

Government data-driven decision-making (DDDM) framework implementation. Test case: crisis management

Deliverable 2.4: Risk mapping and disaster loss data
management to-be situation report

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Glossary

Term	Definition
A risk of an emergency	A situation where based on an objective assessment of the circumstances, it may be considered likely that an event or a chain of events or an interference with a vital service may escalate into an emergency in the near future. ¹
An emergency	An event or a chain of events or an interruption of a vital service which endangers the life or health of many people, causes major proprietary damage, major environmental damage, or severe and extensive interferences with the continuity of vital services and resolution of which requires the prompt coordinated activities of several authorities or persons involved by them, the application of a command organisation different from usual and the involvement of more persons and means than usual. ²
Compound risk	When multiple risks occur simultaneously, or one after another. ³ Compound risk events enlarge the consequences of the risk events and make the emergency more difficult to deal with. Compound risks have a combination of multiple drivers and/or hazards that contribute to societal or environmental risk. ⁴
Continuity of a vital service	The capability of the provider of the vital service to ensure continuous operation and to restore continuous operation after an interruption of the vital service. The providers of vital services are usually public companies. The responsibility of assuring the continuity of these services is given out to specific authorities. ⁵
Crisis	An unstable condition involving an impending abrupt or significant change that requires urgent attention and action to protect life, assets, property, or the environment. ⁶
Crisis management	A system of measures which includes preventing, preparing for, and resolving an emergency. ⁷
Damage	The total or partial destruction of physical assets and infrastructure in disaster-affected areas, expressed as replacement and/or repair costs. In the agriculture sector, damage is considered in relation to standing crops, farm machinery, irrigation systems, livestock shelters, fishing vessels and ponds. ⁸
Disaster loss accounting	Assessment of disaster loss for crisis that have taken place (backward looking). The primary motivation for recording disaster loss with the

¹ Riigi Teataja, "Emergency Act," published June 13, 2017, <https://www.riigiteataja.ee/en/eli/513062017001/consolide>

² Riigi Teataja, "Emergency Act," published June 13, 2017, <https://www.riigiteataja.ee/en/eli/513062017001/consolide>

³ Dale Willman, "Double Trouble: The Importance of Thinking About Compound Risk," Columbia Climate School, published August 11, 2017, <https://news.climate.columbia.edu/2020/08/11/compound-risk-hurricanes-wildfires/#:~:text=Compound%20risk%20%E2%80%94%20when%20multiple%20risks,at%20Columbia%20University's%20Earth%20Institute.>

⁴ Jakob Zscheischler, Olivia Martius, Seth Westra. et al., "A typology of compound weather and climate events," *Nat Rev Earth Environ*, no. 1 (2020): 333-347, <https://www.nature.com/articles/s43017-020-0060-z>

⁵ Riigi Teataja, "Emergency Act," published June 13, 2017, <https://www.riigiteataja.ee/en/eli/513062017001/consolide>

⁶ The International Organisation for Standardisation "ISO/DIS 22300 Security and resilience – Terminology"

⁷ Riigi Teataja, "Emergency Act," published June 13, 2017, <https://www.riigiteataja.ee/en/eli/513062017001/consolide>

⁸ Piero Conforti, Mira Markova, Dimitar Tochkov, "FAO's methodology for damage and loss assessment in agriculture," *Food and Agriculture Organization of the United Nations*, published 2020, <https://www.fao.org/documents/card/en/c/ca6990en/>.

Term	Definition
	aim to document the trends and aggregate statistics informing local, national and international disaster risk reduction programmes. ⁹
Disaster loss methodology	Disaster loss methodology aggregates the losses suffered as a result of a disaster event. Most commonly, disaster loss is calculated for human, physical and economic losses. Disaster loss can be accounted for, after the event takes place, but also potential loss can be estimated based on a risk scenario. Once this is used in disaster risk management it allows to analyse avoided losses.
Disaster risk	<p>The potential loss of life, injury, or destroyed or damaged assets which could occur to a system, society or a community in a specific period of time, determined probabilistically as a function of hazard, exposure, vulnerability and capacity.</p> <p>The definition of disaster risk reflects the concept of hazardous events and disasters as the outcome of continuously present conditions of risk. Disaster risk comprises different types of potential losses which are often difficult to quantify. Nevertheless, with knowledge of the prevailing hazards and the patterns of population and socioeconomic development, disaster risks can be assessed and mapped, in broad terms at least.¹⁰</p>
Disaster risk modelling	Assessment of disaster loss for potential crisis (forward looking). It aims to improve risk assessments and forecast methods. Loss data is used to infer vulnerabilities and to identify sectoral areas for disaster risk reduction and mitigation measures. ¹⁰
Interdependency of services	Dependency of service providers on other services, resources etc. Disruptions in one service may lead to disruptions in others.
Loss	Quantifiable measures expressed in either monetary terms (e.g., market value, replacement value) for physical assets or counts such as number of fatalities and injuries. ¹¹
Risk	An effect of uncertainty on objectives. Risk is usually expressed in terms of risk sources, potential events, their consequences, and their likelihood. ¹²
Risk management	Coordinated activities to direct and control an organisation with regard to risk. ¹²
Vital service	A service that has an overwhelming impact on the functioning of society and the interruption of which is an immediate threat to the life

⁹ Tom De Groeve, Karmen Poljansek, Daniele Ehrlich, "Recording Disaster Losses: Recommendations for a European approach," Joint Research Centre – Institute for the Protection and the Security of the Citizen, published 2013, <https://reliefweb.int/sites/reliefweb.int/files/resources/lbna26111enn.pdf>.

¹⁰ Tom De Groeve, Karmen Poljansek, Daniele Ehrlich, "Recording Disaster Losses: Recommendations for a European approach," Joint Research Centre – Institute for the Protection and the Security of the Citizen, published 2013, <https://reliefweb.int/sites/reliefweb.int/files/resources/lbna26111enn.pdf>.

¹¹ Preventionweb, "Handbook for Estimating the Socio-economic and Environmental Effects of Disasters," published 2003, https://www.preventionweb.net/files/1099_eclachandbook.pdf

¹² The International Organisation for Standardisation "ISO31000:2018 - RISK MANAGEMENT"

Term	Definition
	or health of people or to the operation of another vital service or service of general interest. ¹³

¹³ Riigi Teataja, "Emergency Act," published June 13, 2017, <https://www.riigiteataja.ee/en/eli/513062017001/consolide>

Abbreviations

Term	Definition
BA	Bank of Estonia
CM	Crisis management
DDDM	Data-driven decision-making
DG	Data Governance
EB	The Environmental Board
EC	European Commission
ErSS	The State of Emergency Act (Erakorralise seisukorra seadus)
EU	European Union
GDPR	General Data Protection Regulation
GO	Government Office
HB	The Health Board
HOLP	Emergency Response Plan (Hädaolukorra lahendamise plaan)
HOS	Emergency Act (Hädaolukorra seadus)
ISA	Information System Authority
ISS	The Internal Security Service
KOKS	The Local Government Organisation Act (Kohaliku omavalitsuse korralduse seadus)
LB	The Land Board
LM	Local Municipality
MoC	Ministry of Culture
MoE	Ministry of Environment
MoEC	Ministry of Economic Affairs and Communications
MoF	Ministry of Finance
MoS	Ministry of Social Affairs
PBGB	The Police and Border Guard Board
PoC	Proof of Concept
PwC	PricewaterhouseCoopers
RB	The Rescue Board
RfS	Request for Service
RiKS	The National Defence Act (Riigikaitse seadus)
SE	Statistics Estonia

SIB	Social Insurance Board
SITKE	The Situation Centre of the Estonian Government Office
SITIKAS	The IT system used at SITKE
VFB	The Veterinary and Food Board
VOS	The Preparedness Law (Valmisolekuseadus)

Executive summary

Purpose of the report

The purpose of this report is to give an in-depth overview of the local municipality's risk and crisis management methodology toolbox modules. This overview includes a strategic Target Operating Model (TOM) for the use of the toolbox, detailed working papers for each module of the toolbox and a low fidelity proof of concept (PoC) for the potential toolbox platform.

Scope of the report

This report has been developed within the Project carried out by PricewaterhouseCoopers EU Services EESV (hereinafter – PwC) on behalf of the DG REFORM, according to the specific contract No. REFORM/SC2021/076 (21EE02), signed on 14 October 2021. The report covers the items required in the Request for Service (RfS) adjusted, where relevant, to the changes agreed in Kick-Off and Steering Committee meetings.

This report covers the Outcome 2 (and 3) of the Project – **Crisis management**. A separate report is issued for Outcome 1 and all combined reports make up the complete package of deliverables.

The Estonian Government has an objective to improve the national crisis management and resilience by increasing national risk awareness. As agreed, the Project aims to: 1) create a common methodology for local municipalities to improve their risk awareness and 2) introduce a systematic disaster loss quantification methodology for state authorities.

Key findings and recommendations

During the development of the risk awareness methodology modules, we have come across a few constraints concerning the current situation, which can hinder the success of the implementation of to-be toolbox if they are left unresolved. The issues to consider are the following:

- **Establishing and communicating clear role expectations towards local municipalities.**

We mapped municipalities' role expectations with the information requests to state agencies and ministries and carried out additional interviews where necessary (see Appendix 1). While mapping the crisis management role expectations that different agencies have towards municipalities, it became evident that some agencies and ministries did not have the clear expectations. As a result, they were not able to provide us with straightforward expectations and tasks for the municipality in their responsibility areas. As a compensation mechanism, we have carried out the expectation mapping interviews for those ministries and agencies. However, as the interviews involved one-two representatives of the respective institutions, the expectation list may not be complete and may not represent the comprehensive shared view of the institution.

In addition, some of the expectations listed remain unclear for the municipalities (e.g. expectation to support the agency). We also noticed some situations where the expectation was not consistent with the legal norms currently in place (e.g. simplification of bureaucracy of social assistance payments) or where the understanding of the legal norms was not commonly shared (e.g. collection of coastal pollution).

Although the expectations gathered and systematically presented in the current toolbox are of critical value towards the shared understanding of the municipality's role, we recommend that the GO continues the initiative and maps or mandates such mapping and communication in a more systematic manner in all ministries and agencies which could have expectations towards municipalities. This would support creating more extensive shared understandings both within the ministries or agencies, but also between all municipalities and other state institutions. Such analysis will also highlight legal constraints that should be addressed to create a more efficient risk and crisis management system.

- **Limitations in risk and crisis management data existence and quality.**

When we collected the existing information of the ministries and agencies on statistics of the prior realised risk events and other data variables relevant for the risk and crisis management, it turned out that very often the agencies and ministries do not have an overview of the existence and granularity of such data. There is a lack of understanding of what kind of data is collected by the agencies and ministries, where the data exists and how it is stored. Some of the data is not collected centrally at all (e.g. disruptions of services co-ordinated by the municipalities) or is scattered among different layers of the service providers (e.g. information on electricity outages). In addition, existing data often lacks the necessary detail (service outage duration, risk event location co-ordinates, etc).

The module on the statistics of prior risk events does include the data we were able to collect, but due to the limited risk data awareness within the agencies and ministries it is clearly not complete. We recommend that the GO carries out further analysis on what kind of risk event (and prediction) the related data is currently available within the public sector and what is the level of detail and scope of the datasets. Thereafter, it is also necessary to establish a system to manage and communicate the data as needed.

Lühikokkuvõte

Aruande eesmärgid

Käesoleva aruande eesmärk on anda põhjalik ülevaade kohalike omavalitsuste (edaspidi KOV) riski- ja kriisijuhtimise meetoodika tööriistast. Aruandes sisalduvad kavandatava tööriista juhtimismudel (edaspidi TOM - *Target Operating Model*) ning detailne kirjeldus tööriista moodulitest.

Lisaks sisaldub käesolevas aruandes ka KOV riski- ja kriisijuhtimise tööriista prototüüp. Prototüüp võimaldab Riigikantseleil omandada ülevaate tööriista võimalikust kasutajaliidesest.

Aruande ulatus

Aruanne on koostatud Euroopa Komisjoni struktuurireformide toe peadirektoraadi (DG REFORM) tellimusel ja PricewaterhouseCoopers EU Services EESV (edaspidi – PwC) poolt läbiviidud projekti raames vastavalt 14. oktoobril 2021 allkirjastatud erilepingule nr REFORM/SC2021/076. (21EE02) Aruande koostamisel on lähtutud Projekti lähteülesandes esitatud nõuetest.

Antud aruanne hõlmab projekti 2. (ja 3.) tulemit – **kriisijuhtimine**. Eraldi aruanne koostatakse projekti 1. tulemi kohta ja antud aruanded moodustavad kokku kogu projekti tulemite kogumi.

Eesti valitsus on võtnud eesmärgiks parandada riiklikku kriisijuhtimist ja valmisolekut riikliku riskiteadlikkuse tõstmise kaudu. Projekti eesmärgid on vastavalt kokkulepitule 1) luua kohalikele omavalitsustele ühtne meetoodika riskiteadlikkuse tõstmiseks, hindamiseks ja 2) luua riigiasutustele süstemaatiline kriisikahjude kvantifitseerimise meetoodika.

Tähelepanekud ja soovitused

Riskiteadlikkuse meetoodika moodulite loomisel oleme kokku puutunud mõningate piirangutega, mis võivad tulevikus mõjutada tööriistakasti edukat rakendamist. Mõned murekohad, mida kaaluda, on järgmised:

- **Selguse loomine KOV rolliootuste osas**

Kaardistasime asutuste poolt KOV-ide seatud ootusi tehes asutustesse kirjalikke päringuid ja vajadusel viies läbi täiendavaid intervjuusid. Erinevate asutuste kriisijuhtimise rolliootuseid kaardistades selgus, et mitmed riigiasutused ja ministeeriumid ei oma või ei ole sõnastanud ootuseid kohalikele omavalitsustele (KOV-idele). Seetõttu ei suutnud nad ka meile kommunikeerida kindlaid ootuseid ja ülesandeid, mida KOV-id teatud olukordades nende arvates tegema peaksid. Mitmel puhul viisime ootuste kaardistamiseks läbi täiendavad intervjuud asutuste ja ministeeriumitega, kuid kuna intervjuus osales 1-2 asutuse esindajat, ei pruugi kirja pandud nimekiri olla täielik ega esindada terviklikku vaadet selle kohta, mida asutus KOV-ilt ootaks.

Lisaks on mõned ootused KOV-idele ebaselged (näiteks ootus “asutust toetada”). Lisaks tuli ette ka olukordi, kus asutuse ootus ei olnud kooskõlas praegu kehtiva õigusruumiga (näiteks sotsiaaltoetuste väljamaksete puhul bürokraatia vähendamine) või kus asutuste arusaam õigusruumist erines teiste asutuste (ja ka KOV-ide) arusaamast (näiteks rannikureostuse kokku korjamine).

Ehkki tööriistakasti moodulitesse lisatud ootused on KOV-i rolli mõistmiseks väga olulised, soovime Riigikantseleil jätkata süsteemset KOV-idele suunatud ootuste kaardistamist. Antud kaardistus aitaks luua ühist arusaama nii riigiasutuste siseselt kui ka asutuste ja KOV-ide vahel. Lisaks aitaks ülesanne esile tuua tänased piirangud õigusruumis.

- **Piirangud riski- ja kriisijuhtimise andmete olemasolus ja kvaliteedis**

Ministeeriumite ja riigiasutuste poolt kogutavat statistikat ja andmestikke kaardistades selgus, et mitmel puhul puudub neil ülevaade sellest, mis andmeid kogutakse, mis detailsuses seda tehakse ja kus neid andmeid hoitakse.

On andmeid, mida ei koguta tsentraalselt (näiteks KOV-teenuste katkestused) või mis on laiali erinevate teenusepakkujate vahel (näiteks elektrikatkestuste info). Sageli ei ole ka olemasolevad

andmed piisavas detailsuses (näiteks teenuse katkestuse kestus, toimunud sündmuse asukoha koordinaadid jms).

Ehkki varasemalt toimunud sündmuste statistika moodulis on välja toodud andmed mõningate sündmuste kohta, ei ole seal mainitud andmete nimekiri täielik. Seetõttu soovitame Riigikantseleil ka teha täiendav analüüs selle kohta, milliseid riskisündmustega seonduvaid andmeid (sh prognoose) avalikus sektori kogutakse, kuhu neid talletatakse, ja millises detailsuses seda tehakse. Seejärel oleks vaja ka luua süsteem andmete haldamiseks ja vajadusel ka nende edastamiseks.

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1 Introduction

1.1 Scope of the report

1.1.1 Purpose and Outcome

The report has been drafted for Outcomes 2 (and 3). Outcome 1 is disclosed in a separate report. This report will give a more thorough overview of the gaps which need to be addressed as well as different possible to-be scenarios and recommendations to the Beneficiary.

This report covers only Outcomes 2 and 3 – risk management and disaster loss methodology in Estonia. Separate report is issued for Outcome 1.

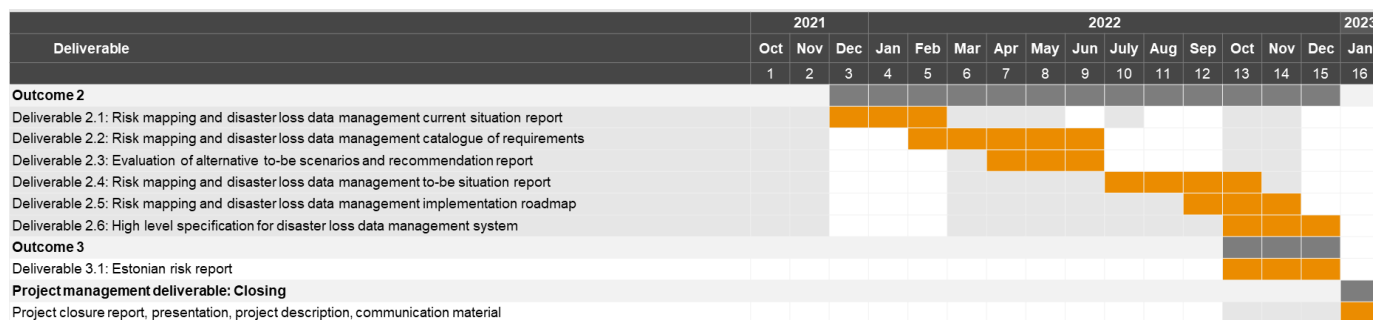
1.1.2 Scope of the Project Outcomes 2 and 3

The scope of the Project Outcomes 2 and 3 has two focuses. The first focus is on the **crisis management activities of the local municipalities**. This involves activities in three stages: preparing for the crisis (creating risk awareness, assessing risks, designing prevention and resilience policies), activities during crisis and activities after a crisis. The second focus is on the **disaster loss data management at the state authority level** and aims to design the methodology for the common loss assessment.

1.2 Methodology and Approach

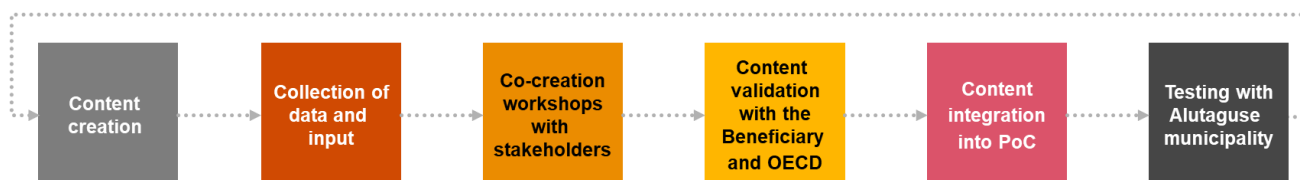
Figure 1 gives a high-level overview of the Project activities and timeline. The activities of risk mapping and disaster loss data management to-be situation took place from August 2022 to October 2022.

Figure 1. Project activities and timeline



Six different methods were used and combined in order to create the content for the to-be toolbox. See Figure 2 below.

Figure 2. Methods used to create the content for the to-be toolbox



The main input for the content creation were the stakeholder requirements mapped in Deliverable 2.2 and the gap analysis as well as scenario analysis established in Deliverable 2.3. Weekly ideation and co-creation workshops were held with the Beneficiary, which also included exchanging and validating

the information obtained to date. Based on this, we designed an initial approach and structure for the content modules.

These drafts were firstly validated and adjusted by the core team of the Beneficiary. When needed, other state authorities were engaged to provide the specific information to the module. The engagement of the authorities took place either by written information requests or via interviews and workshops (see Appendix 2) depending on the preference of the authority. The information provided by the authorities was, for example, risk event related data in their field or describing their role expectations for municipalities. Thereafter, all the content modules were introduced to the selected municipalities in co-creation sessions, and they had an option to comment and propose adjustments. All relevant feedback from the numerous co-creation sessions were collected and the module content was validated with the Beneficiary. Once the Beneficiary had given a preliminary approval for the module, we also carried out a testing for the selected modules with one of the municipalities in the pilot group (Alutaguse). The testing session allowed us to get the key information about the usability and relevance of the selected modules and adjust them accordingly. The modules completed with Alutaguse can be made available for the other users as module outcome examples.

1.3 Limitations

We encountered some limitations that had some effect on the creation of the methodology contents. Firstly, the geopolitical situation in Ukraine and numerous spill-over effects (refugee crisis, energy crisis, etc.) have impacted the Estonian society and made some of the key risk and crisis stakeholders less available and engaged in the project co-creation process. This has resulted in somewhat limited participation of some stakeholders in co-creation workshops and therefore less extensive comments and feedback to the modules.

Secondly, it became evident that the ability of responsible agencies and ministries to provide the relevant information (such as risk event data or role expectations of municipalities) was inconsistent. Some responsible agencies and ministries were well prepared because they had mapped their relevant crisis management data and expectations towards municipalities beforehand, while for others our information request was the first trigger for such discussions within the organisation. Therefore, the level of details for risk event data and role expectations is not consistent among the different risks or across the local municipality services. We used the information requests and interviews to map the expectations. During interviews, the fact that such expectations were not mapped and communicated became evident, however, it is unclear which processes were followed by the stakeholders who just filled in the request and whether the information provided by them is complete and internally communicated.

Estonia is currently in process of establishing a new Preparedness Law which incorporates and renews the current Emergency Act, State of Emergency Act, and The National Defence Act. As the drafting, reviewing and communicating of the new law has also been restricted by the above-mentioned limitations, some underlying key aspects of the new regulation are still in progress. Therefore, it has been difficult to make the decisions considering the toolbox implementation policy and roles, and responsibilities of municipalities and state agencies. However, this unique timing also allows us to make recommendations to the draft legislation as well, e.g. consider making it mandatory for all municipalities to carry out risk assessments and map their capabilities for their crisis management plans.

2 Strategy and target operating model

2.1 Target Operating Model of the local municipality's risk and crisis management methodology

To create the Target Operating Model (TOM) for the local municipalities' risk and crisis management methodology and toolbox we relied on the scenario analysis and co-creation sessions carried out and presented in Deliverable 2.3. We used the PwC Operating Model Framework (OMF) (see Appendix 3) as a basis for the TOM. The OMF provides the PwC standard taxonomy for creating a holistic view of an enterprise's operations. Although we have a different setting (we are looking at the implementation of the methodology rather than an enterprise), the TOM concepts remain similar – simply in this case there are less relevant components to consider.

2.1.1 Problem statement

There is a great variability of the level of crisis risk awareness between local municipalities. This has a direct impact on the local municipalities' crisis preparedness and mitigation efforts, resulting in varying ability to cope with crisis situations. Local regulations assign relatively few specific risk and crisis management duties to the local municipalities and the interpretation of these duties differs among the stakeholders. At the same time, the local municipalities are responsible for ensuring numerous local services, some of which are vital to the local population. The municipalities and the continuity of their services are impacted by the various risk events and, although Estonia is managing the crisis response centrally through the central government responsible agencies, the local municipalities are also expected to prepare for and contribute to solving the acute crisis situations. These expectations are not clear to all the affected stakeholders and the varying risk awareness and crisis preparedness in local municipalities may have negative consequences for the well-being of the local population.

2.1.2 Ambition

The Project aims to increase the local municipality's risk awareness and facilitate the unification of role expectations between the different stakeholders. The ambition is to create a crisis risk management toolbox that will help the local municipalities to get a better understanding of their risk environment and interconnections between the risk events and continuity of local services. In addition, the toolbox will create the clarity in municipalities' crisis role expectations and allow them to better assess their resilience and crisis preparedness. Thus, the toolbox will create necessary preconditions to motivate municipalities to undertake proper crisis preparedness activities and investments. The implementation roadmap will set up more detailed ambition and success KPIs for various development and implementation stages.

2.1.3 Overall approach

Considering the limited personnel resources and risk management competence available for most local municipalities, the tool should empower the municipalities to efficiently carry out the risk management process. This is accomplished by the structured process flows and guidance materials integrated into the toolbox. The risk assessment process is further eased for the municipalities by collecting relevant risk-related data sources available for them at the central government level.

Strategic scope of the toolbox:

- Risk awareness component will support municipalities in understanding their risk profile, introduce most relevant risk events as well as connect and prioritise these events to specific services offered by the municipality.

- Crisis preparedness component will provide municipalities with an overview of their role in national crisis management activities, allow them to assess their ability to respond to specific crisis and assess their general preparedness level. Understanding their shortcomings and the potential consequences will motivate municipalities to take further action and increase their crisis resilience (e.g. reduce their risk vulnerability through the local planning and other strategic investments).

Overall, the implementation of the crisis risk management toolbox will improve and standardise the risk/crisis awareness and enhance crisis preparedness across all municipalities in Estonia.

2.1.4 Target users and their capabilities

Target users of the toolbox will be the local municipalities of Estonia. The toolbox will include numerous interlinked modules, all of which contribute to more efficient risk and crisis management at municipality level.

The municipalities have limited resources and in-house risk management competences. With the exception of a few larger municipalities, the local municipalities do not have designated crisis management personnel. Risk and crisis management is therefore often not a priority. Thus, the toolbox is designed to be simplistic and user-friendly for people without any special risk management competences – the usage will empower the municipalities to carry out their risk management process.

We believe that the risk and crisis management starts with awareness, motivation and skills, and this toolbox will contribute to all of that and, thus, empower the municipalities to manage their risks and build resilience. We will create awareness by collecting all the relevant information on risks, vulnerable services and role expectations that municipalities need to understand their responsibility in disaster management. We create an environment and structure to systematically think about risk, evaluate preparedness and motivate investments into preparedness if gaps are detected. The tool is also a great learning environment that empowers municipalities to carry out their assessment.

We will carry out the preliminary capacity building workshops for the municipalities in the project pilot group. This training will be recorded, and this recording will be available for all municipalities, that would like to use the toolbox. Additionally, the toolbox will include guidance materials that can be used by anyone using the toolbox.

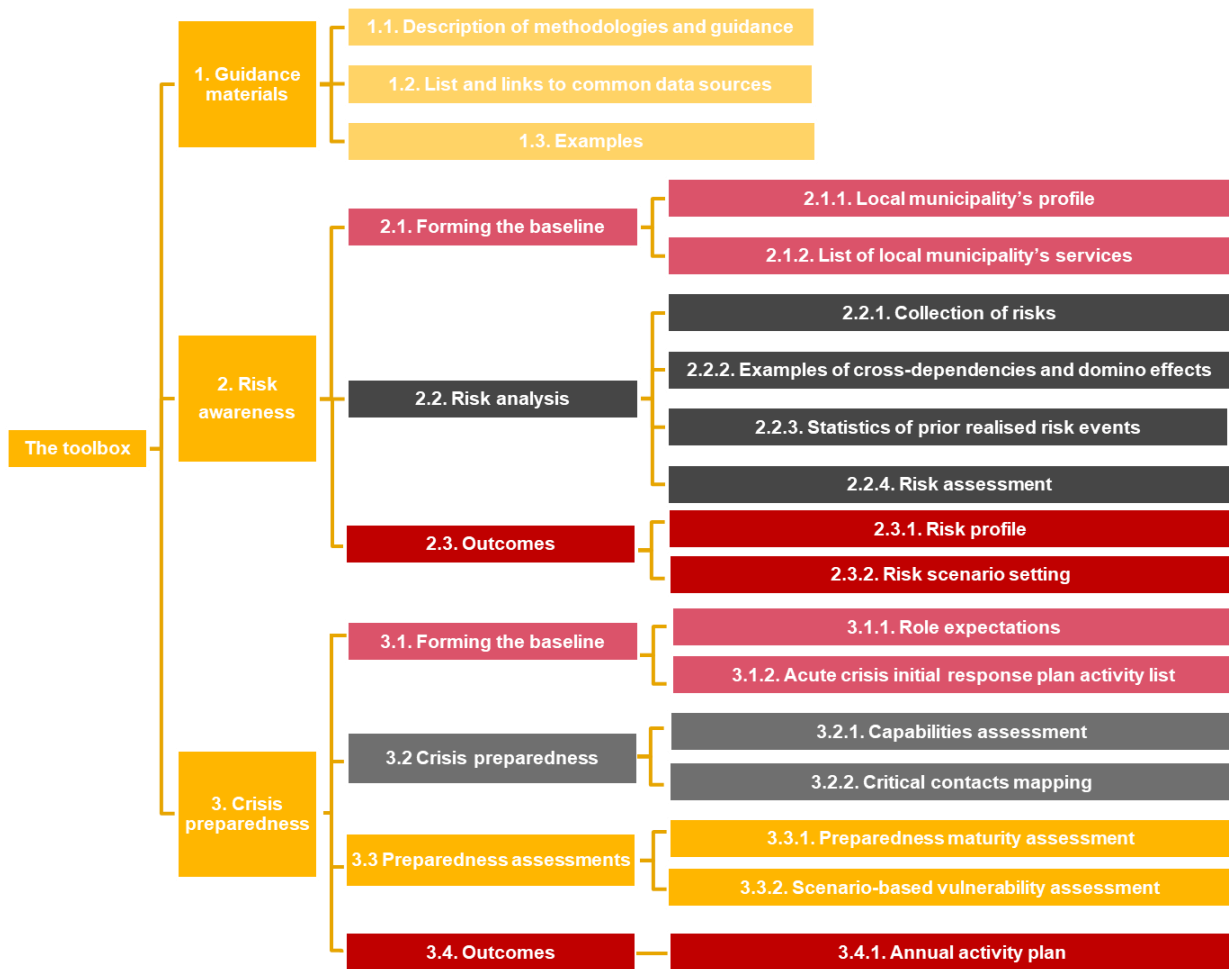
It is evident that the implementation of this methodology will require continued promotion, training and support. We consider the Estonian Rescue Board (RB) to be the most suitable authority to provide the future trainings and ongoing operational support for municipalities, because its current legal responsibilities also include supporting and monitoring the risk and crisis management activities by local municipalities.

2.1.4.1 Structure of the toolbox

The toolbox is divided into three categories, each of which has several subcategories (see Figure 3. Modules of the toolbox below).

The following chapter will include a high-level overview of the modules of the toolbox. You can open the specific module templates by clicking on the underlined name of the module.

Figure 3. Modules of the toolbox



2.1.4.2 Guidance materials

The guidance materials include a description of methodologies and guidance materials which support the user to get acquainted with the toolbox, a centralised overview of (and links to) relevant data sources that can be used for assessing risks, and necessary templates for different modules, which allow the local municipalities to also do their risk assessments offline. In addition, this section includes illustrative examples of selected modules which were filled in with Alutaguse municipality in the testing phase.

2.1.4.3 Risk awareness

The risk awareness section is divided into three subcategories.

2.1.4.3.1 Forming the baseline

The local municipality's profile

This module provides the municipality with a centralised overview of various statistical information (e.g. demographics, local economy, geography, services) about the municipality or its services. The profile creates the baseline for better risk assessment and prioritisation.

List of local municipality's services

This module offers an overview of services offered by local municipalities. These services are pre-categorised by their importance to the local population (vital services, critical crisis services and other important services) and it allows the local municipality to determine the most critical services

according to their profile and situation. This offers municipalities clear priorities for ensuring the service continuity.

2.1.4.3.2 Risk analysis

A collection of all risks

This module offers a predefined list of 40 risk events that all municipalities should consider in their risk assessment. The risk lists are supplemented by the descriptions and subcategories of the risk events. This module aims to ensure that all relevant hazards are acknowledged by the local municipality.

Cross-dependencies

This module provides information about cross-dependencies between risks and services – which risk events could cause the failure of which municipality's services. In addition, the module also states why/how these risks impact certain services, e.g. how could severe weather affect the maintenance of local roads. The module will be divided into service categories and the section will highlight the critical dependencies for important services (vital services, critical crisis services and other important services). For each service disruption we have added an explanation on how the service is impacted.

Statistics of prior released risk events

This module makes up a statistical overview of prior risk event occurrences. The goal is to give the local municipalities an understanding of how often different risk events have historically occurred (either at local municipality, regional or country level, as appropriate and available).

Risk assessment

This module guides the local municipalities to consider all the information from the previous modules and carry out a risk assessment to determine risk events that require an elevated focus.

2.1.4.3.3 Outcomes

Local municipality's risk profile

This module includes results from the risk assessment ("elevated" risk events) and results of the service assessment (vital, critical and important services offered by the municipality). The risk profile will connect the risk events, impacted services and the key information regarding the selected local services. The municipality's risk profile serves as an executive summary of the risk assessment and can be exported and communicated to the broader municipality government.

Scenario setting

This module allows the municipality to create more specific risk scenario(s) for the selected risks highlighted in the risk profile. These scenarios will be used in the vulnerability assessment in the crisis preparedness module.

2.1.4.4 The crisis preparedness module

The crisis preparedness module is divided into three subcategories.

2.1.4.4.1 Forming the baseline

Role expectations

This module gives the municipality an overview of its role expectations in crisis risk management. This module has three perspectives:

- responsible agencies' expectations for the municipality crisis preparedness as well as for municipality's role in acute crisis management support activities;
- central government expectations for municipality's role in ensuring the continuity of municipality's services (preparing for service failures and restoring the acceptable service level);
- expectations towards vital service providers in relation to vital service disruptions.

This module creates a shared understanding of the role expectations for all Estonian municipalities. Being aware of the expectations and crisis tasks is a key premise for any effective preparation or resilience building activities carried out by the municipality.

Acute crisis initial response plan

This module guides the municipality to create their all-hazards crisis management plan, which involves initial activities to be taken once a risk event takes place. This helps the municipality to speed up their response in any type of a crisis situation.

2.1.4.4.2 Crisis Preparedness

Capabilities assessment

The new Preparedness Law will require all municipalities to establish a crisis management plan for all the municipality's crisis tasks and vital services if they are considered to be a vital service co-ordinator (see red and orange services in 'List of local municipality's services section'). This plan should also include a capability mapping. According to the Preparedness Law, a capability could consist of the following components: people, means, supplies, infrastructure, operating principles, information and legal environment.

Critical contacts

This module will provide municipality with a template which will help them to map all relevant partners and people whose support they will need in crisis management.

2.1.4.4.2.1 Preparedness assessments

Preparedness maturity assessment

This module consists of a self-assessment questionnaire which will score the general preparedness level of the municipality. The assessment involves categories, such as governance, risk management, crisis management, team, stakeholder engagement, recovery and exercising. If the municipality carries out the assessment, it can make recommendations for further capacity building based on the municipality's responses.

The scenario-based vulnerability assessment

This module offers municipality a structured way to assess their capabilities to respond to a specific risk scenario. This module connects the risk scenario created above with cross-dependencies and role expectations towards the municipality. Vulnerability assessment will guide the municipalities to assess their capacity to deal with the consequences of specific events. We have made two versions of the assessment. The first version makes the municipality to assess whether the preparedness activities they have carried out and the resources they have available are sufficient. The second version guides the municipality to assess the capacity according to specific capabilities needed for the assessment. Future discussions with the RB and the GO on the final approach are still needed to pick the most suitable one. The goal of this exercise is to uncover vulnerabilities created by the lack of preparation and resources as well as understand the consequences of them. It should motivate preventive actions or at least allow municipalities to make informed decisions about their risk appetite.

2.1.4.4.3 Outcomes

Annual activity plan

This module guides the municipality to assess their results in all the modules and mark down the actions they would like to improve within the upcoming year. This module makes it more likely that the toolbox is used functionally, and targeted actions are taken as a result of it.

2.1.5 Process

Local municipalities will use the toolbox to better understand their risk environment, to assess risks, to evaluate preparedness as well as to make risk and crisis management plans. The risk assessment should be carried out by the local municipality at least once in two years and the vulnerability assessment at least once a year. The assessments are not intended to be simply filled in as templates

– much of the value arises from assessment working group internal discussions and brainstorms, the outcome of which is stored in the different modules. The local municipality should involve all relevant people within the municipality in the assessment and complement the working groups with external people from the local crisis committee, local vital service providers or expert advisers where relevant. We also see value in regional knowledge sharing and consolidating the risk analysis at the regional level. Regional crisis committees could be a good platform for it. In the short term we see it as a voluntary recommended practice. Municipalities that have more experience with crisis management should have a promoter role for their peers. However, in the long term, we recommend increasing the crisis management mandate of the regional crisis committees.

2.1.6 Key stakeholders and roles

Local municipality – the main user and responsible stakeholder in charge of using the toolbox.

The Estonian Rescue Board – the main partner for the municipalities, who will be the operational owner of the toolbox which will be hosted on their platform. The RB will monitor municipalities' activities on the platform, provide them with training, guidance and feedback, ensure the information included in the toolbox is up to date and maintain the technical platform. The maintenance includes engaging other agencies and ministries which can provide risk-specific content into the toolbox. The main KPI to measure the success of the RB's activities as implementers and owners of the platform should be the satisfaction of the municipalities using the toolbox. The RB will also oversee the municipalities' risk assessments, decline the approval of the assessments which are clearly insufficient and guide the municipality to improve the assessment.

The Estonian Government Office – stakeholder in charge of the implementation and co-ordinating the legislative requirements related to risk management in local municipalities, including the usage of the toolbox and legal requirements towards municipalities. The Government Office (GO) is the owner of the risk management methodology and is responsible for making any necessary changes to the toolbox structure, components and approach. The GO also has the power to mandate the sharing of the risk-specific information among agencies, ministries and municipalities. As the GO is the one responsible for the national approach to risk and crisis management and is the one establishing the requirements towards municipalities, its main KPI of measuring success should be the usage coverage of the methodology by the municipalities.

Other responsible agencies and ministries in charge of vital services – important contributors to the toolbox. They will be required to share information and data about the risk events and keep their expectations up to date. They should also be available to the municipalities on a request basis and share their expert knowledge about the risk events they are responsible for. As it is in the interest of all of the responsible agencies that municipalities consider their risks sufficiently, their success could be measured by the specific focus areas that the municipalities have set as well as whether they have made their datasets available for the municipalities.

2.1.7 Data

Preliminary collection of the relevant risk and crisis management data (such as local municipality's profile information and prior statistics of risk events) has been made and incorporated into the toolbox. This will give the municipalities an overview of what kind of data is publicly available and what additional data the municipalities could obtain upon the request. However, a separate state-wide crisis management data mapping exercise should be carried out and the data should be integrated into the toolbox during the implementation phase.

2.1.8 Technology

The toolbox is accessible via regular internet browser and the access is restricted based on the specific user rights. It will facilitate the risk management process flow, gather the necessary risk-related information from various sources and store the assessment results. The toolbox will be integrated into the RB's crisis exercise platform, and it is intended to become a main working tool for the local municipality people with crisis management roles as well as for crisis committees.

2.1.9 Regulatory and financing

We suggest that carrying out the risk assessment should be made compulsory for all local municipalities, but given the autonomy of the local municipalities, the usage of the toolbox cannot be mandated. The most value is gained from the tool when all municipalities use it, therefore, its usage should be strongly motivated. This could be done through the regional and local crisis committee regulations or by allocating dedicated additional financing for specific crisis management activities arising from risk and vulnerability assessments done using the toolbox.

2.2 SWOT of the municipality’s risk and crisis management toolbox

<p style="text-align: center;">STRENGTHS</p> <ul style="list-style-type: none"> • The toolbox will empower municipalities to carry out the risk and crisis preparedness assessment by providing them with the guidance, templates, risk lists, etc. This increases the likelihood of the municipalities performing such an assessment and thereby increasing their risk awareness and improving preparedness. • Streamlined methodology and supportive tool will save time and costs of municipalities as compared to designing their individual risk assessment processes. • Common methodology and shared structure for the outcomes will allow for easy monitoring of the outcomes as well as sharing of experiences between municipalities. • Toolbox creates a single source for all risk management related information and allows for easy access to different sources of data and information which they currently need to collect from different sources. • The toolbox fosters the information sharing and communication between the municipalities and responsible agencies/ministries by providing a platform for risk-related data exchange. • The RB has recently launched a new platform which they use for local municipality trainings. By incorporating the toolbox into the already existing system we avoid duplicating information and development/maintenance of the costs and efforts. 	<p style="text-align: center;">WEAKNESSES</p> <ul style="list-style-type: none"> • The toolbox will need constant upkeep and data links renewal to remain relevant. • Pulling data from different sources and mirroring them into the toolbox can be difficult/costly as different data registries can have different technical requirements and access rights. • Implementation of the methodology in large scale across all municipalities is dependent on technical tool development for which currently there are no funding sources in place. • We have identified various areas that need further improvement for the tool to be fully effective (such as assuring the completeness of role expectations, fixing problems with risk-related data accessibility and assigning clear implementation roles to stakeholders).
<p style="text-align: center;">OPPORTUNITIES</p> <p>Political</p> <ul style="list-style-type: none"> • Even in case of a change in the local government, the risk assessments made within the toolbox will remain available, and the previous results can be reviewed and added on by the new government (instead of starting from scratch). • Systematic approach to risk and crisis management may help to incorporate the risk perspectives into other policy areas. <p>Economic</p> <ul style="list-style-type: none"> • Risk assessment will enable better risk and crisis management investment decisions. Preparedness and prevention investments may therefore be more efficient. <p>Technological</p> <ul style="list-style-type: none"> • In the future, additional risk awareness and management modules, such as risk monitoring, can be easily implemented into the toolbox. Technological developments may open new use cases for the platform (e.g. predictive analytics) 	<p style="text-align: center;">THREATS</p> <p>Political</p> <ul style="list-style-type: none"> • There may be a lack of political will at a national level to make the usage of the tool and methodology compulsory, therefore, municipalities might start using it on a voluntary basis (due to general lack of interest in risk management activities). • Initially, it can be hard to engage all municipalities due to their lack of skills in the risk management field. • The strategic decisions regarding resource allocations (both people and investments) are made by local municipality governments which may not be politically motivated to contribute to risk and crisis management. Therefore, specific improvement activities based on the risk assessments may remain undone. • Current political environment shaken by different crisis (Russo-Ukrainian war and refugee crisis, energy crisis, etc.) may not have enough resources and energy to be deployed into the development of the toolbox. Acute crisis

based on Big Data).

Legal

- There is currently a new Preparedness Law being developed which allows integration of the toolbox concepts and requirements into the legislation.
- Even if the use of the toolbox methodology is not made compulsory by the Preparedness Law, the toolbox can still ease the fulfilment of general risk mapping and crisis preparedness obligations of local municipalities.

management will demand all the resources and energy from the key stakeholders.

Economic

- Municipalities generally suffer from lack of resources, because there are a lot of tasks which they are responsible for. Therefore, without designated resources it is unlikely that all of them will dedicate resources to risk and crisis management.
- Developing the technological solution for the toolbox is costly and the RB would need the additional funding. If development resources are not provided, it is unlikely that the toolbox would be established, and it would be much more difficult to push through the tool usage via Excel-based templates.

Social

- There is a risk of data leakage from the tool which may destabilise the local community or become a target for criminal activity.

Technological

- As with any database or online system it will be vulnerable to cyber-attacks. These attacks could result in leakage of the materials and cause reputational damage or outside aggressors could use the information in their advantage.
- If the local municipality does not print out their results/materials, these resources would not be usable in case a real risk event occurs (e.g. during a power outage or data connection loss).

Legal

- As all local municipalities are autonomous, new tasks can only be assigned to them if additional funding is also provided.

2.3 Target Operating Model of the disaster loss data management

2.3.1 Problem statement

There are currently no legal requirements which require any institutions to specifically collect, analyse and use disaster loss data. However, a few authorities have made their first steps towards calculating disaster loss. The Estonian Ministry of Environment is the most advanced authority in their disaster loss calculation activities, as this is required by the EU Flood Directive. Some emergency response authorities have also made attempts to calculate disaster loss, but they have only considered direct costs of the response effort and not the broader societal impacts, such as cost of damaged assets, loss of economic activity or loss of life. During COVID-19 pandemic some efforts were also made to understand the economic loss caused by business disruptions. **However, no common methodology for the disaster loss assessments has been developed. Consequently, disaster loss accounting is not a systematic activity.** Even the authorities who would like to assess disaster losses on more systematic manner have no guidance to rely on. Thus, there is almost no data based on which the impact of potential future crisis events could be estimated and considered in crisis management decision-making.

2.3.2 Ambition

Considering the current low maturity level of disaster loss management in Estonia, our aim is to establish an all-hazards disaster loss methodology. The methodology would encompass the total societal costs (private and public sector direct damages and direct and indirect losses). This methodology should allow to carry out the disaster loss accounting during (and after) any crisis. We see the systematic disaster loss accounting as a precondition for the disaster loss predictive modelling. Therefore, we aim to establish a methodology which is in essence suitable for both perspectives – retrospective accounting and prospective modelling.

Creation of the disaster loss methodology aims to at least partially alleviate the following pain points:

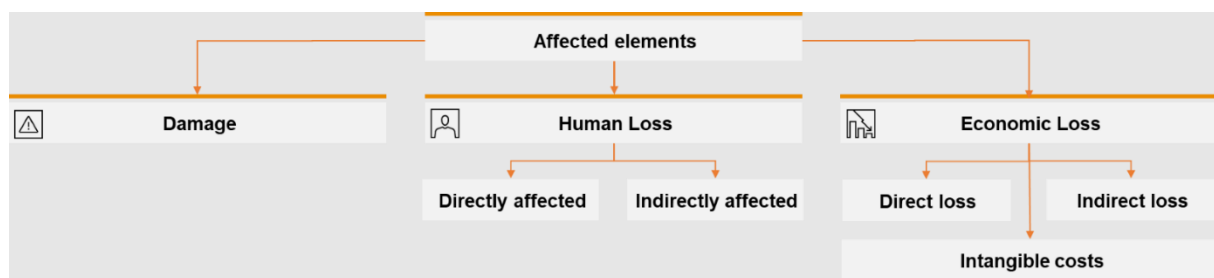
- **Lack of standardised principles** for disaster loss accounting which would allow to compare different emergencies, set priorities from a societal perspective and learn from other authorities' experience.
- **No systematic way** to count in private sector losses together with the public ones.
- **Limited awareness** of what **data is available** for using within the crisis impact assessments.

Disaster loss methodology should enable a broader understanding of crisis risks and their wide societal impact. In addition, it should direct agencies to think systematically about the consequences and their investments into the preventions and preparations. A comprehensive disaster loss methodology must be usable for different types of crises across all sectors and areas affected by the disaster.

2.3.3 Overall approach

The current practice in disaster loss data recording across the EU shows that there are hardly any comparable disaster loss management systems: differences that exist in the methods of data recording as well as in the governance approaches to manage disaster damage and loss data. The lack of standards for damage and loss data collection as well as recording represents the main challenge for damage and loss data sharing and comparison, especially for cross-border co-operation within the EU. In our approach we will mainly rely on the guidance of the Joint Research Centre (JRC) and the European Commission's in-house science service.¹ The approach proposed by the JRC sets out a minimum set of loss indicators in three categories (Figure 4). This approach, however, needs to be adjusted to meet the specific requirements and opportunities in Estonia (e.g. data availability or technical and operational set-up).

Figure 4. Disaster loss categories



2.3.4 Strategic scope

The usage functions that the disaster loss methodology aims to have, can be summarised in three:

- **Disaster loss accounting** – for loss accounting the primary aim is to record the losses caused by past (and current) risk events. This is helpful for the Estonian authorities for numerous reasons. Firstly, understanding the actual loss of past events provides the information for modelling the impact of future crisis. Secondly, the knowledge of how much the disaster costs allows the Estonian Government to apply for funding from the European Union Solidarity Fund

if the estimated losses due to the natural hazard are larger than €3 billion, or account for at least 0.6% of the GDP for that year or 0.03% of GDP for regions. And finally, quantifying the disaster loss allows to actualise the impact of the crisis and could motivate future attention to crisis management activities, prevention and preparedness.

- **Disaster loss modelling** – Estonian authorities have been trying to assess the impacts of different emergency risks as a part of the national risk assessment process. All of the agencies have struggled with such assessment because there is no methodology for this, cross-sectoral co-operation is limited, and it is unclear which loss elements and which data should be used for the modelling. This Project aims to provide the authorities with a specific methodology and recommendation on which data to use and how to calculate the loss. Moreover, the implementation recommendations around assigning a central co-ordinator for the methodology implementation should facilitate greater cross-sectoral co-operation.
- **Disaster reduction** – key component of successful disaster risk reduction assumes the ability to account for losses caused by the vulnerabilities. With a systematic loss accounting and modelling the authorities will also be able to better assess the impacts of the pre-emptive measures and prioritise their investments towards areas where the impacts are most severe or where the measures can bring the most benefits. This methodology will not provide a methodology for investment prioritisation but structure the way that authorities model their disaster risks and responses, and therefore create a standardised approach for all authorities and for all types of crisis risks. This is a foundation for future reduction/preparedness measure assessment.

2.3.5 Target users and their capabilities

We see four types of users for the disaster loss methodology: the GO as the implementation lead co-ordinator, responsible agencies which oversee the response efforts towards the crisis events, other ministries and state institutions which are responsible for specific areas impacted by the crisis, and larger more capable municipalities on a voluntary basis.

Based on the suggestions from international practice and recommendations of the OECD, the data collection and analysis task should remain with the authority that is responsible for the same task outside the crisis. By following this recommendation, the system avoids some insufficiencies in competences as well as reduce some of the data accessibility issues.

Considering the current maturity level of the disaster loss assessment in Estonia, together with very limited experience of different stakeholders, all users will need the sufficient onboarding and upskilling before implementation. We consider the GO to be the most suitable stakeholder to carry out the promotion and training activities.

2.3.6 Process

Disaster loss data management should be co-ordinated by one authority – the GO. The mandate of the GO is to firstly gather the understanding of impacts in different areas/sectors and co-ordinate the assessments across the different impacted areas (which are driven by the relevant ministries). The GO should validate if the disaster loss information reported to them is complete and different ministries/agencies do not duplicate the losses.

Disaster loss assessments for specific areas are done either by the agencies or ministries which is responsible for the field in question (for example MoS for healthcare) or responsible for the data collection and analysis (for example Statistics Estonia). **However, considering that the analysis of the data from disaster loss perspective is a new task for the most Estonian ministries and agencies, it is not automatic from the beginning and will need some additional resources, may create additional costs and may occasionally require additional manual research/analysis.** The scope of it depends on the event and the necessity of the analysis may be assessed on case-by-case bases.

2.3.7 Key stakeholders and roles

The GO. It should be the owner and co-ordinator of the disaster loss methodology. The GO introduces the new disaster loss assessment approach to the stakeholders and makes sure that each stakeholder providing disaster loss assessment inputs is aware of the methodology and follows the same approach and loss classifications. The GO co-ordinates the collection of the disaster loss components from various institutions (ministries and agencies), ensures the completeness and quality of assessments, assembles the overall results from these components and includes the final assessment results also into the national risk report.

The ministries, responsible agencies and other state agencies. All other institutions are required to carry out the disaster loss assessment within their area of responsibility and expertise. They will provide the results of the loss assessment (including the cost of the direct crisis response effort, if applicable) to the GO for consolidation. If relevant, ministries may appoint one stakeholder to co-ordinate the overall disaster losses for the particular ministry's administrative area (so-called sub-consolidation of the assessment results). Considering that the disaster loss assessment must also cover private sector losses, the GO may need to appoint certain ministry or agency to drive a specific assessment element (e.g. loss of business activity by private companies).

Local municipalities. As the disaster loss methodology aims to quantify societal impacts of the disasters and local municipalities have only limited expertise and resource available for risk management matters in general, there will be no specific role expectation towards municipalities. Larger municipalities (such as Tallinn, Tartu, Narva) that have dedicated risk management experts may want to enhance their own internal risk assessments by using the same disaster loss methodology principles (as a supporting tool in risk impact assessment), but they have no obligations for providing any inputs nor reporting their outcomes in disaster loss assessment.

2.3.8 Data

The disaster loss methodology will include a list of categories for disaster loss and guidance on how in general to calculate the losses. We will carry out a preliminary high-level assessment on what data is easily available for the Estonian authorities and make recommendation on what kind of data should be collected going forward. For the success of the methodology, it is important that this approach will not stay static, and it will be continuously improved upon. A separate state-wide disaster loss related data mapping exercise should be carried out and the data should be gathered or linked into one point of access in the future.

It is key to success in the implementation of the methodology that the disaster loss assessment employs the data already collected for another purpose by different state agencies and ministries. In addition, the collection task should remain within the authority which is responsible for the collection and the analysis should be carried out by the one that has the access to the data and uses the data for non-crisis analysis or has the most competence for the assessment. If needed, additional data could be collected for detailed analysis (for example collect direct data from the private sector companies impacted as a precondition to business support measures). For example, the damaged area and damage will be mapped by the responsible agency, but the economic impact will be calculated by another authority (for example MoEC).

2.3.9 Technology

Considering the current maturity level and the adjusted scope of this Project (to create a disaster loss methodology, not a data management system), establishing a technical solution is not the priority. However, in the long term, the technical solution may make it easier to store both inputs and outputs and also compare the results of different events. It could also be possible to automate the collection of the data and make some underlying data available for multiple agencies making the assessment easier and more efficient.

2.3.10 Regulatory and financing

Since the disaster loss methodology improves the quality of risk assessment and requires the joint effort of many parties, using the methodology should be mandatory as a part of the preparation for the next national risk report.

3 Proof of Concept

Our goal was to establish a clickable low-fidelity Proof of Concept (PoC) for the local municipalities' risk and crisis toolbox. As agreed with the Beneficiary, the goal of the PoC is to provide a high-level understanding of the potential design and structure of the toolbox. This means that instead of developing the full functionality of some modules, the PoC provides a high-level overview of all the modules and shows how different modules conceptually look and work together. Thus, each of the modules will only display a few limited examples of the content. Moreover, the PoC visualises the modules in a more user-friendly environment than independent Excel templates.

The development of the PoC has taken place in close co-operation with the Beneficiary. The GO has approved the core content of the modules before the PoC development. In addition, there was a continuous opportunity to access the PoC and leave comments regarding the design of the PoC. We have also demonstrated the PoC to the RB for introduction and feedbacking purposes. Although the piloting of the methodology will not take place through the PoC, we plan to use the PoC also at the training event for the municipalities to get their feedback on the potential look of the future system.

As agreed during the scoping of the Project and re-established during the Deliverable 2.3 scenario analysis, the PoC reflect only the local municipality's risk and crisis management methodology toolbox. Disaster loss management is not intended to be used by the local municipalities and therefore is also not a part of the PoC. Moreover, as agreed with the Beneficiary, the main goal of the disaster loss is not to establish a tool or a management system, but rather develop a shared methodological approach and principles for the loss assessment criteria.

We used Figma's collaborative web application interface design environment as a technical solution for developing the PoC. Figma was selected because it is the preferred environment for the PoC process for the Estonian public sector. On Figure 5 and Figure 6 below you can also find extracted examples of what the PoC looks like. The full PoC can be accessed [here](#).

Figure 5. PoC risk assessment module

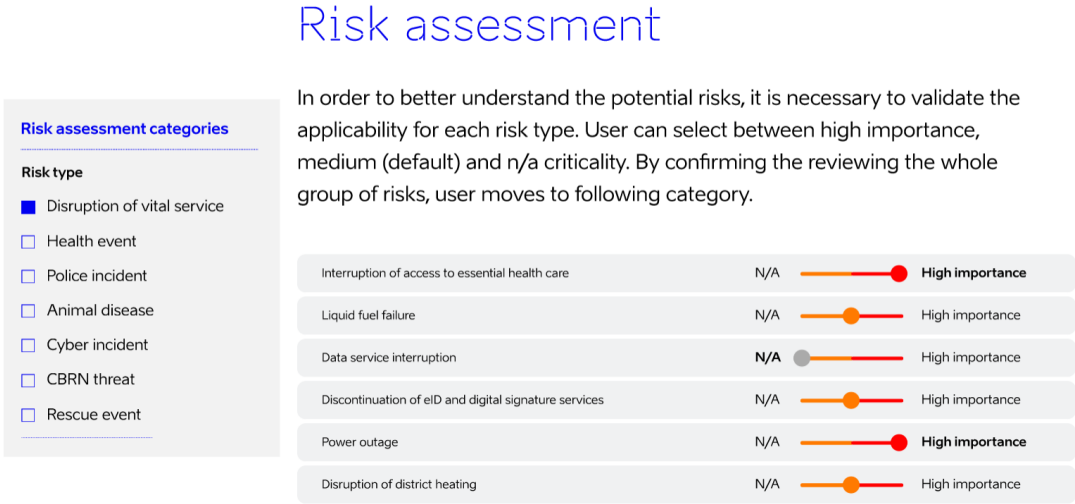


Figure 6. PoC Role expectations module

Roles expectations

Main modules

- Risk
- Services
- Vital services

Risk type

- Health event
- Police event
- Animal disease
- Cyber incident
- CBRN threat
- Rescue event

Roles expectations

The roles expectations are split into three main modules - by risk, by service and per vital services.

health event

Epidemic

Responsible authority MKM TTJA

The expectations of the responsible authority - proactively ^

- Mapping of the human resources
- At local governments and also at the county level, either at the level of the local government union or the county development center, the capacity to map the need for personal protective equipment and other crisis supplies and to receive and store the supplies must be created

Expectation of a responsible step in solving the event ^

- Distribution of protective equipment
- Quick sharing of information
- Communication of behavioral guidelines

Poisoning

4 Appendices

Appendix 1. List of interviews and discussion groups

Organisation/event	Date of the interview	Interviewees
Strategic discussion on approach to disaster loss management with the GO	06.07.2022	Galina Danilišina Triin Raag Jaanus Teearu Kersti Maurer
Operational Committee	08.07.2022	Roman Diez Gonzalez (DG) Adrian Juan Verdejo (DG) Nestor Alfonso Santamaria (OECD) Erik Ernits (GO) Triin Raag (GO)
Stakeholder workshop on the municipality's risk and crisis management tool	04.08.2022	Maido Nõlvak (Rakvere municipality), Galina Danilišina (GO) Margo Irve (Tallinn) Annika Orav (Police and Border Guard Board), Tauno Võhmar (Alutaguse Municipality), Evelin Uibokand (Tartu) Jan Trei (Association of Estonian Cities and Rural Municipalities) Kristel Siiman (Ministry of Economic Affairs and Communications) Terje Lillo (Rescue Board) Marius Kupper (Rescue Board) Hergo Tasuja (Hiiumaa)
Weekly meeting with the Government Office of Estonia	05.08.2022	Galina Danilišina Erik Ernits
Stakeholder workshop on disaster loss management	08.08.2022	Helen Alton (Social Insurance Board) Margus Auväärt (Ministry of Social Affairs) Simona Andreas (Social Insurance Board) Agne Aruväli (Ministry of the Environment) Kristel Siiman (Ministry of Economic Affairs and Communications) Jako Reinaste (Ministry of Economic Affairs and Communications) Annika Orav (Police and Border Guard Board) Kristjan Sirp (Health Board) Raul Kurrista (Environmental Board) Tiiu Pärnmäe (Ministry of Social Affairs) Triin Raag (GO)
Weekly meeting with the Government Office of Estonia	12.08.2022	Galina Danilišina Erik Ernits Triin Raag
Overview of the JRC's Risk Data Hub	16.08.2022	Christina Corbane (JRC) Tiberiu-Eugen Antofie (JRC) Galina Danilišina (GO) Triin Raag (GO)
Weekly meeting with the Government Office of Estonia	16.08.2022	Galina Danilišina Erik Ernits Triin Raag
Q&A session on data and expectations collection	17.08.2022	Margus Auväärt (Ministry of Social Affairs) Heidi Käär (Food and Veterinary Office)

Organisation/event	Date of the interview	Interviewees
Q&A session on data and expectations collection	22.08.2022	Agne Aruväli (Ministry of the Environment) Teet Koitjärv (Environmental Board) Raul Kurrista (Environmental Board) Priit Enok (Estonian Stockpiling Agency)
Meeting with the Ministry of Social Affairs to collect expectations towards municipalities	24.08.2022	Tea Varrak Kersti Lea
Meeting with the Rescue Board to collect expectations towards municipalities	24.08.2022	Terje Lillo Marius Kupper Ago Meister Triin Raag (GO) Galina Danilišina (GO)
Stakeholder workshop (municipality profile, resources mapping, list of risks, risk scenario)	25.08.2022	Tauno Mettis (Tallinn) Risto Aasmaa (Tallinn) Evelin Uibokand (Tartu) Jan Trei (Association of Estonian Cities and Rural Municipalities).
Weekly meeting with the Government Office of Estonia	26.08.2022	Galina Danilišina Triin Raag Erik Ernits
Workshop with the Rescue Board to collect expectations towards municipalities	30.08.2022	Terje Lillo Marius Kupper
Meeting with the Ministry of Social Affairs to collect expectations towards municipalities	30.08.2022	Tea Varrak Kersti Lea
The Government Office of Estonia (co-creation workshop)	31.08.2022	Galina Danilišina Triin Raag Erik Ernits
Weekly meeting with the Government Office of Estonia	02.09.2022	Galina Danilišina Triin Raag Erik Ernits
The Government Office of Estonia (PoC overview workshop)	02.09.2022	Galina Danilišina Triin Raag Erik Ernits
The Government Office of Estonia (working papers overview)	06.09.2022	Galina Danilišina Triin Raag Erik Ernits Jaanus Teearu
Workshop with the Rescue Board to collect expectations towards municipalities	06.09.2022	Tagne Tähe
Stakeholder workshop (role expectations)	08.09.2022	Maido Nõlvak (Rakvere municipality), Hergo Tasuja (Hiiumaa) Raul Kudre (Setomaa) Risto Aasmaa (Tallinn) Tauno Mettis (Tallinn) Urmas Tokman (Narva)
Meeting with the Rescue Board to see the RB's	15.09.2022	Terje Lillo Marius Kupper Jako Vernik

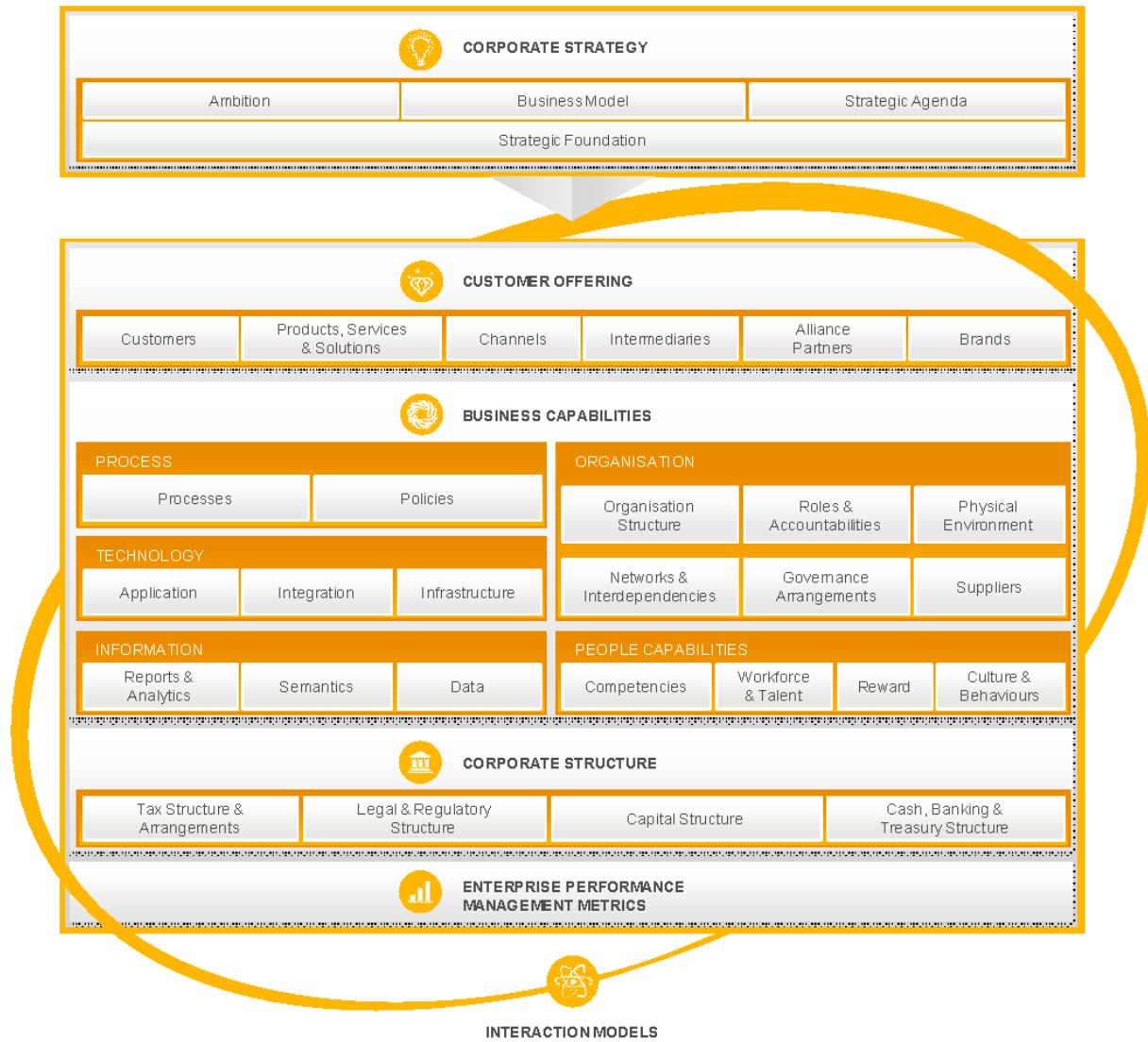
Organisation/event	Date of the interview	Interviewees
training platform and introduce PoC		Ago Meister
Workshop with Alutaguse – testing the risk scenario module	15.09.2022	Kairi Hõbemer Tauno Võhmar
Weekly meeting with the Government Office of Estonia	16.09.2022	Galina Danilišina Triin Raag Erik Ernits Jaanus Teearu
Operational Committee	21.09.2022	Akshay Bakhai (DG) Adrian Juan Verdejo (DG) John Roche (OECD) Nestor Alfonzo Santamaria (OECD) Erik Ernits (The Government Office of Estonia)
Workshop with Alutaguse – testing the vulnerability assessment module	23.09.2022	Kairi Hõbemer Tauno Võhmar
Weekly meeting with the Government Office of Estonia	23.09.2022	Galina Danilišina Triin Raag Erik Ernits Jaanus Teearu
Stakeholder workshop (LM's profile, resource mapping, list of risks, risk scenario)	23.09.2022	Hergo Tasuja (Hiiumaa) Risto Aasmaa (Tallinn) Tauno Mettis (Tallinn) Maido Nõlvak (Rakvere) Marius Kupper (Rescue Board)
Co-creation workshop with the Government Office of Estonia (in-depth overview of the modules)	26.09.2022	Triin Raag Jaanus Teearu
Weekly meeting with the Government Office of Estonia	30.09.2022	Galina Danilišina Triin Raag Erik Ernits Jaanus Teearu

Appendix 2. List of authorities and their input

Authority	Working paper
The Ministry of the Environment	<ul style="list-style-type: none"> Data sources Role Expectations
The Environmental Board	<ul style="list-style-type: none"> Data sources Role Expectations
Estonian Information System's Authority	<ul style="list-style-type: none"> Data sources Role Expectations
The Ministry of Social Affairs	<ul style="list-style-type: none"> Data sources Role Expectations
Social security office	<ul style="list-style-type: none"> Data sources Role Expectations
The Ministry of Economic Affairs and Communications	<ul style="list-style-type: none"> Data sources Role Expectations

Estonian Stockpiling Agency	<ul style="list-style-type: none"> • Data sources • Role Expectations
Estonian Internal Security Service	<ul style="list-style-type: none"> • Data sources • Role Expectations
Estonian Ministry of Defence	<ul style="list-style-type: none"> • Data sources • Role Expectations
The Ministry of the Interior	<ul style="list-style-type: none"> • Data sources • Role Expectations
Estonian Rescue Board	<ul style="list-style-type: none"> • Data sources • Role Expectations
The Health Board	<ul style="list-style-type: none"> • Data sources • Role Expectations
The GO	<ul style="list-style-type: none"> • Data sources • Role Expectations
The Ministry of Education and Research	<ul style="list-style-type: none"> • Data sources • Role Expectations
Estonian Land Board	<ul style="list-style-type: none"> • Data sources • Role Expectations
Road Administration	<ul style="list-style-type: none"> • Data sources • Role Expectations
Elering	<ul style="list-style-type: none"> • Data sources • Role Expectations
Elektrilevi	<ul style="list-style-type: none"> • Data sources • Role Expectations
The Agriculture and Food Board	<ul style="list-style-type: none"> • Data sources • Role Expectations
Estonian Ministry of Culture	<ul style="list-style-type: none"> • Data sources • Role Expectations
Bank of Estonia	<ul style="list-style-type: none"> • Data sources • Role Expectations
Consumer Protection and Technical Regulatory Authority	<ul style="list-style-type: none"> • Data sources • Role Expectations
Police and Border Guard Board	<ul style="list-style-type: none"> • Data sources • Role Expectations

Appendix 3. The PwC Operating Model Framework





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