they best deal with the language in cross-border cooperation
• Identifying risks and vulnerability
• Identifying organisational and communities' responsibilities

Participants expected to learn more about risk communication. In fact, they stated that the self-assessment was a good starting point. Especially, participants thought that it would be a good opportunity for organizations to develop their risk communication strategy based on the results of the self-assessment. Participants found it very important to receive feedback on their institutions' risk communication and also suggestions on how they can improve their institutional risk communication for the public. In addition, they considered the tool as very cost-effective since it was available online and did not require, at least in its initial usage, external support or consultation.

In most workshops the overall intention, set-up and content of the self-assessment and the feedback reports were perceived as very helpful and most expectations were fulfilled by the self-assessment, this became apparent in the second round of workshops. There was general agreement that the thematic blocks of the organisational self-assessment were comprehensive and also has the necessary degree of detail with regard to some aspects. In some groups, particularly the potential for inner-organisational exchange and learning was highlighted. Some groups concluded that the self-assessment has potential to be conduct by different persons or units within an organisation allowing

to comparison of results and discussion of its implications among members of an organisation and hence initiate debates and discussions among the participating persons.

It also became apparent during the workshop that the usefulness of the organisational self-assessment was rated quite differently depending on the degree of experience with regard to risk communication. It was pointed out that some people or organisations already have a lot of experience in dealing with flood risks or other emergency situations. For them it was considered as being more useful to have a checklist of what they can do based on the result (short list, maximum one page, only focus on methods and things that need to be done in the case of an emergency). They also stated, however, that other organisations are much less experienced and are possibly more interested in obtaining more background information. For them, a longer assessment and feedback report would be valuable.

By some participants of workshops, the general feedback on the organisational self-assessment was rather ambivalent: on the one hand participants had the impression that questions were too general and not helpful in their context; they expected a decision-support-tool that would help them to communicate better in a case of emergency (e.g. when a flash flood is occurring), on the other hand they also underlined that the self-assessment might be more helpful for an organisation that is less experienced and less advanced with regard to risk communication as the one that tested the self-assessment.

Some expectations of stakeholders clearly went beyond the scope of TACTIC. It is neither intended to be a decision-support tool nor will it allow evaluating risks and vulnerability, at least not directly. However, the general public self-assessment allows assessing the preparedness of the general public in a specific community if the assessment is conducted thoroughly and receives high return rates and might hence also help to identify vulnerabilities of the population or shortcomings with regard to risk communication of responsible organisations.

Also with regard to the general public's self-assessment we collected stakeholders' expectations.

Table 10: Expectations as expressed by stakeholder with regard to the preparedness check of the general public and the feedback report

• Assessing the preparedness of the general public with regard to different hazards
• What does the general public expect from authorities with regard to risk communication
• Give recommendations on what to do to increase preparedness by identify the actions and things that they can do (e.g., creating a grab bag).
• To identify the information that the general public can expect from authorities.
• Identify and understand cultural and socio-demographic differences in communication habits and needs as well as preparedness
• To identify the threats and risks that would affect them as a community

Also the general feedback of the general public's self-assessment, including the feedback report, was quite positive. Participants mentioned that especially questions about concrete measures that people can take before and after flood events and things they are asked to do during the flood are always relevant and frequently asked by members of the general public in their community. Having answers to these questions is not only seen as useful for the general public but also for the organisations as it supports their work. In the case-study on flooding many stakeholders were interested in testing the self-assessment for the general public in their communities because they thought that a) their feedback is a very valuable source of information for them and b) because it provides answers to the questions that the general public asks, (e.g. links to where to find information about certain measures).

Generally, all topics and themes that are included in the GPSA were rated as important. The thematic blocks include all relevant issues. The overall impression of the group is that the tool is functional and allows reflection on individual flood risk preparedness.

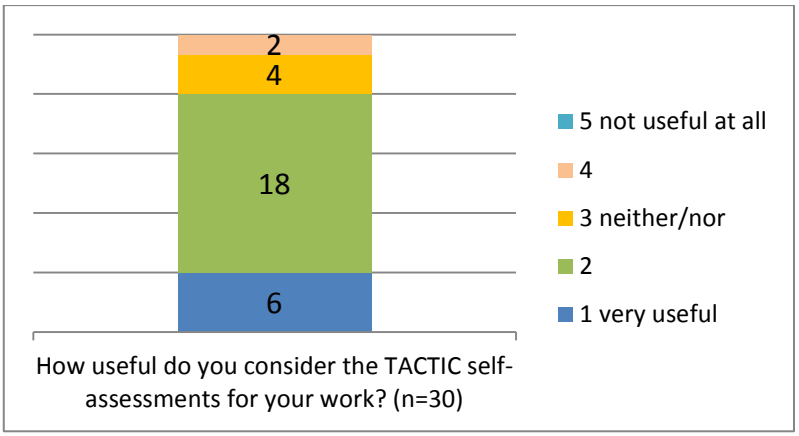
However, it was mentioned again that the applicability is limited to persons with computer skills. In terms of user friendliness it was mentioned that the design of the dialogue window should be more intuitive. Sometimes it would be important to define the terms used in explanations below the questions. It would be interesting for them to go through the self-assessment again after having worked through the feedback report and after having received the link to the good practices (to test the added value and learning factor). It was considered important to promote this tool on a wider scale.

More detailed information on the feedback we received and how we incorporated it into the platform are presented in Annex 1 detailing the single comments and how the consortium considered them in the development of TOSAP.

3.5 Overall evaluation of the outcomes

The final evaluation of the outcomes of the TACTIC project was done during the final conference (for more details see Deliverable 10.4). After the overall idea and approach of the TACTIC project as well as central outputs, such as the self-assessments, feedback reports and the library of good practices was presented to the audience, attendees of the conference were asked to anonymously evaluate "How useful they consider the TACTIC self-assessment for your work". Figure 10 shows that 80 % of respondents (n=30) rate the self-assessment as "useful" or "very useful" indicating that the TACTIC platform is organized in a way that meets current requirements, demands and interests of many different stakeholders in Europe.

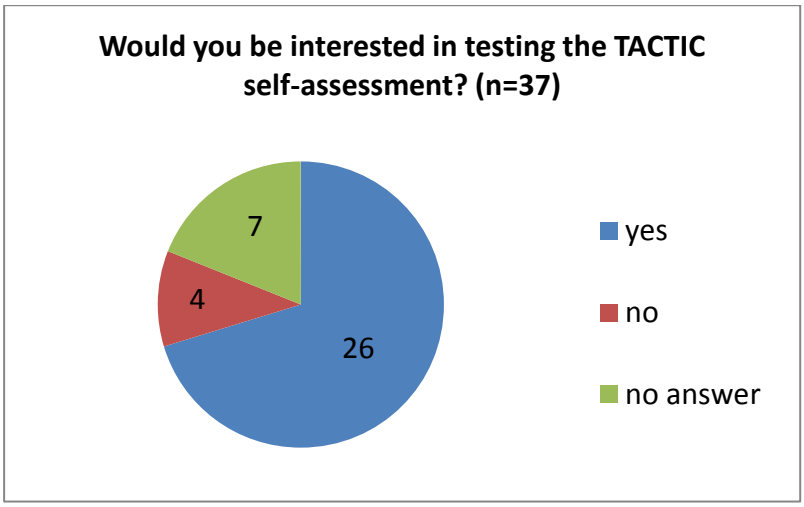
Figure 10: Overall evaluation of the usefulness of the self-assessments



This result is also underlined by the positive feedback we obtained in the workshop as well as the willingness to test the final version of both the organisational self-assessment as well as the preparedness self-assessment for the general public. Also among the participants of the final conference, by far the majority of participants were willing to test the final version of the self-assessments.

As an outcome of the case study process, TACTIC is on close contact with a set of stakeholders who would like to test the platform when it is finalised. This includes particularly the usage of the preparedness self-assessment for the general public. The district of Bautzen (case study on flooding in Central Europe) will use the preparedness check to assess how prepared the citizens of the district are (330.000 inhabitants) and how effective the organisations risk communication activities are. Also other stakeholders expressed similar motivations. The TACTIC platform will therefore be maintained both by UFZ and ED. It is aimed at finding additional resources to develop the platform further. There is hence a very high likelihood that the outcomes will sustain after the end of the project.

Figure 11: Willingness to test the final version of the self-assessments



3.6 Evaluating TACTIC as a social learning process

In this concluding section of this chapter we present the results of a qualitative self-evaluation of the TACTIC project based on the indicators outlined in section.

Table 11: Self-evaluation of TACTIC's collaborative process and its outcomes

Principles	Indicators	Self-evaluation of TACTIC
Interaction (general frame)		
Number of involved stakeholders	• Overall number of stakeholder involved	• In total TACTIC interacted directly with around 250 stakeholders (12 in a thematically focused workshop, 160 during the case study workshops, and around 80 during the final conference). TACTIC indirectly reached many more stakeholders through the consortium's participation in external events and the dissemination activities undertaken.
Number of different types of stakeholders and organisations represented	• Diversity of institutional backgrounds participating in the processes	• TACTIC engaged with a great diversity of stakeholders during the case studies representing very different institutional background (governmental organisations including municipalities (75), non-governmental organisations (40), first responders (12), Academic (14), journalist (5) religious representatives (4), and students (7). • During the final conference it interacted with stakeholder from academia and research institutions (30), first-responders (7), governmental representatives (17), industry (8), non-governmental organisations (7), representatives from the media (2) and from small and medium-sized enterprises (6) • During the thematically focused workshop ii interacted with 5 representatives from the policy-level (mostly governmental bodies) and 7 scientists
Reflection and interaction (process of co-production)		

Definition of roles of different stakeholders involved	• Roles are clearly defined and communicated to stakeholders • Roles are defined but not communicated • Roles are neither defined nor communicated	• TACTIC defined the role of external stakeholders, communicated it to them and also received written confirmation that the role was accepted by stakeholders
Indication of intensity of involvement of stakeholders	• Informing the target group (least advanced) • Consulting the target groups (more advanced) • Involving the target group in the design (even more advanced) • Involving the target group in the decision-making process (most advanced)	• During the case study work TACTIC involved stakeholders in the design and development of the final outputs to be developed • During the final conference TACTIC informed stakeholders about its central outcomes as well as its central insights and consulted participants by asking for an evaluation of the overall usefulness of its central outputs as well as the willingness to test its outputs • During the thematically focused workshops participants were able to influence the decision-making process by involving them in the development of central components of preparedness develoed in WP 3
Number of different types of interaction	• E.g. online conference, online discussion, conferences, interviews, workshops	• TACTIC relied predominantly on three different forms of interaction, that is (1) preparatory interviews that aimed at understanding current practices of risk communication, stakeholder networks and forms of interaction in the case studies as well as the general governance setting; (2) 8 workshops conducted in the case-studies as well as a thematically focused workshop and (3) a final conference were central outputs and insights were presented to a larger group of stakeholders
Iteration of interaction	• Once during the process • Twice • Three times	• The process in the case-studies was iterative as there were two workshops organised in each case study. While the first one aimed and understanding and identifying stakeholders' needs and requirements with regard to risk communication and possible gaps in enhancing preparedness, the second workshop aimed at evaluating the first comprehensive draft of the self-assessment, feedback reports and the "library of good practices" in order to improve the final outputs of the project.
Outcomes		

Internal evaluation of outcomes	• Expected outcomes are clearly defined and achieved • Expected outcomes are clearly defined but only partially achieved • Expected outcomes are clearly defined but not achieved • Expected outcomes are neither clearly defined nor achieved	• TACTIC defined its central objective from the outset and has achieved its central outcomes. Yet, there is one sub-objective that TACTIC was not able to achieve: to assess whether and how the products developed by TACTIC contribute to an increasing awareness of hazardous situations in the case studies. During the process the emphasis shifted from focusing on hazard awareness (which was very high among stakeholders involved) towards focusing on developing final outputs which are usable and hence ensure the sustainability of our products.
Evaluation of outcome by external stakeholders	• "Very useful" to "not useful at all"	• During the final conference participate were given the opportunity to feedback on the products developed by TACTIC. The overall rating was quite positive. 80 % of respondents rated the outputs as "very useful" or "useful". In addition, almost ¾ were interested in testing the final outputs.
Sustainability of outcomes	• Outcomes will sustain after the end of the process • Outcomes will not sustain after the end of process	• As an outcome of the case study process, TACTIC is on close contact with a set of stakeholders who would like to test the platform when it is finalised. This includes particularly the usage of the preparedness check for the general public. The TACTIC will be maintained both the UFZ and ED. It is aimed at finding additional resource to develop the platform further. There is hence a very high likelihood that the outcomes will sustain after the end of the project.

4 Developing an organisational risk communication strategy

Risk communication can follow quite different rationales and rely on a plurality of methods (see-section 2.2). This chapter aims at providing organisations involved in risk and disaster management with basic information about steps to be taken to develop a comprehensive risk communication strategy. It introduces the reader to single topics, gives reasons for its relevance, outlines a set of specific questions that allow organisations to self-assess their own risk communication activities and provides a short feedback on the answers provided in the assessment.

Table 12: Definition of risk communication

Concept	Definition
Risk communication	• Risk communication can be defined as "any purposeful exchange of information about health or environmental risks between interested parties. More specifically, risk communication is the act of conveying or transmitting information between parties about (a) levels of health or environmental risks; (b) the significance or meaning of health or environmental risks; or (c) decisions, actions, or policies aimed at managing or controlling health or environmental risks. Interested parties include government agencies, corporations and industry groups, unions, the media, scientists, professional organizations, public interest groups, and individual citizens"

Source: Covello et al. 1987, 172

4.1 A stepwise approach to risk communication: an overview

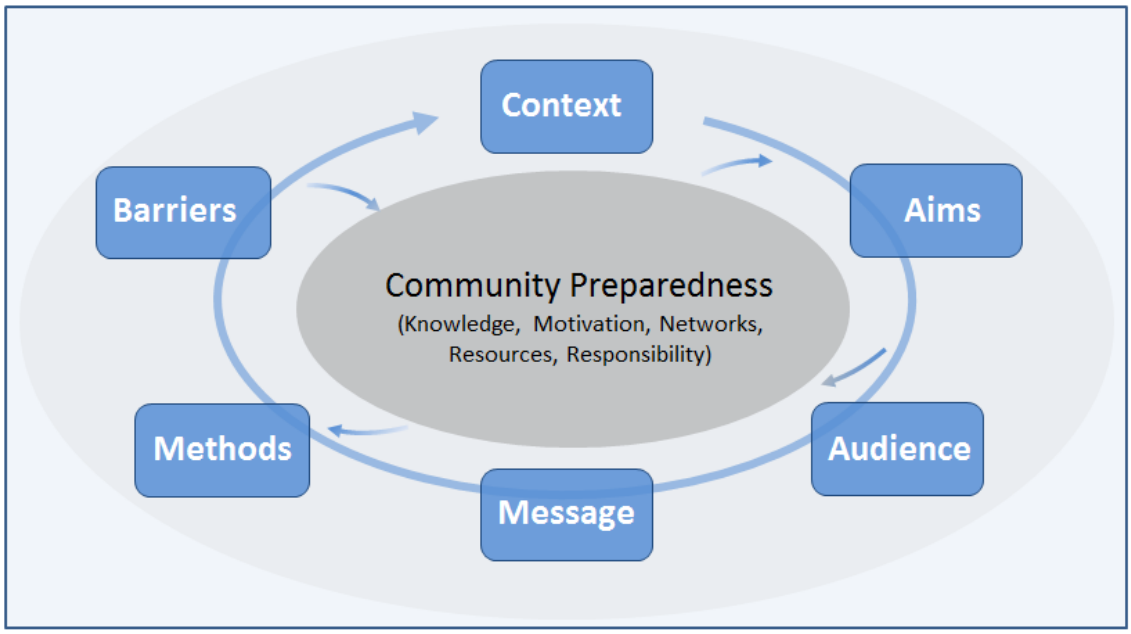
A communication strategy is a crucial part of organisational and therefore, community preparedness (Richie et al, 2008). A communications strategy can help organisations charged with managing risk overcome difficulties such as knowing how and when information should be communicated, by whom, to whom (Kasperson, 1986; Convello and Sandman, 2001; Otway and Wynne, 1989). One of the aims of the **TACTIC** project is to provide organisations with information and inspiration for the development or improvement of a risk communication strategy.

A risk communications strategy is a strategic plan that is developed and put in writing by an organisation that communicates risk. This formal strategy should be evaluated regularly. TACTIC therefore develops two assessments that help to develop and evaluate a risk communication strategy. The risk communication strategy TACTIC is suggesting has been adapted from Environment Protection Agency (EPA) (2012). It includes the following steps:

- **Context** of the organisation's work conditions and its risk communication practices
- Current **aim(s) of** risk communication activities
- **Intended audience**
- **Key messages**
- Choice of **communication method**
- **Barriers and good aspects** of risk communication

The results of the self-assessment for organisations will highlight the strengths and weaknesses of current risk communication with the general public. Based on these results, a feedback report will be provided which points out the potentials for improvement. It will be supplemented through examples of successful communication practices from the TACTIC library of good practices. The results of both the self-assessments and the preparedness-check will be available for information exchange between organisations/communities and members of the general public with the aim of improving communication between organisations responsible for managing risk and citizens at risk.

Figure 12: A stepwise approach to developing a risk communication strategy for increasing community preparedness



The following questions are taken from the self-assessment and should readers given an impression the kind of questions they are asked. Such sections are included in each chapter in this document.

Risk communication strategy

Does your organisation have a risk communication strategy covering the risk of terrorism/flooding/earthquake/epidemics?

- Yes, and I think it is excellent in practice
- Yes, but it needs improvement
- No
- I don't know

The feedback report will provide explanations to following aspects:

- The relevance of a defined aim of your communication
- How your risk communication should address the intended audience and what to consider e.g. motivations, risk perceptions, communication behaviour
- The importance of a key message and how to develop it

- Methods for reaching your communication aim and their advantages, limitations and alternatives
- Barriers and good aspects of risk communication

Moreover, based on the results of the self-assessment, the TACTIC library of good practices will provide inspiration for future risk communication with the general public through examples of existing practices. Independent from conducting the self-assessments, everybody can search the library by clicking here

https://www.tacticproject.eu/tosap/

The self-assessment for organisations takes approx. 20-30 min to complete.

In the next sections we will provide readers with more detailed information about the single steps of developing a communication strategy.

4.2 Understanding context, including cross-border communication

What is the organisational but also the regional context within which risk communication is taking place? Which are the most relevant hazards? How well is an organisation equipped with resources? These are some of the questions which are relevant for taking into account the context when developing a risk communication strategy. While some context-factors can be changed, other remain relatively stable over time and are independent of the organisational efforts to communicate or manage risks. Therefore it is often necessary to adapt to the contextual factors or aim at transforming them in the long-run.

In this section we describe some of the contextual factors which are important when developing a risk communication strategy

- Multi-hazard context: terrorism, flooding, epidemics, earthquakes –which hazard is relevant for a community
- When was the last hazard experience?
- Were there lessons learned after the last experience and were they implemented?
- Which role plays cross-border communication and interaction?

Relevant hazards and experience

TACTIC focuses on four different hazards (terrorism flooding, earthquakes and epidemics)

Terrorism: Due to the nature of terrorism, it is very difficult for communities to prepare for any terrorist attack. Unlike other hazards (except for potential epidemics/pandemics) the source of terrorism is “intelligent” and “intentional” unlike other hazards such as flooding and earthquakes. The source and nature of the hazard is likely to have an impact on how the community perceives and prepares for the hazard. Relating to terrorism, the UK Cabinet Office (2012) highlights how providing the public with information can enable the public to both understand the threat of terrorism and how to respond should a terrorist attack occur. Therefore, the implementation of sound risk

communication practices will be imperative. If risk communication is ineffective, the result could be fear and outrage and pressure on the government to act rather than the public acting themselves (McGough et al, 2005). However, as highlighted by Anson et al. (2015) in **TACTIC** D4.1, for terrorism the focus is predominantly on organisational, rather than public, preparedness for terrorism. Organisations have the responsibility to undertake a wide-range of activities to prevent, prepare for, respond to and recover from a terrorist attack. Whilst for terrorism, the focus is predominantly on organisational preparedness, "[p]oor communication can result in at-risk populations overacting, taking inappropriate actions, and losing trust in government officials or agencies" (McGough et al, 2005:243). For more information see Begg et al. 2016.

Flooding: Floods are a quite common and well-known phenomenon in Europe. Floods are the costliest disasters (Münich Re 2014) in Europe. Although floods are quite common in many parts of Europe, they still pose a profound challenge to emergency and risk management agencies. This is particularly true in the large-scale river basins that run through different national (and regional) territories. Therefore, much can be learnt from the experiences drawn from flooding in order to increase community preparedness. The case study on floods focuses on potential cross border flood events that could occur in Central Europe (i.e. Germany, the Czech Republic, and Poland). Such an event requires communication and collaboration between countries. Previous research has found that communication on flooding in Europe tends to focus on one-way methods of raising awareness (Höppner et al, 2010). However, it has also been argued that such approaches may not be sufficient in order to be able to encourage personal action and therefore community resilience (Kuhlicke et al, 2011).

Pandemic/epidemics: The case study on pandemics and epidemics present an example of a complex hazard of which sources can be both technological and natural and underlines how challenging it is to take health-related preparedness actions in order to increase community preparedness but also the wider organisational and institutional challenges that arise from a complex hazard scenario. This case study focused on lessons learnt from the outbreaks of bovine spongiform encephalopathy (BSE) in the UK. This example in particular is used as a "bad" example of risk communication in practice. In the UK in 1996, risk communicators learnt that seeking to comfort the public with 'no risk' messages can backfire (Leiss and Powell, 2004). "The no-risk message contributed to devastating economic and social effects for Britons, a nation of beef-eaters, to the mass slaughter of British cattle, and to the decrease in global consumption of beef, all at a cost of billions of dollars" (Leiss and Powell, 2004:3-4). By communicating the message of no-risk, authorities lost credibility and trust to media hype during the BSE breakout in 1996 (Leiss and Powell, 2004).

Earthquakes: Earthquakes, like floods are seen to be natural events. However, the nature of the hazard is quite different. Although floods can mostly be predicted or have significant warning times, earthquakes can come about quickly and mostly with little warning. Lessons drawn from the case study on earthquakes have provided the project with valuable information about how communities might prepare for such quick-onset events. The case study on earthquakes built on the experience of the 1999, Kaynasli Earthquake in Turkey. Since this earthquake many efforts have been made to improve risk communication and education practices (Karanci, 2013). By communicating with the public before an event, organisations can help to encourage the development of feelings of self-efficacy by explaining the cause of earthquakes and the types of personal measures that can be taken to protect oneself and one's family. Mileti and Fitzpatrick (1992) suggest that successful

communication for earthquakes must be delivered to a range of different audiences through a range of different channels and from different sources so as to reinforce the need for the public to take action.

The role of experience

Numerous empirical studies on risk perception and preparedness have documented that the actual experience of a hazard is a decisive factor shaping the perception as well as the preparedness of people at risk. However, the role of experience is quite often paradoxical: Direct experience can have a positive effect on risk perception (reinforcing behaviors) by not only leading to higher risk awareness but also to an increased preparedness as people quite often know what to do if they experience a similar threatening event again (see Wachinger et al. 2013). At the same time, experience can also have a negative affect for low severity and seldom experienced events as it can produce a false sense of security/misjudgment of the ability to cope. If for instance a person was able to cope with a flood event in the past, it happens quite often that they underestimate the risk associated with actual or projected future risk events (Kuhlicke, 2008): the so-called "prison of experience" (Kates 1971). It is therefore in many cases vital to keep individual experience and associated memories alive or to explicitly point out following a warning for a hazardous event how this event is, or might be, different from past events.

Lessons learned and their implementation

For improving disaster risk management in the future past disaster experience offer valuable insights as they are the ultimate test of how well organisations as well as the public were prepared to anticipate, cope with and recover from the impact of a flood event or an earthquake. Basically a lessons learned report documents, ideally in a rather comprehensive manner, what went well and what went wrong. The report should outline the goals and objective of an organisation and how they were met during a crisis situation, identify areas where there is need for additional efforts and needs for improvement, identify areas that operated very effectively, evaluate and reflect critically on the roles of individual organisational units and the organisation as a whole. Yet, it is not sufficient to simply draft a document; it is equally relevant to agree upon concrete steps of how to implement the lessons learned and also designate clear responsibilities to ensure accountability during the implementation process.

Cross-border interaction and communication

Communication is generally prone to the risk of misunderstanding; in the case of cross-border communication this risk is increasing sharply. This starts with the very basic setting of communication that a sending and a receiving entity must be connected in order to communicate effectively; the receiver also needs to understand the meaning encoded by the sender, which is often hampered by language barriers. As simultaneous translation is very often not an option in crisis situations, many organisations have developed more standardised communication routines that operate independent of language knowledge. However, cultural and institutional differences with regard to communication, and risk and disaster management need to be taken into account. Therefore, cross-border communication and cooperation needs special attention and in many cases additional resource to be prepared for an emergency. In summary, the organisational self-assessment questions related to context include:

Context of risk communication

Relevant hazards and experience

Which hazard do you think is most relevant for your organisation?

- Floods
- Earthquakes
- Epidemics (animal- and human-transmitted disease, e.g. mad cow disease and influenza)
- Terrorism

Has your community/city/region ever experienced the consequences of a terrorist attack/flood event/earthquake/epidemic event?

- Yes
- No

If you answered yes to the previous question, when did a terrorist attack last occur in your community?

- Less than one year ago
- Between one and ten years ago
- More than ten years ago

Lessons learned and their implementation

Has your organisation drawn out lessons from the most recent terrorist/flood/earthquake/epidemic event?

- Yes
- No
- I don't know

If yes, has your organisation systematically documented these lessons and developed recommendations for improvement?

- Yes
- No
- I don't know

If yes, have these recommendations been implemented?

- Yes
- No
- I don't know

Cross-border interaction and communication

How regularly are you in contact with organisations from neighbouring countries?

- Regularly
- From time to time
- Never

Do you have communication plans with organisations from your neighbouring countries that might be affected by a terrorist attack/flood event/earthquake/epidemic event?

- Yes
- No
- I don't know

Do you face language barriers in communicating with your neighbouring countries?

- No, we don't face language barriers
- Yes, we have taken actions to minimize barriers
- Yes, we face language barriers, but we have not taken actions yet.
- I don't know

Relevance of risk communication and resources

How important is risk communication in your organisation in comparison to other activities that your organisation is responsible for?

- Important
- Unimportant
- I don't know

In your opinion, how well are you and your organisation equipped with resources to communicate risk in your community/city/region?

Finances (money, sources of funding, etc.)

Important Unimportant I don't know

Staff (personnel)

Important Unimportant I don't know

Knowledge (knowledge about risk and risk reduction, risk communication knowledge, etc.)

Important Unimportant I don't know

Skills (e.g., designing information material, communicating prevention measures)

Important Unimportant I don't know

Motivation (desire to actively reduce the risk of terrorism in your community/ increase preparedness for terrorism)

Important Unimportant I don't know

Networking

How often do you collaborate with the following organisations in your day-to-day business?

Public

Regularly From time to time never

Private

Regularly From time to time never

Public/private

Regularly From time to time never

Non-profit

Regularly From time to time never

Other

Regularly From time to time never

4.3 Aims of risk communication

Communication about risks can have very different aims and purposes. While some organisations aim at simply providing information to the public so they can draw their own conclusions from this information, other organisation might follow a very specific goal such as convincing residents exposed to the risk of an earthquake to take measures that help to increase their preparedness in case an earthquake strikes. Based on the literature and exchange with numerous stakeholders from across Europe (see section 3.3), TACTIC has identified four overarching aims a risk communication strategy could contain. Being clear about the aims an organisation is following is a key factor for a successful communication strategy. It influences the choice of methods, good aspects but also possible barriers an organisation might face when communicating risks. TACTIC has identified four different aims.

Raising risk awareness

Being aware of a hazard is the first step towards preparing for a hazard. Only if people know that they are facing a certain hazard they can start the decision making process about how strongly they feel exposed, whether they feel responsible to mitigate possible negative consequences, and take concrete steps to increase their preparedness. **Raising risk awareness comprises informing and exchanging with the public about the type, the expected intensity, probability and the anticipated consequences of the event, including cascading effects** (e.g. when one hazard event – for example an earthquake – triggers a second event – for example a tsunami). Risk perception is influenced, among others, by the experience of a hazard, the information provided as well as trust in organisations (for a more detailed overview see Shreve et al., 2014;

Wachinger and Renn, 2010). Particularly in cross-border contexts (e.g. a river crossing two national boarders) raising of risk awareness may be a challenging task, as the origin of a flood in the upper part of a river system quite often does not overlap with the down-stream areas where the most devastating consequences are experienced.

Strengthening capacities to act

Many communication activities are directed towards trying to strengthen the capacity of people to act before, during and after a disaster strikes. It is often assumed that people would have a lack of knowledge about the types of personal measures that can be taken to improve personal preparedness for floods. Therefore, great efforts are focused on communicating the types of actions that can be taken and the benefits of doing so. Yet, from many empirical studies it is well established that the capacity to act is largely influenced, among others, by such variables as self-efficacy, trust in the effectiveness of measures and in responsible organisations (Shreve et al., 2014; Wachinger et al., 2014). **Therefore, simply providing detailed information about the hazard and possible steps to prepare will not be sufficient to strengthen the capacity to act. Working together with people at risk, to develop a shared understanding of the benefits and people's ability to take specific preparedness actions is more promising**.

Warning in case of emergency:

Timely and clear warning in case of emergency can reduce hazard related damages. The population at risk can then be informed about when which impacts are expected. Most important is the clear and understandable formulation of a warning message including clear instructions of actions to take. **The use of a combination of methods to disseminate warning messages is strongly recommended as people generally seek to have a warning message reinforced through a number of channels before they take the message seriously.**

Resolving conflicts and building trust:

Resolving dispute and conflicts and hence (re)building trust after events are key elements of a functioning and effective communication strategy. Trust is a result of ongoing interactions and takes time to be developed. If trust is low, smaller workshops and meeting could be organised to encourage deliberative discussions. Mutual trust is in many cases, fundamental for any risk communication. An advantage of being a trusted source is that it enables the communicator to communicate effectively, even when communication barriers exist. Individual trust, however, overrides organisational trust. **Therefore, trust in an organisation depends also on the trustworthiness of the person communicating and how they present themselves (e.g. verbally and non- verbally).**

Aims of risk communication

Please specify which of the following aims are relevant for your organisation's risk communication activities related specifically to the risk of terrorism/flooding/epidemic/earthquake. Please tick all that apply. *Although, in practice, these four aims of risk communication overlap, they are still conceptually different. Therefore, based on the research evidence and in order to simplify the task ahead, we will only focus on these four aims.*

- Raising risk awareness (i.e. informing people about risks well before an event occurs)
- Strengthening capacities to act (informing people about what to do in case of an emergency, knowing how to prevent terrorism, etc. before an event)
- Warning in case of emergency (what is known about an impending attack, how should the population respond, etc.)
- Resolving conflicts and building trust (e.g. disputes about appropriate measures, tensions between different groups of the community, etc.)

4.4 Who is the audience?

Who is actually our audience? With whom are you communicating? Are you simply talking to "the" general public, only to residents at risk? Do you also take into account the information needs of different audiences? Unless you know your audience, you face the risk of creating communication outputs that do not achieve their aim. Understanding the needs and interests of the intended audience is hence an important step in developing a communications strategy. Gathering information about your audience can help you to develop an effective and targeted communication strategy. Lundgren and McMakin (2013) suggest three potential types of audience analysis that can be conducted in order to achieve difference communications aims.

Baseline audience analysis

A baseline audience analysis is the simplest form of analysis and can usually be done without investing a great deal of resources. It collects information related to the audience' s ability to comprehend the communication, such as reading ability, ability to speak the respective language in which a message is communicated, it engages with how and where an audience gets its information (communication channel) and with a general understanding of the level of trust/hostility. At least a baseline audience analysis should be conducted for any risk communication effort but is particularly relevant for the aim of warning.

Baseline audience analysis is suitable for the aim of **warning**

Midline audience analysis

A midline analysis is a more comprehensive analysis than the baseline analysis. It includes baseline information plus information about socioeconomic status, demographics, and cultural information, such as age, gender, and occupations. It also includes information about the kind of community a communication activity is addressing (e.g. is a transient community or a community with close social networks). A midline audience analysis will usually suffice if the communication aim is to warn, raise risk awareness and strengthen capacities to act. For example, if it is found that the intended audience is highly educated, it is recommended that the language used to communicate risk is detailed and academic. In regards to cultural information, it is important to know which language(s) the audience are likely to respond to. The preparedness-check for the general public (see chapter 4.9) provides information about the types of information the general public is interested in, their method of choice, the types of organisations that they trust and socio-demographic information. Therefore, the preparedness check provides the opportunity to directly link the information from a baseline and midline audience analysis. The categorisation of the library of good practices also includes a number of categories which aim to provide practice examples which have been specifically developed for specific genders, age and cultural groups.

Midline audience analysis is suitable for the aims of **raising risk awareness** and **strengthening capacity to act**

Comprehensive audience analysis

This includes baseline and midline information plus socio-psychological factors, such as motivations and mental models of risk. The preparedness check includes questions which aim to gain an impression of the outrage factors which are present in the community (see chapter 4.9). In addition, the model of information meaning-making and preparedness by Becker et al. (2012) based on Paton et al. (2003) also enables organisations to better understand the links between knowledge and action. A comprehensive audience analysis is usually necessary for strengthening capacities to act or resolving conflicts and building trust.

Comprehensive audience analysis is suitable for the aims of **strengthening capacity to act and solving conflicts and building trust**

Audience analysis

Do you reach out to different groups in your community/city/region (people who use other languages, special communication needs, etc.)?

- Yes
- No
- I don't know

Communication habits and information needs to differ between groups)? Do you take such difference into account in your risk communication?

- Yes
- No
- I don't know

Do you take psychological factors (e.g. risk perceptions and motivations) into account when providing information about preparedness actions?

- Yes
- No
- I don't know

4.5 Agreeing on a key message

What is actually the core of the message you are communicating? We encourage you to develop a clear key message for your communications strategy and make your communication as understandable as possible to reach as many people as possible.

There are a number of things to take into account when developing a key message:

- It should be developed based on the audience analysis you conducted and the special needs and interests of your audience (see intended audience section, above)
- The organisation needs to identify the "take home message" that they want the audience to remember and target this message to the particular intended audience group. This should be as short and concise as possible.

Lundgrun and McMakin (2013) suggest that the communicator asks themselves the following questions when developing the key message:

- Why am I communicating risk? (e.g. raising risk awareness, strengthening capacities to act, warn in case of an emergency, or for joint problem solving?). If your goal is to raise awareness or warn in case of an emergency you may only need information about reading or education levels and preferred ways of communicating. For strengthening capacities to act, you may need a more complete socio-demographic or even socio-psychological profile, including whether and why members of the intended audience are practicing preparedness actions or not, their perception of risk and what might be the motivating factors that encourage them to act. Similarly, if your goal is joint problem and conflict resolution, you may also need to know what the sources of the conflict or potential conflict might be (e.g. is the conflict substantial or procedural?), the intended audiences level of trust in your organisation as well as the organisations that they do trust, and the risk perception.
- Who am I trying to warn/inform/whose behaviour am I trying to change? (e.g. a group of workers, a specific group in a community, an entire community, or a specific group across a country?). Each group is likely to have differences in their risk perception as well as their preferred method of communication.
- Who should be involved in solving conflicts? (e.g. a federal agency, its contractors, concerned citizens groups, or industry representative?). Each group is likely to have differences in risk perception and perceived source of conflict.

Key message

Does your organisation have a key message which is communicated to reach this aim? This could for example be something like "Your actions can reduce flood-related damage."

- Yes
- No
- I don't know

4.6 What is the appropriate communication method?

There are many different ways of communicating risks and what to do in case of an emergency. While in the case of an imminent emergency a warning needs to be disseminated and understood as quickly and as accurately as possible, in other cases it is not so much the effectiveness of transmitting information which is of relevance, but rather its quality and trustworthiness. It is therefore crucial to choose an appropriate method of communication to reach your audience and effectively achieve the goals you aim to achieve with your risk communication strategy. Based on Lundgren and McMakin (2013) TACTIC has identified the following communication methods:

1. **Visualisation of risk:** risk can be communicated through the use of graphical elements and relatively little text to carry simple risk messages. Examples include: photos, posters, displays, direct advertising, videos, and television.
2. **Face-to-face communication:** involves someone speaking directly to the target audience or listening while the audience speaks. Usually, the audience and the speaker do not interact, except perhaps to ask questions. Examples include: presentations, educational settings such as schools, training courses, tours and demonstrations.
3. **Stakeholder participation**: involves the target audience in some way in the discussion, analysis, or management of the risk. Examples include: advisory committees, focus groups, and workshops.
4. **Technology-assisted communication:** uses technology, often computer based, to discuss or disseminate risk information, or allow a member of the audience to query and receive a variety of information about the risk.
5. **Information materials:** are materials that the target audience will read and are generally printed. Examples include: newsletters, fact sheets, brochures, booklets, pamphlets, displays, advertisements, posters, trade journal articles, popular press articles, technical reports and can include games (e.g. board games).
6. **Social media**: involves using the Internet to share opinions, thoughts, and other information via text, graphics, and video on the risk relevant to the audience.
7. **Press (mass media):** the use of sources such as television, newspapers, radio, magazines, and the Internet to communicate risk information to broad audiences. Such sources can be powerful because they can reach large audiences and can be memorable and credible sources for many people.

Also based on Lundgren and McMakin (2013), Figure 13 provides an overview of the methods that can be used to communicate specific goals.

Visualisation of risk

Risk can be communicated through the use of graphical elements and relatively little text to carry simple risk messages. Examples include: photos, posters, displays, direct advertising, videos, and television.

The visualisation for risk is particularly suitable for the aims of **raising risk awareness** and **strengthening capacity to act**

Table 13: Visualization of risk and appropriate aims (including strengths and limitations)

Method	Aim	Strengths	Limitations
Visualisation of risk **Examples include:** posters displays direct advertising videos television	• Raising awareness • Strengthening the capacity to act	• "Can bring simple risk messages to life with stunning clarity" (Lundgren and McMakin, 2013;119) • Avoid large amounts of text • Communicate to a wide range of audiences • Can be easily translated to other languages than other information materials • Visual messages can be memorable • Is seen as being particularly effective for raising awareness	• May be culturally specific • Carry limited information and therefore cannot address as many questions that audiences may have about a risk as other methods • Can lose their impact if overused • Cannot be used as a standalone method • Can take time to produce • Requires technical knowledge to ensure that the intended message is produced (e.g. graphic designer)

Face-to-face communication

Face-to-face communication involves someone speaking directly to the target audience or listening while the audience speaks. Usually, the audience and the speaker do not interact, except perhaps to ask questions. Examples include: presentations, educational settings such as schools, training courses, tours and demonstrations.



Face-to-face risk communication is particularly suitable for the aims of **raising risk awareness, strengthening capacity to act and reducing conflicts and rebuilding**

Table 14: Face-to-face communication and appropriate aims (including strengths and limitations)

Method	Aim	Strengths	Limitations
Face-to-face communication **Example include:** presentations to clubs, societies, and citizens groups, talks in educational settings such as grade school, college classes, or training courses tours and demonstrations video audience interviews information fairs	• Raising awareness • Strengthening the capacity to act • Reducing conflicts and building trust	• Has an identifiable human representative of an organisation/credible person presenting the risk information, thus, personalising it • Offers the opportunity for immediate feedback • Easy to organise • Multiple presentations can be planned in order to reinforce the message and keep the audience up-to-date	• Can be easily misunderstood • Audiences may be too overwhelmed or hostile to ask questions • Oral presentations alone give the audience nothing to refer to later on

Stakeholder participation

Stakeholder participation involves the target audience in some way in the discussion, analysis, or management of the risk. Examples include: advisory committees, focus groups, or workshops.

Stakeholder participation is particularly suitable for the aims of **strengthening capacity to act and reducing conflicts and rebuilding**

Table 15: Stakeholder participation and appropriate aims (including strengths and limitations)

Method	Aim	Strengths	Limitations
Stakeholder participation **Examples include:** advisory committees, facilitated deliberation, alternative dispute resolution, focus groups, community operated environmental monitoring, formal hearings in which the audience is invited to give testimony	• Strengthen capacity to act • Engaging stakeholders in dialogue aimed at resolving disputes and (re-)building trust	• Can build relationships and trust • Decisions based on participation are more likely than those that are not to be accepted • Can accommodate a variety of audiences • Can help deal with conflict situations	• If not organised correctly (allowing the audience to interact in a meaningful way) it can damage an organisations reputation and credibility • Time consuming and costly (stakeholder participation is seen to be particularly effective if it is long-term)

Technology-assisted communication

Technology-assisted communication is often computer based, and it is used to discuss or disseminate risk information, or allow a member of the audience to query and receive a variety of information about the risk.

Technology-assisted communication is suitable for the aims of **warning** and **raising risk awareness**

Table 16: Technology-assisted communication and appropriate aims (including strengths and limitations)

Method	Aim	Strengths	Limitations
Technology assisted communication **Example include:** computer-based technology	• Warning • Raising awareness	• Is able to distribute large amounts of information, which audience members can tailor to their own needs (e.g. allows people to see large amounts of data and develop their own interpretation of risk) • Once developed such technologies can be easily up-dated and revised • Information can be quickly disseminated • Is a cost-effective way of involving audience members • Can be entertaining	• Sophisticated computers and skills are required for both the communicators and audience

Information materials

Information materials are materials that the target audience will read and they in most cases printed. Examples include: newsletters, fact sheets, brochures, booklets, pamphlets, displays, advertisements, posters, trade journal articles, popular press articles, technical reports and can include games (e.g. board games).

Information material is suitable for the aims of **warning** and **raising risk awareness**

Table 17: Information materials and appropriate aims (including strengths and limitations)

Method	Aim	Strengths	Limitations
Information materials **Example include** newsletters, fact sheets, brochures, booklets, pamphlets, displays, advertisements, posters, trade journal articles, popular press articles, technical reports	• Raising awareness • Strengthening the capacity to act	• Can include large amounts of information • Can be expanded or condensed to meet the audiences needs • Are one of the most inexpensive forms of communication to produce (both time and resource costs are relatively low – of course this depends on the scale of the activity) • May be more comfortable for some users to use than other methods of communication (e.g. social media and stakeholder participation)	• Some information materials can be difficult for some users to understand (e.g. technical language as well as length are important factors to take into account, therefore a pre-test is suggested)

Social media

Social media involves using the Internet to share opinions, thoughts, and other information via text, graphics, and video on the risk relevant to the audience.




Social media suitable for the aims of **warning, raising risk awareness, enhancing capacity to act, solving conflicts** and **rebuilding trust**

Table 18: Social media and appropriate aims (including strengths and limitations)

Method	Aim	Strengths	Limitations
Social media **Example include** uses the Internet to share opinions, thoughts, and other information via text, graphics, and video on a risk found relevant to the audience	• Warning • Raising awareness • Strengthening the capacity to act • Engaging stakeholders in dialogue aimed at resolving conflicts and (re-)building trust	• Because people choose to engage in a conversation on social media, their interest is already high and that willingness may translate into a change in behaviour • Information can be quickly posted and up-dated • Feedback is instant and easy to track over time. • Little technical knowledge is required to use social media and set up an account	• Due to expectations of users of social media, information must always be kept up-to-date or someone must always be available to answer questions • Certain demographics are more likely to use social media than others

Press (mass media)

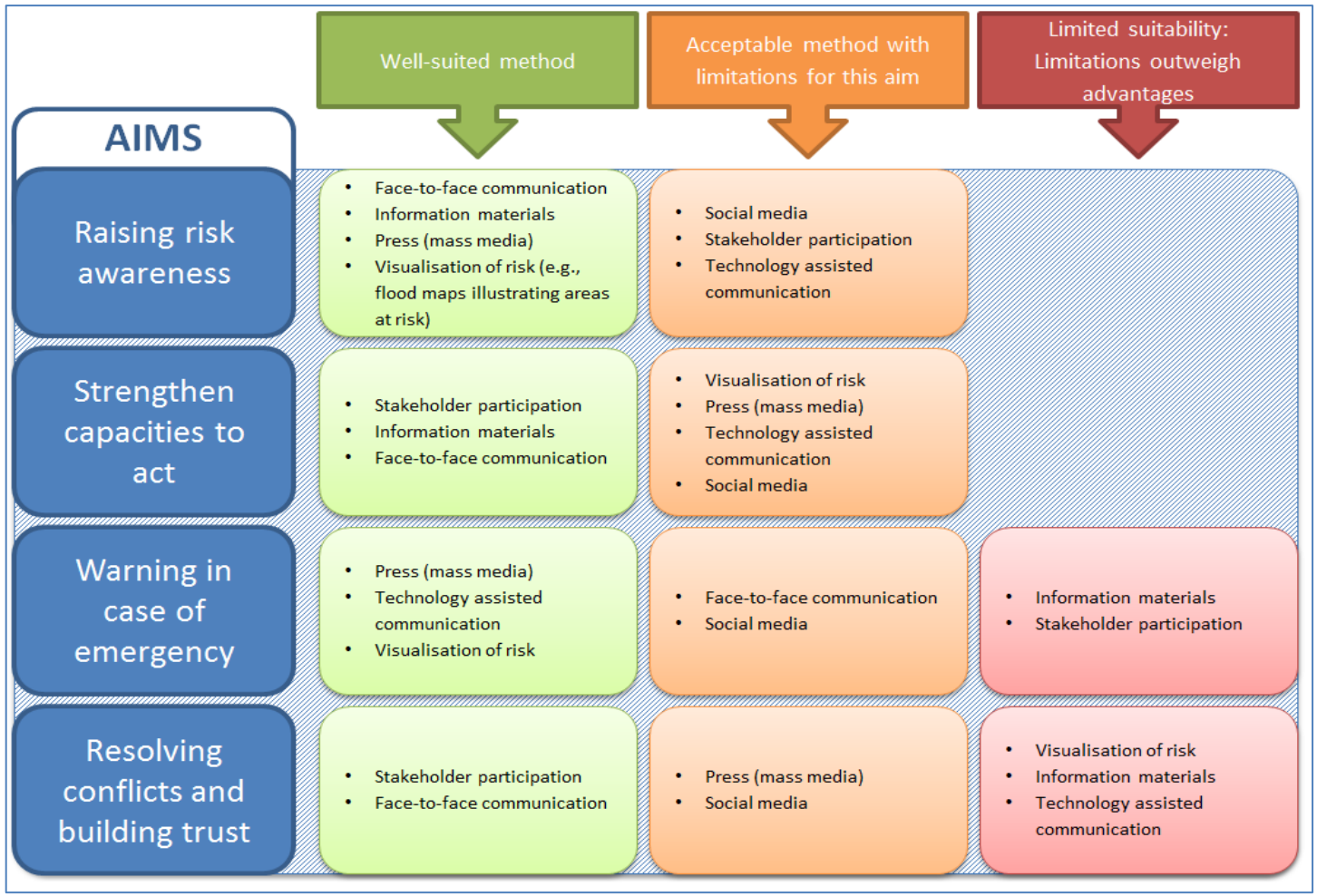
Press (mass media) includes the use of sources such as television, newspapers, radio, magazines, and the Internet to communicate risk information to broad audiences. Such sources can be powerful because they can reach large audiences and can be memorable and credible sources for many people.

Press (mass media) suitable for the aims of **warning, raising risk awareness, enhancing capacity to act, solving conflicts** and **rebuilding trust**

Table 19: Press (mass media) and appropriate aims (including strengths and limitations)

Method	Aim	Strengths	Limitations
Press (mass media) **Examples include** television, newspapers, radio, magazines, Internet	• Warning • Raising awareness • Strengthening the capacity to act • Engaging stakeholders in dialogue aimed at resolving conflicts and (re-)building trust	• Can reach large audiences • Can be memorable and credible for a lot of people • Can provide information quickly • Good relationships with media representatives can lead to a more informed and solution-oriented public	• Media source mostly controls the content and timing of the story and therefore should not be relied upon as a sole source of information provision • A small amount of negative coverage can destroy trust and credibility

Figure 13: Aims of risk communication and appropriate communication methods



Choice of appropriate methods?

When you communicate with the public in order to [warn/raise awareness/strengthen capacity to act/resolve conflicts and (re-)build trust) with regard to risk of terrorism/flooding/epidemic/ earthquake, which methods do you use? (Multiple answers possible)

Visualisation of risk

- Photos
- Posters and displays
- Direct advertising
- Videos

Face-to-face communication

- Public meetings/hearings
- Public workshops
- Round table discussion
- Theatre plays

Stakeholder participation

- Role-playing
- Simulations (e.g. emergency exercise)

Technology-assisted communication

- SMS
- Automatic Voice/Phone Notification System

Information materials

- Brochures, Leaflets, etc.
- Movies, Podcasts

Social media

- Twitter,
- Facebook
- Other

Mass media

- Website
- Publication in local/regional newspapers (incl. official gazettes)
- Television/Radio
- Information materials
- Brochures, Leaflets, etc.
- Movies, Podcasts

4.7 Barriers and good aspects of risk communication

There are many different barriers to a successful risk communication. Most apparently a message may not reach its intended audience since the communication is interrupted and does not reach its audience. In other cases, relevant information might not be shared with a larger group of stakeholders or certain groups of stakeholders may not have access to relevant information. In this chapter we outline how the barriers an organisation is facing in communicating effectively with the public not only depends on the relationship an organisation is having with its audience or the actual risk it is communicating about, it also depends on the general risk communication model and aims an organisation is pursuing.

Differences in risk perception – outrage factors

The perception of risk is quite often very different between organisations responsible for managing risks and those exposed to risks. In regards to the psychological barriers that influence risk perception, Blake (1995), Bennett et al (2010) and Covello and Sandman (2001) provide a list of "outrage factors" (see Table 20). These factors list general ways in which individuals and society may perceive a hazard. The higher the outrage the more likely people are to feel at risk. Gaining an understanding of how a target audience may perceive a given hazard can help inform appropriate risk communication.

Importantly, whether people perceive a hazard to be risky is based on more than just fatalities or pure economic impacts. What the public perceive as risk is much more complicated than expert's calculations of risk and, therefore, there is no "right" definition of risk (Covello and Sandman, 2001; Otway and Wynne, 1989; Plough and Krimsky, 1987). As a result, risk communication is not just about explaining numbers, it is also about reducing outrage (Covello and Sandman, 2001) and recognising the differences between "expert" and "public" perceptions of risk (Lundgren and McMakin, 2013). Bennett et al (2010) point out that the way that the content is framed, how it is communicated and the impact it has is likely to vary depending on the audience. This is because, "risks are different", "people are different", "probabilities can be difficult to interpret", and "debates about risk are conditioned by their social/ political context" (pp.7-8).

Based on the workshop feedback and discussions with consortium partners, only the factors that are in bold (see Table 20) are included in the final version of the self-assessments.

Table 20: Outrage factors of risk perception

Factors that decrease outrage	Factors that increase outrage	Implication for communication	Reference
Voluntary	**Imposed**	Risks that are perceived as being imposed rather than voluntary are likely to lead to outrage. This is linked to the factor of control. Presenting people with options in regards to what they can do to reduce their own risk is recommended.	Blake, 1995; Bennett et al, 2010; Covello and Sandman, 2001
Control	Lack of control	Risks that are perceived as being something that is uncontrollable are likely to lead to outrage. Clearly communicating what can be done to manage the risk and what is uncertain is recommended.	Blake, 1995; Bennett et al, 2010; Covello and Sandman, 2001
Fair	**Unfair**	Risks that are perceived as being unfair are likely to lead to outrage. Clearly communicating why decisions have been made and the effect of decisions on different groups is recommended.	Blake, 1995; Covello and Sandman, 2001
Ordinary	Memorable	If a hazard is perceived to be an ordinary occurrence, it is less likely to cause outrage than a memorable risk which is out of the ordinary. Ensuring that the memory of a hazard is kept alive or that the potential implications of a low probability hazard are communicated clearly and often is recommended.	Blake, 1995; Covello and Sandman, 2001
Not dreaded	Dreaded	Risks that are dreaded are likely to lead to outrage. Increasing familiarity with the hazard and its potential impacts as well as options for decreasing the risk is recommended.	Blake, 1995; Bennett et al, 2010; Covello and Sandman, 2001
Natural	**Technological, artificial**	This factor is linked to control. People are likely to be more outraged if the source of a hazard is perceived to be human. Clear communication about the hazard and its sources is recommended.	Blake, 1995; Bennett et al, 2010; Covello and Sandman, 2001
Familiar	**Unfamiliar**	Risks that are perceived as being unfamiliar are likely to lead to outrage, whilst people who have experienced a hazard, particularly those who have experienced damages are more likely to be motivated to take actions to prepare themselves (Wachinger et al, 2013; Tversky and Kahneman, 1973). Clearly communicating what can be done to manage the risk and what is uncertain is recommended.	Blake, 1995; Covello and Sandman, 2001; Wachinger et al, 2013
Morally acceptable	Morally unacceptable	Risks that are perceived as being morally unacceptable are likely to lead to outrage. Clear communication about the hazard, its benefits, trade-offs and consequences are recommended.	Blake, 1995; Covello and Sandman, 2001
Trustworthy source	**Untrustworthy source**	Communication is more likely to be positively received and acted upon if the source is perceived as being trustworthy.	Blake, 1995; Covello and Sandman, 2001

Equal distribution	Unequal distribution	Risks that are perceived as being unequal are likely to lead to outrage. Clear communication about the hazard, its benefits, trade-offs and consequences are recommended.	Bennett et al, 2010; Covello and Sandman, 2001
Effects are reversible	Effects are irreversible	People are more likely to take notice of a risk if the impact of the hazard is perceived as being irreversible. Clear communication about the hazard, its benefits, trade-offs and consequences are recommended.	Bennett et al, 2010; Covello and Sandman, 2001
Anonymous victims	Known victims	People are more likely to take notice of a risk if the victims are known.	Bennett et al, 2010; Covello and Sandman, 2001
Lack of personal threat	Personal threat	People are more likely to take notice of a risk if it presents a personal threat. Communication can address this factor by personalising the message through storytelling or taking into account factors that motivate the target audience.	Covello and Sandman, 2001
Risk is not posed to future generations (e.g. pregnant women and small children)	Risk poses particular danger to future generations	If a risk is perceived as posing a threat to pregnant women and children it is likely to be less acceptable than a risk that does not pose particular risk to these two groups. Clear communication about the hazard, its benefits, trade-offs and consequences are recommended.	Bennett et al, 2010
Messages are clear and consistent	Messages are unclear and contradictory	Clear and consistent messages over a long period of time can help to increase trust and increase the chance that the message is received by the audience.	Bennett et al, 2010
Clearly understood by science (i.e. certain)	**Not clearly understood by science (i.e. uncertain)**	The public prefer information about the hazard to be certain. Therefore, it is important to clearly communicate uncertainties as well as what is known in order to assure the public that best efforts are being used to deal with the given hazard based on existing information.	Bennett et al, 2010; Blake, 1995; Covello and Sandman, 2001
Lack of media attention	Large amounts of media attention	Media attention can lead to the social-amplification of risk and can have negative impacts on trust if the communication source is seen to be hiding information. Therefore, it is important to communicate early and work in close cooperation with the media.	Covello and Sandman, 2001

Socio-psychological barriers of risk communication

Risks and actions to mitigate risks can be perceived differently (e.g. the organisation may perceive the risk of terrorism as being very low but the general public may believe that it is high). Are you aware of differences in how your organisation perceives the risk of terrorism and how members of the public perceive the risk of terrorism?

- Yes
- No
- I don't know

Did conflicts arise out of differences in risk perception?

- Yes
- No, not yet - but I am sure that conflicts will arise
- No, the difference in risk perception is rather minor
- I don't know

We are interested in how you perceive the given hazard. The answers that you give will feel subjective but this is the point. Much research has highlighted that there is a difference in the way that risk managers and those at risk perceive the given risk. Please answer the following questions quickly based on your opinion and first thoughts.

To what extent is the risk of terrorism/flooding/epidemic/earthquake voluntary (e.g. do people's choices put them at greater risk of flooding) or not?

Voluntarily				Involuntarily
1	2	3	4	5

To what extent is the risk of flooding/epidemic/earthquake natural or human-made?

Natural				Human-made
1	2	3	4	5

To what extent is the risk of terrorism/flooding/epidemic/earthquake threatening or unthreatening?

Threatening				Unthreatening
1	2	3	4	5

How familiar or unfamiliar is the risk of terrorism/flooding/epidemic/earthquake?

Familiar				Unfamiliar
1	2	3	4	5

To what extent is the risk of terrorism/flooding/epidemic/earthquake manageable or unmanageable?

Manageable				Unmanageable
1	2	3	4	5

To what extent is the risk of flooding/epidemic/earthquake distributed fairly or unfairly among members of society?

Fairly				Unfairly
1	2	3	4	5

To what extend is the knowledge about the community's risk of terrorism/flooding /epidemic/earthquake scientifically certain or uncertain?

Certain		Uncertain

1 2 3 4 5

Do you believe that the general public trusts the information that your organisation is communicating?

- Yes
- No
- I don't know

The risk message model – barriers with regard to warning

To receive a warning often implies stress, anxiety and uncertainty: "When people are in a state of high concern because they perceive a significant threat, their ability to process information effectively and efficiently is severely impaired" (Covello et al, 2001:385). The emotional reaction (e.g. anxiety and anger) which is aroused when an individual feels that what they value is being threatened may therefore create mental noise. "Under such circumstances, the ability to attend and retain information is estimated to be 80% less than normal" (Lundgren and McMakin, 2013:18). In order to make warning still effective Lundgren and McMakin (2013) suggest that communicators must make sure that messages are relevant to the intended audience and clearly communicate the severity of the hazard. Apart from that they clearly must reach their audience. The audience must be able to implement the recommended actions (e.g. physically, emotionally, socially and financially) and must believe that these actions will be effective. Therefore, they suggest that "risk information must be carefully packaged and presented…no more than three key messages, repeated frequently, should be used, along with reinforcement of verbal and written communications with visuals, and ruthless removal of jargon, technical terms, and acronyms" (p.18).

Good aspects regarding warning

Please state whether you agree with the following statements:

The warning was very precise (e.g. time and location)	Yes	No	I don't know
The warning provided no contradictory information	Yes	No	I don't know
The warning was very timely	Yes	No	I don't know
People have received too many false warnings in the past and therefore did not trust our last warning	Yes	No	I don't know
We have used multiple channels to reach out to the general public in the event of an emergency	Yes	No	I don't know
We did not reach our audience since our communication channels were insufficient	Yes	No	I don't know
Others	Yes	No	I don't know

The risk instrument model – barriers with regard to raising awareness and enhancing capacity to act

Communication practices following the risk instrument model often aim at increasing awareness or enhancing the capacities of actors to act. They usually are based on seeing communication as a function of "sender" → "message" → "receiver" (Renn, 1992). Psychological barriers can impact upon the choice of communicator (*sender*), and the message communicated (*message*). These two choices need to take into account a range of potential barriers in order to successfully communicate the intended message to their audience (*receiver*).

Generally, individuals who receive risk communication are more likely to take action if they feel that the hazard is of relevance to them and if they feel like their actions can make a difference (e.g. control). In addition, unrealistic optimism, can often lead individuals to ignore or dismiss risk information. Many people believe that they are less likely than others to be involved in an accident or get cancer, for example. "Overconfidence and unrealistic optimism are most influential when the risk in question is voluntary, and when high levels of perceived personal control lead to reduced feelings of susceptibility" (Covello and Sandman, 2001:4). Such optimism is linked to experience with a given risk: "We tend to assign greater probability to events of which we are frequently reminded (e.g., in the news media, scientific literature, or discussions among friends or colleagues), for example, or to events that are easy to recall or imagine through concrete examples or dramatic images" (Covello and Sandman, 2001:3). In fact, it is argued that individuals apprehend reality in two fundamentally different ways "one labelled intuitive, automatic, natural, nonverbal, narrative, and experiential, and the other analytical, deliberative, and verbal" (Slovic and Peters, 2006:322; also see Kahneman, 2011). In addition, as a result of experience, people may also perceive themselves as being less at risk from the impacts of a disaster than others around them; this may result in them transferring the risk to others in the community (Paton et al, 2008) and thus not undertake preparedness action.

Also the very framing of information shapes the likelihood that actions are taken: Negative information is processed differently to positive information in high-concern situations. "People put greater value on losses (negative outcomes) than on gains (positive outcomes)" (Covello et al, 2001:386). For example, presenting risks in terms of the probability of survival versus dying can have a major impact on how individuals perceive risk (e.g. it was found that people were more likely to perceive the risk of cancer being high if they were presented the information: 1 in 100 people die from cancer, compared to those who received the information: 99 out of 100 people survive from cancer (Covello and Sandman, 2001). It is also suggested that information about options for reducing risk are framed in terms of losses, people are likely to make riskier decisions, whereas they are likely to 'play it safe' when choosing between alternative gains (Bennett et al, 2010; Kahneman, 2011; Covello and Sandman, 2001).

As a result, it is suggested that a negative message should be counterbalanced with solution-oriented and positive messages. This is because communications that "contain negatives (e.g., the words no, not, never, nothing, none, and other words with negative connotations) tend to receive closer attention, are remembered longer, and have greater impact than positive messages" (Covello et al, 2001:386). Therefore, it is suggested that the use of negatives is limited in risk communication as they may have a detrimental effect and overpower the positive message/solution and could also undermine trust. Moreover, "risk communications are most effective when they focus on what is being done rather than what is not being done" (Covello et al, 2001:386). Risk communication should

therefore focus on the positives of taking action in addition to the risks of not doing so (Reynolds and Seeger, 2005).

Good aspects for raising awareness and enhancing the capacity to act - flooding

Do you provide information about the risk of flooding to your community/city/region (e.g. Information about the probability of flooding occurring in the future in the community/city/region and what the consequences might be/have been in the past)?

- Yes, regularly
- Yes, from time to time
- No
- I don't know

In order to raise risk awareness/strengthen capacity to act with regard to the risk of flooding, do you use….?:

- Simple, graphical, and factual materials (yes/no/ I don't know)
- Simple language (yes/no/ I don't know)
- Vivid examples and stories that communicate on a personal level (yes/no/ I don't know)

In order to raise the capacity to act, how regularly does your organisation inform your community/city/region about the following issues?

How to read and understand flood hazard and risk maps
Regularly From time to time Never I don't know

Rain water management on individual property
Regularly From time to time Never I don't know

How to insure buildings against damage from natural disasters
Regularly From time to time Never I don't know

Preparation of individual flood emergency / evacuation plan for family, small firm or farm
Regularly From time to time Never I don't know

Emergency kit: Appropriate behaviour in case of emergency (e.g. store important documents, medicine, phone numbers ready, evacuation procedures)
Regularly From time to time Never I don't know

Financial aid for reconstruction after floods?
Regularly From time to time Never I don't know

Elevation of furnace, water heater and electrical panel
Regularly From time to time Never I don't know

Installation of „check valves"
Regularly From time to time Never I don't know

Construction of barriers (concrete walls / earth levees) to stop floodwater from entering the building
Regularly From time to time Never I don't know

Appropriate floor material on the ground floor

Regularly From time to time Never I don't know

Sealed walls in the basement with waterproofing compounds

Regularly From time to time Never I don't know

When you communicate with the general public, does your organisation emphasise the potential benefits of taking these actions?

- Yes
- No
- I don't know

Good aspects for raising awareness and enhancing the capacity to act - terrorism

Do you provide information about how residents in your community/city/region can prepare themselves for a terrorist attack?

- Yes, regularly
- Yes, from time to time
- No
- I don't know

In order to raise risk awareness/strengthen capacity to act with regard to the risk of terrorism, do you use….?:

- Simple, graphical, and factual materials (yes/no/ I don't know)
- Simple language (yes/no/ I don't know)
- Vivid examples and stories that communicate on a personal level (yes/no/ I don't know)

In order to raise the capacity to act, how regularly does your organisation inform your community/city/region about the following issues?

Preventing terrorism (e.g., vigilance and reporting suspicious activities or packages, security measures to protect electronic items from cyber-terrorism)

Regularly From time to time Never I don't know

Avoiding certain activities to reduce the risk of terrorism (e.g., avoiding travelling to certain countries)

Regularly From time to time Never I don't know

Preparation of an individual/family emergency plan including how to respond to a terrorist attack

Regularly From time to time Never I don't know

Preparation of an emergency kit including medical supplies and copies of important documents

Regularly From time to time Never I don't know

Information about local emergency plans covering terrorism

Regularly From time to time Never I don't know

Good aspects for raising awareness and enhancing the capacity to act – earthquakes

Do you provide information about how residents of your community/city/region can prepare themselves for earthquakes?

- Yes, regularly
- Yes, from time to time
- No
- I don't know

In order to raise risk awareness/strengthen capacity to act with regard to the risk of an earthquake event, do you use….?:

- Simple, graphical, and factual materials (yes/no/ I don't know)
- Simple language (yes/no/ I don't know)
- Vivid examples and stories that communicate on a personal level (yes/no/ I don't know)

In order to raise the capacity to act, how regularly does your organisation inform your community/city/region about the following issues?

Earthquake-safe construction or about earthquake protection in buildings
Regularly From time to time Never I don't know

How to read and understand earthquake hazard and risk maps
Regularly From time to time Never I don't know

Safe evacuation and emergency escape routes
Regularly From time to time Never I don't know

Information about earthquake resistance/building codes
Regularly From time to time Never I don't know

Non-structural risk mitigation on individual property (e.g. good practise in stabilizing and arranging furniture)
Regularly From time to time Never I don't know

How to insure buildings against damage from natural disasters
Regularly From time to time Never I don't know

How to insure buildings against damage from natural disasters
Regularly From time to time Never I don't know

Preparation of individual earthquake emergency / evacuation plan for family, small firm or farm
Regularly From time to time Never I don't know

Preparation of an earthquake family reunion plan
Regularly From time to time Never I don't know

Information about what to put into an earthquake emergency kit (e.g. store important documents, medicine, phone numbers, evacuation procedures)
Regularly From time to time Never I don't know

Appropriate behaviour for emergency (e.g. store important documents, medicine, phone numbers ready, evacuation procedures)
Regularly From time to time Never I don't know

Concrete example of what to do in the case of an earthquake event (e.g. "drop, cover and hold

on")

Regularly From time to time Never I don't know

When you communicate with the general public, does your organisation emphasise the potential benefits of taking these actions?

- Yes
- No
- I don't know

Good aspects for raising awareness and enhancing the capacity to act – epidemics

Do you provide information about how residents in your community/city/region can prepare themselves for an epidemic event?

- Yes, regularly
- Yes, from time to time
- No
- I don't know

In order to raise risk awareness/strengthen capacity to act with regard to the risk of epidemics, do you use….?:

- Simple, graphical, and factual materials (yes/no/ I don't know)
- Simple language (yes/no/ I don't know)
- Vivid examples and stories that communicate on a personal level (yes/no/ I don't know)

In order to raise the capacity to act, how regularly does your organisation inform your community/city/region about the following issues?

Preparing your home for an epidemic

Regularly From time to time Never I don't know

How to interpret epidemic risk communications

Regularly From time to time Never I don't know

Infectious disease control measures and policies

Regularly From time to time Never I don't know

Information about keeping individuals/families/ animals healthy during an epidemic

Regularly From time to time Never I don't know

Preparation of epidemic emergency plans for families, small business or farms

Regularly From time to time Never I don't know

Emergency kits: Appropriate behaviour in case of emergency (e.g. store important documents, emergency supplies, medicines, phone numbers ready, evacuation procedures)

Regularly From time to time Never I don't know

Insurance against epidemic-related damages

Regularly From time to time Never I don't know

Financial aid for recovery after epidemics

Regularly From time to time Never I don't know

When you communicate with the general public, does your organisation emphasise the potential benefits of taking these actions?

- Yes
- No
- I don't know

The dialogue model – barriers with regard to (re-)solving conflicts and building trust

Trust is the cornerstone of any risk communication (Covello et al, 2001; Earle and Cvetkovich, 1995; Höppner et al, 2010; Earle and Cvetkovich, 1995). Individuals are more likely to follow the advice of risk managing bodies if they perceive them as trustworthy (Covello and Sandman, 2001). Only once trust is established can communication goals be achieved.

Individuals generally trust organisations that they deem to carry the same values as they hold themselves (Höppner et al, 2010; Slovic, 1987). Any message from a source that is seen to be untrustworthy is likely to be disregarded. People are generally reluctant "to change strongly held beliefs, and their willingness to ignore evidence that contradicts them" (Covello and Sandman, 2001:4). It is on these terms that people grant institutions the responsibility to manage risks on their behalf. Disagreements between experts; lack of coordination amongst organisations; lack of effective listening, dialogue, and participation between organisations and the public; unwillingness to disclose or sharing information with the public in a timely manner; and perceived negligence in fulfilling management responsibilities, can lead to a lack of trust (Covello et al, 2001).

Open dialogue and inclusive participation with a range of actors can be employed to increase trust and build relationships. To build trust, Rowan (1993) provides four options 1) "show understanding of and respect for an audience's concerns", 2) "offer to work toward mutually satisfactory solutions, rather than impose a reformulated one", 3) "call for a fair hearing, just as you have given your audience", and 4) "offer complete messages. Discuss both benefits and harms of substances you are asked about" (p. 369). In order to deal with suspicions regarding the communicator's competence, Rowan (1993) provides the following suggestions 1) "describe your personal successes and relevant background in solving similar problems in the past", 2) "explain how judgements were reached", and 3) "indicate knowledge of an appreciation for local expertise" (p.370). In regards to dealing with suspicions about willingness, Rowan (1993) suggests: 1) provide names and phone numbers to call, so concerned citizens can monitor progress in resolving some problem", 2) "describe ways you can personally benefit from serving your audience's best interests", 3) "locate power in entity larger than one-self", 4) "speak with confidence in your position" (p.370).

Research suggests that individual and small group settings (e.g. workshops and public meetings) are the most effective approaches for communicating these factors. An advantage of being a trusted source is that it enables the communicator to communicate effectively, even when communication barriers exist. Individual trust, however, overrides organisational trust. Therefore, trust in an organisation depends on the trustworthiness of the person communicating and how they present themselves (e.g. verbally and non-verbally) (Covello, et al, 2001).

Good aspects with regard to solving conflicts and rebuilding trust

Have you taken efforts to understand what the actual source of the conflict is (e.g. diverging interests, exclusion of stakeholder from the decision-making process etc.)?

- Yes
- No
- I don't know

In order to solve the conflict, did you involve members of the general public from the beginning of the decision-making process?

- Yes
- No
- I don't know

In order to solve a conflict, the process needs a clear objective that is agreed upon by all relevant stakeholders from the outset. Have you agreed on the overall objective of the conflict solving process?

- Yes
- No
- I don't know

In many cases it is vital for the process that it is lead, moderated and facilitated by an experienced external moderator. Have you involved an external moderator?

- Yes
- No
- I don't know

Agreement on specific actions is essential for the sustainability of the conflict-solution. Have you agreed on specific follow-up steps that different actors need to take?

- Yes
- No
- I don't know

Are you in contact with the media in order to ensure that messages are clear and concise in order to avoid conflict being instigated by the media (e.g. mass media/ press)?

- Yes
- No
- I don't know

Table 21 summarises good aspects of risk communication by linking them with different aims of risk communication.

Table 21: Aims and good aspects of risk communication

Communication aim	Good aspect of communication:	Definition:	Reference:
All	**Clear and concise communication**	Whether a practice can be evaluated as being clear and concise or is likely to depend on the goal of the communication and the target audience. Lang et al, 2001, states that it is important to ensure that the message means the same to the audience as it does to the communicating organisation. It is also important to ensure that the language used to communicate information about the risk is suited to the target audience. Rowan (1993) suggests 1) "substitute a more easily understood term if doing so will not mislead" the audience, 2) "if the difficult term is really the best choice, use it and then define it by its critical (always present) attributes rather than its variable (frequently associated with the term but not crucial to its meaning) attributes", and 3) "give examples and "nonexamples" of the term's use", for example, what might be commonly held as examples of the term but are not examples of the term (p.371). If the hazard that you are trying to describe is complex and difficult to understand, Rowan (1994) suggests: 1) "provide a sense of the 'big picture'", for example, the Earth is like a greenhouse, and 2) "use text features that highlight connections among main points", for example, risk communication has two broad aims (p.372). This provides a structure for the topic and breaks it down into smaller pieces. If a risk is hard to understand because it is hard to believe, Rowan (1994) suggests four steps 1) "state the erroneous but plausible notion", 2) "acknowledge its apparent plausibility", 3) "demonstrates its inadequacy by noting inconsistencies between it and evidence familiar to the audience but not yet considered" and, 4) "present the more accepted view and demonstrate its greater adequacy" (p.372).	Höppner et al. 2010; Keeney and von Winterfeld, 1986; Lundgren and McMakin, 2013; Infanti et al, 2013; Lang et al, 2001; Kuhlicke et al. 2011; Sandman and Lanard, 2004; Leiss, 2004; Fischhoff, et al, 2011, Reynolds and Seeger, 2005
All	**Frame your message**	How your audience reacts to a message is likely to be effected by how it is framed. For example Thaler and Sunstein (2009) argue that people are more likely to accept a mortality rate for cancer, for example, if it is presented in a positive way. Specifically, if they are presented with a 90 per cent chance of surviving as opposed to a 10 per cent chance of dying. People also are likely to react to losses more than they are likely to react to gains. For example, water and save €300 per year or, don't save water and lose €300 per year. In addition, all words evoke frames. Epidemics, floods, and terrorism all have images and emotions associated with them. It is good to keep this in mind when developing a key message.	Thaler and Sunstein 2009

All	**Tell a story**	Narratives are a fantastic way to communicate a key message. Why does your organisation want to communicate the given key message; what is the story behind this motivation? For example, is it because of the amount of damage caused by past hazard events that you want to communicate to your audience. What have you done in the past? Is this new information? Where did the information come from? By using a personal testimonial, people better able to imagine themselves being at risk than if they are only presented with factual information (Janssen et al, 2013).	Janssen et al, 2013
All	**Information is conveyed to a range of audience segments**	Renn (1991) states that one requirement of risk communication is to "tailor communication according to the needs of the targeted audience" (p.511). According to Lundgren and McMakin (2013) "different segments of your audience will have different needs—for information, for involvement, and for responding to the risk. To communicate effectively, you must communicate with each segment in a way that meets those needs. Just make sure not to change the basic information as you change the method or you will lose trust" (page 77). In other words, different methods/channels of communication are required for different target audiences. Lang et al. (2001) note that "people associate specific values with specific channels of communication" (page 328)	Höppner et al. 2010; Lundgren and McMakin, 2013; Glik, 2007; Lang et al, 2001; Bennett et al, 2010; Hagemeier-Klose and Wagner, 2009; Kasperson, 1986; Renn, 1991; Reynolds and Seeger, 2005.
All	**Transparent and Honest**	Keeney and von Winterfeld suggest that organisations should state their "true communications objectives explicitly and communicate in a straightforward manner" (page 423)	Keeney and von Winterfeld, 1986; Lundgren and McMakin, 2013
All	**Information is objective**	Lundgren and McMakin (2013) suggest that it is important to ensure that the information that is communicated is as objective as possible. They argue that it is important to "quantify information whenever possible. Avoid words like 'significant', 'negligible', and 'minor'. They beg the questions, 'Significant to whom? Under what conditions? Based on what evidence?' Whenever possible, give examples, numbers that can be put in perspective, and concrete information" (p.75).	Lundgren and McMakin, 2013.
All	**Communications should be extensively pre-tested**	Communication should be pre-tested before crisis situations, particularly amongst at-risk and hard-to-reach communities.	Glik, 2007
All	**Builds trust and credibility**	Any message from a source that is seen to be untrustworthy is likely to be disregarded. Additionally, open dialogue and inclusive participation with a range of actors can be employed to increase trust and build relationships. To build trust, Rowan (1994) provides four options 1) "show	Slovic, 1993; Lundgren and McMakin, 2013; Bennett et al, 2010;

	understanding of and respect for an audience's concerns", 2) "offer to work toward mutually satisfactory solutions, rather than impose a reformulated one", 3) "call for a fair hearing, just as you have given your audience", and 4) "offer complete messages. Discuss both benefits and harms of substances you are asked about" (p. 369). In order to deal with suspicions regarding the communicator's competence, Rowan (1994) provides the following suggestions 1) "describe your personal successes and relevant background in solving similar problems in the past", 2) "explain how judgements were reached", and 3) "indicate knowledge of an appreciation for local expertise" (p.370). In regards to dealing with suspicions about willingness, Rowan (1994) suggests: 1) provide names and phone numbers to call, so concerned citizens can monitor progress in resolving some problem", 2) "describe ways you can personally benefit from serving your audience's best interests", 3) "locate power in entity larger than one-self", 4) "speak with confidence in your position" (p.370). Covello et al. (2012, page 10) • Devote substantial attention and resources to building trust and credibility. • Listen carefully to people and their concerns • State your credentials; but do not ask or expect to be trusted by the public • If you do not know an answer or are uncertain, say so • Get back to people with answers • Admit mistakes • Disclose risk information as soon as possible (emphasising any appropriate reservations about reliability), even when this means the release of uncertain or preliminary data; provide a realistic timetable for when better information will be available • If in doubt, lean towards sharing more information, not less – or people may think you are hiding something • Identify and candidly discuss data uncertainties, strengths, and weaknesses, including those identified by other credible sources • Recognise and address the "hidden agendas," symbolic meanings, and broader social, economic, and political considerations that often accompany and complicate the task of risk communication • Identify worst-case estimates as such, and cite ranges of estimates when appropriate • Always try to include a discussion of risk management actions that are under way or can be taken • Whenever possible, present options that give people a sense of personal control over the	Kasperson, 1986; Renn, 1991; Rowan, 1994; Lang et al, 2001; Paton, 2008.

		risk situation • Tell people what you cannot do and why • Promise only what you can do, and be sure that you do what you promise	
All	**Empathy**	When dealing with an outraged audience it is important to be willing to apologise for mistakes and address/rectify the situation, increase transparency and public involvement. It may also be helpful to consider avoiding communicating only scientific results which may come across as distant and uncaring.	Lang et al, 2001; Sandman and Lanard, 2004
All	**Up-to-date**	It is important that the information communicated is kept up-to-date. Especially if the communication practice is used over an extended period of time.	Höppner et al, 2010
All	**Encourages learning and reflection**	The information aims to challenge and stimulate reflection. This is relevant for practices that require the audience to ask reflexive questions such as an emergency plan. This category does not include practices that present hazard information without asking the audience to do something with that information. Keeney and von Winterfeld (1986) suggest that communication should aim to increase the learning potential for both the organisation and the public.	Keeney and von Winterfeld, 1986; Lundgren and McMakin, 2013; Kasperson, 1986; Stern, 1991
Strengthening capacities to act and resolving conflicts and building trust	**If communication aims to deal with outrage, it must go beyond acknowledging that outrage exists.**	Communication should focus not just on acknowledging people's outrage, it should communicate that they are entitled to be outraged and why they are entitled. This can help to improve credibility of the message and the likelihood that people will listen to the message being communicated.	Covello and Sandman, 2001

4.8 Evaluation and Feedback

How effective is your risk communication and what impact do you have on community preparedness? Are you providing relevant information, do you use the right channels, do you reach your audience and if yes, what does it change? Evaluating your risk communication activities is crucial if you want to understand whether you are successful or not with your risk communication.

By evaluating an established risk communication strategy an organisation should aim at better understanding to what extent it achieves its expected impacts and/or its defined aims (see chapter 4). Simply focusing on quantitative outputs (e.g. how many brochures were printed or how often a website was visited) is not sufficient in this regard as it does not allow a grasp of the quality of information and how this might contribute to increasing preparedness. Similarly, to simply take into account to what extent the intended audience receives information provided by an organisation is not sufficient as it does not unravel which impact a communication activity had on people preparedness. Therefore, it is decisive to have a clear understanding of what an organisations actually means by "preparedness" in order to evaluate to what extent communication activities have contributed to increasing preparedness. In the next chapter we outline what TACTIC's preparedness-check, structured along the components of knowledge, motivation, responsibility networks and resources. By distributing this self-assessment to the general public in a specific community, organisations will receive detailed information on both the level of preparedness among the general public as well as information needs expressed by the public. Based on the results of the "preparedness check" it is thus possible for an organisation to answer the following questions:

- Context: Did the context change within which communication between organisations involved in disaster risk management and the general public is taking place? How well is the organisation trusted by the public? Did the overall relevance of a "risk-topic" change since the risk communication strategy was established?
- Aims: Are the aims an organisation agreed on to pursue still of relevance? Are there alternative aims more relevant and hence need to be considered in the future? To what extent were the aims achieved and what are critical levels that need to be transgressed?
- Audience: To what extent was an organisation able to reach or interact with its audience? Were different cultural, but also socio-demographic and economic backgrounds of the audience taken sufficiently into account when communicating to or with the different audiences?
- Message: Did the key message come across; was it accepted and shared by member of the general public? Does it possibly need revision or is there a need to develop alternative key messages for future risk communication activities?
- Methods: Are the methods used for risk communication still appropriate and relevant? Do they help to achieve the aims an organisation agreed upon? Which methods are having a high and which a low impact – in which audience? Is there a need for alternative methods or are there new technological or socio-cultural developments that require new testing of new methods?

- Barriers: Are the barriers for an effective risk communication? What factors shape these barriers? Are the barriers with regard to the "transmission" of information or rather with regard to different perceptions and framings of risks? What needs to be done to overcome these barriers?

Figure 14: Relevant questions for the evaluation of a risk communication strategy

In chapter 6 more information will be provided on how to do the evaluation and which principle should be considered in order to increase preparedness in the context of social learning.

Evaluation and Feedback

Are you actively collecting feedback on your communication practices related to the aim of strengthening the public's capacity to respond to a flood event?

- Yes
- No
- I don't know

If yes, are you using the feedback to improve your communication practices related to floods?

- Yes
- No
- I don't know

4.9 The library of good practices

TACTIC has developed a library of “good” practices in order to provide inspiration for the improvement of risk communication and, as a result, community preparedness. Therefore we collected a wide range of practices.

A major challenge is thereby always to define what exactly is a “good” practice? TACTIC decided that a good aspect is a practice that fits above all with the communication needs of ah organisations. Therefore, we propose to an organisation doing the self-assessment only those practices which might be particularly relevant for the organisation, based on the outcomes of the assessment. For more information, please consult Deliverable 3.2.

You may also have a look at the library of good practices.

https://www.tacticproject.eu/tosap/mod/data/view.php?d=5&mode=asearch&lang=en

5 The TACTIC preparedness check for the general public

How prepared is an individual to cope with the consequences of an earthquake event? What can be done to prepare a household better for a devastating flood event? While the previous chapter outlined some basic steps for developing a risk communication strategy, this chapter engages with the development of what we call a preparedness-check.

As stated in section 2.3, community preparedness describes the capacities (i.e. knowledge, motivation, networks, responsibilities and resources) of a community including residents, the voluntary sector and private actors (e.g. local companies) but also organisational actors from responsible organisations to effectively anticipate, respond to, and recover from, the impacts of likely, imminent or current hazard events or conditions.

In this chapter we develop a preparedness-check for the general public that has two objectives:

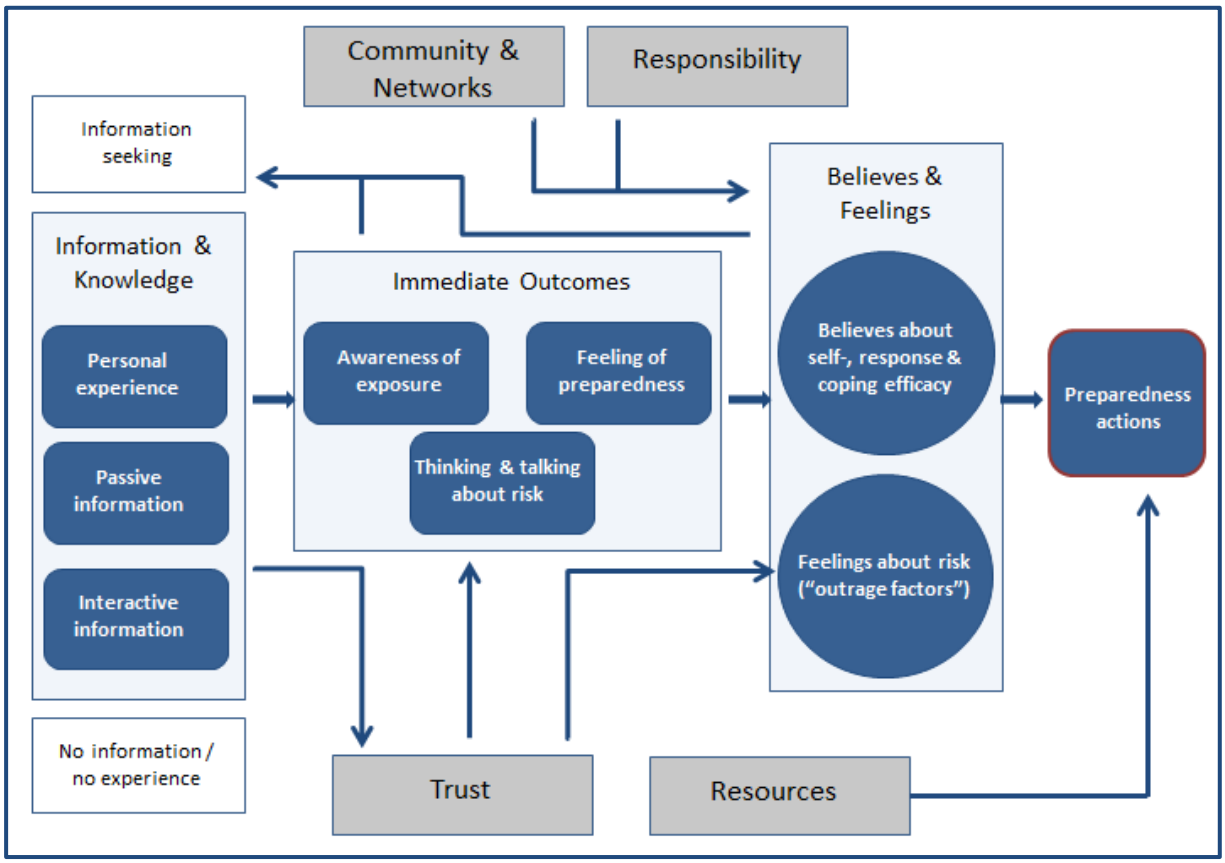
- Based on the preparedness components outlined in chapter 2.3 and a substantive literature reviews (see Shreve et al., 2014) it allow individuals to receive a short feedback on their risk awareness, on key factors that shape their risk preparedness, their information needs as well as on specific measures that can be taken to increase preparedness. The preparedness check is based on a socio-psychological model developed by Becker et al. (2012).
- It should allow organisations to evaluate the effectiveness of risk communication activities conducted by organisations engaged in disaster risk management by providing feedback with regards to current practices of risk communication in order to assist them in the improvement of their communications strategy.

5.1 The preparedness check: an overview

Based on the definition of preparedness outlined in section 2.3 as well as the work of Becker and colleagues (Becker et al., 2012), Table 22 outlines the indicators that were developed in TACTIC to make the assessment of preparedness at the household level operational.

The preparedness check is based on an assessment approach developed with regard to earthquakes, but was meanwhile also applied to other hazards (Becker et al., 2012; Paton, 2003; Paton, 2007; Paton, 2008; Paton et al., 2015; Paton et al., 2008; Paton and Johnston, 2001; Paton et al., 2000). The model has a very high explanatory power with regard to explaining preparedness actions before, during and after a crises event (see also Shreve et al., 2014) and is one of the best tested and most widely applied behavior-related models in hazard and risk research. More specifically, Figure 15 outlines the model and how the different components underlying the preparedness model are interlinked. The single components (i.e. information & knowledge, immediate outcomes, beliefs and feelings, community and trust as well as responsibility and community) are detailed in more depth in subsequent sections.

Figure 15: The TACTIC preparedness model



Source: Based on Becker et al., 2012

Table 22 gives an overview on central indicators the preparedness-check is based on.

Table 22: Components and indicators of preparedness

Components	Indicators
Knowledge	• Personal Knowledge o Knowledge through personal experience o Knowledge about the consequences • Passive information o Source of information o Frequency of use of sources of information o Preferred sources of information in the future • Interactive information o Participation in preparedness training activities • Information seeking in the past
Motivation	Immediate outcomes of knowledge/information o Awareness of exposure o Feeling of preparedness o Frequency of thinking about risk o Frequency of talking about risk o Belief about preparedness • Beliefs and Feeling o Believe about preparedness efficacy o Believe about self-efficacy o Believe about coping and response efficacy o Feelings about risks (“outrage factors”)
Networks	• Networks and trust o Relevance of other opinions (family, friends, community, authorities) o Trust in sources of information o Trust in public authorities
Responsibilities	• Beliefs about self-efficacy • Belies about coping and response efficacy
Resources	• Socio-demographic-economic variables (income, age, education, etc.)

5.2 Information and Knowledge

In many regions and localities across Europe a substantive amount of information and knowledge with regard to different risks exists, be it in the form of personal experience, narratives, leaflets or maps on the likely impacts of hazards or concrete practices of how to prepare for them. At the same time, this information and knowledge is all too often not shared among and between different authorities and organisations operating in the field of risk and disaster management as well as between authorities and the public. It is therefore vital to better understand to what extent information is provided and how this is perceived and how it interacts with individuals' motivation to increase their preparedness; this includes knowledge generated through personal experience, passively "consumed" information or knowledge produced through active participation in decisions-making processes.

Personal experience

As previously stated (see section 4.2), the actual experience of a hazards is a decisive factor shaping the perception as well as the preparedness of people at risk. However, the role of experience is quite often paradoxical: Direct experience can have a positive effect on risk perception (reinforcing behaviours) by not only leading to higher risk awareness but also to an increased preparedness as people quite often know what to do if they experience a similar threatening event again (see. Wachinger et al., 2013). At the same time, experience can also have a negative affect for low severity and seldom experienced events as it can produce a false sense of security/misjudgment of the ability to cope.

Passive information

Making information available first of all relies on one-way communication with (almost) no feedback mechanisms. Most prominently, this relates to notice boards, mailing lists, public meetings to inform residents or other actors and making documents and plans publicly accessible. Such communication measures and strategies may have many different purposes such as raising awareness, enhancing the capacity to act, or warn residents at risk. The assessment focuses particularly on the sources of information and from which source of information one would like to receive more information. It is quite well document that this form of information can have an influence on raising awareness but only very limited consequences on the capacity to act.

Interactive information

Information can also be provided in a more interactive setting. The need for more effective participatory processes has become a significant theme in the scientific discussion on risk and disasters. For example, an influential statement of key principles of sustainable hazard mitigation (Mileti 1999) includes the importance of participatory processes and the involvement of more than those with scientific or technical expertise. Schneider (2002) stresses the need to integrate emergency management into processes of community planning and development and argues for the need to see disasters as "community-based problems requiring community-based solutions" (ibid., 143). Pearce (2003) similarly stresses the importance of public participation within a framework of community planning that integrates closely with disaster management. For Tompkins et al. (2008) 'good governance' of disasters is related to stakeholder participation in decision-making, democratic access to knowledge and transparency and accountability in relation to policy decisions. Wachinger

and Renn (2010) therefore underline that “research indicates that people become more aware of floods and are more motivated to initiate protective action if they are involved in a participatory exercise. This seems mainly due to a shift towards greater trust in authorities and the experts”.

Information and Knowledge

Personal experience

Have you ever personally experienced the negative consequences of a terrorist attack/flood event/epidemic event/earthquake?

- Yes
- No

How many times have you experienced a terrorist attack/flood event/epidemic event/earthquake within the last 10 years?

- Once
- Twice
- More than twice
- Never

Did you suffer negative consequences from the terrorist attack/flood event/epidemic event/earthquake? (you may select multiple answers if applicable)

- No
- Yes, I or a family member suffered material damage (to my home, possessions, etc.)
- Yes, I or a family member suffered physical harm (injuries)
- Yes, I or a family member suffered psychological consequences (fear, depression, death in the family/ friend, etc.)
- Yes, through damaged transportation or supply infrastructure, etc.

Passive information

From whom did you receive the information about the risk of terrorism? (you may select multiple answers if applicable)

- National agencies
- Regional agencies
- Local agencies
- Family/Friends/Neighbours
- The media
- Relief organisations (e.g. fire fighters)
- Civic associations
- Others

How often do you use the following sources of information in order to obtain information about the risk of terrorism?

Discussions with neighbours, friends and family					
Once a week, or more	A few times a month	Once a month	A few times a year	Rarely	Never
Newspaper					
Once a week, or more	A few times a month	Once a month	A few times a year	Rarely	Never
Online news					
Once a week, or more	A few times a month	Once a month	A few times a year	Rarely	Never
Radio					
Once a week, or more	A few times a month	Once a month	A few times a year	Rarely	Never
Social media					
Once a week, or more	A few times a month	Once a month	A few times a year	Rarely	Never
Television					
Once a week, or more	A few times a month	Once a month	A few times a year	Rarely	Never
Training course					
Once a week, or more	A few times a month	Once a month	A few times a year	Rarely	Never
Workshops or public meetings					
Once a week, or more	A few times a month	Once a month	A few times a year	Rarely	Never
SMS from emergency services					
Once a week, or more	A few times a month	Once a month	A few times a year	Rarely	Never
Others [….]					
Once a week, or more	A few times a month	Once a month	A few times a year	Rarely	Never

Which source of information would you like to use more often in order to obtain information about the risk of terrorism?

- Discussions with neighbours, friends and family
- Newspaper
- Online news
- Radio
- Social media
- Television
- Training course
- Workshops or public meetings
- SMS from emergency services
- Others [….]

Interactive information

Have you been involved in activities organised by local government designed to prepare for terrorism (e.g., community meetings, exercises)?

- Yes
- No, but I would like to become involved
- No, I am not interested

Information seeking

Have you informed yourself in the past about the risk of terrorism in your community?

- Yes
- No

What were the main reasons? (you may select multiple answers if applicable)

- I wanted to know more about the risk
- wanted to learn more about what I can do to reduce my personal risk c) I wanted to know more about how exposed I am personally to a terrorist attack
- I wanted to learn more about my
- I wanted to learn more about how I can participate in activities organised by local government
- There is a conflict in our community with regards to risk and I wanted to gather more information
- Other reasons

5.3 Immediate outcomes of personal experience and communication activities

The immediate outcome of receiving information or personally experiencing a risk event is a change of awareness as well as a possible increase or decrease in feelings of preparedness. At the same time, information and knowledge may also stimulate thinking and talking about the risk one feels exposed to. Therefore TACTIC as developed questions and indicators that allows better understanding of whether the provision of information, or the participation in decision-making processes or an emergency exercise or the personal experience of a disastrous event results as an immediate outcome in a increased awareness and an increased or decreased preparedness.

Immediate outcomes

Awareness of exposure

How much do you feel exposed to the risk of terrorism?

- Very exposed
- Exposed
- Neither exposed nor not exposed
- Not exposed
- Not exposed at all

Feeling of preparedness

How prepared do you feel for the risk of a future terrorist attack?

- Very well prepared
- Prepared
- Neither prepared nor unprepared
- Not prepared
- Not prepared at all

Thinking about risk talking about risks

Please describe how often you:

Think about terrorism/flooding/epidemics/earthquakes

Once a week, or more	A few times a month	Once a month	A few times a year	Rarely	Never

Talk about terrorism with family and friends

Once a week, or more	A few times a month	Once a month	A few times a year	Rarely	Never

5.4 Beliefs, feelings and emotions about preparedness and risks

A growing body of literature suggests that particularly beliefs, feelings and emotions influence and shape people's preparedness, particularly their motivation to take specific, quite often also costly action. It is hence less the immediate outcome of an information campaign that needs to be taken into account to really understand people's preparedness and what motivates and shapes their preparedness, but rather their beliefs and emotions about risks but also about the measure they are expected to take. Many studies underline that in order to act, individuals need to have both a high awareness of risk as well as high self-efficacy and coping appraisal. If they have high threat appraisal but low coping appraisal, they are unlikely to act. Therefore, it is argued that coping appraisals like self-efficacy (e.g. the level of confidence in one's ability to take action) or protective response efficacy (e.g. the belief that protective actions will be effective) play and important role in whether citizens take action in regards to different risks (see also Shreve et al. 2014)

In addition, we also included also questions on the perception of risk. The perception of risk is quite often very different between organisations responsible for managing risks and those exposed to risks. In regards the psychological barriers that influence risk perception, Blake (1995), Bennett et al (2010) and Covello and Sandman (2001) provide a list of "outrage factors" (see Table 20). These factors list general ways in which individuals and society may perceive a hazard. The higher the outrage the more likely people are to feel at risk. Gaining an understanding of how a target audience may perceive a given hazard can help inform appropriate risk communication as well as to better understand how the perception of risk is shaped by information and knowledge as well as other factors.

Believes, feelings and emotions

Preparedness efficacy

Please describe the extent to which you agree or disagree with each of the following statements regarding preparing for a terrorist attack: (please select one answer per line)

A terrorist attack is too destructive to bother preparing for

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree

A terrorist attack is unlikely to occur in my community during my lifetime

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree

Preparing for a terrorist attack is inconvenient for me

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree

It is difficult to prepare for a terrorist attack

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree

I don't want to think about preparing for a terrorist attack

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree

I feel that I/my family are prepared for an a terrorist attack because, we have taken steps to prepare for such an event

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree

Preparing for terrorism makes me feel more at risk of a terrorist attack

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree

Self-efficacy

What do you think, to what extent are you able to reduce the impact of a terrorist attack through your own actions and decisions?

- To a very large extent
- To a large extent
- Neither nor
- Not
- Not at all

Response and coping efficacy

Please describe the extent to which you agree or disagree with each of the following statements: (please select one answer per line)

Preparing for terrorism/flooding/epidemic/earthquake will enable me to take some control during the uncertainty of an attack

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree

Preparing for t terrorism/flooding/epidemic/earthquake will significantly improve my ability to respond effectively to an attack

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree

Preparing for terrorism/flooding/epidemic/earthquake will significantly improve my ability to deal with the consequences of a terrorist attack (e.g., psychological impact, physical impact)

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree

Feelings and emotions ("outrage factors")

We are interested in how you perceive the given hazard. The answers that you give will feel subjective but this is the point. Please answer the following questions quickly based on your first thoughts.

To what extent is the risk of terrorism/flooding/epidemic/earthquake voluntary (e.g. do people's choices put them at greater risk of flooding) or not?

Voluntarily			Involuntarily	
1	2	3	4	5

To what extend is the risk of flooding/epidemic/earthquake natural or human-made?

Natural			Human-made	
1	2	3	4	5

To what extend is the risk of terrorism/flooding/epidemic/earthquake threatening or unthreatening?

Threatening			Unthreatening	
1	2	3	4	5

How familiar or unfamiliar is the risk of terrorism/flooding/epidemic/earthquake?

Familiar			Unfamiliar	
1	2	3	4	5

To what extent is the risk of terrorism/flooding/epidemic/earthquake manageable or unmanageable?

Manageable			Unmanageable	
1	2	3	4	5

To what extend is the risk of flooding/epidemic/earthquake distributed fairly or unfairly among members of society?

Fairly			Unfairly	
1	2	3	4	5

To what extend is the knowledge about the community's risk of terrorism/flooding /epidemic/earthquake scientifically certain or uncertain?

Certain			Uncertain	
1	2	3	4	5

5.5 Community, networks and trust

Individual preparedness is also shaped by how well a person is networked to other members of the community as well as the overall sense of community and trust in other members of a community (be they organisational or private). Social networks are not only relevant for interactions between and among organisations but also between organisations and the general public. Communication, for instance, occurs between individuals, groups, private and public institutions, in small or mass communication settings, face-to-face or mediated by technical devices. Communication may take place within and across local, regional, national or international levels. Involved actors can be regarded as nodes in communication chains or networks between which information and other resources flow in one or many directions. The strength, stability, frequency and direction of the information flow and the centrality of the actors are the defining characteristics of such networks. Social networks form an important nexus between the individual and social structures and are transmitters of different social capacities and also enable interactions between members of local communities and representatives of risk management organisations.

Community, networks and trust

To what extent do you agree that the opinions of the following people are important to you when deciding on a particular course of action?

Opinions of my family

Very important				Very unimportant
1	2	3	4	5

Opinions of my friends

Very important				Very unimportant
1	2	3	4	5

Opinions of my neighbors/community

Very important				Very unimportant
1	2	3	4	5

Opinions of local authorities

Very important				Very unimportant
1	2	3	4	5

In regard to your general feelings about living in your community, please describe the extent to which you agree or disagree with each statement.

I trust that responsible state agencies authorities will keep me informed about changes in the terrorism threat level

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree

I trust that responsible state agencies will take my worries seriously regarding potential terrorist attacks

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree

I trust that responsible state agencies are taking the necessary prevention and preparedness measures before a terrorist attack occurs

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree

I trust that responsible state agencies are able to help me in the event of a terrorist attack.

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree

I trust that government authorities are interested in my involvement in preparedness activities for terrorism (e.g. participation in exercises)

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree

How trustful do you consider the actors that you received the information from?

National agencies

Very trustful	Trustful	Neither trustful nor untrustful	Not trustful	Very untrustful	Does not apply

Regional agencies

Very trustful	Trustful	Neither trustful nor untrustful	Not trustful	Very untrustful	Does not apply

Local agencies

Very trustful	Trustful	Neither trustful nor	Not trustful	Very	Does not

		untrustful		untrustful	apply
Family/Friends/Neighbours					
Very trustful	Trustful	Neither trustful nor untrustful	Not trustful	Very untrustful	Does not apply
The media					
Very trustful	Trustful	Neither trustful nor untrustful	Not trustful	Very untrustful	Does not apply
Relief organisations (e.g. fire fighters)					
Very trustful	Trustful	Neither trustful nor untrustful	Not trustful	Very untrustful	Does not apply
Civic associations					
Very trustful	Trustful	Neither trustful nor untrustful	Not trustful	Very untrustful	Does not apply
Others					
Very trustful	Trustful	Neither trustful nor untrustful	Not trustful	Very untrustful	Does not apply

Has your trust in the actors changed over the last 10 years/since the last terrorist attack?

National agencies			
Yes, it improved	No	Yes, it worsened	Does not apply
Regional agencies			
Yes, it improved	No	Yes, it worsened	Does not apply
Local agencies			
Yes, it improved	No	Yes, it worsened	Does not apply
Family/Friends/Neighbours			
Yes, it improved	No	Yes, it worsened	Does not apply
The media			
Yes, it improved	No	Yes, it worsened	Does not apply
Relief organisations (e.g. fire fighters)			
Yes, it improved	No	Yes, it worsened	Does not apply
Civic associations			
Yes, it improved	No	Yes, it worsened	Does not apply
Others			
Yes, it improved	No	Yes, it worsened	Does not apply

5.6 Preparedness actions

Preparedness actions are the ultimate goal of many communication activities. Such actions include steps taken long before an event occurs (e.g. making a building more earthquake resistant), actions that are helpful during an event as well as actions after an event. TACTIC addresses the different actions and measure taken for different hazards in a very structured manner (see below).

Preparedness actions

Actions with regard to terrorism

Have you taken any of the following measures to prepare yourself for a terrorist attack?
(you may select multiple answers if applicable)

Have you studied actions that can be taken to prevent a terrorist attack (e.g. reporting suspicious activity)?

- Yes
- No If no, why?
  - I didn't know that a terrorist attack could be prevented
  - I haven't had the time
  - I have no interest
  - Psychologically, I don't want to think about terrorism

Have you created an emergency kit specifically for terrorism?

- Yes
- No If no, why?
  - I don't have the time
  - I don't think that such a kit will make a difference
  - I don't know what to put in such a kit
  - I don't want to engage with preparing for a terrorist attack
  - I don't have the financial resources to build such a kit

Do you have an emergency plan specifically covering terrorism?

- Yes
- No If no, why?
  - I don't have the time
  - I don't think that such a plan will make a difference
  - I don't know how to develop such a plan
  - I don't want to engage with preparing for a terrorist attack

Did you look at the instructions/advice from local/regional/national government on how to respond to a terrorist attack?

- Yes
- No If no, why?
    - I don't want to think about terrorism
    - I didn't know that this information was available
    - This information is not provided
    - I don't have the time to do this
    - I don't see any benefit/value in doing this

Did you take security measures to protect yourself / your family from a cyber-terrorism attack?

- Yes
- No If no, why?
    - I don't know what cyber-terrorism is
    - I didn't know that you can prevent cyber-terrorism
    - I don't have the time to do this
    - I don't see any benefit/value in doing this

If your community experienced a terrorist attack tomorrow what would you do?

- Listening to the radio
- Checking the Internet regularly
- Speaking to my neighbour(s), family, friends
- Watching television for updates

What would you do after the terrorist attack?

- I would immediately leave the area
- I would contact friends/family to confirm my safety
- I would contact friends/family to check that they were safe
- I would check for information from local authorities/experts
- I would volunteer to support the response (e.g., donating blood)
- I would seek psychological assistance

Actions with regard to flooding

Have you taken any of the following measures to prepare yourself for a flood? (you may select multiple answers if applicable)

Have you studied flood maps to know your flood risk?

- Yes
- No If no, why?
  - I was not aware of the existence of flood maps
  - I don't know how to access them
  - I haven't had the time to look for them
  - I have no interest
  - I don't feel comfortable reading a map

Do you have flood insurance?

- Yes
- No If no, why?
  - Insurance is not available
  - I tried to get one, but didn't get one
  - They are too expensive
  - I had one but cancelled it
  - I had one, but it was cancelled by the insurance company
  - I don't need one

Do you have an emergency kit for a flood event?

- Yes
- No If no, why?
  - I don't have the time
  - I don't think that such a kit will make a difference
  - I don't know what to put in such a kit
  - I don't want to engage with preparing for a flood event
  - I don't have the financial resources to build such a kit

Do you have a Flood Emergency Plan?

- Yes
- No If no, why?
  - I don't have the time
  - I don't think that such a plan will make a difference
  - I don't know how to develop such a plan
  - I don't want to engage with preparing for a flood event

Did you elevate the furnace, water heater and electrical panel because you live in an area of high flood risk?

- Yes
- No If no, why?
    - The building was already constructed in a flood-safe manner
    - I didn't know that this was something that I should do
    - I don't have the financial resources to do this
    - I don't have the time to do this
    - I don't see the benefit/value of doing this

Have you installed "check valves" to prevent flood water from backing up into the drains?

- Yes
- No If no, why?
    - I didn't know about them
    - I don't know where to access them
    - I don't have the financial resources to do this
    - I haven't had the time to install them
    - I don't see any benefit/value of doing this

Have you sealed walls in the basement with waterproofing compounds?

- Yes
- No If no, why?
    - I didn't need to because they were already built before I moved in
    - I don't know who to contact to help me to do this
    - I don't have the financial resources to do this
    - I don't have the time to do this
    - I don't see any benefit/value in doing this.

Have you changed floor material on the ground floor to be water resistant?

- Yes
- No If no, why not?
    - I didn't need to because they were already built before I moved in
    - I don't know who to contact to help me to do this
    - I don't have the financial resources to do this
    - I don't have the time to do this
    - I don't see any benefit/value in doing this

Have you constructed barriers (concrete walls / earth levees) to stop floodwater from entering the building?

- Yes
- No If no, why?
    - I didn't need to because they were already built before I moved in
    - I don't know who to contact to help me to do this

- I don’t have the financial resources to do this
- I don’t have the time to do this
- I don’t see any benefit/value in doing this

Have you prepared mobile barriers on basement/ground floor windows and doors?

- Yes
- No If no, why?
  - I didn’t need to because they were already built before I moved in
  - I don’t know who to contact to help me to do this
  - I don’t have the financial resources to do this
  - I don’t have the time to do this
  - don’t see any benefit/value in doing this

Have you implemented water drainage systems around the house (drainage pipes, rain garden, retention basin, etc.)?

- Yes
- No If no, why?
  - I didn’t need to because they were already built before I moved in
  - I don’t know who to contact to help me to do this
  - I don’t have the financial resources to do this
  - I don’t have the time to do this
  - I don’t see any benefit/value in doing this

If a flood warning was to be issued tomorrow what would you do?

I would inform myself about the risk by:

- Listening to the radio
- Checking the Internet regularly
- Speaking to my neighbour(s), family, friends
- Wait and see if it looks like it is going to flood
- Watching television for updates

I would prepare myself/my family/my belongings by:

- Leaving as soon as possible
- Moving valuables to upper floors
- Checking if other people in my household require help
- Waiting to be evacuated
- Disconnecting electrical appliances
- Moving pets / livestock to safe place

Actions with regard to epidemics

Have you taken any of the following measures to prepare yourself for a human disease epidemic? (you may select multiple answers if applicable)

Do you have insurance against epidemic-related damages (e.g. health insurance, farm/business insurance, epidemic insurance)?

- Yes
- No If no, why not?
  - Insurance is not available
  - I tried to obtain an insurance plan, but was unable
  - Plans are too expensive
  - I had one but cancelled it
  - It was cancelled by the insurance company
  - I don't need one

Do you have an emergency kit (e.g. it includes any of the following: medical supplies, a radio to receive emergency warnings, prescription medications for myself/my family, over the counter medications, electrolytes, cleaning & disinfecting supplies, batteries, I know where I store important documents, emergency supplies, medicines, phone numbers ready, evacuation procedures)?

- Yes
- No If no, why not?
  - I don't have the time
  - I don't think that such a kit will make a difference
  - I don't know what to put in such a kit
  - I don't want to engage with preparing for an epidemic event
  - I don't have the financial resources to build such a kit

Do you have an epidemic emergency plan for your family, small business or farm (e.g. I have a 'flu buddy' to get medications or supplies for me when I am sick, I have made plans for how to take care of a sick member of my household or for those I look after in the community, and/or I developed a farm health care plan, etc.)?

- Yes
- No If no, why not?
  - I don't have the time
  - I don't think that such a plan will make a difference
  - I don't know how to develop such a plan
  - I don't want to engage with preparing for an epidemic event

Do you know about infectious disease control measures and policies (e.g. I get vaccinated when disease threats are identified in my community and vaccines are available, I have diversified my farm business portfolio, I am a member of a livestock scheme or other

groups that enable members to discuss and learn about biosecurity, farm health concerns, and/or engage in other preparedness plans etc.)?

- Yes
- No If no, why not?
    - I don't know where to access them
    - I haven't had the time to look for them
    - I am not concerned about potential negative health outcomes (e.g. stress over injections, concern over vaccination, other concerns)
    - I don't feel that this is a good way to prepare

Do you know what to do during an epidemic event (practise good hand hygiene, avoiding crowds, public transportation or other public gatherings during an epidemic warning or an epidemic, etc.)?

- Yes
- No If no, why not?
    - I don't know where to gain information on these activities
    - This information is not provided
    - I haven't had the time to inform myself
    - I am not concerned about the risk of epidemics

If an epidemic warning was to be issued tomorrow what would you do?

I would inform myself about the risk by:

- Listening to the radio
- Checking the Internet regularly
- Speaking to my neighbour(s), family, friends
- Considering risk associated with travel plans
- Watching television for updates
- Other please specify

I would prepare myself/my family/my belongings by:

- Leaving public areas to return home as soon as possible
- Checking if other people in my household require help
- Waiting for instructions from local or national authorities
- Watching television for updates
- Other please specify

Actions with regard to earthquakes

Have you taken any of the following measures to prepare yourself for an earthquake? (you may select multiple answers if applicable)

Have you studied seismic risk (earthquake) maps to know your risk?

- Yes
- No If no, why?
  - I was not aware of the existence of earthquake maps
  - I don't know how to access them
  - I haven't had the time to look for them
  - I have no interest
  - I don't feel comfortable reading a map

Do you have earthquake insurance?

- Yes
- No If no, why?
  - Insurance is not available
  - I tried to obtain an insurance plan, but was unable
  - Plans are too expensive
  - I had one but cancelled it
  - It was cancelled by the insurance company
  - I don't need one

Do you have an emergency kit for earthquakes?

- Yes
- No If no, why?
  - I don't have the time
  - I don't think that such a kit will make a difference
  - I don't know what to put in such a kit
  - I don't want to engage with preparing for a an earthquake event
  - I don't have the financial resources to build such a kit

Do you have an earthquake emergency and evacuation plan?

- Yes
- No If no, why?
  - I don't have the time
  - I don't think that such a plan will make a difference
  - I don't know how to develop such a plan
  - I don't want to engage with preparing for an earthquake

Do you have a family reunion plan (e.g., identifying a common meeting place to come together after a possible earthquake)?

- Yes
- No If no, why?
    - I don't have the time
    - I don't think that such a plan will make a difference
    - I don't know how to develop such a plan

Did you arrange all the furniture in your home so that they are not next to the windows and they will not block the escape routes?

- Yes
- No If no, why?
    - I didn't need to because they were already arranged before I moved in
    - I didn't know that this was something that I should do
    - I don't have the time to do this
    - I don't see any benefit/value in doing this

Have you secured items that could fall and cause injuries (e.g., bookshelves, mirrors, etc.) because you live in an area of high earthquake risk?

- Yes
- No If no, why?
    - All of my moveable belongings were already secured before I moved in
    - I am a tenant, my landlord won't permit me to make changes
    - I don't know how to secure items
    - I don't have the financial resources to do this
    - I don't have the time to do this
    - I don't see the benefit/value of doing this

Have you identified the location of the switches for water, gas, and electric power?

- Yes
- No If no, why?
    - I didn't know that this was something that I should do
    - I don't know where to access them
    - I haven't had the time to look for them
    - I don't see any benefit/value of doing this

Have you assessed your home and/or your business building for earthquake resistance according to building codes?

- Yes
- No If no, why?
    - A serious earthquake is unlikely to occur during my lifetime
    - I don't know who to contact to help me to do this
    - I don't trust assessment firms or procedures
    - Earthquakes are too destructive to bother preparing for
    - I don't have the financial resources to do this
    - I don't see any benefit/value in doing this

Have you retrofitted your home and/or business building structurally?

- Yes
- No If no, why?
    - I didn't need to because it was already retrofitted
    - I don't know who to contact to help me to do this
    - I don't have the financial resources for retrofitting
    - I don't have the time to do this
    - I don't see any benefit/value in doing this
    - I am a renter; I am not responsible for structural retrofitting.

Have you identified safe places to go to in case of an earthquake (e.g., under a sturdy piece of furniture or against an interior wall in home, office or school)?

- Yes
- No If no, why?
    - I didn't know that this was something that I should do
    - A serious earthquake is unlikely to occur during my lifetime
    - I don't have the time to do this
    - I don't see any benefit/value in doing this

Have you practiced what to do during and immediately after an earthquake (e.g., "Drop, Cover, and Hold On")

- Yes
- No If no, why?
    - I didn't know that this was something that I should do
    - Earthquakes are too destructive to bother preparing for
    - A serious earthquake is unlikely to occur during my lifetime
    - Preparing for earthquakes is inconvenient for me
    - I don't see any benefit/value in doing this

5.7 Resources

Resources are decisive when it comes to taking preparedness actions as some of them can be very costly. A household may be very motivated to take an action but may not have the resource to do so. Therefore understand the resource portfolio of a household and how this relates to its preparedness is very important with regard to increasing community preparedness.

Resources – socio-demographic-economic variables

Gender

- Male
- Female
- I do not wish to declare

Age

- Younger than 14
- 14-25
- 26-35
- 36-45
- 46-55
- 56-65
- Older than 65

The house/apartment I am living in is:

- My property
- Property of relatives
- Rented
- Other

How many people (including you) live in the household in total?

- __ Adults (over 18)

How many children live in the household?

- __ Children (under 18)

How many people with a disability (physical or mental health problem) or special needs (e.g. non-native speakers, learning disabilities) live in your household?

- ___ people with special needs or a disability
- people with lower language proficiency (e.g. non-native speakers who may require some assistance with translating warnings or advice regarding a hazard threat)

What is your highest degree in formal education?

- No formal education
- Completed Primary Education
- Completed Secondary Education
- Technical/Vocational Certificate
- University degree
- Postgraduate qualification
- Still in education

What is your occupational status?

- Employed
- Self-Employed
- Unemployed
- Retired
- Stay at home parent
- Student

Are you a member of an association, such as a sports club, religious organisation (e.g. church, mosque, temple, etc.), volunteering organisation or other clubs in your community?

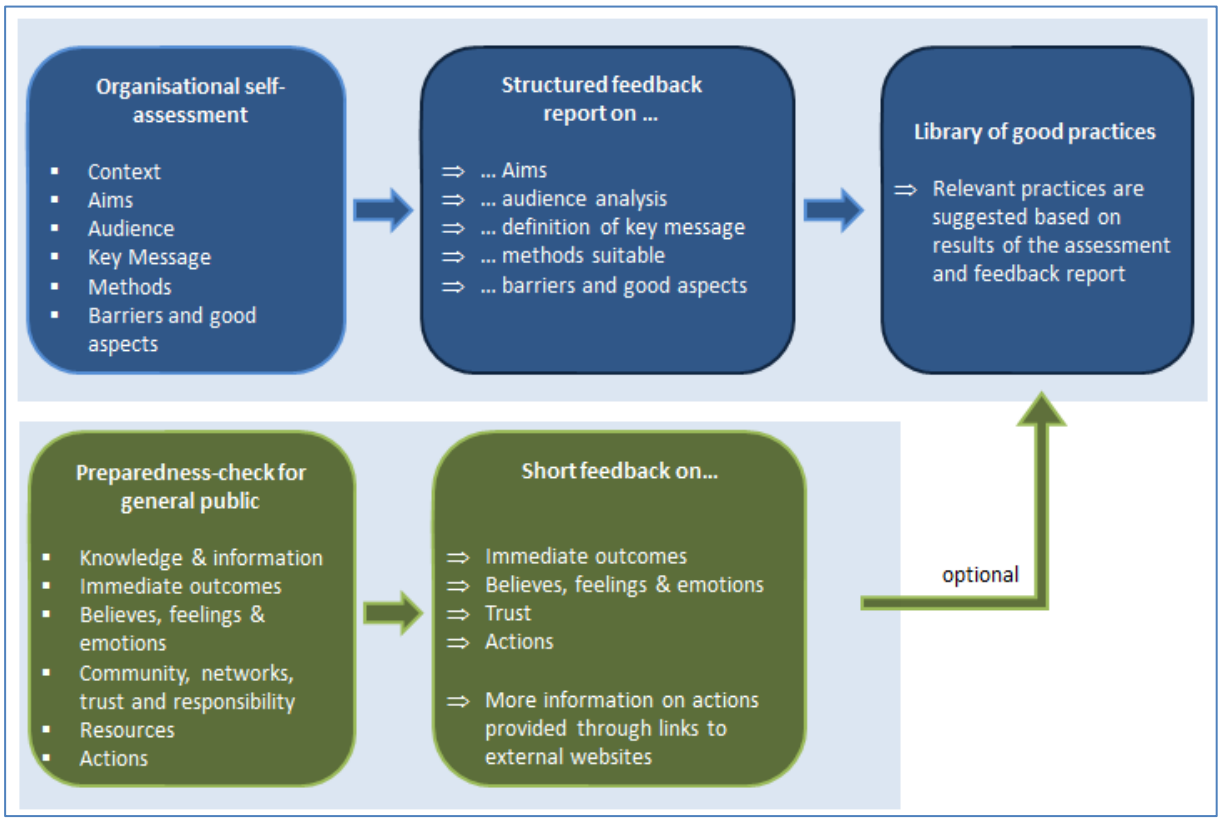
- Yes
- No

6 Social learning and community preparedness

In this concluding chapter we outline how the single assessment presented so far can be utilized to initiate a long-term learning process that aims at sustainably increasing community preparedness. It outlines both single steps, as well as guiding questions for the development of such a learning process as well as some indicators to track how effective learning processes are after they are initiated.

Generally, the results of both the organisational self-assessment and the preparedness-check for the general public can be used in many different ways. Most importantly, they should be used as an empirical basis for exchange and interaction between organisations responsible for managing disaster risks as well as the general public; a point we return to below. However, results can also be used simply as an internal feedback within an organisation, for instance. In this respect, it may serve as a way of reflecting upon established practices and get a structured feedback on these practices through the feedback report. Similarly, a single household may use the preparedness-check in order to learn more about measures that might be relevant for the household to increase its preparedness, for epidemics or earthquakes, for instance (see Figure 16).

Figure 16: Interlinkages of self-assessments, feedback reports and library of good practices

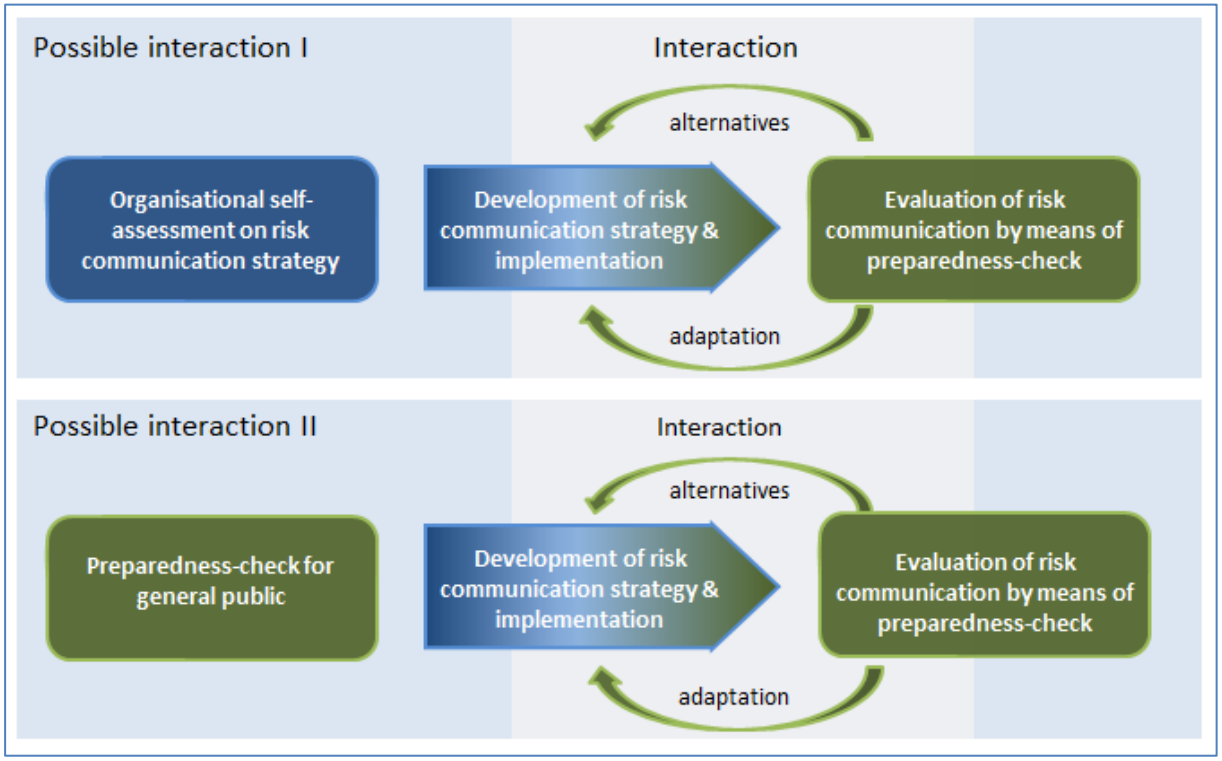


However, TACTIC encourages both organisations as well as members of the general public to use the outcomes of the assessments as a basis for exchanging on questions related to enhancing community preparedness and hence understand the process of exchange as process of social learning (see also section 2.1), that is a deeply interactive and communicative activity that is ideally based on some kind of two-way exchange, organised iteratively and aims to initiate both incremental as well as more

fundamental learning processes by enhancing the capacities of individuals as well as organisations to prepare for different kind of crises in a multi-hazard context.

There are many different possibilities of how the organisational self-assessment and the preparedness check can build upon each other (see Figure 17). On the one hand, an organisation may develop its risk communication strategy based on the outcomes of the organisational self-assessment and use the preparedness-check to evaluate its own risk communication activities and practices. On the other hand, an organisation can also use the preparedness-check as a highly structured assessment to understand the current level of preparedness in a community and develop a risk communication strategy based on the results of the preparedness check and re-evaluate its practices some year later by using the preparedness-check again. Apparently, also other forms of interaction are imaginable.

Figure 17: Different way of how TACTIC's self-assessment interact with each other



Importantly, particularly during phases when risk communication strategies are evaluated and possibly adjusted or alternative ways of communicating and interacting with the public are thought about, a more engaged and interactive exchange is advisable as the outcomes of the assessment will still be open to interpretation and debate. This can be done in different degrees of intensity, as we will outline in the next section. There are some guiding questions, however, that may help to structure the interaction between organisations engaged in disaster risk management and representatives of the general public.

Based on the outcomes of the organisational self-assessment Table 23 outlines some of the key questions to be addressed by organisations when they interact with the public.

Table 23: Guiding questions for organisation when assessing their risk communication strategy

Guiding questions for organisations

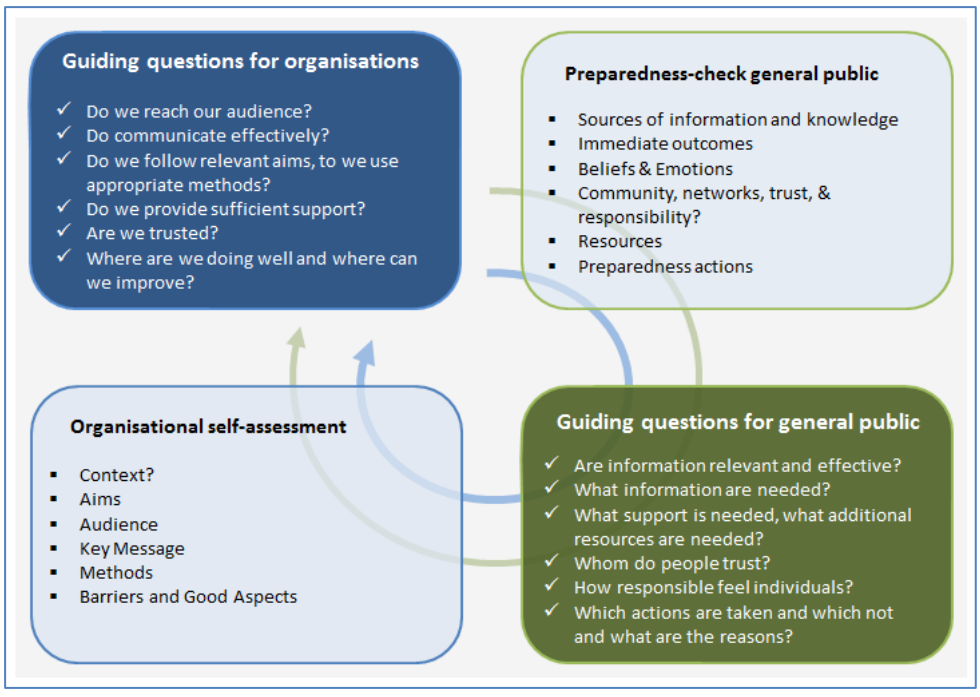
• Do we reach our audience?
• Do we communicate effectively?
• Do we follow relevant aims, to we use appropriate methods to reach these aims?
• Do we provide sufficient support to the community?
• Are we trusted by the community?
• Where are we doing well and where can we improve?

Table 24: Guiding questions for representative of general public

Guiding questions for representative of the general public
• Is information we receive relevant and effective?
• What information do we need needed?
• What support do we need, what additional resources are needed, what are our strengths?
• Who do people trust?
• Which actions are taken and which not and what are the reasons?
• Where are we doing well and where can we improve?

Figure 18 outlines how the single assessment as well as the guiding questions can feed into each other during phases of intensive interaction within a context of social learning, a process that is described in greater detail in the next sections.

Figure 18: Interaction of organisational self-assessment as well as preparedness check for the general public on the community level



6.1 Social learning as interaction to increase community preparedness

As previously stated, social learning refers to a process that evolves "with the input of various actors (including those at the community level)" (Pelling et al., 2015, 2) and is thus a deeply "collective and communicative" social activity. As an implication, social learning is based on the interaction of various actors and their reflections about how to change their interrelation or the interrelations with their environment. TACTIC has developed an approach as well as an online platform that aims at stimulating and facilitating such exchange and interaction within a structure framework that allows the identification of strength and potential weakness with regard to risk communication as well as with regard to community preparedness.

In this section we outline which forms of interaction are relevant for organizing the exchange on the outcomes of the assessment results. Generally, it is advisable to interact with many different actors representing a great diversity of institutional, cultural and demographic backgrounds. There different forms of interaction possible.

- The basis of all learning processes is the sharing of knowledge and information. Therefore it is decisive that the results generated by the preparedness check are made publicly available and fed back to the general public in a specific community. This is at the same time the least advance method of interaction as information is simply provided and there is no possibility to feedback.
- By consulting member of the general public about both the results of an assessment and the conclusion an organisation is drawing from the results, the interaction becomes more advanced. This can be done through focus groups for instance.
- Involving member of the general public in the design and development or even in making final decision on how to develop a future risk communication strategy is probably the highest form of interaction, which can help to build trust and a highly credible communication strategy. At the same time is this form of interaction is very resource and time-demanding and may be beyond the scope of most organisations

The intensity of interaction depends both on the available resource as well as the gap between the results of the preparedness-check and the results of the self-assessment of the general public. If the level of preparedness, for instance, is quite satisfying and the overall feedback is rather positive, a less intensive form of interaction (e.g. informing the public about results) may be sufficient. However, if there are apparent gaps in the communication, unsolved conflicts or low level of preparedness more intensive forms of exchange is needed.

Interaction and social learning

How many stakeholders are involved in the exchange on the results of the assessment(s)?

- Overall number of stakeholder involved

How many different types of stakeholders and organisations are involved in the exchange?

- Governmental representatives
- First-responders
- Non-governmental organizations
- Community groups
- Voluntary organisations
- Small and Medium sized enterprises
- Academics
- Religious representatives
- Journalists/Media representatives
- Cooperative building companies
- Others

Are roles of different stakeholders involved as well as overall expected outcomes clearly defined and communicated?

- Yes, they are both clearly defined and communicated
- They are defined but not communicated
- No, neither nor
- I don't know

How intense is the interaction organised?

- We inform the general public about the results of the preparedness-check
- We provide the general public the possibility to feedback on the results of the preparedness-check and the conclusion we have drawn from the results
- We Involve member of the public for improving our risk communication strategy
- We involve member of the public for improving our risk communication strategy and allow them also to co-decide on how to proceed

6.2 Social learning as an iterative process

Social learning is ideally organised as a cyclical process that includes different steps, such as interpretations of current or past situations, development of new ideas, designing new strategies or measures, implementing agreed upon steps, as well as the review and evaluation of past decisions in order to adapt and revise established pattern.

It is therefore crucial to organise the interaction not simply as a one-shot event, but to rather organise a series of events that allow the interaction over a longer period of time. Ideally, this is also done through using different methods of communication and interaction. Below, we outline some key points you might consider.

Social learning as a iterative process

Iteration of interaction

- Once during the process
- Twice
- Three times
- Four times and more

Methods used to interact and communicate

Visualisation of risk

- Photos
- Posters and displays
- Direct advertising
- Videos

Face-to-face communication

- Public meetings/hearings
- Public workshops
- Round table discussion
- Theatre plays

Stakeholder participation

- Role-playing
- Simulations (e.g. emergency exercise)

Technology-assisted communication

- SMS
- Automatic Voice/Phone Notification System

Information materials

- Brochures, Leaflets, etc.
- Movies, Podcasts

Social media

- Twitter,
- Facebook

6.3 Social learning as a transformative process

Social learning should not simply be about improving the status quo, it should rather aim at more fundamental changes in social networks, established stocks of knowledge and skills as well as in the wider societal and institutional structures. In this report we highlighted the idea of loop-learning, whereas:

- Single-loop learning describes the correction and amendment of specific organizational instruments which usually includes the definition of alternative strategies or measures to reach a well-established aim. As an outcome of one of the TACTIC assessment, it might be concluded by an organisation that agreed upon aims are not effectively reached by established modes of communication, which therefore need to be adapted.
- Double-loop learning is more fundamental as it is not so much concerned about how to reach established goals, but rather challenges these goals and objectives by questioning established values and policies and aims at changing the behaviour of actors. In this case, it the preparedness-check might unravel that established aims of an organisations (e.g. enhancing the capacity to act) are not shared by the members of the general public as they do not feel responsible or might even have a very different perception of the relevance of a risk. In this case more engaged forms of interaction and learning might be necessary.
- Triple loop learning is concerned with underlying governance norms and protocols that influence and shape processes with regard to single- and double-loop learning. Such fundamental learning processes are probably to very often to be observed. An example might be that increasing preparedness cannot be achieved through the means of risk communication or an enhancement of motivation of single actors as preparedness is, above all, a matter of missing resource. Therefore underlying modes of distributing resource and sharing the costs and benefits of preparedness actions need to become a matter of concern.

Social learning and transformation

What was/is the aim of the learning process?

- Improving current risk communication activities in order to increase community preparedness
- Exchanging about alternative ways of risk communication in order to increase community preparedness
- Exchanging about alternatives that go beyond risk communication in order to increase community preparedness

6.4 Social learning and capacities

Social learning is based on certain capacities and at the same time aims to enhance capacities. TACTIC has identified five overarching capacities that need to be taken into account in order to increase preparedness sustainably. Based on the preparedness-check profound results can be expected with regard to the five components of the preparedness and possibly strengths and weaknesses in a community can be identified and strategies developed to mitigate them (weaknesses):

- Knowledge: This relates to the general publics' knowledge and information about the risk they feed exposed to as well as their information needs and information seeking behaviour. It also includes the individual experience of past occurrences of hazards in a specific community. This also includes individuals' risk awareness
- Motivation: Relates to the general public's believes and emotions related to the risk the feed exposed to. This includes self-efficacy as well as response and coping-efficacy and feeling about preparedness. Motivation is one of the most important factor shaping people's decision to take preparedness action or not.
- Networks: This relates to respondents relationship with other actors' as well as they trust in different organisational and non-organisational actors. It also includes their sense of community and their level of support
- Responsibilities: Relate to how duties are distributed between public/individual and private actors as well as how this distribution is perceived, in addition to being able to participate in decision and policy-making processes
- Resources: Include financial (land, physical material, buildings etc.) and human (e.g., personnel and skills) and provide the means to be able to know and act, be motivated, and establish networks.

7 TOSAP – The TACTIC online platform

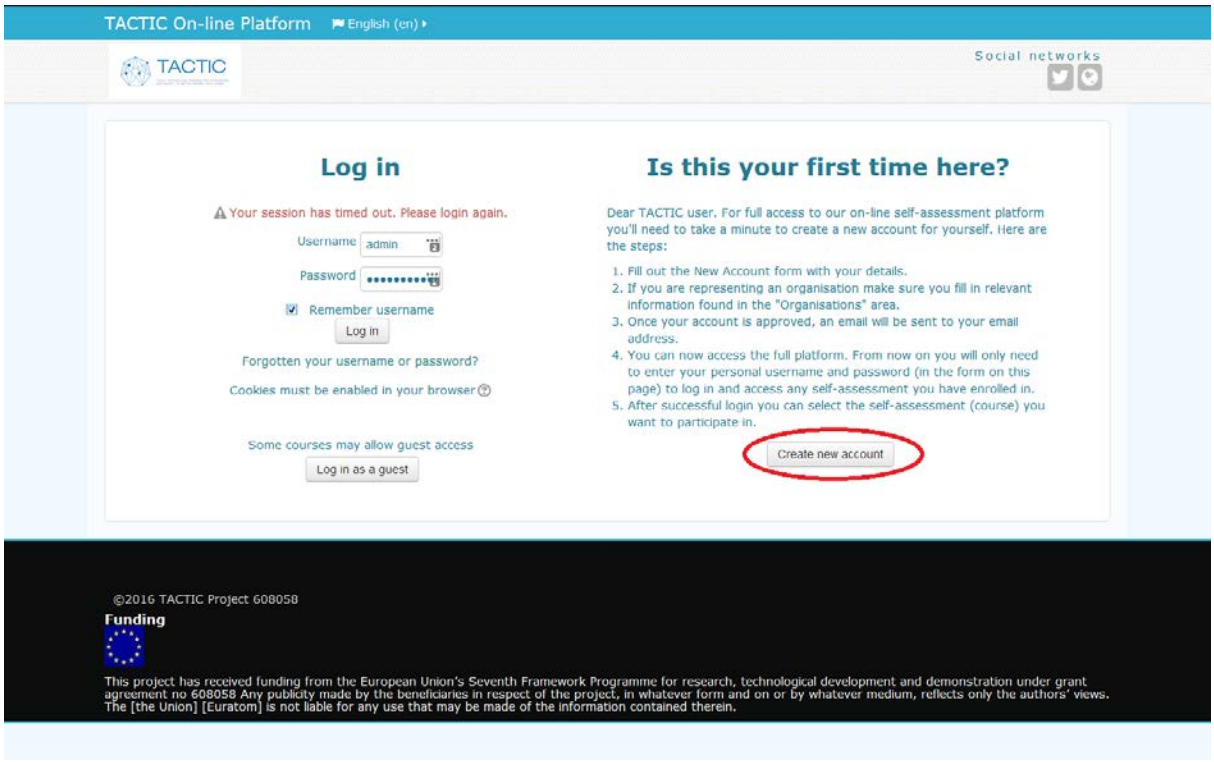
This chapter gives the reader a visual impression of the platform and explains some of its key features.

7.1 Registering on the platform

At the current stage, the TOSAP platform is available under https://www.tacticproject.eu/tosap/

In order to access the platform material users are encourage to login to the platform by clicking on the “Log in” link located at the top right corner, in which case they will be redirected to the platform login page, shown below:

Figure 19: TOSAP login page



If this is a first time user they can request for an account by clicking on the “Create new account” button in which case they will be re-directed to the “New account” page as shown below, where they are requested to fill in relevant details.

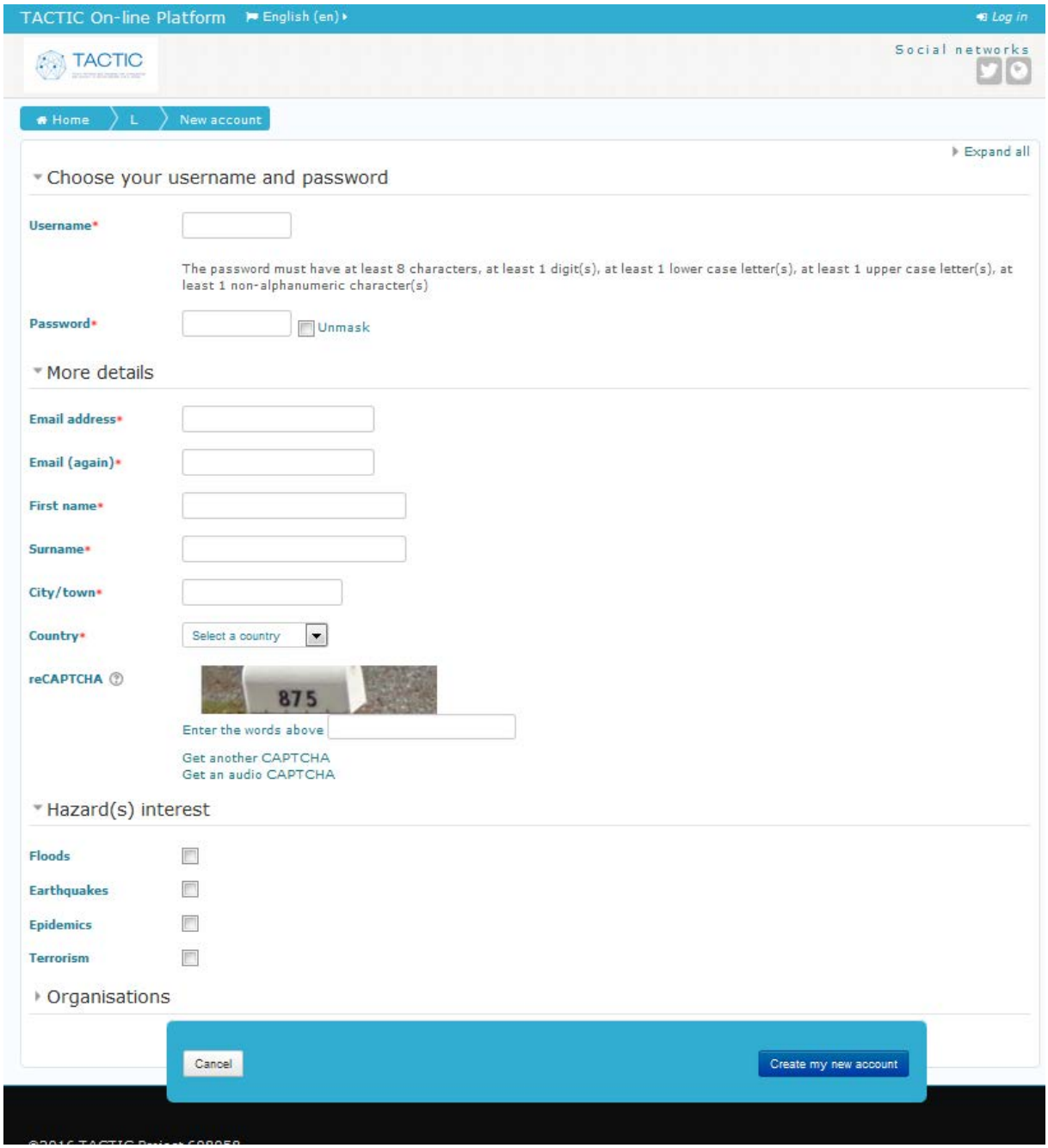


Figure 20: TOSAP request new account page (General Public)

After the successfully requesting a new account users receive the following confirmation:

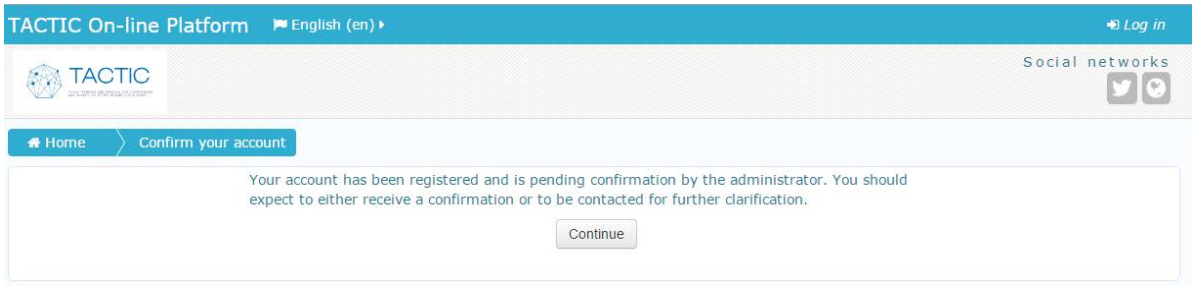
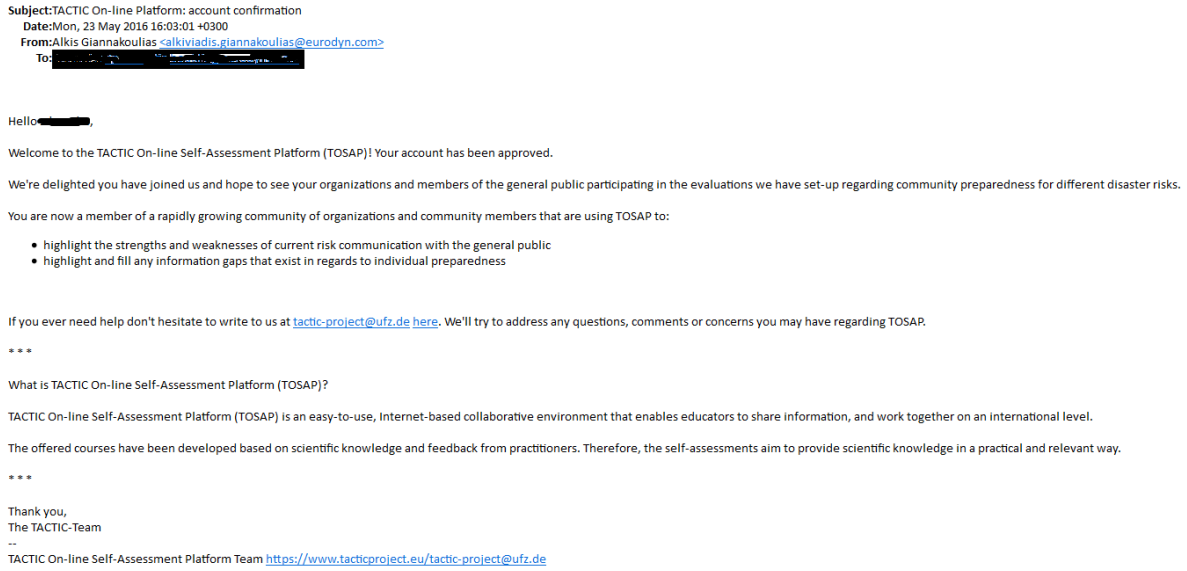


Figure 21: TOSAP request new account page (Pending Confirmation)

At the same time the platform administrator (European Dynamics SA) receives an email from the platform requesting either to confirm the registration process or decline it. If the administrator selects to confirm the account creation request the user received the following email confirmation message and then they are ready to access the platform.



Subject: TACTIC On-line Platform: account confirmation
Date: Mon, 23 May 2016 16:03:01 +0300
From: Alkis Giannakoulias <alkiviadis.giannakoulias@eurodyn.com>
To: [redacted]

Hello [redacted],

Welcome to the TACTIC On-line Self-Assessment Platform (TOSAP)! Your account has been approved.

We're delighted you have joined us and hope to see your organizations and members of the general public participating in the evaluations we have set-up regarding community preparedness for different disaster risks.

You are now a member of a rapidly growing community of organizations and community members that are using TOSAP to:

- highlight the strengths and weaknesses of current risk communication with the general public
- highlight and fill any information gaps that exist in regards to individual preparedness

If you ever need help don't hesitate to write to us at tactic-project@ufz.de here. We'll try to address any questions, comments or concerns you may have regarding TOSAP.

* * *

What is TACTIC On-line Self-Assessment Platform (TOSAP)?

TACTIC On-line Self-Assessment Platform (TOSAP) is an easy-to-use, Internet-based collaborative environment that enables educators to share information, and work together on an international level.

The offered courses have been developed based on scientific knowledge and feedback from practitioners. Therefore, the self-assessments aim to provide scientific knowledge in a practical and relevant way.

* * *

Thank you,
The TACTIC-Team
--
TACTIC On-line Self-Assessment Platform Team https://www.tacticproject.eu/tactic-project@ufz.de

Figure 22: TOSAP request new account page (Account Creation Confirmation Message)

Once logged in to the platform the user has the possibility to change the language used throughout the platform (i.e. English, German, Polish, and Turkish).

User, either organisations or general public members, can access the platform content by clicking on the available courses found at the main page, that leads them to the next figures.

7.2 The self-assessments

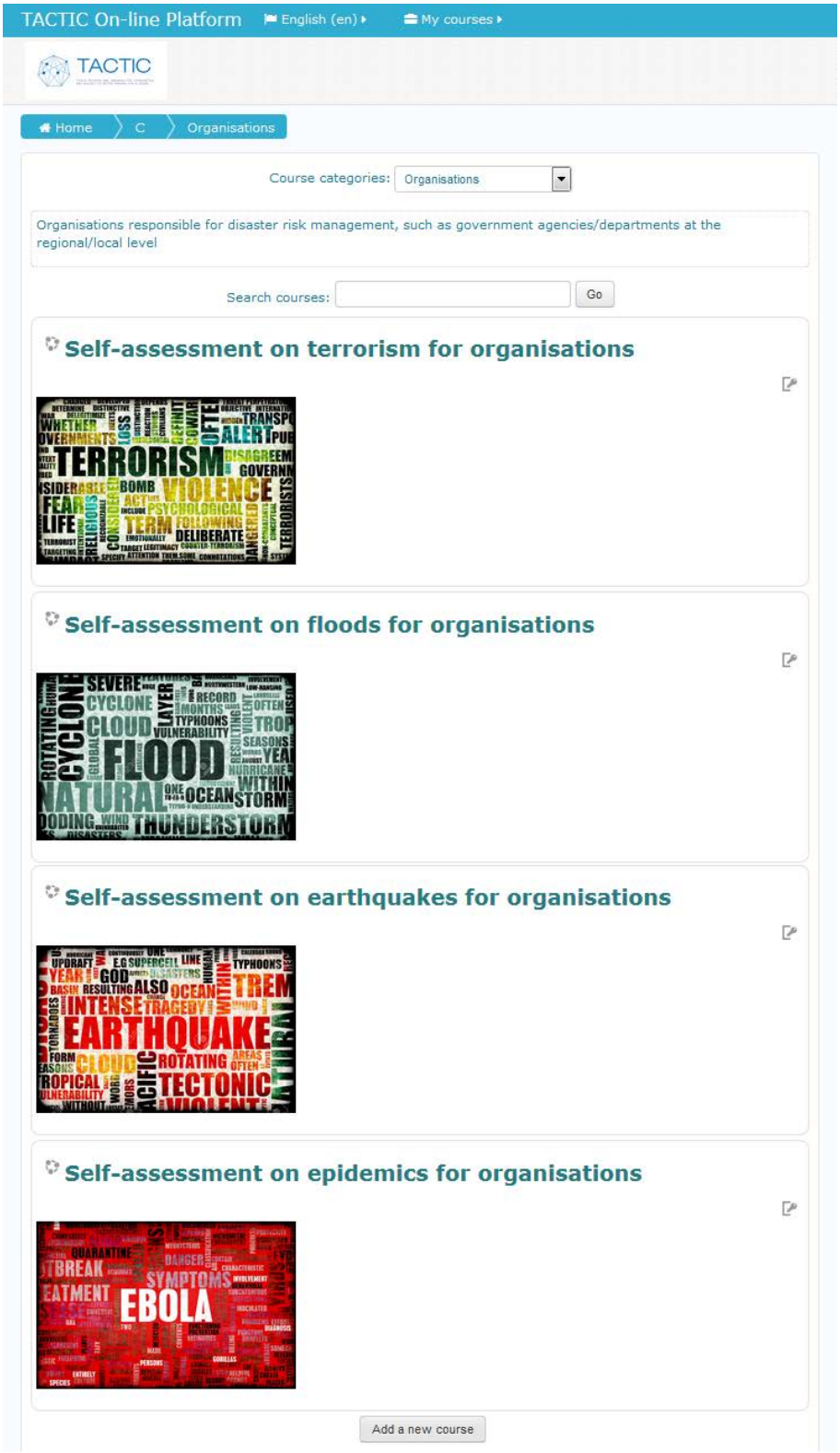


Figure 23: TOSAP main page (Organisation Available Courses)

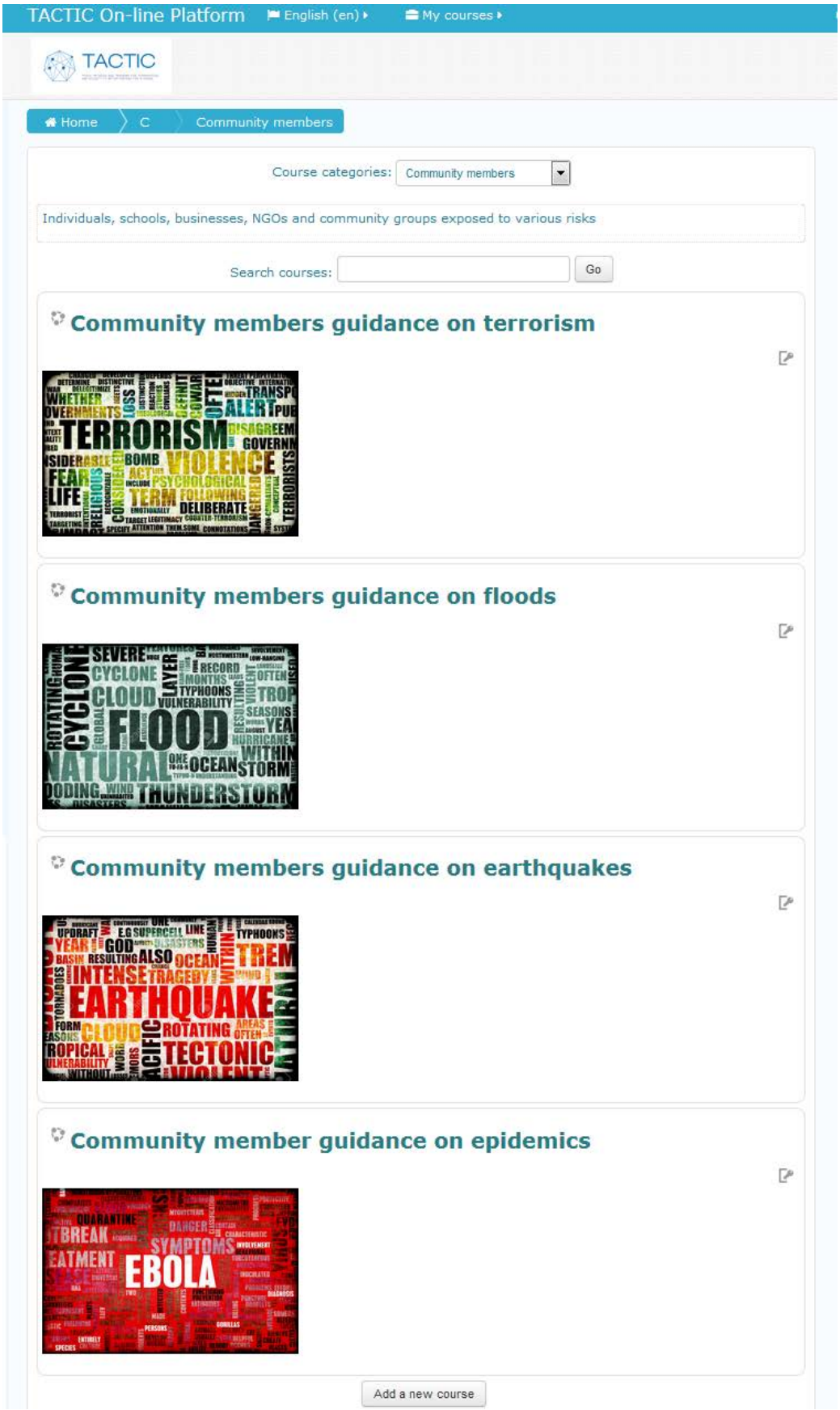


Figure 24: TOSAP main page (General Public Available Courses)

Next to each course there is a “key” icon. This indicates that the course is not open to everyone but rather than it requires an “Enrolment key” that is sent to the users in a separate email.

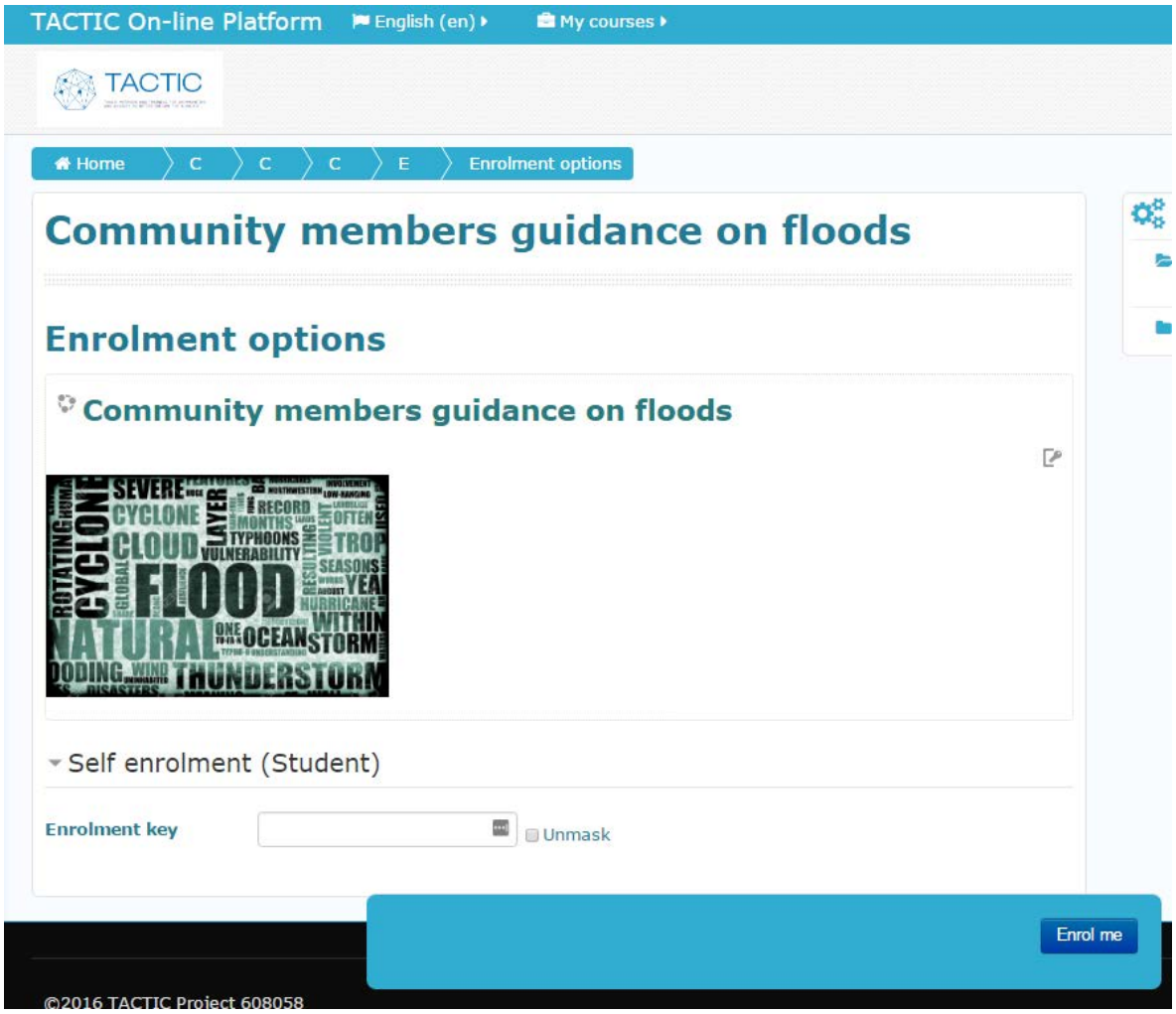


Figure 25: TOSAP course page (Course requires “Enrolment key”)

Passing in the key unlocks the course contents as shown below:

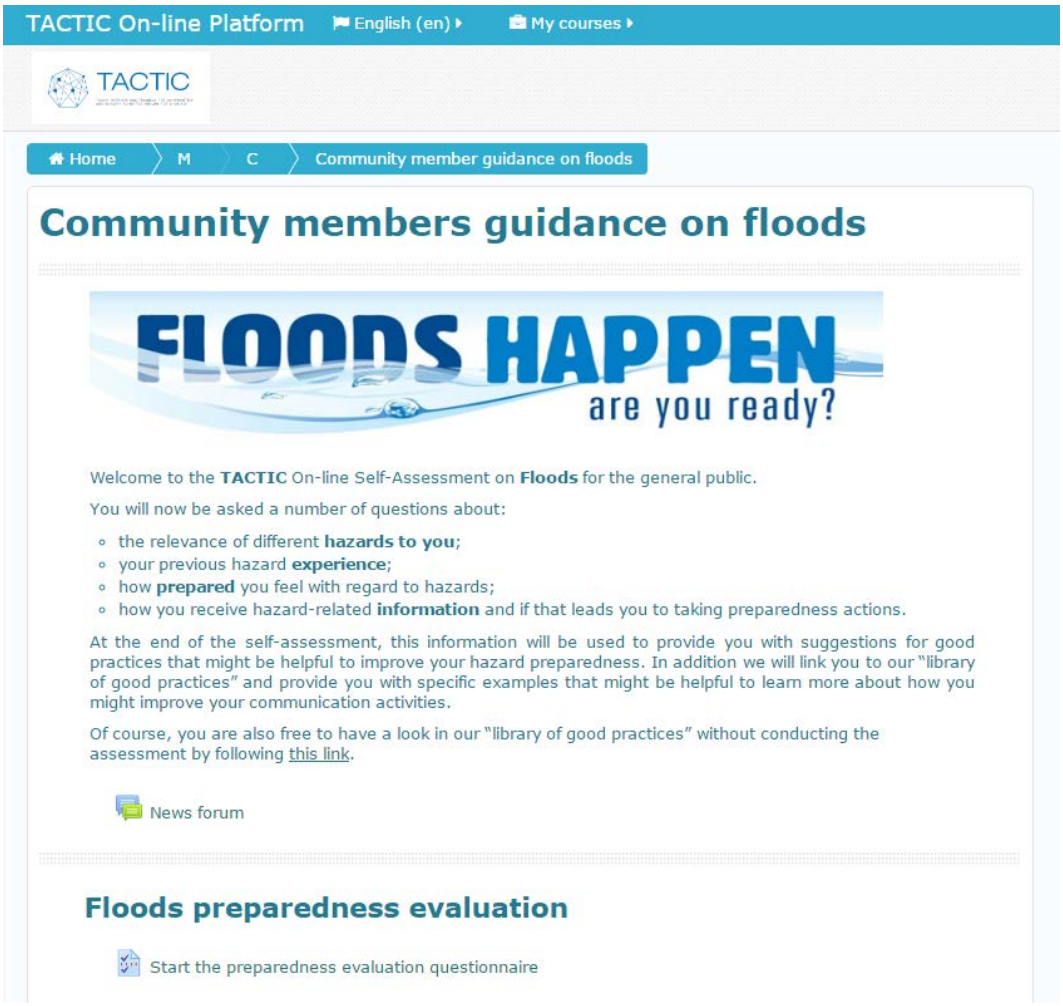


Figure 26: TOSAP course page (Course available after passing the "Enrolment key")

After unlocking course, users (Organisation and/or general public) can start the self-assessment by clicking the relevant link. The structure and content follows the logic and singe questions as outlined in chapter 4 for organisations and chapter 5 for the general public.

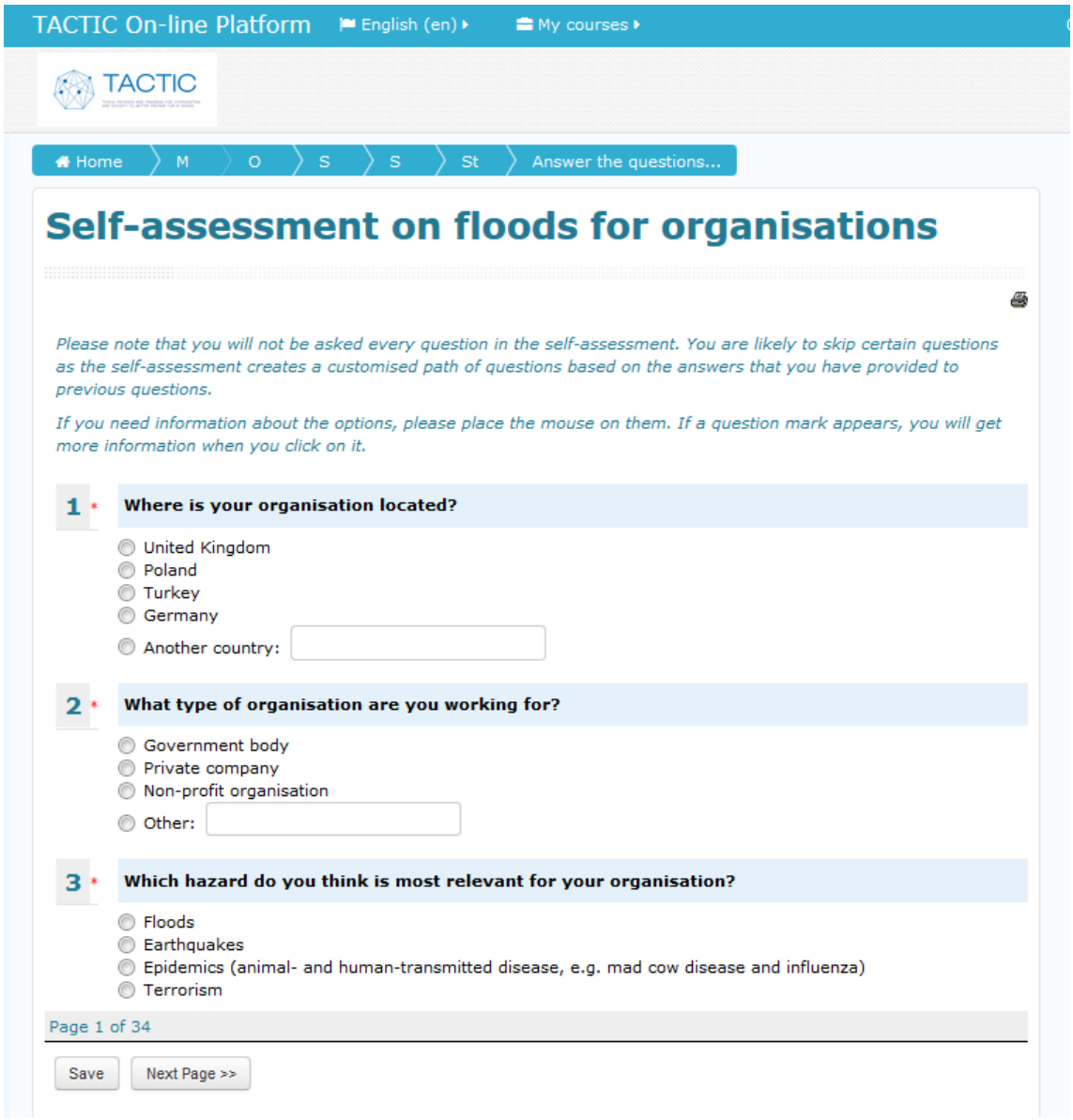


Figure 27: TOSAP Organisation Self-Assessment

Importantly, the users are not asked every question in the self-assessment. Certain questions are likely to be skipped as the self-assessment creates a customised path of questions based on the answers users provide to previous questions.

7.3 The feedback report

After answering “all” questions users receive a feedback as shown in the next figures.

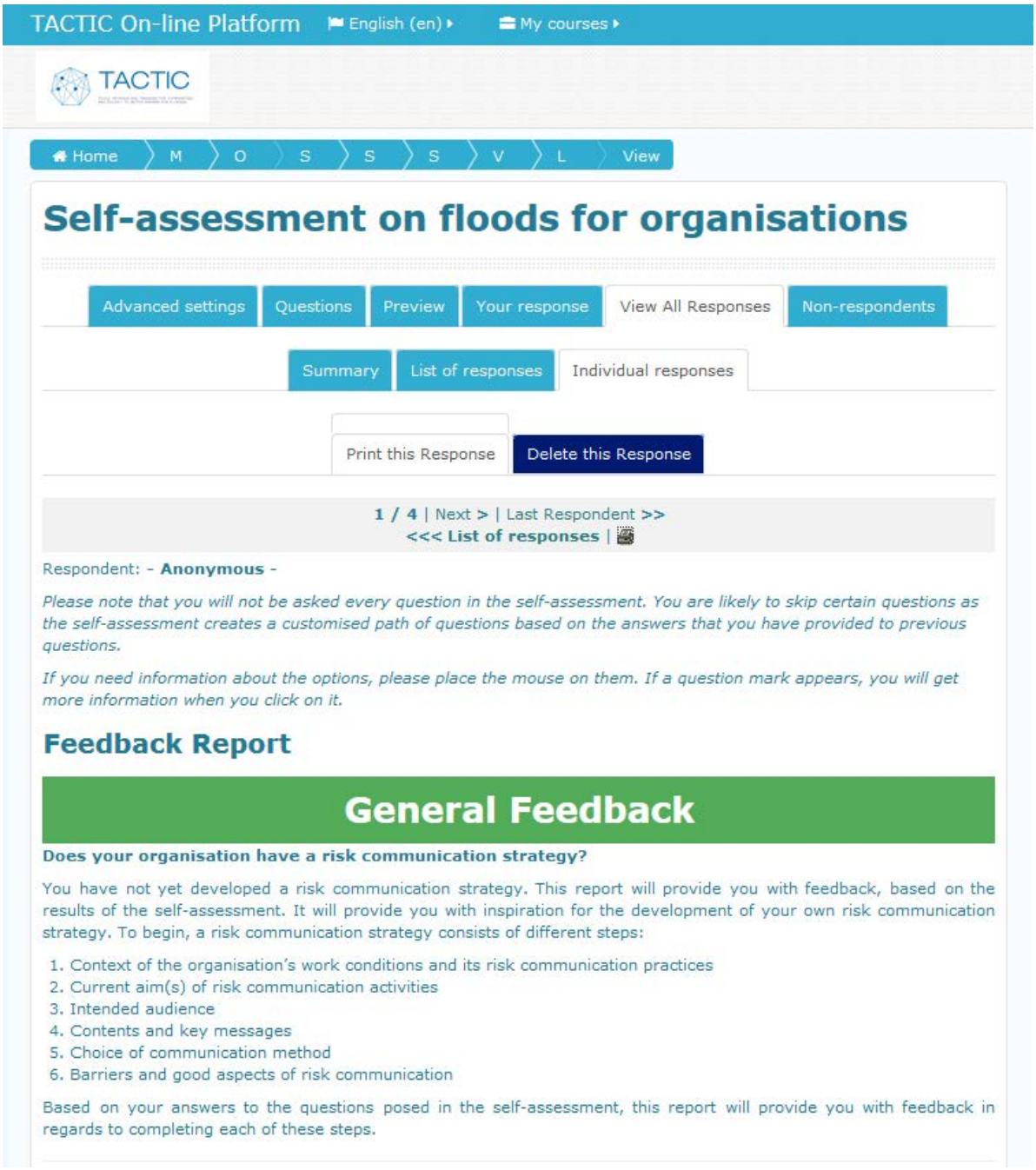


Figure 28: TOSAP Organisation Self-Assessment (Feedback Report #1)

Detailed Feedback On: Capacity To Act

Do you provide information about the risk of floods?

You don't provide information about how residents in your community/city/region can prepare themselves. Here is space for improvement! Members of the general public are not always aware of what they can do to prepare themselves for a flood event. Therefore, risk communication which aims to strengthen capacities to act is of great importance.

How regularly do you provide information about the risk of flooding?

- **You provide information about how to read and understand flood hazard and risk maps from time to time**. It can be beneficial to do this on a regular basis, because to be able to interpret a map is a relevant skill in order to get prepared.
- **You provide information about rain water management on individual property from time to time**. It can be beneficial to do this on a regular basis as having information about how to get prepared is an important step to make the decision to do so.
- **You provide information about how to insure buildings against damage from natural disasters regularly**. This can be important, because insurances can raise household's resilience after a flood event and can help to return to the normal life.
- **You don't provide information about preparation of individual flood emergency/evacuation plan for family, small businesses or farms regularly**. This can be relevant as such plans can be an important step to get prepared and to act.
- **You don't provide information about emergency kits and appropriate behaviour in case of emergency**. This is important, because it provides people at risk helpful suggestions about how to act in case of emergency, about what to do and what to avoid.
- **You provide information about financial aid for reconstruction after floods regularly**. This is important as it is an relevant step for communities to recover.

Which good aspects of risk communication do you consider in order to increase the capacity to act?

- Simple and graphical material? You should inform yourself about whether your organisation uses simple, graphical and factual materials in order to enhance the capacity to act. Simple graphical representations of the information that you want to communicate can help to create a memorable communication.
- **Very good, you use a simple language in order to enhance the capacity to act**. Research has shown that careful communication of information is really important. By avoiding technical language and making sure that your information that you communicate is limited to three main points, or messages, which are repeated often, can help to reinforce your message and make it memorable.
- **It seems you are not yet using vivid examples**. this might be relevant for you as personal accounts of experiences with flood-related hazards can help the intended audience to empathise with the person communicating. Such communication can also help to ensure that the message being communicated is memorable.

When you communicate with the general public, does your organisation emphasise the potential benefits of taking these actions?

Great, you emphasise the potential benefits of taking actions! Research has found that if individuals perceive a risk of being high and believe that their actions can make a difference, they are likely to take action. It has also been found that the communication of negative information should be limited in risk communication as they may have a detrimental effect and overpower the possible solution and could also undermine trust. Risk communication should focus on the risks of inaction but place more emphasis on the audiences ability to act and the benefits of doing so.

Figure 29: TOSAP Organisation Self-Assessment (Feedback Report #2)

Detailed Feedback On: Raising Risk Awareness

Do you provide information about the risk of floods?

You provide information about the risk of floods to your community/city/region. Having information about potential risks is an important step to get prepared.

Which good aspects of risk communication do you consider in order to raise risk awareness?

- **You are not using simple, graphical and factual materials** in order to raise risk awareness. It might be relevant for you to use such materials, as this can help to create a memorable communication.
- **You should inform yourself about whether your organisation provides information in simple language**, which avoids technical terms and is quickly comprehensible. Research has shown that careful communication of information is really important. By avoiding technical language and making sure that your information is limited to a couple of main points, or messages, which are repeated often, can help to reinforce your message and make it memorable.
- **Great, you use vivid examples and stories** that communicate on a personal level in order to raise risk awareness. Personal accounts of flood experiences can help the intended audience to empathise with the person communicating. Such communication can also help to ensure that the message being communicated is memorable.

How well do your methods of risk communication suit your communications aim?

To raise risk awareness you use **mass media**.

Strengths:

- Can reach large audiences
- Can be memorable and credible for a lot of people
- Can provide information quickly
- Good relationships with media representatives can lead to a more informed and solution-oriented public

Limitations are:

- Media source mostly controls the content and timing of the story and therefore should not be relied upon as a sole source of information provision
- A small amount of negative coverage can destroy trust and credibility

How well do your methods of risk communication suit your communications aim?

To raise risk awareness you use **information material**.

Strengths are:

- Can include large amounts of information
- Can be expanded or condensed to meet the audiences needs
- Are one of the most inexpensive forms of communication to produce (both time and resource costs are relatively low – of course this depends on the scale of the activity)
- May be more comfortable for some users to use than other methods of communication (e.g. social media and stakeholder participation

Limitations are:

- Some information materials can be difficult for some users to understand (e.g. technical language as well as length are important factors to take into account, therefore a pre-test is suggested)

Figure 30: TOSAP Organisation Self-Assessment (Feedback Report #3)

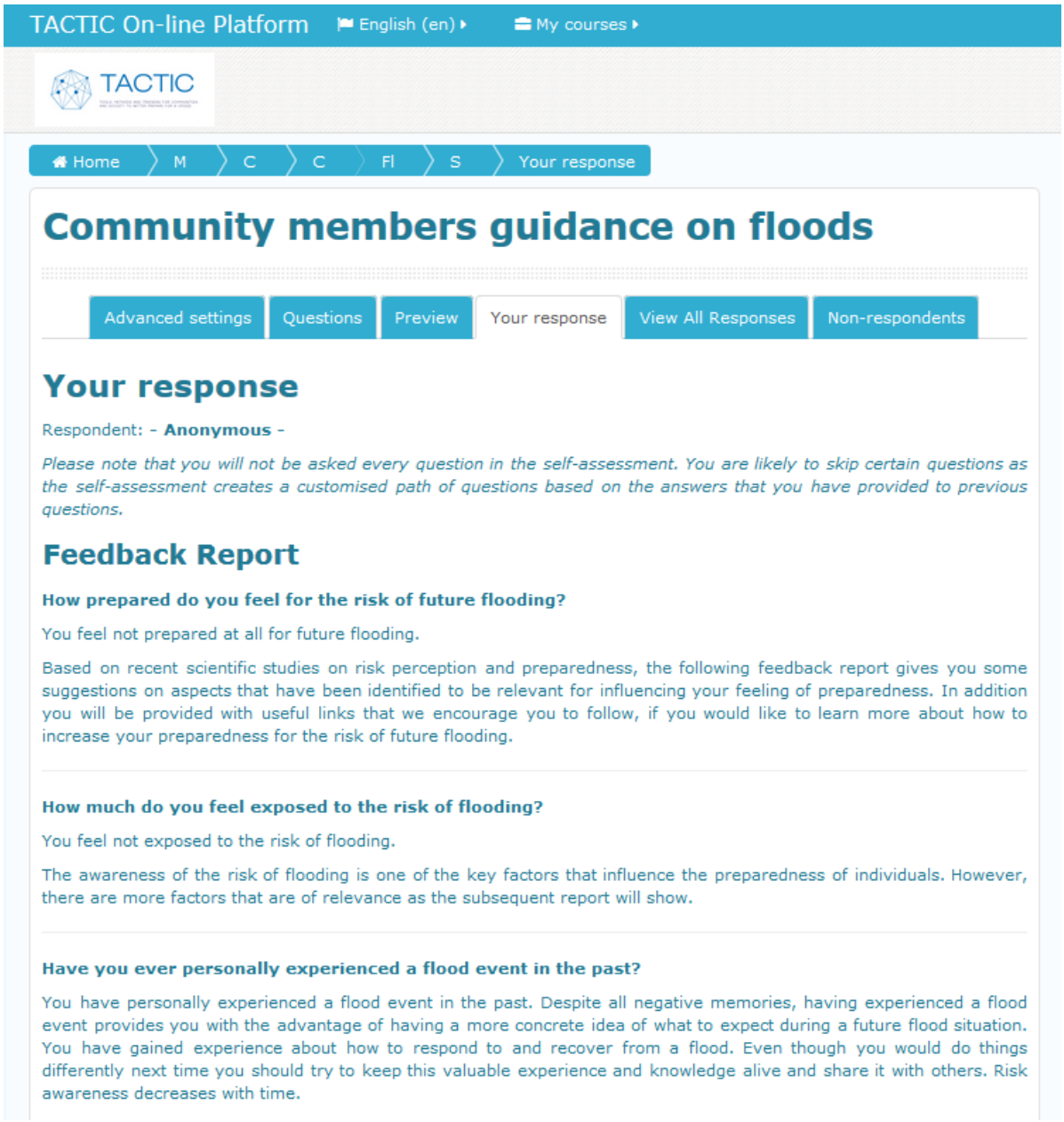


Figure 31: TOSAP General Public Preparedness Evaluation Questionnaire (Feedback report)

This feedback report, including the questions and answers that the individual gave, can be printed using the relevant internet browser functionality (File -> Print).

7.4 The library of good practices

Additionally users (even not registered ones) can access the library of “good” practices directly from the platform main screen. Illustrates the contents of this library.

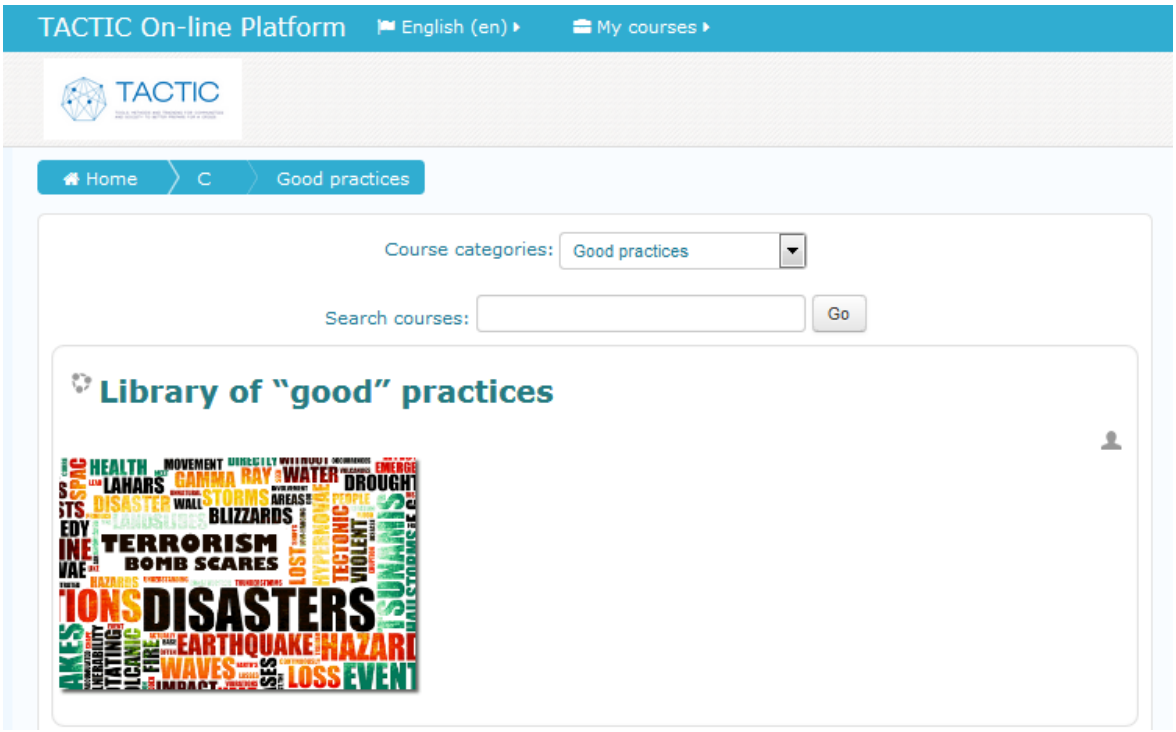


Figure 32: TOSAP Library of "Good" Practices

Users can navigate through the available practices using the "Next" or "Previous" navigation options. They can view the content of the practice by clicking on the magnifying lens icon

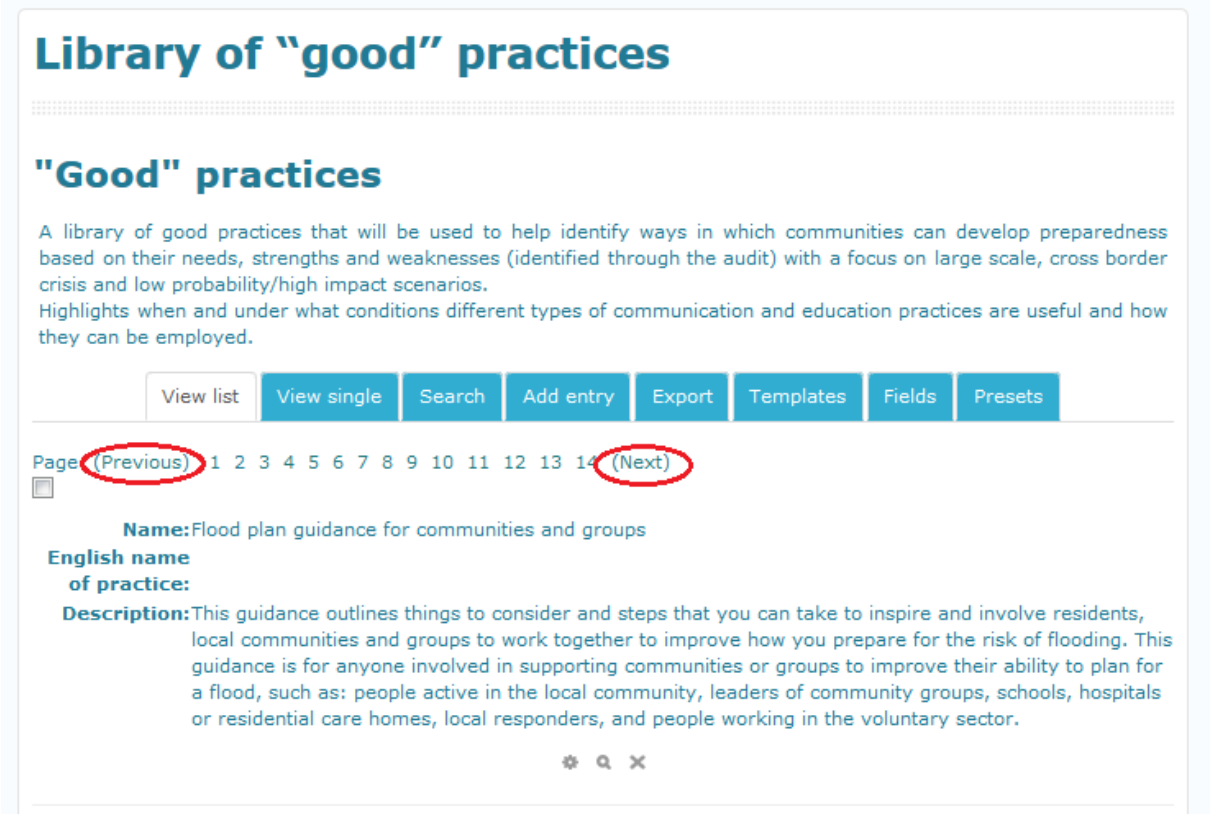


Figure 33: TOSAP Library of "Good" Practices (Navigating through available practices)

They can search for a good practice, using either the default simple search or the advanced search functionality as the following figures illustrate.

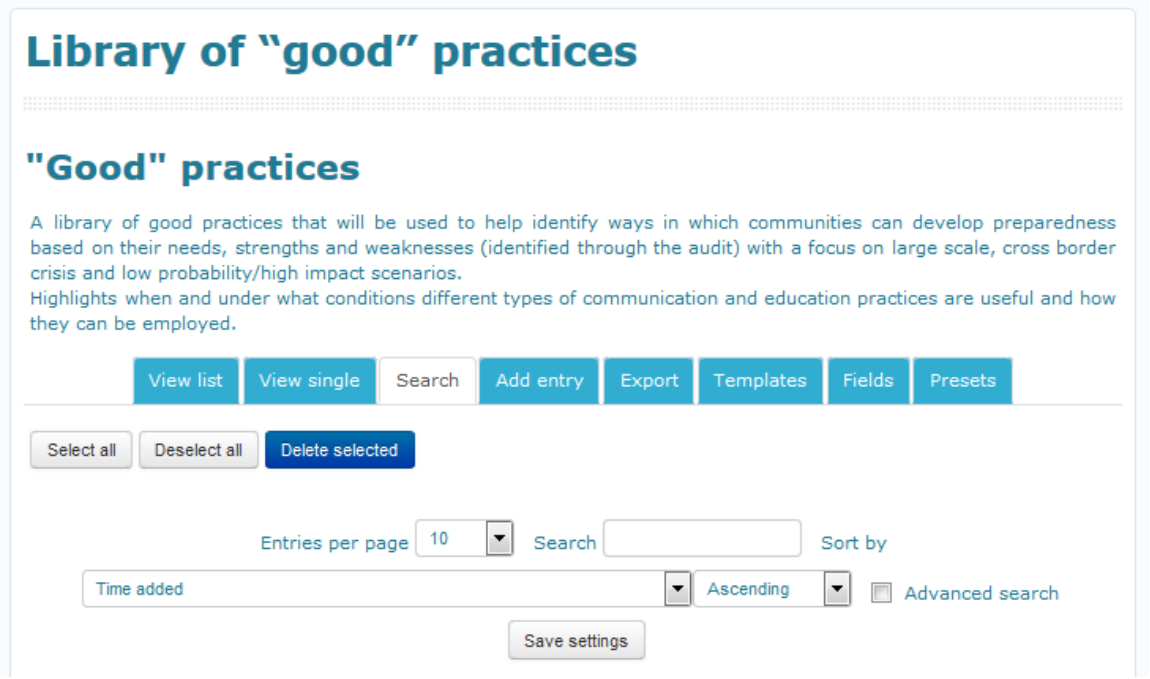


Figure 34: TOSAP Library of "Good" Practices (Simple Search)

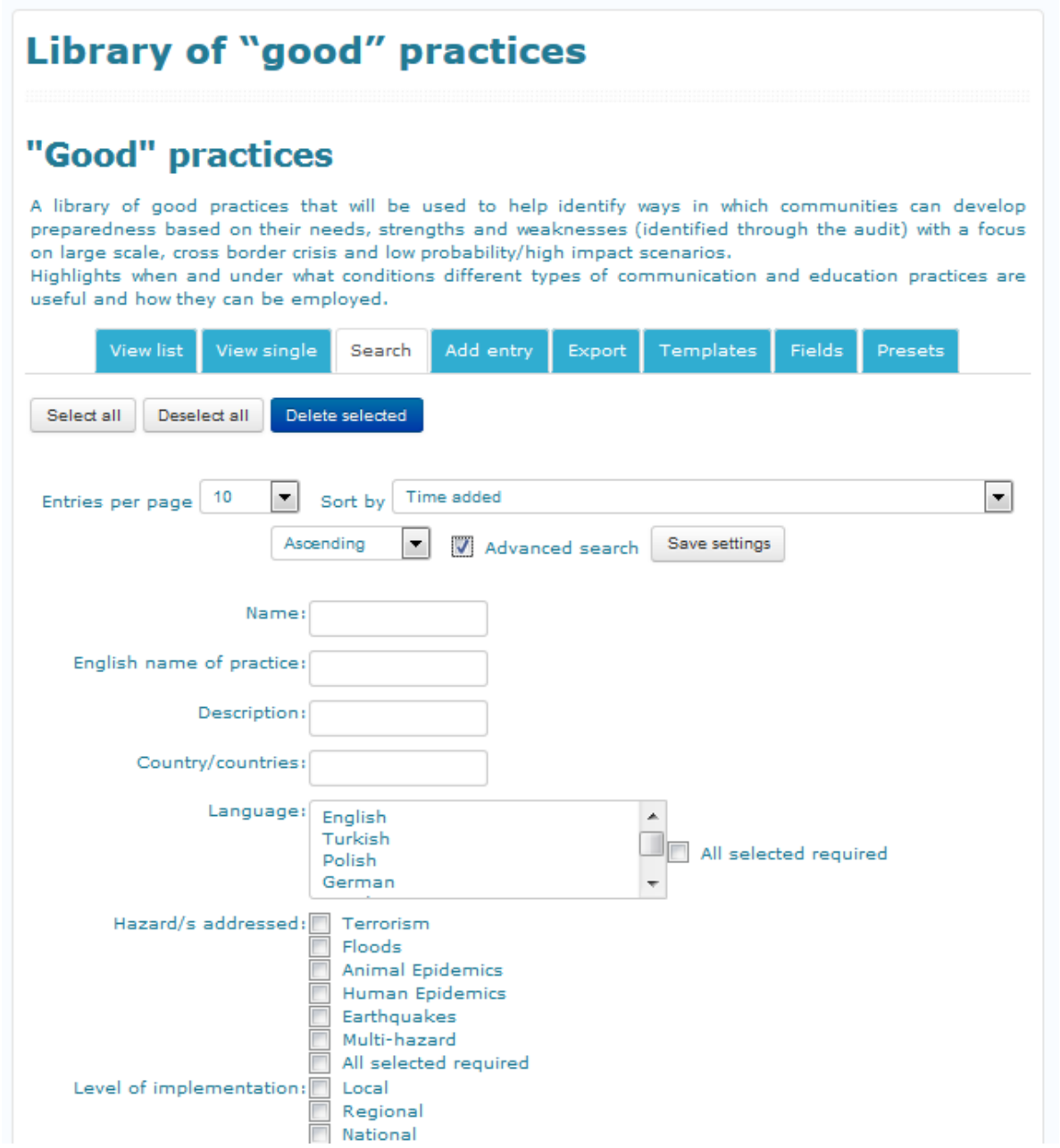


Figure 35: TOSAP Library of "Good" Practices (Advanced Search)

8 TACTIC's roadmap: Future research needs and next steps towards implementation

This chapter outlines future research needs as they became apparent throughout the TACTIC projects and also specified the next to be taken to further develop the online platform and its content.

8.1 Future research needs

Hazard specific research needs: terrorism

- As communicating about terrorism can make the public feel more at risk, there is a need to further understand the impact of communication about terrorism whether this results in an increased feeling of preparedness or rather results an increase feeling of risk of even fear. The General Public Self-Assessment for terrorism can be used to further explore this interrelation.
- The findings from TACTIC suggest that the public may not prepare for terrorism as they believe that organisations are preparing. Further research is required to understand the different factors that influence the perceived responsibility for preparedness and how this in turn influences levels of preparedness.
- TACTIC found that the characteristics of terrorism (e.g., uncertainty, unpredictability) have resulted in a focus on requesting the public's assistance in preventing terrorist attacks through vigilance, rather than on preparedness. Further studies could examine the relationships between the characteristics of terrorism and if / how they influence prevention and preparedness. Additionally, studies could investigate the relationship between prevention and preparedness. Particularly, it was emphasized by workshop participants that the public are prepared for terrorism through their employer, rather than being prepared through government initiatives. Thus, for terrorism the organisational responsibilities for preparing communities may be different than for other types of disasters. It needs to be further explored to what extent, government authorities could work with large organisations to prepare their employees for terrorism and how this increases the overall preparedness of communities

Hazard specific research needs: flooding

- Generally, the research on flood risk events as well as how to communicate and increase preparedness is well established. However, less is known the effectiveness of risk communication as well as self-assessment tool such as the ones developed by TACTIC. It is therefore recommended to scrutinize the long-term effects of tools that aim at raising preparedness and response/self-efficacy on how they change the latter.
- It needs to be tested whether and how the organisational self-assessment is used by different communities of practice and to what extent it is changes risk communication activities of responsible organisations; similarly it should be evaluated how the preparedness-check is used and to what extent it is able to increase self-efficacy and preparedness among the population. Also it should be scrutinized how the interaction between the public and responsible organisations is altering through the use of TOSAP.

Hazard specific research needs: epidemics

- Risk communication is paramount during epidemics, as it can impact the safety of people and animals, and potentially influence the spread of infectious disease. Misinformation and mixed messaging were flagged as serious challenges during the 2001 foot-and-mouth disease (FMD) epidemic, resulting in undue uncertainty and stress for residents, front line workers, and impacting businesses. In contrast, there is strong evidence that the communications strategy used by the government during the 2009 H1N1 'swine flu' pandemic was successful in building public awareness and in supporting critical elements of the response (Hine, 2009: 15[1]). During the 2009 'swine flu' pandemic the UK adopted a 'single authoritative voice' for providing information to the media led by Chief Medical Officers (CMOs) in England, Northern Ireland, and Wales, and the Deputy First Minister and Cabinet Secretary for Health and Wellbeing, supported by the CMO for Scotland (Hine, 2010: 116). In contrast, communications for exotic notifiable animal diseases such as FMD are managed by Regional Operations Directors (RODs); a voluntary position within the Department for Environment, Food, and Rural Affairs (DEFRA), which only becomes activated during crises. Whilst communications have improved since 2001, this places a lot of responsibility on the RODs[2] (Anderson, 2008). There is a need to better understand how the different modes of governance/communication interaction with the public awareness/preparedness.
- Greater community engagement in training exercises for epizootics could help to raise risk awareness, and engage a more of the community in preparedness efforts. Exercises such as 'Operation Silver Birch,' a training event led by the government in 2010 to test FMD preparedness plans, could be reproduced to engage more farms, and a wider section of the community beyond agriculture. There is a need to better understand to what extent such exercise help to increase awareness and preparedness in more systematic manner.
- Preparedness and contingency planning for human and animal disease epidemics, despite the many overlaps, are managed apart from one another, and with quite different strategy and policy. Animal disease epidemics such as the 2001 FMD epidemic demonstrate the numerous human impacts of this "animal disease". More holistic approaches to epidemic preparedness such as One Health emphasize of the interconnectedness between humans, animals, ecosystems and disaster risk, and advocate for greater multi-disciplinary and trans-disciplinary engagement. Little exchange is evident between the veterinary and public health communities in the UK and in other parts of Europe on this topic, yet it could greatly benefit community-level preparedness, especially in a 'multi-hazard' context. This needs further exploration.

[1] Hine, D. (2010), "The 2009 Influenza Pandemic: An independent review of the UK response to the 2009 influenza pandemic", *An independent review of the UK response to the 2009 influenza pandemic*, Cabinet Office, London.

[2] Anderson, I. (2008), "Foot and mouth disease 2007: a review and lessons learned", *Report Submitted to the Prime Minister and the Secretary of State for Environment, Food and Rural Affairs*, The Stationery Office, London.

- Reducing epidemic risk, for both human and animal diseases, requires effort at home and abroad. FMD and many other infectious diseases are endemic in other parts of the globe, and FMD outbreaks often originate from contaminated imports. Focusing on border controls and phytosanitary measures to reduce the risk of bringing in contaminated products, or transmitting the disease once in country, are an important risk management measure. However, actually reducing epidemic risk requires greater attention and investment in the root causes of epidemic risk (land use change, rapid urbanization, climate change, habitat loss, antimicrobial resistance, etc.) abroad, where diseases are endemic.
- Community-initiated activities such as crisis lines, help-lines, and other support services played a vital role in helping communities to cope with the stress and anxiety of the 2001 FMD epidemic[3]. However, these actions are not well recognized in policy. Furthermore, these resources helped to document the human impacts of FMD, which were not well recognized by the government[4] (Cumbria Foot and Mouth Disease Report, 2001; Bailey et al., 2006). To what extent use of citizens' panels can help to understand public health impacts, as well as recognition and networking with informal community services in order to monitor public health impacts, and better prepare for future events needs to be explored

Hazard-specific research needs: earthquakes

- Examination of the impacts of general public self-assessment (GPSA), feedback reports and the library of good practices on the risk awareness and preparedness behaviors of the public
- Evaluation of the impacts of organizational self-assessment, feedback reports and the access to the GPSA on organizations' risk communication methods , mediums and the effectiveness of the organizations's risk communication methods for the public
- Examinaning changes in the risk communication methods of the organizations after using the TOSAP
- Evaluating different methods of ensuring the visibility ,sustainability, ownership and motivation to use the TOSAP for both the organizations and the public
- Evaluate the use of TOSAP by printed out versions for the public who have limited access to the internet
- Evaluating different methods for the promotion of the use of TOSAP
- Evaluating the good practices library for cultural suitability of the practices

Research needs: From single hazards- to multi-hazards (including cascading effects)

[3] Shreve, Cheney, Belinda Davis, and Maureen Fordham. "Integrating animal disease epidemics into disaster risk management." *Disaster Prevention and Management: An International Journal* 25, no. 4 (2016).

[4] Cumbria Foot and Mouth Disease Report (2002), "Cumbria Foot and Mouth Disease Inquiry Report", Cumbria Foot and Mouth Disease Task Force, Cumbria, UK, 22 August.

Bailey, C., et al. (2006), "Different public health geographies of the 2001 foot and mouth disease epidemic:'citizen'versus 'professional'epidemiology", *Health & place*, Vol. 12, No. 2, pp.157-166.

The current set-up of the assessments as well as the feedback reports is focusing on four different hazards, but following a single-hazard centre approach and hence focuses less on the commonalities between hazards or the interdependencies between hazards as a truly multi-hazard centred approach would aim at. The reason for this decision are grounded above all in the increasing acknowledgement during the first phase of TACTIC project that the differences between hazards are quite substantial and this not only in relation to their physical dimension (i.e. return rates, impacts, speed of onset) but more importantly with regard to their socio-psychological consequences and the wider management and governance approaches, this at least was a central insights of the substantial literature review conducted in WP 1 as well as the first round of workshops conducted in the case-studies. Therefore the consortium decided to develop in a first step the hazard centred assessment and reports according to the state of the art in the respective research fields in order to actually be able to support disaster risk management organisations in improving their risk communication strategy. This implies also that the hazards posed by a multi-hazard context both with regard to risk communication and increasing community preparedness is less well understood. Therefore more research is in order to better understand the commonalities and differences with regard to different hazards - both with regard to their perception and people's preparedness, but more importantly also with regard to their management and governance.

- The individual mitigation measures are quite different with regard to the different hazards; this is also underlined by the assessments. While some measures are applicable for all hazards (e.g. individual disaster emergency plan), they are quite different with regard to physical ways of preventing damages (e.g. between earthquakes and flood events) or how effective they are (e.g. terrorism vs pandemics). More research is therefore needed to better understand what motivates people in the different fields to take measures, what similarities are, what differences are and how might different hazard-centred approaches be useful for learning and improvements in other fields.
- At the same time there is also a need to better understand the implications of a truly multi-hazard event with interacting hazard scenarios and an enormous, but largely unknown and uncertain vulnerabilities and cascading effects. How to prepare for such event, this became clear during the case-studies and the literature review, is hardly known and not very well researched. The research on terrorism for instance examined how the public can be prepared indirectly for terrorism. However, there is a need for further research to understand the influence of multi-hazard approaches on community preparedness for terrorism. Further research can be used to examine if multi-hazard approaches influence preparedness for all types of crises and whether a multi-hazard approach is suitable for terrorism due to its unique characteristics. What happens in a setting where first responders and voluntary helpers are involved in flood protection during a flood event and also affected by a pandemic flew event? Which measures and strategies are necessary to plan and prepare for such events?
- Also socio-organisational as well as institutional cascading effects need to be better understood. While current research focuses on better understanding the physical interactions between different hazards or on the cascading effects on critical infrastructure, the wider social and organisational-institutional consequences are less well understood. The case studies revealed, for instance, that many organisations prepare for specific single events and in addition to this they also have a very well-functioning basic disaster response capacity that is generally prepared for different types of disasters. However, mostly cascading effects are not considered that relevant. In the flooding case study, for instance, the discussion on cascading

effects was rather restrained and showed that this topic is currently not explicit on the daily agenda. This means that because risk by definition is uncertain and because it is impossible to plan for all potential scenarios, organisations do not. Instead they have a general plan of how to deal with general emergency situations (e.g. who to communicate with and what needs to be communicated in general) and everything else is dealt with based on the situation that occurs. Therefore it would be necessary to better understand for unexpected and radically surprising interactions between different hazards occurring simultaneously.

Research needs with regard to rural areas

- Rural areas are on the one hand less exposed to various risks as less people are housing there and critical infrastructures are less often located in such areas and hence also dependency lower, if critical infrastructures can no longer provide their services to the public. At the same time wide geographic range and rough terrain are practical concerns for emergency and disaster risk management in rural areas. Also public transportation is often more limited, or restricted, in rural areas compared to more urban ones. Policy makers should consider this in decisions about resource allocation, as greater time and resources are needed for rural residents to access services within their communities. Also with regard to decisions about allocating emergency and disaster risk management resources, rural areas should receive greater attention in national and local level contingency planning. More generally, there is a need to understand the commonalities with regard to community preparedness in rather urban, densely populated and interconnected areas in contrast to rural, less densely and also less connected areas in order to be able to understand the long-term consequences of demographic change in urban and rural areas.

Research needs with regard to cross-border situations

- Generally, cross-border communication was considered as a challenging task in all case-studies. Particularly, the specific working procedures on the other side of the border are seldomly known. However, it became also apparent that, if necessary, procedures were established that would support the exchange of information and cross-border exercises were organised to better understand how the joint cooperation would function in practice. Research need, however, is particularly identified with regard to different cultural interpretation of how to organise cooperation and also how to build trust across border, particularly in cotexts where communication is hampered throught different languages. Also it needs more exploration to what extent advancements in communication and modelling can support cross-border communication and exchange of data and information.

Research agenda setting: Socio-technical systems and social science concepts in disaster risk management.

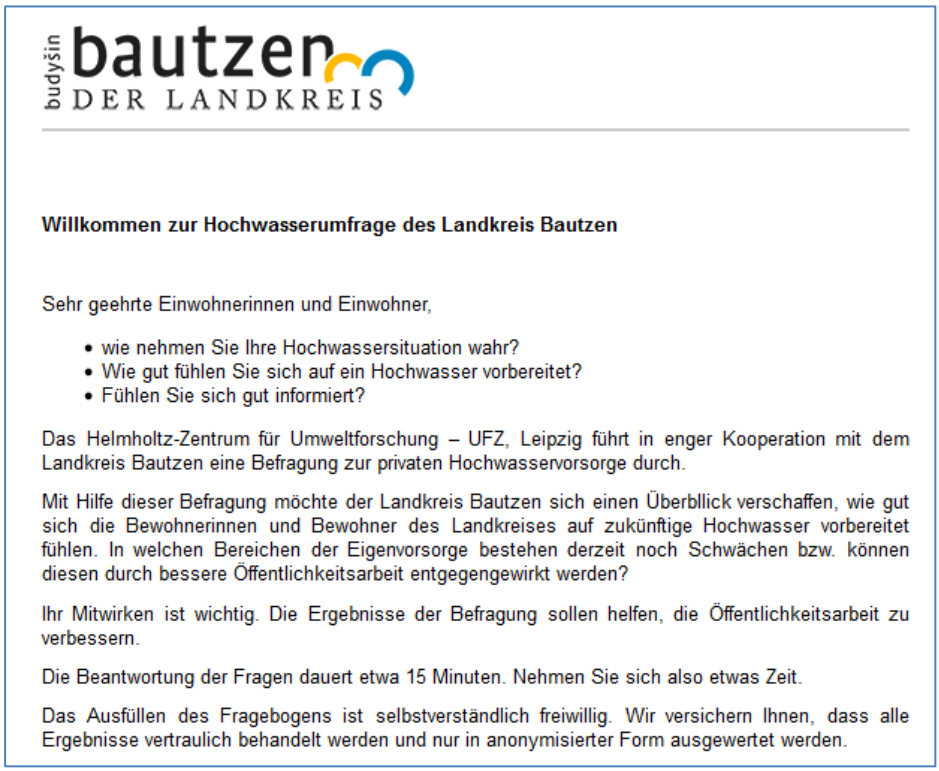
- TACTIC, similarly as other recently funded European project, is operating at the interface of science, society and technology. More specifically, they are based on and utilize social scientific concepts, theories, evidences as well as technological advancements in order to help societies or certain groups in society to be better able to adapt to and cope with the negative consequences of high impact events. Examples are: the usage of social media in crises and emergency situation in order to spread information more quickly but to also collect information and monitor the real-team progression of a crises situation. Other socio-

technical systems are more long-term oriented and aim at stimulating and facilitating mutual understanding and communication as well as collaborative learning (e.g. TACTIC). This is a fairly recent development that needs to be understood and scrutinized more thoroughly. As the research in this area is just, but rapidly evolving, we will organize a thematically focused workshop and as an outcome of that workshop aim at publishing an edited Special Issue in a highly visible interdisciplinary disaster risk-focused journal. The aim is to bring together scientists as well as stakeholders working at the science-policy interface as well as on the interface of (social)-science and technology with a focus on disaster risk management in order to get an overview about recent socio-technical advancement in the field of disaster risk reduction and put these developments into the larger economic, societal and technical context as well its associated governance changes. Contacts were established by the UFZ with the coordinator of the FORTRESS-project and it is aimed to organize an agenda-setting workshop in spring 2017. We will get in contact with other relevant projects and will draft an open call for paper. High quality papers presented at the workshop will be encouraged to further developed in order to be include in a Special Issue.

8.2 Next step of TACTIC – developing further and implementing the platform

- The TACTIC project experienced considerable interest during its duration, both in the case studies but also beyond. Therefore the consortium decided to further maintain and test the platform and establish a strategy for exploiting its results more systematically. The Coordinating institution will further pursue the exploitation strategy, which comprises of the following corner stones:
- Testing, consolidation and development: The first objective is to test, validate and further develop the platform. Therefore, different case study partner have expressed their interest to test the platform. In September 2016 the preparedness-check was tested by the district of Bautzen (Germany) with approx. 300.000 inhabitants located in the State of Saxony, at the border to Poland and Czech Republic.

Figure 36: Information about the preparedness-check as published in the District of Bautzen (Germany) in September 2016



budyšin bautzen
DER LANDKREIS

Willkommen zur Hochwasserumfrage des Landkreis Bautzen

Sehr geehrte Einwohnerinnen und Einwohner,

- wie nehmen Sie Ihre Hochwassersituation wahr?
- Wie gut fühlen Sie sich auf ein Hochwasser vorbereitet?
- Fühlen Sie sich gut informiert?

Das Helmholtz-Zentrum für Umweltforschung – UFZ, Leipzig führt in enger Kooperation mit dem Landkreis Bautzen eine Befragung zur privaten Hochwasservorsorge durch.

Mit Hilfe dieser Befragung möchte der Landkreis Bautzen sich einen Überbllick verschaffen, wie gut sich die Bewohnerinnen und Bewohner des Landkreises auf zukünftige Hochwasser vorbereitet fühlen. In welchen Bereichen der Eigenvorsorge bestehen derzeit noch Schwächen bzw. können diesen durch bessere Öffentlichkeitsarbeit entgegengewirkt werden?

Ihr Mitwirken ist wichtig. Die Ergebnisse der Befragung sollen helfen, die Öffentlichkeitsarbeit zu verbessern.

Die Beantwortung der Fragen dauert etwa 15 Minuten. Nehmen Sie sich also etwas Zeit.

Das Ausfüllen des Fragebogens ist selbstverständlich freiwillig. Wir versichern Ihnen, dass alle Ergebnisse vertraulich behandelt werden und nur in anonymisierter Form ausgewertet werden.

- To further develop the tool the consortium will look for funding and is therefore in close contact with local, regional and national institutions. As the project is also helpful for communities and the public we will also have a look at the possibility of crowdfunding. In addition we will further clarify possible data security issues and who to solve them. Generally, the current version of the platform considers all relevant security aspects and has already established a high data protection standard as data protection of TOSAP is in full accordance with the European Data Protection Directive 95/46/EC and with Article 29 Working Party. Physical security is also provided since all data are stored on encrypted drives. No original data is saved in any cloud services. In addition we will further explore next steps to be taken to ensure a high standard of data protection and maintain or even increase the trustworthiness of the platform. In addition, the platform can be easily customized to different requirement as it is based on open-source software. Actually, the consortium has made quite a few code customizations to stakeholders'' needs.
- Networking and transformation: TACTIC has established and will further consolidate its connection and exchange with other relevant EU-funded but also nationally funded research and innovation projects in order to connects its output with the work of other projects. The DRIVER project, for instance, will use and test parts of the organisational self-assessment as well as the PLACARD-project, which will use both the self-assessment as well as the library of good practices. Similar activities are foreseen in the ANYHWERE project, where the platform will be further developed and tested in different pilot sites. In addition, close collaborations are also established with the FROTRESS project. It is also foreseen to engage with the Smart Mature Resilience Project (SMR). Through such activities we ensure that central insights and outcomes of the TACTIC project will be used, tested and further developed in the context of other research and innovation actions.

- Building alliance and agenda setting: We will further build alliance and aim at agenda setting with an emphasis on further developing the interaction between experts from the natural and social sciences, technological developers, social media and stakeholders from disaster risk management and community engagement from across Europe. There have recently be funded a serious of project that engage more thoroughly as in previous project with social science concepts and try to raise awareness, increase preparedness and stimulate cooperation and interaction between different stakeholder groups as well as between the civil society and organisations operating in disaster risk management by relying on and further developing technical tools (online tools, social media). We consider this as a fairly recent development that needs more exchange and interaction between different groups of actors. Therefore activities are foreseen to foster exchange and develop joint pathways towards innovation and market-update for socio-technical innovations in the field of disaster risk reduction. The consortium suggests to have a more practice-oriented joint workshops with projects that are following a similar aim and are also similarly set-up in order to prepare a common vision of next steps to be taken to ensure that currently developed tools and approaches meet the demands and requirements of possible end-users and have the potential to be taken up by the European market and spread across communities in Europe. This will be done in close collaboration with other European funded projects.

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10 Annex 1 - Feedback on usability and technical details of the online-platform

This section provides a detailed overview on the feedback we received during the usage of the self-assessment and the online platform during the second round of workshops focusing on earthquakes, floods, epidemics and earthquakes and aspects participants wanted to be modified and the consortium's suggestions on how to deal with these desired modifications.

Table 25: Overview on detailed feedback on the organisational self-assessment

	Issue	Proposal for its solution	Suggested changes from UFZ
	TOSAP		
fl 1	UFZ_CB: Will the TOSAP be available as a mobile app?	This is something to be discussed with ED	This is not something we will create for the first version of the Platform.
	Organisational self-assessment		
fl 2	UFZ_AM: the assessment process possibly takes too long for some organisations, especially the ones that already have a communication strategy and risk communication experience	fl 2_ One proposal could be to have a filter question at the beginning, e.g.: "Do you just want a quick check of your methods and aims or are you more interested in a longer assessment that takes about an hour but also provides more explanation and in-depth feedback?" Technically, that would mean that we would have to develop a short and a long version of the feedback report. Because users only obtain feedback to the questions they answer: If they decide for the quick version they might be asked the same questions as in the long version but we could duplicate them and label them 2a (quick assessment) and 2b (long assessment). If they are directed to 2a and answer this question of the short version of the self-assessment they only obtain a very	ED has suggested that it is possible to have two separate self-assessments. The short self-assessment can be based on the long self-assessment. Both feedback reports are being refined and will be sent to the consortium for feedback by 19.02.2016.

		brief feedback. If they are directed to 2b they will consequently obtain a longer feedback with more background information. We would then have "two" self-assessments (i.e. and a-version and a b-version with duplicated questions and respective short or long versions of the feedback). The only disadvantage is that the user would have to decide right from the beginning what he wants and that he needs to answer the questions twice if he decides to go for the long feedback after having conducted the short version of the self-assessment.	
t 1	46 pages is **too long** and the users would switch off before completing the self-assessment. They would prefer a version that is ten pages maximum.	ep 1_ Alternatives/additions: **provide a checklist/ positive feedback** that they can present to their supervisors (e.g. congratulations, your methods are suitable for you aims; you use simple graphics and avoid technical language – this is important because…; you actively involve the general public – this is important because…). We could communicate reasons why we think that it is important to evaluate risk communication regularly and that there is always room for improvement as well as gaining inspiration from existing risk communication practices (e.g. good practice library). We could also think about asking organisations which have extensive experience with risk communication to add their practices to the good practice library so that other organisations might be able to learn from their experience.	This feedback is related to the structure of the feedback report. The long feedback report will present the concepts behind the self-assessments in both a checklist style as well as text based information for those who wish to learn more.
eq 3	The users of the online tool are unable to understand how much is left during the assessment.	A **status bar** showing the completion rate of OSA would be better for the users to see their progress and how	ED has informed us that Moodle does not support a progress bar and the page numbers are

		much there is left. Reduce the number of pages by reducing the content. Participants recommended a **maximum of 10 pages**. Condense the 4-5 questions on the same theme into 1. Alternatively, workshop participants suggested removing the page numbers and including a **progress bar** instead.	defined by Moodle based on the previous answer. We need to discuss our options in regards to this matter with ED.
ep 5	Clarify the purpose of the tool in the **introduction.**	An **introduction** to the self-assessment should raise the awareness for the terminology as well as for the format, aims and outputs to be expected from the self-assessment. Different sections should be introduced separately. We will communicate the benefit of using this tool for such organisations (e.g. by providing a checklist/ positive feedback that they can present to their supervisors (e.g. congratulations, your methods are suitable for you aims; you use simple graphics and avoid technical language – this is important because…; you actively involve the general public – this is important because…). We will also highlight that it is important to evaluate risk communication regularly and that there is always room for improvement. Particularly the links to the library of good practices will be relevant for high performing organisations as they will gain inspiration from risk communication practices from other contexts.	We will develop an introductory text for the self-assessment as a whole as well as the individual sections of the self-assessments.
fl 3	**UFZ**_AM: the **target user group of TOSAP is too large** (relates to length of self-assessment): organisations with a communications strategy in place and practical risk experience are not interested in answering all these questions	Offer two versions of the self-assessment (long and short version, see above) and clearly explain who the target user group is (to be added in to the new introduction session)	The demand for a short and a long version of the OSA seems to be based on the level of risk communication experience a given organisation has. Therefore, in theory, the short version of the self-assessment will be developed for organisations that have extensive communication experience and only wish to be provided with a checklist of what they are doing well and what could be improved and organisations that wish to

			conduct a more thorough assessment of their risk communication can conduct the long version of the self-assessment. It is important to note that TACTIC is based on the notion that risk communication can always be improved. Our main target audience is small organisations that may not have a communications department who are interested in improving their communication. Therefore, those organisations which choose to only conduct the short assessment will be provided with a short text about the benefits of conducting the long self-assessment and receiving the long feedback.
t 3	TRI_SA: As the user has already registered, the answers for the first three questions should already be completed.	Link the **registration process** to the **first three questions**.	This is a suggestion for ED
fl 4	**UFZ**_AM**:** an **uneven scaling** (1 to 5) is tempting to not decide for one direction. Users might tend to use 3 (i.e. the middle) as a general answer or if they do not immediately understand the question.	**fl 4_** Use an even scaling (1-6)	Likert scales are generally five-point scales. We need to make sure to include the numbers but also the explanations for what each of the numbers represent for each of these questions (e.g. 1) Strongly disagree, 2) Disagree, 3) Neither agree nor disagree, 4) Agree, 5) Strongly agree. In the new version of the OSAs we have replaced a lot of the Linkert scale questions with yes/no questions.
ep 3	The scaling of some of the questions is a bit **vague**.	**ep 3_** Scaling from 1-5 or from 'not very important' to 'very important' could perhaps be simplified to yes, no, does not apply, or do not know.	
eq 1	There are no anchors for **Likert-type** response options in some of the questions in the assessment.	**eq 1_** Rating scales should be indicated also by numbers so that they can be better understood.	
eq2	Some questions do not allow the users who might be interested in selecting an in-between response option instead of "Yes" or "No".	**eq2_** The option "**partially**" can be added to the questions whose response options consist of "Yes", "No", and "I don't know".	@UoN: Why?

fl 5	UFZ_AK,CK: emphasise the **synchronisation of all language versions**	Use **professional translators to translate the final versions** of the TOSAP into the case study languages	Professional translators will be used to translate the self-assessments, feedback reports and practices. If we have extra budget then we can also translate the TACTIC brochures.
all	Questions are too **long, complex, and hard to understand.**	**fl 7_ Simplify the language, shorten the length of the questions and avoid English terminology**	Questions will be revised, simplified in terms of length and language.
fl 8	UFZ_IC,CB: **questions related to ethics** particularly in regards to how information is communicated and working with the media should be added.	Chloe will do some more reading on issues to do with communication and ethics and then we can decide if it makes sense to add questions related to ethics to the OSA.	At this stage due to the length of the OSA it was thought best to leave questions related to ethics out.
fl 12	Overall, methods applied in **cross-border cooperation** and communication seemed to be sufficient	We should **collect these examples and add them to the library of good practices** so that they might be able to help other organisations interested in improving their cross border communication.	Due to time restraints we will not collect these practices from the workshop participants. We need to discuss later whether users of the platform should be allowed to add their own practices. If we make this option available we can provide users with instructions for how to add their practices.
fl 13	In regards to **cascading effects**, participants do not prepare for such hazards. Instead, they have a general plan of how to deal with general emergency situations (e.g. who to communicate with and what needs to be communicated in general) and everything else is dealt with based on the situation that occurs.	This highlights the need to deal with all-hazards approaches. This could be covered by providing literature and examples of all-hazards/multi-hazards approaches. We could also highlight the hazard-independent advices in our feedback report and mention that hazard-specific preparedness is something like an add-on to general risk preparedness (or vice versa)	The issue of cascading effects is likely to be something that we will have to deal with in our reporting rather than specifically in the TOSAP. We need to specify in our reporting (e.g. D8.2) that we are focusing on multi-hazards by dealing with a number of hazards separately and how preparedness can be improved to those specific hazards rather than focusing on cascading effects of those hazards. The reason for this is that we did not find examples of preparedness against cascading effects in practice. Instead, organisations tend to prepare for a certain event and then deal with any cascading effects as they occur. Pervious research suggests that this is perhaps an effective way of dealing with the situation (e.g. Kuhlicke, 2015). This information will be included in the feedback reports. For how to deal with cascading effects in the OSA see fl

			15, below. Kuhlicke, C., (2015), Vulnerability, ignorance and the experience of radical surprises In: Groß, M., McGoey, L., (eds.) Routledge international handbook of ignorance studies, Routledge International Handbooks, Routledge, Abingdon, p. 239 - 246 In addition, the terrorism report includes a question about multi-hazards (see T39, below). A question related to multi-hazards has been added to each of the OSAs.
fl 14	Concerning the topic of cross-border cooperation it was mentioned that **too little is known about specific working procedures on the other side of the border.**	Does this mean that we should include such questions and allow organisations to access the results of other organisations in their area? I am not sure how we should otherwise deal with this issue in the TOSAP. We could also add a question asking how much they know about working procedures in their partner institutions in the other country. This could then be connected to providing information about programs that support /encourage this type of exchange (see list of Christina presented during workshop).	We acknowledge that this is an important point but based on the structure of the self-assessment, it is not possible to provide this information to organisations conducting the self-assessment.
fl 15	**Including a multi-hazard approach** and **cascading effects**	We will not be able to develop a fifth self-assessment for organisations and the general public. However, we still need to include the topic of multi-hazards into the TOSAP. We need to deal with both of these terms because they are promised in the DoW.	We do not have time nor do I think that it would make sense to develop a fifth SA for multi-hazards. At the same time, it may not be enough to say that we take a multi-hazard approach by focusing on a range of hazards separately. First we need to agree on a definition for multi-hazards. I would suggest that multi-hazards can occur in two ways, 1) two separate hazards which take place at the same time and 2) a hazard which is triggered by another hazard (i.e. cascading effect). In addition, multi-hazards can be prepared by taking actions that can be taken to prepare for a number of hazards.

			We added a question to the OSAs which refer to actions which can be taken for a range of hazards (see T39, below). This is already a category in the categorisation.
fl 16	**Think about creating a new aim for cross-border hazards.** The addition of the cross-border questions in the context section of the OSA confused the participants as they were not sure who the intended audience of their risk communication was supposed to be. Most of the time we are referring to the general public but here we are referring to other organisations. We need to be clear about how questions related to cross-border communication effect the aims of communication. If they don't perhaps we should think about creating a new aim for organisations that are interested specifically in improving their cross-border communication because, for some organisations, such communication may not be relevant at all.	Option 1: By making it an aim, we might also be able to sort out or problem in regards to the list of intended audiences. If cross-border communication is an aim, it might also make more sense as to why the intended audience also includes organisations and not just members of the general public. Option 2: Another option would be to create a filter for question 20 (Is your organisation in contact with organisations from neighbouring countries?). When the answer is "yes" they will receive questions 21-23. If they answer "no" they will continue with question 24. We could provide information in the feedback report in regards to the importance of both inter-organisational communication as well as cross-border communication based on this answer.	We have made some changes to the questions related to networks. We will ask questions about working with organisations within a community as well as working with organisations across borders. We will also add an introduction to the networks section of the OSA so that it is clear that the focus of communication is still communication with the general public but that working together with other organisations in the community and across borders is an important part of successful risk communication.
ep 7	Questions could be added pertaining to tourism specifically.	Tourism is economically important in many regions, as well as important with regards to safety and planning. Having questions specifically related to risk communication and tourism could be useful.	We have decided to not include this, but point out in the final report, that this is a topic which could be added in subsequent development, if there is a great need for this topic.
eq 4	The assessment tool only includes written material (i.e., text) and this may bore the target audience.	Add **icons** next to each item in the questions which ask about ways of communication	We have a graphic designer working on this for us.
eq 5	TOSAP proceeds slowly due to "one question in one page" display.	Questions related to one topic can be organized as appearing on the same page.	See eq3, above
eq 8	The questions asking "Which method do you use for ….?" Participants could not understand why they had to answer the same question over and over again. • This brings another issue: **Participants could not realize that they were answering this question for different communication aims.**	Can be asked once in all assessments. For each aim, **the colour of that section can differ** so that participants realize the difference.	This question is now only asked once for each aim. Colours will also be used to ensure that users can better distinguish between the aims.

t 2	TRI_SA: Communicating about terrorism is difficult and depends on the political party in power. In some countries, organisations are unable to communicate about terrorism.	Include a question in the self-assessment about whether the user is responsible for / allowed to communicate with the public about preparedness for terrorism.	We would assume that if organisations are conducting the OSA for terrorism they are legally responsible for/ allowed to communicate the risk of terrorism to the public.
t 4	Group: The TOSAP should provide the ability for all nationalities to register, not just limit it to the "TACTIC" countries.	Add additional countries to the registration options.	We will restrict the countries at this stage to the case studies. We are developing a prototype: therefore it is relevant to show the general functionality; this can easily be changed in subsequent development.
t 5	Group: The use of "organization" is too broad as it could cover a small business or an international NGO.	Specify the term "organization"	TACTIC uses the term "organisation" to refer to any group of people who are responsible for or are interested in communicating risk to a particular audience.
t 10	The need for a different self-assessment for each hazard was questioned. Instead, the commonalities across the different hazards could be texploited.	Discuss this with the TACTIC partners in line with the feedback from the other workshops.	This comment is similar to fl 13 and links to the discussion about what to do about multi-hazards and cascading effects. Information about preparedness for multi-hazards and cascading effects will be included in the feedback report. This will include actions that can be taken to prepare oneself across hazards as well as the benefits and limitations of an all-hazards approach.
	Based on the feedback in regards to resolving conflict it has become clear that this aim may not be relevant for the terrorism OSA		Delete resolving conflicts aims from the terrorism OSA.

Table 26: Overview on detailed feedback on the general public's self-assessment

This table provides an overview about the feedback the consortium received in the second round of case study workshop on the general public's self-assessment (preparedness-check) focusing on terrorism, floods, epidemics and earthquakes. It also includes the translation of feedback into a specific action as well as a short explanation how, of if not included, the action was implement or not implement.

	General public's self-assessment		
fl 17	UFZ_AM: anonymous login/registration without email address was desired for the general public. Workshop participants were concerned that a formal login would very likely decrease the general public's motivation to conduct the self-assessment.	Allow an anonymous login for the GPSA	Suggestion UFZ: If we allow anonymous access we won't be able to create statistics. Also the email is used for receiving the questionnaire enrolment keys, that is then used to filter statistics. Therefore, it is important to encourage users to use the login. We could create a short text at the beginning of the GPSA that explains the importance of the login.
ep 10	Statement is needed about how user login information will be utilized and securely stored.	Registration requires an email address and zip code. Providing a statement explaining how the data will be used and stored will reassure users that their information will be securely stored and will always appear anonymously in the system.	In regards to the general public having access to computers. The GPSA will also be available as a PDF so that organisations can conduct the assessment face-to-face or via post. However, it should be noted that in order for the organisation as well as the GP to receive feedback (i.e. the results of the GPSA), the organisation will have to manually enter the results into the TOSAP. This will depend, however, on the aim of conducting the GPSA (e.g. to receive anonymous and individual feedback from members of the general public or to use the questionnaire as a facilitation tool in a community workshop in which case a group login would be helpful. The potential aims and their advantages can be presented to organisations either at the end of the OSA or in the OFBR.
ep 11	Option for a group use or an administrator login to use with groups of people could be useful.	Computer access and skills may be a challenge in reaching individuals in rural, aging communities. It was recommended that TOSAP could be used in a group setting with a community organizer or volunteer providing instruction. To facilitate this, it would be useful to have a group login/password.	

			Discuss group login/password with ED
fl 18	UFZ_AM: GPSA is only useful if organisations receive **feedback** from their community (e.g. **through ZIP codes**) or at least on a district (Landkreis) level and not for the entire State of Saxony. The PCPSs are really interested in learning how useful their communication strategy for their community is. For this reason, they need feedback from their intended audience (i.e. the people living in their community) and nothing that is averaged out or falsified by members of other communities.	**Create such accounts at least for our PCSPs to test the tool** This needs to be discussed with European Dynamics. However, we need to keep in mind that within TACTIC we develop a proto-type; only in the post-TACTIC period a highly user-friendly and demand-based version can be developed; a step not yet backed-up with resources (neither financial nor personal resources).	**Suggestion UFZ:** Our idea is to provide organisations with statistical feedback for the GPSA. Because it is not possible to use ZIP codes we thought that organisations could request that members of the general public could use QR codes (which allow members of the general public to scan the advertisement and are taken directly to the TOSAP GPSA which is linked to that organisation) or a 3-4 digit code that the member of the general public can enter at the beginning of the GPSA so that their answers are linked to the organisation. This allows the platform to sort the answers for the GPSA. So that organisations only receive answers from GP users that have entered the given QR.
fl 19	UFZ_AM: simplifying the **access** to the general public self-assessment using e.g. **QR codes** for publications in official gazettes was desired	**Provide QR codes to access to the GPSA**	**Suggestion UFZ:** See fl 18
fl 20	**IMGW-PIB:** Restrictions on use arising from access to the Internet and computer skills (especially for the elderly). Participants underlined that it is important to have one person in the household with computer skills. The participants have no experiences with similar tools.	A **pdf/printable version of this tool will** be made available on our webpage.	**Suggestion UFZ**: see fl 17
fl 21	**UFZ_CB:** Should we add questions related to conflict to the GPSA in order to provide feedback for the questions related to conflict in the OSA?	For example, the aim: joint problem solving and conflict resolution contains a list of questions about how the organisation deals with conflicts (e.g. Q71 In order to solve the conflict, did you actively involve members of the general public from the beginning of the decision making process?). It might be helpful to know if the general public feels like they have the opportunity to be involved in decision-making processes and whether organisations have actively tried to deal with conflict.	**Suggestion UFZ**: Are you aware of opportunities to become involved in decision-making processes related to the management of floods in your community? Have you ever taken part in decision-making processes related to flood management in your community? If yes, do you feel like you were able to contribute to the decision-making process and that your

			interests were taken seriously?
fl 22	**UFZ_CB:** In the GPSA we ask why people didn't take measures but perhaps we could also ask why they took measures in order to better understand their motivation.	By asking people what motivated them to take action we can provide this information to organisations as it may help them to develop a better understanding of not just the hindrances but also the motivators of action in regards to taking preparedness actions.	**Suggestion UFZ:** We see the relevance of this addition, and keep it as an option to be included at a later stage.
ep 9 t 11 t 16	An **introduction** to the audit is needed to explain the tool, the key outcomes, and how information will be stored and utilized. **The assessment was not what they were expecting** as they were expecting to receive a risk matrix informing them of what their risks are. UoN_CS: The **feedback process needs to be explained** at the beginning of the self-assessment. Users were disappointed to not receive something (e.g., how well they were doing in terms of their preparedness).	Alternatives/additions: provide an introductory video or text at the start of the assessment that explains what the user can expect from the self-assessment. During this video it might be useful to mention that the library of good practice can be used as an idea bank to learn about other organisations/programmes of interest. Provide detailed information on the purpose, format and outputs of the self-assessment. Provide clear information on how the user will receive feedback on the self-assessment once they have completed it before they start answering any questions.	**Suggestion UFZ:** Although it is a good idea, we will not have time to produce a video. We will however, create a clear introductory text for the GPSA in general as well as each of the sections.
ep 12	Questions about the general changes to the risk landscape may be useful.	Additions/recommendations: Add in additional questions about perceptions of community preparedness and services over time.	**Suggestion UFZ**: Although this is an important point, the focus of the TOSAP is on the effectiveness of risk communication and what members of the general public can do to prepare themselves, rather than the services that the organisation provides in general. Therefore, I would leave these questions out.
ep 13	Questions/content is missing concerning the physical environment, which can pose a different suite of challenges in rural areas (e.g. dealing with 'sparsity' factors).	Additions/recommendations: Adding in questions or good practice examples that discuss crisis management in rural contexts.	**Suggestion UFZ**: Again, this is a good point but it is difficult to achieve in the broad assessment that we are trying to create with this prototype. This could be something to keep in mind, however, if we gain funding to create more context specific versions of the TOSAP.
ep	Some sort of **progress tracking bar** would be a	**Include a progress bar** and explanation that the self-assessment will	**Suggestion UFZ:** See eq 3

14	nice addition (as opposed to seeing page numbers along the bottom).	not include all questions.	
t 13	UoN_CS: The self-assessment **is too long**.	**Reduce the length of the self-assessment.**	We are working on shortening some of the questions, particularly in the context section.
t 14	UoN_CS: The questions need to be reordered as there is some **overlap**.	Review the questions and **remove/merge questions when appropriate**.	This is dealt with in the specific feedback, below.
t 15	UoN_CS: Some of the questions were **too academic and wordy and could be condensed**.	Reword the questions and **simplify the questions** where possible.	**Suggestion UFZ:** All questions will be reviewed and simplified in terms of length and language.
t 18	UoN-CS: Explain at the beginning of the self-assessment what is meant by **"community"**. Is a community a neighbourhood or geographically based?	**Provide a detailed definition of community** at the beginning of the self-assessment. Alternatively, participants suggested that a question could be included asking participants "what is your community"? in order to address who they are filling it in as or on behalf of?	**Suggestion UFZ:** In regards to risk communication, TACTIC understands the community to be a collection of risk communicators and the people that those risk communicators are trying to reach. The process of communication between these two groups aims to improve community preparedness as a whole through improving the flow of knowledge about risk as well as actions that can be taken to prepare members of the general public for that risk.
t 19	UoN-CS: Participants discussed the use of the term **"preventing" vs the term "protecting".** Individuals do not feel that they can prevent a terrorist attack. They would prefer the use of being vigilant and alert. However, another participant commented how "preventing" is the term used tby authorities.	Examine how the term "preventing" is used in the self-assessment and consider whether this can be replaced with "protecting", "vigilant" and/or "alert".	**Suggestion UFZ:** replace "preventing" with "protecting"
t 20	oN-CS: Provide a description of the emergency kits and the emergency plan in the guidance.		**Suggestion UFZ:** these descriptions will be provided through the "good" practice examples.