

GUIDELINES FOR SIMULATION EXERCISES ON EARLY WARNING SYSTEMS FOR WEATHER-INDUCED RISKS

EXERCISE PROCESSES WITHIN CIVIL PROTECTION
AND DISASTER RISK MANAGEMENT IN THE CONTEXT
OF INTERNATIONAL PROJECTS



KNOWING THE RISK

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(1) CIMA Research Foundation
(2) Italian Civil Protection Department

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Foreword

A civil protection and disaster risk management system must operate constantly and in a coordinated manner to manage risk across all its phases: from forecasting to prevention and preparedness, and from the emergency response through to overcoming the event itself and a return to the previous 'normality'.

In practice, this is a highly complex structure. It includes early warning systems, which are not made up of technological tools alone but also the coordination of information and of the many stakeholders involved in risk management.

One of the core aspects of a civil protection and disaster risk management system is its capacity to turn early warning messages into early action procedures and coordinated operational responses. However, the system needs to 'train' itself in order to do this effectively. And it is within this context that simulation exercises stand as a vital tool, since they help strengthen preparedness for disaster risk management, and enable the checking of procedure effectiveness and improvement of responses by institutions, organisations and communities.

The integration of forecasting within simulation exercises (SIMEXs) – through the simulation of predictable events and deployment of early warning systems – further enhances their value. This approach makes it possible to work not only on managing the emergency but also on coordination mechanisms and activation of the entire decision-making and operating chain, with a focus on anticipation and early action. Thus SIMEXs become a key means for assessing early warning systems, encouraging an integrated understanding of processes, interaction between actors, operational capacity and information flows, while also fostering inter-institutional coordination and use of a shared language.

These guidelines emerge from the lengthy experience accrued by CIMA Research Foundation within numerous national and international projects developed in partnership with the Italian Civil Protection Department and with Italian and international organisations such as UNDRR, Italian Red Cross and UNU-EHS. The aim is to strengthen and disseminate a shared methodology for the entire SIMEX process, and one consistent with the UNDRR framework and integrated with the many existing operating manuals.

CIMA Research Foundation provides these guidelines with the intent of delivering practical operational guidance grounded in methodology quality, inter-institutional collaboration and constant improvement, to contribute to strengthening civil protection and early warning systems both in national contexts and in international cooperation.

These guidelines mark the first publication in a new editorial series of the CIMA Research Foundation. Through this initiative, CIMA's researchers seek to leverage this opportunity to present and critically engage with their work, fostering a scientific dialogue that is open, rigorous, and enduring. This is our way of moving forward and growing together.

We hope you find this a valuable read.

Luca Tamarit



Credits: CIMA Research Foundation

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Abbreviations

CPX	Command-Post Exercise
DBX	Discussion-Based Exercise
DRA	Disaster Risk Assessment
DSS	Decision Support System
ECC	Emergency Coordination Centre
EET	Exercise Evaluation Team
EXCON	Exercise Control Team
EW	Early Warning
EW-EA	Early Warning - Early Action
EWS	Early Warning System
FX	Field Exercise
ICPD	Italian Civil Protection Department
MEL	Main Events List
MIL	Main Injects List
MOC	Municipal Operations Centre
SIMEX	Simulation Exercise
TTX	Table-Top Exercise
UCPM	European Union Civil Protection Mechanism
UNDRR	United Nations Disaster Risk Reduction
UNU-EHS	United Nations University - Institute for Environment and Human Security
WMO	World Meteorological Organization
WP	Work Package
WUI	Wildland Urban Interface
VIP Programme	Very Important People Programme - SIMEX activities involving authorities of a certain institutional or political standing



Credits: IPA Floods and Fires

Introduction and aims of these guidelines

Simulation exercises (SIMEXs) in the disaster risk management and civil protection field are essential tools for strengthening disaster risk preparedness, and contribute to reducing the potential impacts of the disasters. When these exercises also focus on the Early Warning System (EWS), they are even more valuable. In fact, besides testing the emergency response itself, SIMEXs allow the observation and the understanding of the activation mechanisms in the entire decision-making and operating chain also in terms of early action and preparedness (WMO 2018), identifying its critical areas and strengths.

SIMEXs are a useful tool for the in-depth analysis of early warning systems, in that they enable a better understanding of: the various processes, the interactions between the actors seen as nodes of a chain, operational capabilities, information and data flows, the dynamics of the system as a whole (e.g. Skryabina et al. 2017; WMO 2024).

Furthermore, the entire SIMEX preparation, implementation and follow-up process fosters an improvement in coordination between actors from different sectors and territorial levels, it contributes to developing a common language, and it encourages greater operating familiarity. In this sense, simulation exercises stand as a valid training and capacity-development tool (Giambelli et al. 2023; WFP and USAID 2024; WMO 2024).

General purpose

The aim of these guidelines is to strengthen the methodology framework to the SIMEX process, which is structured with the phases of planning, design, implementation and, lastly, debriefing and follow-up, as under the UNDRR framework (2020); they also provide detailed information on the analysis and testing of civil protection and early warning systems within international projects. Thus they make a targeted contribution, integrating with the many existing operational handbooks (e.g. CADRIM and IFRC 2013; Federal Office of Civil Protection and Disaster Assistance (BBK) 2011; IASC 2012; UCPM 2024; WHO 2017), which offer general instructions and standards for building a SIMEX process. The adopted approach stems from the experience gained in numerous international projects, firstly in those where CIMA Research Foundation has worked with the

Italian Civil Protection Department, but also in those conducted with other international agencies such as UNDRR, Italian Red Cross (IRC) and UNU-EHS. Target audience and goals for this target These guidelines are specifically aimed at teams of experts who work on international projects and intend to co-design simulation exercises with a country's local actors, to analyse and test its early warning and national civil protection systems. Central in this approach is the involvement of the country concerned, through its key stakeholders. This factor is essential to ensuring 'ownership' of the SIMEX process and to facilitating assimilation of the findings, to improve the system. In addition, co-designing a simulation exercise is also an opportunity (for each country) to constructively and mutually engage with other disaster risk management and civil protection systems. Sharing tools, methods and procedures is valuable both in strictly operative terms and from the perspective of a disaster risk reduction culture, fortifying the moment of the simulation itself within a broader framework of preparedness and emergency planning.

These guidelines are intended for the entities and persons proficient in understanding early warning systems and with experience in organising simulation exercises, since these two aspects are essential in building an effective process. It is also a useful guide for the country concerned, so that it may assess action progress and share methods and procedures.

Contents

The guidelines focus on a specific selection of SIMEXs that are considered the most appropriate for the analysing and testing of early warning and civil protection systems also in international project contexts. These SIMEX types are Discussion-Based EXercise (DBX), Table-Top EXercise (TTX) and Command-Post EXercise (CPX), which have proven to be flexible and effective tools as well as sustainable in terms of cost. Particular attention has been given to predictable risk scenarios associated with meteorological forcings, such as weather and water-related events and wildfires, which are central in CIMA Research Foundation research and modelling.

These guidelines are structured with three main sections:

**PART 1
THE THEORY
FRAMEWORK**

It goes into the various phases of the SIMEX process and the steps in each phase. The steps are illustrated to answer three essential questions: what the activity involves, who is responsible for what, and what aspects require particular attention. Each section ends with a checklist and a list of the key documents produced for that specific phase.

**PART 2
CASE STUDIES**

It provides concise case files to describe the exercise process experiences, offering an all-round vision of the SIMEX, with information for each phase and step, and highlighting the strengths and weaknesses of the conducted activities.

**PART 3
REFERENCES**

It provides further contributions on the reference framework for these guidelines, both in relation to literature on the topic of early warning systems and regarding simulation exercises, plus a glossary.

BOX 1.1 General Criteria for an Effective SIMEX Process



Adopt a participatory and co-design approach. It is important to build the SIMEX process in close collaboration with the country concerned during all the phases, in order to ensure ownership and transparency in the decision-making process, while taking into account the local context and the knowledge and know-how of all the parties involved.



Engage early warning system actors at all levels. It is essential to involve a broad range of early warning system actors at different territorial levels throughout the process. Including subnational-level pilot cases is crucial for testing communication flows and the chain of command as well as for checking operational capacities at various levels.



Understand the context to guide the exercise. Not all SIMEX types are suitable to a certain context or are effective for achieving a certain purpose. There are some factors that should be assessed before beginning the process since these may influence development of the SIMEX process. These include: the team of experts' degree of familiarity with the EWS and civil protection system (and the context in general) where the operations are going to take place; the maturity level of the systems themselves.



Each phase is relevant. The planning, design, implementation and debriefing/follow-up phases making up a SIMEX process are all relevant. Maintaining flexibility and adaptability in the choice of individual components is essential, to reflect diversity in terms of goals, context and know-how.



It is a training and development process. The entire SIMEX process should be seen not purely in terms of analysis and testing but also as a training and capacity-development process.



Evaluate to improve the system. The process should be developed with the aim of ensuring feedback and practical recommendations that can be applied by the countries concerned. A 'hot wash' debriefing involving all participants immediately after the SIMEX is essential, and better if completed with an after-action review and a detailed report with suitable recommendations based on the systematic observations collected during the entire process.



From simulation to strengthening of the system. The entire process should aim to lay the groundwork for integrating the feedback and lessons learned from the simulation exercises within the early warning and early action systems (EW-EAS).

BOX 1.2 What are the Benefits for the Country?

Why are we offering countries (i) a SIMEX model aimed (ii) to test and analyse early warning systems (iii) collaboratively?

(ii) – Testing and analysing early warning systems makes it possible to:

Place people around the same table – SIMEXs foster connection and mutual awareness among the actors in the civil protection and early warning system, from a national to a local level.

Strengthen the concept of system – SIMEXs enable an improvement in the mutual understanding of roles among the engaged parties, highlighting the importance of strengthening also the weakest links.

Develop system capacities – and not just those of individuals or a single agency.

Understand, update or develop plans and procedures – A SIMEX may also be deployed to analyse existing procedures or plans, to assess their effectiveness, and to identify any reviews required for the purpose of strengthening the country's risk understanding and management.

Provide observations and feedback mechanisms – What the country has put into practice can be discussed, and areas for improvement can be identified.

Make EWS activation quicker and more effective – SIMEXs enable optimisation of activation times and methods for early warning systems and the related decision-making processes.

(i-iii) – A collaborative and replicable approach enables:

The sharing of know-how and experience between the representatives of the various institutions, agencies and countries involved in the SIMEX process. Simulation exercises promote peer-to-peer learning among these entities, while fostering operational solutions and sharing on best practices and challenging aspects.

Development of a planning, design, implementation, debriefing and follow-up model for the SIMEX so that the country may independently conduct the SIMEX (through tools such as checklists and operative recommendations).

During the Planning and Design phases

Improvement of a system begins from the planning phase, as an opportunity to reflect on and discuss its current state in terms of challenging areas and good practices.

Analysis and establishing scenarios based on past events together enable a first assessment of any procedural gaps and the identification of possible areas for improvement, initiating an update and review of existing procedures.

During the Implementation phase

A controlled and safe environment and a well-designed scenario enable participants to test procedures, tools and operating decisions without real risks and at reduced costs.

During the Debriefing and Follow-up phase

The debriefing phase allows mechanisms for communication between participants to be reinforced. Developing dialogue during this stage familiarises the various actors with discussion and mutual collaboration, strengthening mutual trust and the ability to work together in real situations.

PART 1

THE THEORY FRAMEWORK



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Before starting the process: the project proposal phase

PART 1

The SIMEX process may be the sole activity planned in a project or it may be embedded in a broader project. In this latter case, **the general purpose of the SIMEX within the project (i.e. its function)** takes on a strategic role during the project proposal definition phase, **also in view of the actual country's requirements and needs, and therefore the project goals.**

In this regard, and considering the focus of these guidelines, the following general purposes can be identified in relation to the country's early warning system:

- The SIMEX as a **fact-finding tool to analyse existing conditions.** The SIMEX is used to collect fundamental information on the current status and to provide preliminary analysis of the system (e.g. in terms of capacities, existing plans, the functioning of a specific procedure) as support to subsequent activities. In this case, the SIMEX process is generally included from the initial stage of the project.
- The SIMEX as **an operations evaluation tool to support a previous initial analysis/knowledge base.** In situations where the project involves in-depth analysis also with other tools, the SIMEX enables collection of data and information useful to guiding further action and decision-making, and allows a more in-depth look at previously conducted analysis. In this case, the exercise process is included during a central phase of the project or towards its last stage.
- The SIMEX as a **tool for validating models, procedures, plans or changes introduced by the project or occurring in the system and regarding which there is in-depth knowledge.** The exercise process is used to check the effectiveness of innovations and actions undertaken within the project context, and in this case, it is included towards the last stage of the project.

All the simulation exercises, if carried out after a training or capacity-development process, allow retrospective evaluation of the acquired knowledge, skills and know-how.

Besides the general purpose of the SIMEX process within its reference project, the project designers should, when drafting the proposal, also consider various factors – some related to the team of experts and some to the country involved – that influence several choices connected with building the SIMEX process and that require certain attention. Specifically, two determining factors can be identified:

The level of system knowledge possessed by the team of experts appointed to develop the SIMEX process in a specific country. This parameter indicates the level of information and understanding the team of experts has regarding the country's EWS and civil protection system, as well as to what extent interaction with the key stakeholders is consolidated. Familiarity with the local context and counterpart is vital to accurate planning. Three levels can be identified, and these also depend on the purpose of the SIMEX itself and on the timeframe in which the SIMEX process is included:

- **Low** – The team sets out with limited knowledge and no preliminary documentation, and this is typical for exercises aimed at analysing the system at the start of a project.
- **Medium** – Initial analysis resulting from preliminary assessments or training experiences is available, and this provides a partial information base.
- **Advanced** – In-depth analysis exists and is supported by direct interaction with stakeholders, which ensures detailed knowledge of the system.

The maturity level of the system to be analysed and tested. This describes to what extent the system itself is already defined, structured and operationally functional. In this case too, there are three levels, and the most appropriate emerges during the needs analysis phase:

- **Low** – There is little system development, an early warning system does not exist, disaster risk management is very reactive, etc.
- **Medium** – The system possesses several components but these have still not been fully integrated with each other (e.g. early warnings issued by hydro-meteorological services are not used effectively by the civil protection authorities, the actions set out in preparedness and emergency

plans are not linked with the existing early warning systems, activation procedures are inexistent).

- **High** – There is a well-developed consolidated system where stakeholders are also very familiar with SIMEXs.

Both the above factors can influence various aspects of a SIMEX process, such as (i) the choice of SIMEX type (DBX, TTX, CPX), (ii) scenario complexity, (iii) training needs and (iv) duration of the design and follow-up phases. In any case, failing to evaluate these factors during the project proposal phase – in relation with a chosen general purpose – could compromise the feasibility of the SIMEX process with regard to what was originally conceived.

Combining these factors with the general purpose therefore generates useful guidance and critical considerations to steer the project proposal for an effective SIMEX, and these go to join the aspects underlined in the following units of these guidelines.

For instance, in a context where the team of experts has limited preliminary knowledge of the system and the system has low maturity, it is advisable to opt for simplified solutions – such as a DBX or even a simple workshop – that foster direct dialogue between actors and facilitate collection of essential information. Conversely, in the case of a mature system and a team of experts with in-depth knowledge – and especially if the general purpose is operations analysis – complex scenarios should be developed to adequately reflect reality and to effectively engage all participants.

Phases, steps and practical instructions for using these guidelines

The SIMEX process is developed through a series of activities, which these guidelines subdivides into four main phases, borrowing from the framework proposed by UNDRR, 2020:

1 PLANNING

Defining the initial elements for structuring the exercise, and assessing its size, scope, type and specific goals

- Step 1.1** Consultations & establishing goals and SIMEX type
- Step 1.2** Budget & resources
- Step 1.3** Timeline
- Step 1.4** SIMEX teams, figures & roles
- Step 1.5** Stakeholder analysis
- Step 1.6** Recognising training needs
- Step 1.7** Conceptualisation, agenda & invitations

2 DESIGN

Developing the practical and theory aspects for exercise execution, such as choice of sites and scenario definition

- Step 2.1** Defining the scenario
- Step 2.2** Injects
- Step 2.3** Logistics, tools, equipment, documents & materials
- Step 2.4** Observation & evaluation plan

3 IMPLEMENTATION

Description of some of the components necessary to exercise execution, including the tools needed to run the SIMEX and the simulation

- Step 3.1** Set-up & administration
- Step 3.2** Training & briefing
- Step 3.3** Facilitation & control
- Step 3.4** Observation & evaluation

4 DEBRIEFING & FOLLOW-UP

Collecting and analysing feedback, and processing the outcomes so that they are useful to the project

- Step 4.1** Debriefing & feedback
- Step 4.2** Final report & action plan

Each phase is described in depth in its own unit of these guidelines, from a perspective of logic that also prepares for the subsequent phase. In terms of time, the design phase is sometimes conducted parallel to the planning one.

This approach does not differ substantially from those proposed by other national and international frameworks (e.g. Covaciu et al. 2021; Homeland Security 2020; IASC 2012; WHO 2017). The use of specific terminology for the individual phases and steps has in any case been adopted.

The guidance provided in the following units is based on the assumption that the SIMEX process is developed within a project that, from its outset, identifies a reference authority – an entity with a role in the country's civil protection/disaster risk management system – and ideally also a project focal point. The reference authority is usually specific to a territorial level (national, sub-national, local) for which it should generally have the mandate to promote and organise SIMEX processes.



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PHASE 1: PLANNING

STEP 1.1 CONSULTATIONS, AND ESTABLISHING GOALS AND SIMEX TYPE

ACTIVITIES

The consultations stand as the departure point for defining key components in the SIMEX process, and the design phase is initiated on these foundations.

These preliminary meetings may involve not only the project focal point but also the other key stakeholders; they are for the purpose of ensuring a participatory and collaborative approach (see Box 1.1.) right from the process outset.

These actors – team of experts, focal point and key stakeholders – form the SIMEX planning and design team, and work in close collaboration to identify goals, priorities, areas of interest and implementation methods. Thus the preliminary consultations are not limited to a **mere comparison between the parties but stand as a co-design touchpoint where methodology assumptions, responsibilities and mutual expectations are shared.**

Ideally, the first consultation takes place with representatives from the reference authority and the project focal point, who are generally responsible for subsequently involving the other key stakeholders in the consultations.



During the consultations, it is advisable to agree on an overview of the SIMEX process, outlining its various phases, clarifying terminology and discussing the role that each member of the SIMEX planning and design team is called upon to perform in the process. These aspects are essential for establishing common ground for understanding and to foster effective collaboration between all the parties involved. During the course of these meetings it is also necessary to discuss and define:

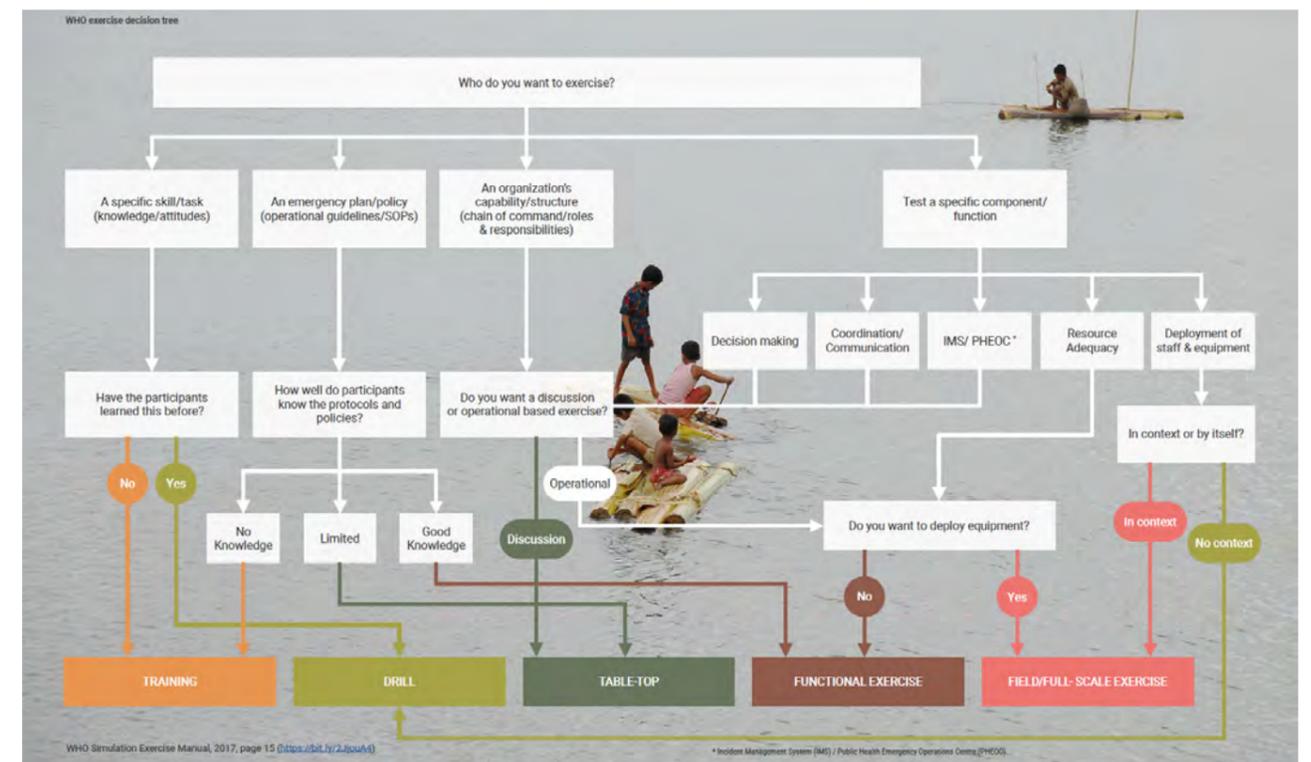
- **The overall aims and specific goals of the SIMEX.** Although the context is early warning and civil protection systems, goals may vary based on the needs of the countries involved. *For instance*, the overall aim of an exercise might be to check the effectiveness of an organisational model in the case of foreseeable events. Nevertheless, at a more specific level, the SIMEX could focus on simulating the set-up of certain emergency coordination centres. In other cases, the overall aim might be to get actors prepared before the wildfires or rainy seasons, with the specific goal of testing some early warning procedures. Regardless of the focus, the goals established guide the choice of scenario and the components to be tested. A non-exhaustive list of possible components to test is shown in Table 1 (Giambelli et al. 2023; UNDRR and CIMA Research Foundation 2024).

- **The territorial and institutional levels to engage.** These depend on the exercise goals, and the scale of the simulated event is based on these. The SIMEXs may be, *for instance*, (i) national if they involve the system at different territorial levels and are organised in agreement with other agencies and authorities, or (ii) sub-national/ local if only these levels are tested; (iii) they can also be transnational if they include coordination and communication components involving pan-regional rooms or neighbouring countries.
- **The type of hazard or multi-hazards** that the SIMEX intends to simulate, considering likely and localised events, or rare situations but with potential catastrophic impacts, depending on the priorities identified by the country in question.
- **The composition of the SIMEX planning and design** team contributing to building the exercise. To achieve an effective SIMEX process, this team should comprise not only members from the team

of experts but also representatives for the local counterpart – key stakeholders and focal point. *As a rule*, participants in this group cannot take on the role of player during the actual simulation.

- **The type of exercise to be conducted** (*for instance*, TTX, CPX – see PART 3, Table 14: Types and definitions of simulation exercises), considering budget constraints and available resources as well as goals. A diagram formulated by UNDRR (Words into Action guidelines - Design and conduct of simulation exercises, 2020, adapted from a 2016 WHO publication) is shown below as support for choosing SIMEX type. It illustrates the decision-making process for selecting the exercise type to adopt, taking into consideration the above aspects. It should be reiterated here that factors such as SIMEX general purpose, the team of experts' knowledge level regarding the system, and the maturity of the system itself must all be considered already from the design phase and then integrated into these assessments.

Figure 1: Decision-making process for choice of exercise type (UNDRR, 2020)



Potential specific goals	Potential components to test
Generating bulletins and early warnings	<ul style="list-style-type: none"> Evaluation procedures (thresholds, criteria, etc.) and issuance procedures (actors, methods, timing, early warning/alert validity) Decision-making processes with relative debriefings Use of hazard, vulnerability, exposure and capacity data for risk assessment Content completeness and message clarity Early warning timeliness Updating of bulletins and early warnings Targeting of the early warnings Multi-hazard assessments (cascading, concurring, etc.)
Early warning dissemination	<ul style="list-style-type: none"> Targeted early warnings for specific actors or users Use of hazard, vulnerability, exposure and capacity data for risk notification Communication channels Feedback and reception verification Content completeness and message clarity
Communication flows within each agency and/or externally between different sectors and territorial levels	<ul style="list-style-type: none"> Communication channels Information management Data and information processing Computerised information management systems (logbooks, DSS, etc.) Codification and traceability of exchanged data
Activation and deactivation of emergency operations rooms and centres and relative organisations	<ul style="list-style-type: none"> Activation mechanisms Activation confirmation or notification Organisation for support functions
Activation and implementation of preparedness and emergency plans /early actions	<ul style="list-style-type: none"> Activation of preparedness and emergency plans based on alert level of the early warning Gradual activation of systems related to early warning levels Actions associated with early warning levels Actions coordinated with various sectors and territorial levels Decision-making processes Actions based on risk scenarios Use of hazard, vulnerability, exposure and capacity data for risk assessment and implementation of specific early actions

Table 1: Potential specific goals and test components of the early warning system

WHO DOES WHAT

The team of experts, the project focal point and key stakeholders form the **SIMEX planning and design team** during this phase.

- Team of experts: It facilitates the initial consultations, proposes a concept note and any shared working documents required, prepares the meeting agendas and summarises the findings. The team is tasked with leading discussions, alongside the project focal point, and coordinating

the technical and methodological approach of the exercise process, also based on the country's experiences.

- Project focal point: It ensures the key stakeholders' participation and the sharing of relevant information on the local and institutional context.
- Project focal point and key stakeholders: Along with the team of experts, they share in decisions on the outlined points, contributing to establishing priorities and specific requirements.

ASPECTS REQUIRING SPECIFIC ATTENTION

Regarding consultations, **scheduling an adequate number of meetings** is essential, as is allocating sufficient time between meetings to allow for any necessary reviews or adjustments emerging from the collected feedback. **As a rule**, the planning and design phases require at least three planning and design team meetings, with the scope to vary this based on the counterpart's level of engagement, autonomy and familiarity with the SIMEX. Typically, these meetings are held at the start of the exercise process, midway through the planning and design phases and just before the implementation phase. Besides these consultations, there are often supplementary meetings with smaller groups focusing on the design phase, to define exercise content such as the scenario and injects.

Following the initial consultations, further meetings may be organised with other actors from the civil protection/early warning system at various territorial levels to hone the planning and design activities for the SIMEX, ensuring full alignment with the established goals. This enables the sharing of key documents and evaluation of the country's exercise experiences regarding the specific topic. Regarding the SIMEX planning and design team, it is necessary to:

- Involve representatives** from the relative civil protection and early warning authorities for the territory in this team, in order to establish the specific goals and expected outcomes for the SIMEX. These stakeholders are among the most relevant in the SIMEX context for testing the EW and civil protection system. Stakeholder analysis (see Step 1.5) plays a crucial role in identifying the main actors to involve in the preliminary phase. Nevertheless, this analysis can be enhanced during the initial consultations, enabling a potential expansion of the planning and design team to include additional relevant stakeholders.
- Ensure that the team clearly defines the goals and that it has a precise and **shared understanding of the terms, expectations and assigned roles during the SIMEX process**. It is in fact useful, with regard to this purpose, to establish all the actors'

duties and responsibilities within the exercise process, to maximise their effectiveness and the value of the contributions provided (see also Step 1.4).

- Involve the sub-national levels in the planning and design team when possible and if deemed useful – during all the phases therefore and not only during implementation. This facilitates capacity development for the SIMEX process also at sub-national levels.

Regarding goals, it is necessary to:

- Have a clear idea of the **general purpose** underpinning the exercise if this is part of a broader project, so that aligned overall aims and specific goals may be defined. **For example**, if the purpose is to validate changes in municipal preparedness and emergency plans, the overall aim should involve testing the activation of these plans, while the specific goals will depend on the procedures developed.
- Understand what the **key stakeholders' priorities** are, attempting to balance reasonable goals for the exercise with the specific interests of its participants.

In general:

- Ensure that the choices made during the consultations are **compatible with the human, financial and technical resources available** (see Steps 1.2 and 1.3).
- Take into account that the planning phase consultations sometimes overlap or are conducted parallel to other activities related to Phase 2 – Design.
- Consider the **territorial coverage set out in the project**. In transnational projects (**for instance**, the IPA FF programme – see Case Study File 5.1), the SIMEX process may involve more than one country and may aim to gain a pan-regional evaluation of systems, with the goal of formulating recommendations that are applicable to all the territories involved. This scale requires a harmonisation of the planning, design, execution and evaluation approaches of the various participant countries.

STEP 1.2 BUDGET AND RESOURCES

ACTIVITIES

Development of an effective SIMEX process must be built on careful assessment of the available and the required resources, as well as the associated budget. The guiding questions in this step are:

- What resources are **required** for the specific SIMEX type?
- What resources are **available** and what resources are lacking?
- How can **additional** resources be obtained?

WHO DOES WHAT

Budget and resources should be assessed by the team of experts responsible for financial management, and shared with the project focal point to enable a joint vision of the opportunities and limitations in the planning and implementation of the SIMEX process, and also so that the steps may be agreed on.

ASPECTS REQUIRING SPECIFIC ATTENTION

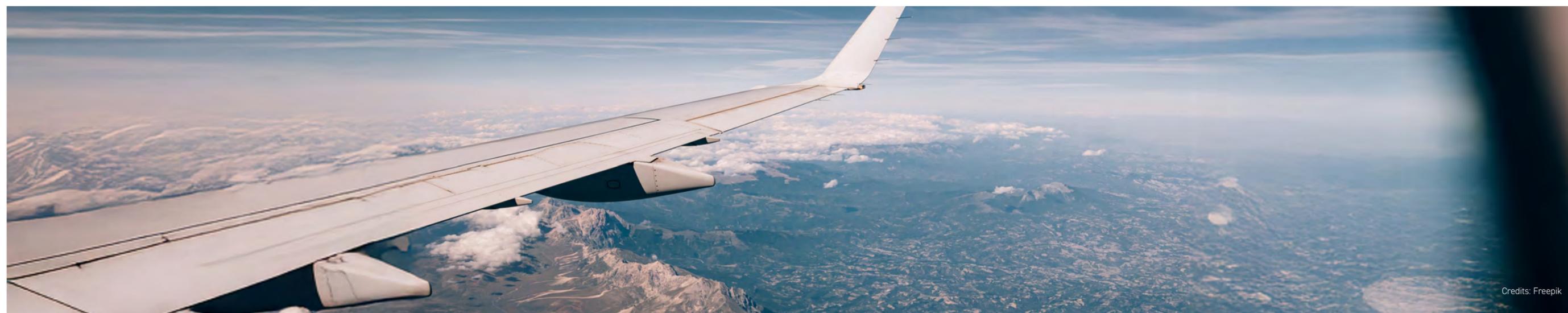
Assessment of the necessary resources and consequently the budget depends closely on:

- **The choice of SIMEX type** (see Step 1.1). The various exercise types can vary significantly in cost. *For instance*, a full-scale exercise involving the mobilisation of many players on the field will necessarily have higher costs than a functional exercise conducted in the usual operations rooms. Similarly, a CPX could require greater resources than a DBX, since the former deploys a higher number of experts spread across different sites, to facilitate and observe the exercise.
- **Timeline** (see Step 1.3). Resources and budget need to be assessed based on the duration and completion of the planning and design phases, the actual simulation itself, and the follow-up phase.
- **Specific operating context**. This can generate costs related to travel, translating if required, per-diem expenses, etc.
- **Possible engagement of international experts** on specific issues, such as critical infrastructure, environmental impact, etc.

The budget and resources to complete all the phases of the SIMEX process must necessarily take into account the expenditure items listed in Table 2.

Budget items to consider	Specifics
Personnel and other human resources costs (regarding team of experts)	<ul style="list-style-type: none"> • Experts in SIMEXs, civil protection and early warning systems (minimum 2 people for planning, minimum 4 for implementation and follow-up, ensuring a balance of competencies across the three sectors. Team composition should be tailored to SIMEX type, ensuring the presence of experts with specific knowledge appropriate to the goals and activity context) • Personnel dealing with administrative, financial and logistical aspects • Local experts, if required • External evaluators, if required (see Step 2.4)
Service contracts	<ul style="list-style-type: none"> • Catering service, if required, for in-person planning meetings and/or for SIMEX implementation • Hiring of meeting rooms, if required, for in-person planning meetings and/or for SIMEX implementation • Interpreters, if required, for online planning meetings and/or during SIMEX implementation • Translating, if required, of final report or other necessary documents • Transfers within the country in the event of a SIMEX involving various sites
Supplies, goods, materials	<ul style="list-style-type: none"> • Any necessary communication materials (badges, certificates, vests, etc.)
Travel	<ul style="list-style-type: none"> • Travel expenses for team of experts + for external experts, if pertinent • Team of experts' per-diem expenses
Potential costs for participants' travel to the SIMEX site	<ul style="list-style-type: none"> • Participants' per-diem expenses

Table 2: Budget items - valid for TTXs, DBXs and CPXs



Credits: Freepik

STEP 1.3 TIMELINE

ACTIVITIES

The timeline for designing the entire SIMEX process should be developed in collaboration with the project focal points/key stakeholders, detailing the necessary time to allocate to each phase (UNDRR 2020).

It is crucial to develop a **realistic timeline** for the exercise process, and this originates from dialogue and consultation with the local counterpart. The timeline should take into account key meetings for SIMEX planning and design, consultations, logistics, deadlines, analysis and drafting of the relevant documents (UCPM 2024), well as the budget and necessary resources.

The timeline should be constantly **updated and adjusted**. Gantt charts are useful tools for this purpose.

WHO DOES WHAT

The established timeline should result from a joint process between the team of experts and the local counterpart. The team of experts and the project focal point develop an initial proposal, which is then checked with the key stakeholders in the relative civil protection/EW system to make any necessary adjustments.

ASPECTS REQUIRING SPECIFIC ATTENTION

The duration of each phase of the SIMEX process depends both on (i) complexity aspects of the exercise itself, and on (ii) context variables related to the country, the stakeholders involved and the level of knowledge of the civil protection and early warning systems to be tested:

- **SIMEX type and aims.** Organising a table-top exercise generally requires less time than a field/full-scale one. Similarly, implementation times vary, ranging from just a few hours to several days in the case of field/full-scale exercises.
- **Territorial levels and stakeholders involved.** Preparing an exercise engaging actors at a single territorial level might require less time than a multi-territory SIMEX.
- **The team of experts' level of knowledge of the country's EWS and civil protection system** (see also Part 1 - Before starting the process: the project proposal phase). The better the team facilitating the design and implementation of the SIMEX knows the civil protection/EW system to be tested, the more the planning phase can focus solely on structuring the SIMEX. Should this not be the case, time has to be allocated to consultations with key actors, to gathering and analysing documents, procedures and plans, and to understanding practices in place, etc. This aspect could significantly extend the timeline of the preparatory phase, although its management parallel to the other Phase 1 activities is also feasible.
- **Maturity of the system to be tested** (see also Part 1 - Before starting the process: the project proposal phase). The maturity of a civil protection and early warning system affects the timeline of the exercise process. **For instance**, an advanced system can speed up the planning and design phases, thanks to the existence of standard operating procedures and plans, and consolidated strategies known to all the key stakeholders. These components make it easier to establish clear goals and enable well-structured and well-defined exercise organisation. Conversely, a less mature system may require more time due to a lack of coordinated components; however, its simplicity may prompt the decision to develop less complex exercises, shortening the overall timeline. The following point is also connected with this aspect.
- **Key stakeholders' and all participants' capacities and familiarity with exercises.** The greater the stakeholders' knowledge, capabilities and experience regarding exercises, the smoother and quicker the process may be. This is thanks to the 'pre-existence' of: a common language/ glossary; knowledge of and ability to understand, or even conduct, the various phases; familiarity with the necessary documentation and implementation methods, etc. Should this not be the case, the planning and design phases require more time so that the necessary know-how can be gained to ensure the building of a SIMEX where all stakeholders have 'ownership'.

- **Key stakeholders' availability to attend meetings and to carry out the technical activities for planning and design.** The timeline should be structured also based on the stakeholders' actual readiness and availability to plan the SIMEX in terms of taking part in meetings as well as preparatory technical work.
- **Seasonality of hazardous events to be tested and 'window of opportunity'.** Depending on the hazardous event driving the system testing, certain periods of the year might be more suitable and effective in terms of preparedness (e.g. before the cyclone season, before the rainy season) This aspect must be considered when defining a timeline, and should be incorporated when possible. In addition, scheduling SIMEX implementation during a period when the system is often activated is advised against, since the system might already be managing real events.
- **Time of year (possible festivities, political situations).** In general, it should be remembered that certain periods of the year are unfavourable for SIMEX planning or implementation. These include, **for instance**, festivities or specific political situations (e.g. election or post-election periods).
- **Time required to develop recommendations.** The SIMEX is not an end unto itself but aims to pinpoint gaps and areas for improvement as well as the strengths of a system. Therefore, sufficient time should be allocated to proper analysis after exercise implementation and to developing recommendations for system enhancement, to be discussed with the key stakeholders.

STEP 1.4 SIMEX TEAMS, FIGURES AND ROLES

ACTIVITIES

There are various teams in an exercise process and these take on distinct roles and functions in direct relation to the various phases. Already introduced in these guidelines, the SIMEX planning and design team is formed right at the outset, to define all the necessary exercise components. It typically includes members of the team of experts and representatives for the key stakeholders.

During the simulation itself – implementation – besides the players, who simulate their own actions, other specific figures/roles exist. They do not play, but are involved in conducting, facilitating, observing and evaluating the simulation itself; their roles, in certain cases, may be carried out by members of the same SIMEX planning and design team.

As a rule, these figures vary depending on the choices made during the planning phase.

1. During the implementation phase:

An **exercise control team** (EXCON) is present. This is tasked with managing the SIMEX by setting the pace for response to the injects, coordinating the overall progress of the exercise and potentially monitoring the dynamics between the players, also ensuring that the SIMEX proceeds as planned and that its goals are met.

A **facilitation team** (referred to also not only as facilitators but sometimes as trainers/coaches) may be engaged. This often comprises experts with complementary skills that are all useful to facilitating the simulation, to guiding discussion among players, and to supporting response to injects. This group works closely with the EXCON and may overlap with it, especially during DBXs and TTXs.

The EXCON and the facilitation team may partially or wholly include the SIMEX planning and design team.

2. With the EXCON and facilitation teams formed, it is advisable to also form a **team to evaluate the simulation activities and another to observe them**. These two latter teams may be one and the same or separate, depending on SIMEX type, available resources and the assessments made at the start of the exercise process.

Exercise Evaluation team (also referred to as EET). Its purpose is to evaluate the entire SIMEX process from planning and design through to execution and final feedback. It should therefore be formed at the outset. **Observation team.** Its purpose is to monitor specific activities carried out during the simulation exercises – often through observation forms – in order to

identify system strengths and areas for improvement, response management capacity or degree of coordination between participants. Typically, each observer/group of observers is assigned a specific activity to evaluate.

There are also **players**, who should be chosen based on the goals and scenario. These might include

representatives for the authorities and agencies in charge for each tested process/component, as well as representatives for the authorities and agencies using/benefitting from the process/component in question.

Table 3 outlines the duties expected of the identified roles/figures for the entire SIMEX process.

Role	Planning	Design	Implementation	Debriefing
Planning and Design Team	This team is always formed, ideally not only comprising members from the team of experts but also representatives for the counterpart	It builds the scenario and injects, providing instructions and key information to all participants		
Excon Team	This team is always formed, and may overlap wholly or partially with the planning and design team	It may overlap wholly or partially with the planning and design team. It contributes to building the scenario and the injects, and provides instructions and key information to all participants	It manages and coordinates the simulation itself. It controls the scenario, sends injects and monitors simulation pace	It provides feedback as well as full analysis of the outcomes
Facilitation Team	If this team is separate from the EXCON, the various facilitator roles are discussed and defined	If separate from the EXCON, the team receives key information or is directly involved in building the scenario and the injects.	It facilitates simulation, discussion and response to injects	The facilitators provide their own feedback
Evaluation Team	Evaluators are chosen from within or externally to the team of experts. They take part in planning meetings	This team defines the evaluation plan. If required or applicable, it participates in/observes the design process	It evaluates the SIMEX based on the criteria established	The evaluators provide their own feedback as well as analysis of the evaluations
Observation Team		The observers are selected	It observes the SIMEX through observation forms	The observers provide their own feedback
Players	These are chosen based on the aims and the outline scenario	They receive invitations, with the agenda and instructions	They simulate their roles, responding to the injects	They provide their own feedback

Table 3: Roles and expected activities during the SIMEX process

Additional support roles, such as technical experts and logistics assistants, may be present during the SIMEX, as might be role-players and guest attendees. The guest attendees (present for example in the Savona exercise in Paragraph 5.4.1) are called in by players during response to specific injects, to observe specific activities that involve them, without having an active role in the simulation.

WHO DOES WHAT

During the initial consultations the planning and design team has to evaluate:

- Which figures/roles will be present during exercise implementation, clarifying the meaning of the terms used.
- The responsibilities these roles will also have during all the other SIMEX process phases.
- Who will actually take these roles, based on the stakeholder analysis (see Step 1.5).

For instance, some key stakeholders who help define and build the scenario and injects during the design phase might join the EXCON or the facilitation team during the simulation.

ASPECTS REQUIRING SPECIFIC ATTENTION

- Identifying which roles (facilitators, observers, etc.) should be present during the implementation phase may depend on the team of experts' previous experience as well as that of the country where the SIMEX is to take place. For example, some countries might be very familiar with conducting SIMEXs involving system experts, such as facilitators, alongside the EXCON.
- Including the **key stakeholders in the various teams** is crucial, and gives the exercise process greater value: not only does it foster real sharing of responsibility and 'ownership' of the exercise, but also a more effective understanding of the civil protection and early warning system that is to be tested. In addition, it enables the country representatives to acquire greater knowledge and know-how, so that they can independently develop/repeat other SIMEXs in future. Therefore, it is advisable to:
 - » Include key stakeholders in the planning and design team and the EXCON.

- » Identify key stakeholders to actively work with the facilitation team to understand the system functioning/organisation.
- » Involve the country's observers and evaluators, as well as international ones when possible, to strengthen mutual learning and the joint evaluation of outcomes.
- In this case too, it is important to underline that **planning and design team members, the EXCON, facilitators, evaluators and observers cannot simultaneously act as players**.
- In CPX-type exercises, it is necessary to arrange for multiple groupings and teams to be deployed across the different emergency coordination centres/rooms, to perform specific management, facilitation, observation and evaluation duties.
- The number of players conditions SIMEX complexity, especially during the execution and observation phases.



Credits: CIMA Research Foundation

STEP 1.5 STAKEHOLDER ANALYSIS

ACTIVITIES

'Stakeholders' are defined as persons, organisations, networks or groups with an interest or concern in disaster risk reduction (UNDRR 2017). Specifically, a stakeholder is a party whose opinion or decision can positively or negatively influence whether set goals are met.

Stakeholder mapping and analysis, conducted during the preliminary phase (and integrated throughout the process) is a key step for the successful execution of the SIMEX activities, in that it serves various purposes, including:

- **Understanding and reconstructing the institutional framework of the system to be tested.** This means, on the one hand, reconstructing the network of all the actors – roles and responsibilities included – that are part of the civil protection and early warning system while, on the other hand, understanding the activation and communication channels between the different network nodes, as well as existing plans, procedures and practices.
- **Understanding which institutions/key stakeholders could be involved in the various SIMEX process phases,** including participants who will simulate their own functions and those who will be involved in the teams/roles running and conducting the exercise. This means identifying the most suitable institutions and representatives:
 - **a. for planning,** to define the specific goals, *for instance* (see Step 1.1);
 - **b. for design,** to develop the scenario and the injects, *for example* (see Step 2.1);
 - **c. for implementation,** to take part as players or as members of the teams deployed in running the exercise (EXCON, observers, etc. See Step 1.4).
 - **d. for evaluation/observation.**

Therefore, the general purpose of stakeholder analysis is to systematically and effectively identify the agencies/institutions that should be given priority

consideration in the SIMEX process and engaged in the various activities. Ultimately, this analysis helps ensure pertinent feedback to improve the effectiveness of the SIMEX activities and the EWS and civil protection system.

One *practical example* involves a SIMEX focused on the procedures for early warning-early actions (EW-EAs). In this case, stakeholder mapping and analysis should identify all the parties involved in forecasting, monitoring, assessment of impacts and effects on the ground, bulletin and early warning generation and dissemination, and activation of preparedness and emergency plans, early actions and coordination centres. In particular, analysis of EWS communication flows (the sending and reception of bulletins and early warnings) enables the mapping and involvement of the relevant parties on distribution lists, and therefore the subsequent evaluation of early action procedures.

Another *example* involves SIMEXs to test activation of the emergency coordination centres and the early actions introduced by the various system actors. In this context, it is essential to understand how event management is organised, starting from an early warning or an emergency within these centres, and verifying, *for instance*, whether they operate through support functions or clusters – namely in operating areas that require joint and coordinated action by multiple parties, and who these parties are. Depending on the SIMEX aims, the stakeholder analysis should help to determine which clusters to involve as actors and at what territorial level.

WHO DOES WHAT

In reconstructing the institutional framework, stakeholder mapping and analysis is performed by the team of experts with support/verification from the project focal point. The analysis can be further deepened, also using remote methods, through discussion and interviews with some key stakeholders.

The focal point and the key stakeholders are crucial in the activity of determining the actors. In fact, this process should be carried out jointly by the team of experts, the focal point and the key stakeholders, to

ensure that group composition and roles reflect the country's priorities, operative set-up and vision. It is therefore essential that the involved parties understand and share the SIMEX process goals, so as to best recognise, *for instance*, the players to engage in the activities. In fact, identifying the participants most suited to the SIMEX activities is closely linked to defining the scenario and the goals to test.

ASPECTS REQUIRING SPECIFIC ATTENTION

- Stakeholder mapping and analysis are essential process components, and the **time needed** to complete them depends on the team of experts' prior knowledge of the system and on the purpose/function of the SIMEX within the broader project (see Part 1 - Before starting the process: the project proposal phase). If stakeholder analysis has already been performed outside of the SIMEX process, this activity could require less time during the planning phase. Conversely, if the team of experts' knowledge of the context is poor or inexistent, this analysis becomes crucial and may also steer towards choosing a simpler SIMEX type, aimed at getting to know the system itself.
- Identifying key institutions also depends on the **territorial levels** involved: this is true both for the choice of players and for identifying the persons who will collaborate during the various exercises process phases.
- Understanding the **diversity of stakeholder roles** (e.g. policy-based – managerial or decision-making, or technical – contributing to the injects, or actors) is crucial for comprehension of their contribution within the exercise process (as EXCON, player etc.).
- Stakeholder mapping and analysis should allow assessment of the level of **stakeholder familiarity with the EWS/civil protection system and SIMEXs**, and the planning of suitable training activities to align knowledge levels among all the actors involved (see Step 1.6).
- In some contexts, **understanding the 'sphere of influence'** that certain stakeholders can have on others is useful. Analysing interactions of cooperation or tension between stakeholders helps identify any operating or communication gaps right from the outset. This information can also be useful in identifying who might encourage the adoption of any changes subsequent to the exercise.

STEP 1.6 RECOGNISING TRAINING NEEDS

ACTIVITIES

The SIMEX is not only an opportunity for testing standard operating procedures (SOPs), early warning systems and response capacity, but also serves as a valuable moment for training and for increasing the system actors' familiarity with these aspects. Pre-exercise training is useful to ensure that players and all participants reach the actual simulation better prepared. To accentuate this aspect, targeted training sessions can be incorporated to go into the details of specific topics, which are selected based on the SIMEX aims and the stakeholders' learning needs.

Training needs may be structured to:

- **Foster greater awareness among system actors** regarding their responsibilities and roles within their operating context.
- **Recap the main operating plans and tools,** ensuring that participants become more familiar with:
 - » The early warning issuance process, clarifying roles and activities in the forecasting, surveillance and monitoring phases.
 - » Early warning bulletins, going into their format, content, dissemination method and update frequency.
 - » Activation/deactivation procedures and organisation at the emergency coordination centres.
 - » Preparedness and emergency plans, highlighting, for instance, the activation mechanisms in the operational phases, and prevention measures linked to the levels of alert in the early warnings and field monitoring.
 - » Communication procedures, including the channels, protocols and technological tools used.
 - » Risk maps and other operating resources available to stakeholders.
- **Train the personnel on specific aspects, such as information management and decision-making based on risk and analysis.**
- **Strengthen stakeholders' capacities regarding simulation exercises in general.**

These training sessions may be held before the SIMEX, to encourage an alignment with the existing plans and protocols before the simulation itself starts. In addition, they can be an opportunity to create a space for initial dialogue, useful to sparking discussion and reflection during the SIMEX implementation phase, with the aim of improving overall system preparedness.

WHO DOES WHAT

During the consultations with the key stakeholders, the team of experts is responsible for assessing whether training sessions should be included during the exercise and to explore what the needs are of all the participants, taking into account the specific SIMEX aims.

The training may be delivered partly by the team of experts and partly by the system stakeholders. This latter group is generally the best placed for illustrating aspects of the specific context of the country where the exercise is conducted.

Therefore, during the planning phase, the SIMEX planning and design team should:

- Assess whether training should be held and who it should target.
- Establish the main topics of interest.
- Identify the persons to deliver the training.

ASPECTS REQUIRING SPECIFIC ATTENTION

Recognising training goals is an activity that should be performed in parallel to establishing the SIMEX goals and identifying the key system stakeholders.

The training may be held one or two days prior to the SIMEX, concurrently to the briefing preceding it (see Step 3.2) or during the preceding weeks. The choice of timeframe depends on several factors, such as available budget, whether participants are available to meet before the actual simulation, and other logistics. In some cases, the SIMEX might be the final phase in a broader training and capacity development path, serving as conclusive consolidation (see Part 1 - Before starting the process: the project proposal phase).

STEP 1.7 CONCEPTUALISATION, AGENDA AND INVITATIONS

ACTIVITIES

The term 'conceptualisation' encompasses the process of summarising all the components presented in the previous steps – which have to be systematically assessed – to clearly outline what will be implemented during the exercise process and how.

Therefore, conceptualisation stands as the overall defining of the SIMEX activity. Specifically, key decisions regarding the following aspects are consolidated during this step:

- **The specific goals** to guide the building of the scenario during the design phase.
- **Risk type and an outline** of the components to simulate in the scenario, including which areas of the country will be involved.
- **The number of actual simulation** days during the exercise.
- **The SIMEX type** chosen based on the specific goals, available resources and all the other factors listed previously.
- **The required figures/roles** for the entire exercise process.
- **The stakeholders to engage** at the different territorial levels.
- **How the SIMEX implementation phase is structured**, which is generally with:
 - » An initial briefing, providing participants with all the necessary information, and potentially delivering pre-exercise training
 - » An implementation phase, where scenarios are simulated and systems and players' responses are tested
 - » A debriefing/hot wash-up, where feedback is collected and the initial results are discussed.
- **SIMEX dates.**
- **The working language/s** and a preliminary assessment of potential translation needs.

Some of these aspects will be defined and developed more thoroughly during the design phase.

Conceptualisation includes drafting a concept note and an outline agenda to be shared with participants, along with an invitation.

The concept note should outline the whole project, the aims and expected outcomes of the SIMEX process, as well as all the above components. Its purpose is to introduce all the process participants to the foundation information, which may evolve into the SIMEX masterplan (see Glossary and Paragraph 2.5) and/or a more detailed concept note.

Further details to add at a later date may include:

- A more detailed scenario description with the various macro-actions planned for the simulation days;
- A table outlining the events to be simulated;
- Logistics information, including precise details of the SIMEX sites and the documents the players must bring;
- Instructions lists for the players.

WHO DOES WHAT

Conceptualisation evolves progressively during the planning phase, through the consultations with the key stakeholders.

The team of experts is responsible for drafting the final concept note, along with an outline agenda. The invitations to participants are usually sent by the local counterpart.

ASPECTS REQUIRING SPECIFIC ATTENTION

Conceptualisation must take into account all the previously detailed steps while never losing track of available resources, available timescale, operational feasibility, and the specific SIMEX goals.

- **The concept note is a dynamic tool** useful to getting SIMEX design underway, and it evolves as the project progresses.
- Some more practical components (such as working language) underpin and/or are influenced by the choice of tools to be used during the implementation phase (see Step 2.3), and should be established as early on as possible.
- If applicable, translating is useful not only in briefing and debriefing, but also throughout the simulation itself if adequate tools or skills to facilitate communication between the players or the local experts are absent.

1.8 CHECKLIST – PLANNING

The checklist steps and activities do not necessarily have to be carried out in a strictly chronological order but may be focused on in parallel. It should be noted that this checklist is not an exhaustive compilation of all the aspects requiring specific attention, but those listed are nonetheless described in more detail in the single paragraphs of the steps. The checklist in Table 4 may also be supplemented with further operational information, such as specifying the persons, departments or agencies responsible for the activities, any deadlines, explanatory notes, or other details useful to managing and monitoring the process.

THE PHASE 1 CHECKLIST IS ON PAGES 30-31



1.9 KEY DOCUMENTS PRODUCED DURING THE PLANNING PHASE

Documents to be shared with all participants:

- Concept note and outline agenda, including information on training when necessary;
- Invitations.

Support documents:

- Timeline, to be included in draft form in the concept note;
- Budget, to be used in designing specific SIMEX components;
- Mapping of stakeholders, for use during design, definition of training needs, etc.;
- Outline training agenda, to be honed at the end of the design phase and to include in the consolidated SIMEX agenda.

Please refer to the tools listed in some of the most widely used handbooks (e.g. CADRIM and IFRC 2013; IASC 2012; TWGAA 2025; WHO 2017) for templates and resources useful to developing these documents.

STEP	SUB-STEP	ACTIVITY	CHECK-BOX	
STEP 1.1 CONSULTATIONS & ESTABLISHING GOALS AND SIMEX TYPE	Start of consultations	Determine the project focal point of the country where the SIMEX process happens	<input type="checkbox"/>	
		Share an overview of the exercise methodology (framework for defining goals, phases, triggers, timelines), terminology and roles	<input type="checkbox"/>	
		Form the SIMEX planning and design team and define each member's role	<input type="checkbox"/>	
		Establish a calendar for the consultation meetings	<input type="checkbox"/>	
		Prepare agenda for meetings and proceedings	<input type="checkbox"/>	
		Defining the essential components of the SIMEX process during the consultations	Establish the overall goals	<input type="checkbox"/>
		Understand the country's priorities	<input type="checkbox"/>	
		Define the specific goals	<input type="checkbox"/>	
		Identify the territorial and institutional levels to involve	<input type="checkbox"/>	
		Determine the type of SIMEX to conduct	<input type="checkbox"/>	
		Identify the hazard or multi-hazard types to be tested	<input type="checkbox"/>	
		Check compatibility with human, financial and technical resources	<input type="checkbox"/>	
	STEP 1.2 BUDGET & RESOURCES	Evaluating resources and budget, and checking coverage of expenditure items	Evaluate the resources and budget required for the chosen SIMEX type	<input type="checkbox"/>
			Gap analysis: check available resources and budget against the necessary ones	<input type="checkbox"/>
Identify solutions to obtain additional resources and budget			<input type="checkbox"/>	
Check coverage for staff and other personnel costs:				
Experts			<input type="checkbox"/>	
Administration personnel				
Local experts, if required				
External evaluators, if required				
Check coverage for any necessary service contracts:				
Catering				
Room hire			<input type="checkbox"/>	
Interpreting				
Translation of documents				
Travel within the country				
Check coverage for supplies and materials (any badges, certificates, vests, etc.)	<input type="checkbox"/>			
Check coverage for:				
Travel expenses for team of experts	<input type="checkbox"/>			
Travel expenses for external experts, if required				
Per-diem expenses for team of experts				
Check coverage for:				
Expenses for local participants' travel to the exercise site, if pertinent	<input type="checkbox"/>			
Local participants' per-diem expenses				
STEP 1.3 TIMELINE	Defining the timeline for the entire SIMEX process	Create a Gantt chart with activities to complete and milestones for the planning, design, implementation and follow-up phases	<input type="checkbox"/>	
		Establish frequency of timeline updates	<input type="checkbox"/>	

STEP	SUB-STEP	ACTIVITY	CHECK-BOX
STEP 1.4 SIMEX TEAMS, FIGURES & ROLES	Planning and Design team	Consolidate planning and design team	<input type="checkbox"/>
		EXCON team	Define this team's role within the process Specify team composition/list members
	Facilitation team	Assess whether to include this role/team	<input type="checkbox"/>
		Define this team's role within the process	<input type="checkbox"/>
		Specify team composition/list members	<input type="checkbox"/>
	Evaluation team	Assess whether to include this role/team'	<input type="checkbox"/>
		Define this team's role within the process	<input type="checkbox"/>
		Specify team composition/list members	<input type="checkbox"/>
	Observation team	Assess whether to include this role/team'	<input type="checkbox"/>
		Define this team's role within the process	<input type="checkbox"/>
		Specify team composition/list members	<input type="checkbox"/>
	Players	Assess how many in number and which sector and geographical area they come from	<input type="checkbox"/>
	Any support role/s required	Assess whether to include the role'	<input type="checkbox"/>
		Define its role within the process	<input type="checkbox"/>
Specify composition/list members		<input type="checkbox"/>	
STEP 1.5 STAKEHOLDER ANALYSIS	Stakeholder analysis to reconstruct the institutional framework of the system to be tested	Map actors, roles/responsibilities, flows/early warnings, plans and procedures at the different territorial levels	<input type="checkbox"/>
		Stakeholder analysis to identify the stakeholders to engage in the entire process.	Establish the actors to involve in the various phases Assess familiarity with systems and SIMEXs
	STEP 1.6 RECOGNISING TRAINING NEEDS	Evaluating the need to deliver training	Recognise a need for training, if any Identify targets for training Map the main topics of interest
	Evaluating how to conduct the training	Assess methods for delivering training Identify speakers and trainers Establish an outline agenda	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
STEP 1.7 CONCEPTUALISATION, AGENDA & INVITATIONS	Consolidating crucial decisions regarding:	Specific goals	
		SIMEX type	<input type="checkbox"/>
		Teams/roles in the entire exercise process	
		Stakeholders to involve	
		Outline scenario (risk type, number of days of actual simulation)	<input type="checkbox"/>
		Framework of the SIMEX implementation phase	<input type="checkbox"/>
		SIMEX dates	<input type="checkbox"/>
	Language to be used	<input type="checkbox"/>	
	Possible need for translation		
	Preparation of documents	Concept note	<input type="checkbox"/>
Outline agenda		<input type="checkbox"/>	
Invitations		<input type="checkbox"/>	

Table 4: Phase 1 Checklist – Planning

PHASE 2: DESIGN

STEP 2.1 DEFINING THE SCENARIO

The SIMEX scenario is the main element that the steps of the simulation are developed around. Similarly to when making a film or staging a theatre production, the scenario is the 'outline script', the storyline for the action – in our case the SIMEX action.

ACTIVITIES

The SIMEX scenario is the backbone to the simulation itself since it stands as the foundations that all the activities and interactions between the players are developed on (NATO 2013; UCPM 2024; World Bank 2025). **It may be fictitious yet plausible, or based on events that actually happened.** In any case, the term 'simulation exercise scenario' refers to the set of technical, operational and scientific information emerging for a specific geographical place/area over a specific time (what can essentially be called an event). It is used to simulate a realistic event or series of events, creating a setting where players' operating, decision-making or coordination capabilities can be tested/improved, depending on the SIMEX goals (Moats, Chermack, and Dooley 2008).

Once the risk (or multi-risk) type to test and the overall aims and specific goals have been identified during the planning phase, the building of the scenario necessarily follows three steps aimed at constructing the event to be as realistic as possible:

1. **Identifying a past event** that actually occurred or one that could potentially occur
2. **Collecting all the information** useful to creating or reproducing the identified event
3. **Describing the scenario** within the SIMEX masterplan

Regards identifying a past event that actually occurred or one that could potentially occur, the key stakeholders should be involved in deciding which reference events will be the framework for testing the activities related to the SIMEX goals.

In particular, in the case of hydrogeological and flood risk scenarios, the parties with the most thorough knowledge of past events or potential future ones are the operative, monitoring and forecasting centres, and, for the forcing components, generally the hydro-meteorological institutes. Instead, for aspects related to effects on the ground and impacts in general, information can be obtained from civil protection authorities and other disaster risk management entities.

Systematic collection of all the information useful to creating or reproducing the identified event is crucial in building the scenario. In general, related to the hazards, this second step may comprise:

- **Representing event magnitude**, and *by way of example*
 - » For flood risk: shown through ground impacts by means of rain and/or river gauges, or through indirect measuring instruments such as radar.
 - » For wildfire risk and wildland urban interface area (WUI) risk: shown through parameters regarding wind speed and direction, or litter fuel moisture.
 - » For seismic, volcanic and tsunami risk: shown through images of damage caused or through maps of ground shaking or run-up tremor data.
- **Describing the response by the physical system over time**, and *by way of example*
 - » For hydrological and flood risks, it could be useful to illustrate the evolution of return periods for the river network.
 - » For seismic risk, it may be useful to show graphs of building shake or seismograms.
 - » For wildfire and WUI risk, weather conditions both prior to and during the fire could be shown.
- **Identifying critical situations in forecasting and monitoring terms**, through tools such as early warnings, notifications and threshold exceedance, where applicable regarding risks.
- **Identifying possible impacts**, providing a description of damages – preferably progressively – as well as geographical extent, type, number of victims/missing persons, activation of the civil protection system, any necessary evacuations, etc.

The third and last step in defining scenario is describing the scenario within the SIMEX masterplan. This part should 'tell the story' of the scenario through the evolution of events over time and space, including graphs and diagrams as well as maps of hazard level or damage, which are all useful to understanding which risk and impact situations should be simulated during the exercise.

WHO DOES WHAT

Given the above, it becomes clear that those building the scenario must possess not only technical and scientific expertise regarding the specific risk or multi-risk (e.g. weather-related, hydrological, flooding) but also civil protection competencies. The planning and design team may also call in external experts to define certain aspects of the scenario. *For instance*, the team might ideally include:

- 1 technical expert in risk and EWS from the country in question (e.g. an expert in weather and/or hydrological forecasting and monitoring would be advisable in the case of hydrogeological and flood risk);
- 1 civil protection representative;
- 1 member of the team of experts.

ASPECTS REQUIRING SPECIFIC ATTENTION

Scenario should be aligned with the test goals. When defining the scenario, the team should never forget that its purpose is to achieve the established goals. Therefore, careful attention should be focused on ensuring that scenario outputs are consistent with the goals to be reached. In some cases, certain scenario components should be highlighted so as to test those actions enabling the goals to be reached. *Some examples* are provided in Table 5.

Goal	Main scenario component
To test communication flows	The scenario should include information on the communication needs between civil protection authorities and the general population, or between civil protection authorities at different territorial levels (e.g. national vs. sub-regional), or between offices of the same civil protection agency (e.g. weather service and operations room).
To test plan activation	The scenario should include information useful to the activation of plans. For instance, if evacuation plan procedures for healthcare facilities require testing, information on the flooding of those premises could be included in the scenario.
To test coordination procedures	A worsening of adverse events (e.g. fire spreading rapidly in WUI areas or a sudden rise in river levels) may be the trigger to activate coordination mechanisms, so this type of component should be included.
Subsidiarity	A scenario that includes an escalation in event severity and geographical extent should be designed, to prompt the testing of response systems at the different territorial levels (from local to national).

Table 5: Examples of components to include in the scenario based on the goals tested for

Realistic scenario but compressed in terms of SIMEX content and duration. In many cases, simulation exercises are – depending on their type – conducted to a much shorter timeframe than real-world events. This is why various scenario components are compressed in terms of SIMEX timescale, often to the detriment of event realism. *For instance*, in the case of flood risk, if it might take

4 or 5 hours for water levels to reach the successive alert threshold (e.g. transition from Level 1 to Level 2) in a real event, for simulation reasons this time period might be compressed to just 1 hour. This aspect should be clearly underlined, especially when exercise stakeholders and participants come from different civil protection sectors and are involved in EW procedures.

Another important factor is managing to simulate events that would typically occur in 24-48 hours within a 6-to-12-hour exercise window (i.e. a single working day). In many cases, it becomes necessary to introduce time leaps and/or artificial accelerations that would be unlikely in real conditions, but that are useful to reaching the established goals in the SIMEX context.

A further key aspect is **clear definition of the time** of year (specific month), the day of the week (work day, weekend or public holiday) and the time of day (day/afternoon or night) that is to be simulated. In fact, these time parameters significantly condition vulnerability and the type of simulated event as well as the players' subsequent responses.

Lack/scarcity of data and tools: how to build a physical scenario with little/no data. Sometimes building an event using real data is not feasible since data and monitoring tools may be scarce or inexistent in some cases. This is why, for the purposes of creating a realistic physical scenario, it might be useful to base construction on comparison with nearby geographical contexts that are similar in event type and response or, where possible, to analyse the area on the basis of the available global or pan-regional datasets and then downscale to tailor them to the area of interest.

Maturity of the EWS/civil protection system. In some projects, the SIMEX might be conducted in contexts where the EWS or civil protection system shows a low level of maturity. In this case, developing a leaner and less complex scenario – where goal achievement is nevertheless feasible – is advisable. Similarly, using the SIMEX itself as a tool for evaluating the 'state of the art' and for highlighting any need to upgrade the system in terms of tools, practices, materials and/or improvement of operational capacity is also recommended. In this case, it is particularly important to connect the simulation itself with training and capacity-development processes, potentially using the SIMEX before and after the training sessions as a vehicle for feedback. Conversely, an adequately complex scenario should be developed in the context of a mature EWS/civil protection system.

STEP 2.2 INJECTS

ACTIVITIES

Once the simulation exercise scenario has been developed, the planning and design team should focus on drafting the timing and sequence of injects that the team responsible for exercise control (EXCON) will send to participants during the SIMEX. Whether it be a field exercise or a TTX, the players must receive injects that will in turn prompt activation of, or no activation of, subsequent actions during the simulation.

The two key support tools for this activity are:

- the **MEL - main events list**
- the **MIL - main injects list** (as defined by UCPM).

Taking the scenario as the operating setting, the MEL-MIL builds the *SIMEX storyline designed to trigger certain decisions and activities* (Federal Office of Civil Protection and Disaster Assistance 2011; NATO 2023) by the players, based on the SIMEX goals. The choice of which components to include in the MEL-MIL is closely connected with which SIMEX goals are to be met.

To better illustrate this concept, **some examples** are provided below:

- If the goal is to understand how communication to the public works during an early warning or an ongoing event, the EXCON should establish injects in which members of the public ask for information or journalists ask for press briefings to obtain official statements.
- If the goal is to understand the operational capability of the evaluation or technical units, the EXCON might introduce multiple injects regarding damage related to flooding, such as roads subsiding or retaining walls collapsing near infrastructure.
- If the goal is to understand how well the territorial monitoring mechanisms work, the EXCON might focus on, **for instance**, reaching or exceeding water and rainfall thresholds.

The injects are grouped within the MEL in relation to a specific exercise topic or activity to be tested. Table 6 shows an example of a MEL.

Event ID	Activity	Description	Inject no.
E.1	Communication related to forecasting, monitoring and surveillance	This category includes all the injects regarding forecasting and monitoring by authorities and agencies	9
E.2	Communication related to schools and the schools protocol	This category includes all the injects regarding the schools sector: reports of flooding, critical situations, the start and conclusion of the schools protocol activation	14
E.3	Communication with authorities and agencies	This category includes all the injects regarding the information flow between authorities and the operations agencies supporting the emergency operations centres	19
E.4	Communication related to effects on the ground	This category includes all the injects regarding impacts and effects on the ground reported by the public and operations agencies	16
E.5	Communication with the press and managing information to the public	This category includes all the injects regarding information to the public and requests from the press	4

Table 6: Example of event categories used for grouping events

The MEL contents are included in the MIL and expanded. Figure 2 shows an example of a MEL-MIL. Specifically, each inject must be accompanied by certain related information that helps facilitate and support the EXCON's work during the implementation phase. Some of these elements are listed below:

- **EVENT ID.** This is identified from the MEL.
- **NO.** This is the inject consecutive number.
- **REAL DAY AND TIME.** This is needed for a clear idea of the timing and sequence of inject delivery.
- **SIMULATED DAY AND TIME.** These could differ from the real day and time.
- **COMMUNICATION CHANNEL.** To specify which means is used to share the inject.
- **INJECT SENDER.** This names the inject sender, whether real or simulated by the EXCON.
- **INJECT RECIPIENT.** Specifying who the inject is addressed to is necessary.

- **CONTACT.** Email address/ telephone number/ specific person to send the inject to.
- **CRITICAL SITUATION TITLE and DESCRIPTION.** To frame and clearly identify the type of critical situation described in the inject.
- **LINKS TO SPECIFIC DOCUMENT.** Ad-hoc supporting documents may need to be drafted in advance as injects; these might be bulletins, reports describing damage, press articles, etc.
- **ACTIONS EXPECTED FROM OPERATIONS CENTRES OR RECIPIENTS IN GENERAL.** Based on the system knowledge acquired and on any plans/procedures to be tested, identifying the actions expected in response to a specific inject can be useful.
- **SENT.** This keeps track of what has actually been sent and what has not
- **NOTES.** For any additional remarks.

ID	N°	DAY	TIME	SENDER	RECIPIENT	CONTACT	CRITICAL SITUATION TITLE	DESCRIPTION	LINK TO SPECIFIC DOCUMENTS	ACTIONS EXPECTED FROM MUNICIPAL OPERATIONS CENTRE	SENT
E.2	E.2.6	27/04/2023	10:45	EXCON - CIMA	Local Police	polizia.municipale@comune.savona.it	Flooding	Carabinieri forces on patrol report to the MOC that the gardens at the 'Le Piramidi' complex are flooded	Email text: please be advised that the gardens at the 'Le Piramidi' complex are flooded	Technical unit asks volunteers service to send a team to the affected area	YES
E.4	E.4.10	27/04/2023	10:55	The public, by EXCON	Local Police	polizia.municipale@comune.savona.it	Flooding	Various calls from the public to report several instances of flooding near the Madonna del Monte Sanctuary and to report the presence of mud and debris on the road	Email text: please be advised that several instances of flooding are occurring in the Sanctuary area	Technical unit organises a survey to: understand the quantity of material; identify a temporary storage area for the mud/debris; work with the coordination unit to prepare an order authorising use of the designated area for temporary storage; draft and send notification to the authorities; contact an earth-moving company for the removal and transportation operations.	YES
E.4	E.4.11	27/04/2023	10:55	EXCON - CIMA	Mayor	polizia.municipale@comune.savona.it	Flooding	Various calls from the public to report several instances of flooding near the Madonna del Monte Sanctuary	Email text: please be advised that several instances of flooding are occurring in the Sanctuary area		NO
E.3	E.3.8	27/04/2023	11:00	EXCON - CIMA	Municipal Operations Centre	polizia.municipale@comune.savona.it	Activation of Emergency Coordination Centre (ECC)	The Prefecture of Savona announces ECC activation	ECC Activation_27042023		YES

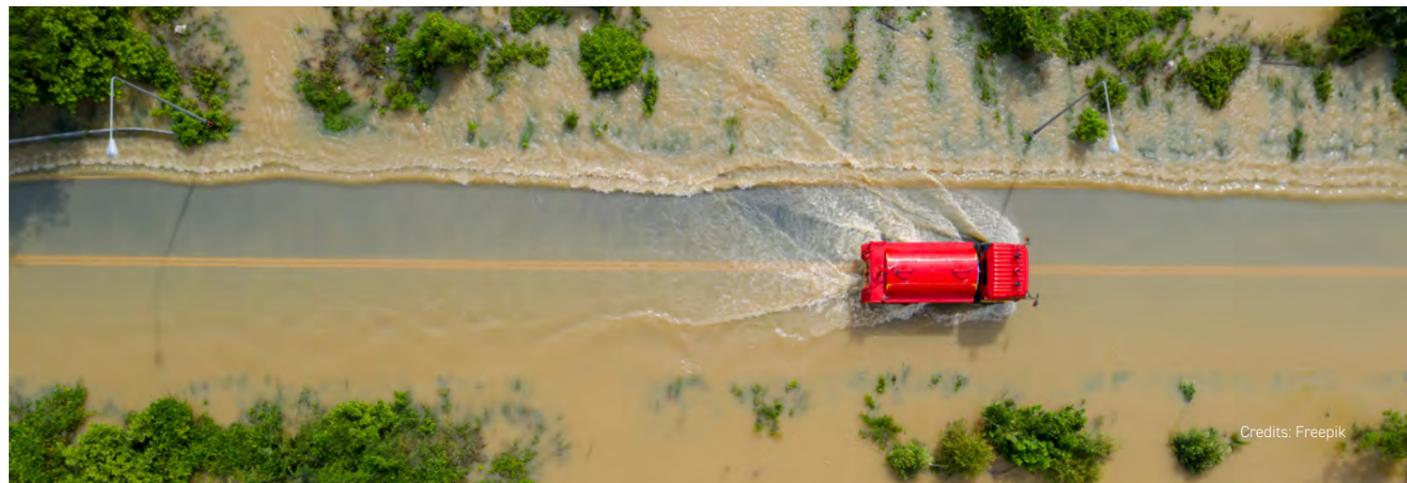
Figure 2: Example of a MEL-MIL

ASPECTS REQUIRING SPECIFIC ATTENTION

- The choice of which components to include in the MEL-MIL is closely connected with which goal/s the SIMEX aims to achieve.
- In many cases, drafting a set of **'reserve' injects** or being ready to create injects 'on the go' can be useful.
- When constructing injects, not only technical/scientific knowledge – about hydrology and flooding, **for instance** – is necessary, but so is more operational or sectorial know-how, in order to prompt the players in the right way and with the right timing. Therefore, it may be necessary during this phase to expand the group of experts by adding human resources from operations agencies or with operative experience at emergency coordination centres, or sector-specific experts.
- In order to generate the most appropriate injects, it is advisable to also conduct assessment of damage and issues resulting from past events, or analysis of the potential damage and issues that the simulated event might cause, also based on existing risk and hazard maps and preparedness and emergency planning tools. **The more realistic the injects** – complete with precise locations and detailed information – **the more effectively the players will**

be able to simulate their responses.

- For an effective and system-wide SIMEX, it is necessary to plan injects – also specific ones – that **directly or indirectly involve all the relative players/functions**, basing this planning on system knowledge to reconstruct potential expected responses to that specific inject.
- Should injects need to be translated into another language, they must be ready far enough in advance to allow the time for their translation.



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STEP 2.3 LOGISTICS, TOOLS, EQUIPMENT, DOCUMENTS AND MATERIALS

As far as logistics, tools, equipment, documents and materials are concerned, everything needed to make the exercise run efficiently and in a favourable context should be carefully planned and designed. This aspect includes considerations regarding spaces and equipment, catering, appropriate simulation tools, participant recognisability, and the documents and material available to players. The total number of participants and how these will be grouped and distributed needs to be established during this step.

ACTIVITIES

2.3.1 Spaces, equipment and catering

Whether the exercise in question is a DBX, a TTX or a CPX, the spaces where the exercise activities will take place must be:

- **Suitable** to accommodating all the participants
- **Spacious** enough to accommodate discussion sessions before, after or during the SIMEX
- **Accessible** to all those involved
- **Equipped** with the necessary items such as printers, paper, etc.
- **Safe** for all participants and easily accessible in logistical terms

- Properly equipped to ensure Internet network redundancy
- Fitted with adequate power outlets for computers, projectors and video conferencing systems to support any necessary remote connections (for SIMEXs at multi-territory level and simulations at separate sites)
- Checked to verify they offer adequate space for a translating booth, if simultaneous translation is required.

It is advisable in the case of certain exercise types – such as a more complex TTX or a CPX – to have at least two rooms, one being for the SIMEX activities and the other for the EXCON's duties.

The SIMEX activities may be carried out in **real emergency coordination centres and/or operations rooms or in devised settings** such as

conference centres or halls. It should be noted that in the former case, systems and infrastructure will probably already be operational from a logistics standpoint, while in the latter the whole environment must be created from scratch, meaning that the layout and fitting out of the settings must be specially conceived and/or designed. In the specific case of CPX simulations, using the premises of actual coordination and operations centres is recommended.

Regards **catering**, an on-site service should be identified during the design phase, and operational details such as number and type of meals, distribution method and designated eating areas should be provided. All participants' specific dietary requirements must be gathered in advance and flexible solutions – such as lunchboxes or extended coffee breaks – should be included to adapt to SIMEX logistics.

2.3.2 Tools available to the EXCON and the players

The tools available to participants (EXCON, players and other teams) during the exercise is another important aspect, and these include:

1. the **tools used by the EXCON** to communicate with players to send the injects and receive responses;

2. the **management tools** deployed to keep track of performed actions (logbook, DSS etc.);
3. the **communication channels** that players may use to interact with each other.

Generally, the **EXCON's tools** vary and become progressively more complex in relation to SIMEX type and number of participants:

- The tool most commonly used for communicating with participants is undoubtedly email, containing the inject text. In some cases, **emails** can be scheduled to be sent automatically at specific times or precise moments of the exercise.
- Another useful communication method is use of **telephone lines**. More specifically, since the EXCON has all the contact details, it could set up a group of operators to call the SIMEX actors to prompt their response, to recreate a context similar to real events in an emergency coordination centre.
- In other cases, the EXCON might decide to use simple sheets of **paper** printed with the injects or, in the case of injects regarding all the players, the inject text could be **projected on a screen**. This latter solution is preferable in the case of a DBX, to foster discussion between all the players while they follow their own as well as other participants' actions and activities step by step.
- The EXCON might also make use of a **virtual environment**, as can be built using Looker Studio, as put in place and tested in various exercises developed by the Italian Red Cross. Linking the MEL-MIL and the observation forms (see Steps 2.4 and 3.4), created in Google Sheet and Form, Looker Studio can be used to generate real-time data reporting: as the players gradually respond to the injects or the observers gradually send their assessments, this information is displayed live, is stored, and is also immediately ready for generating statistics and reports. Hence, this tool can be very useful in EXCON's management and during hot-wash debriefings or subsequent evaluation activities.

Various options are also available regarding **management tools** deployed to track actions. In this case, the tools used by the players should be the

same they use or would use – if these exist – in the event of early warning and emergency. Nonetheless, there is no reason why a different tool should not be used, if so wished, during the SIMEX in order to test its efficiency and effectiveness in managing a possible early warning or emergency. In this case, it is essential for the players to be introduced to and familiar with the tool before the actual simulation.

It may be beneficial to all participants or to the EXCON alone – depending on exercise type – to set up a board displaying the SIMEX information and activities or to set up a paper or digital logbook (e.g. Google Sheet) where the injects and players' responses can be tracked.

Lastly, there are many **communication channels** that the players can use to communicate with each other, and these **depend on SIMEX type, participants' previous experience and the specific aims of the exercise itself**. For a CPX, *for instance*, utilising the tools generally deployed by the system actors (email, messaging apps, radio, etc.) is useful, or, when the purpose is to observe interaction between two different territorial levels, a video conferencing system is a common tool.

2.3.3 Participant recognisability

Another important aspect is the ease with which participants can be recognised, *for instance* to distinguish between players and observers. To this end, various devices maybe used for role differentiation, and these range from badges through to colour-coded vests to indicate a certain SIMEX role (Figure 3).

Whether the exercise takes place in an emergency coordination centre or a room hosting such activities, it is fundamental to know where and who the players are while they represent the specific sectors of action.



Figure 3: Vests and badges for participant recognisability during the EUROMODEX exercise, UCPM.

2.3.4 Documents, material and tools available to players

During SIMEX design, besides specifying communication channels, inject receipt and response mechanisms, and the sites for the simulation, it is also essential to understand and review which **documents players could and should consult and activate during the SIMEX**.

A *non-exhaustive list* includes:

- preparedness and emergency plans
- standard operating procedures (SOPs)
- maps and cartographic material
- forms and templates
- geographical information systems (GIS).

Availability of these items depends not only on their actual existence (*for instance*, a preparedness and emergency plan may not have been developed in some cases, or maps and cartographic material might

be missing), but also on the SIMEX goals and type. *For example*, if the goal is to observe the process of generating and issuing an early warning using tools developed within the project, those tools must be available and the players must already be familiar with them before the simulation starts (see the PPRD East 3 case study, Paragraph 5.2.2). In contrast, the use of geographical information systems might *for instance* be 'simulated' during a CPX, while a DBX might rely on maps and cartographic material alone as support in discussion on specific decisions.

Analysis of the available documents is based on a preliminary review of procedures, plans and tools, which is carried out to complement stakeholder mapping and analysis. Nonetheless, their use during the simulation may be actively encouraged and prompted also in relation to the specific SIMEX goals.

Another crucial document that should be drafted is a **set of instructions**. During this stage of design, a more detailed document can be developed, containing instructions to the players. This document will complement the concept note, explaining the simulation rules, the tools that will be used, and the documents and material it would be useful to have during the exercise.

In this regard, the concept note may be drafted in either a concise or a more detailed form, even becoming a fully-fledged SIMEX masterplan. This document should clearly set out all the aspects established during the planning and design phases, including, *for instance*, the SIMEX aims, the SOPs, an outline description of the scenario and all the components of the observation and evaluation plan.

WHO DOES WHAT

Table 7 provides a checklist with the tools and equipment that should be prepared beforehand for use during the simulation, along with who is in charge of preparing these items.

Regarding tools, in some cases – and for management purposes – it might be useful to establish whether the players are using the same tools they would use during the different phases of operations. It is therefore clear that some of these tools could be brought by the players themselves or supplied by the SIMEX team.

Category	Specific component	Who
Spaces and sites	Accessibility Safety Space size PC workstations Video projector Video conferencing system Internet connection Water, coffee and food	Team of experts + service providers and/or local counterpart
Participant recognisability	Desk nameplates, badges or jackets/vests for the various roles	Team of experts + local counterpart
Documents and material available to players	Maps Plans, etc.	Players, key stakeholders
Other documents and materials	Instructions Forms and templates Diplomas/certificates Logbook, if used Board (also digital) for tracking response action or information	Team of experts + local counterpart
Tools for participants	Communication with the press and managing information to the public	Team of experts + local counterpart
Tools and material available to players	Radio station (depending on SIMEX type) Printed maps and/or plans (depending on SIMEX type)	Team of experts + local counterpart
Other	SIMEX participation mementos	Team of experts

Table 7: Checklist of the tools and equipment to be prepared before a simulation exercise

ASPECTS REQUIRING SPECIFIC ATTENTION

Regarding spaces/sites

- A command-post exercise (CPX) takes place at multiple sites, since the players may remain at their workstations/offices. It is necessary in this case to ensure that the tools chosen for the simulation itself and its artificial features (e.g. virtual EXCON meetings, phone calls) are compatible with the spaces, tools and equipment available to the players in their offices.
- When **multiple territorial levels** are involved, more than one simulation space should be set up. Alternatively, separate simulation workstations can be arranged, distanced from one another so as to mirror the different ‘command posts’ or ‘coordination centres’ and, consequently, the implementation of actions at distinct sites.
- When participants are geographically spread between different sites, **transfers** need to be carefully planned. The same applies to moments of group discussion and sharing, such as initial briefings and workshops or the hot wash-up at SIMEX end.

Regarding meals:

- When organising meal provision, solutions that disrupt the simulation flow as little as possible should be adopted. *For instance*, distributing lunchboxes enables participants to independently decide when and where to eat their meal without having to suspend the simulation at a specific time. Open coffee breaks also allow the same flexibility. These choices also directly influence the implementation schedule.
- For SIMEXs held at multiple sites, the catering service must be coordinated for each site. In the case of a DBX, catering may also be arranged in a more conventional format.
- All participants’ specific dietary requirements should be collected in advance.

Regarding tools to use:

- The choice of the EXCON tools, communication channels and management tools has a significant impact not only on the simulation itself, but also on other practical decisions, such as the need for translation services, the fitting out of virtual

environments, etc. Therefore, this aspect should be carefully discussed, considering all the participants’ technical capabilities, the SIMEX goals and also the means available to the team.

- Regardless of which tool the EXCON is using, it is absolutely essential that **all information and documents exchanged explicitly specify, clearly and visibly, that they relate to a simulation exercise** (e.g. include SIMULATION EXERCISE - SIMULATION EXERCISE in every email or document) *For instance*, during a SIMEX in the Seychelles (see the case study file in Paragraph 5.3), the use of a messaging app was avoided for fear that the message content could be forwarded externally, and potentially trigger a false alarm or fake news regarding the area.
- The **decisions taken regarding tool choice must be communicated to all participants before the exercise**, and instructions should be drafted when these tools introduce artificialities that need to be explained in advance.
- It is important to understand how participants usually take part in SIMEXs, and to assess whether similar tools could be used. Failure to follow this recommendation could give rise to **rejection of or resistance** to the use of more innovative or different tools.
- Planning to have **back up tools** is advisable, in the event of the malfunctioning of or problems with the main tools during the simulation.
- The information the EXCON sends to the players may range from a photo to a simple piece of text through to presentations or mock documents. To foster SIMEX realism, the EXCON should prepare in advance the documents and material to send to the actors. This activity means the EXCON will gather information with the aim of understanding how authorities and agencies communicate with each other during an event or an early warning, and what they communicate. This activity allows the creation of injects that mirror real-world events as closely as possible.

Regarding documents and material:

- A review of the documents, procedures, plans and tools that are commonly used by the stakeholders enables not only the construction of realistic

scenarios but also clearer analysis of the players' responses. Providing instructions may encourage the use and consultation of these documents, prompting reflection on the effectiveness of the available documents.

- The instructions can be gradually compiled as the design phase moves forward. Nonetheless, they should be supplied to players (as well as to all participants) before the simulation exercise starts (see Step 3.1), and discussed during the briefing (see Step 3.2).



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STEP 2.4 OBSERVATION AND EVALUATION PLAN

ACTIVITIES

As reported by UNDRR (2020), the observation and evaluation process is a **key element that makes the entire exercise process a valuable learning experience**. It is therefore crucial to identify right from the outset how the SIMEX will be monitored and evaluated during the entire exercise process, and to establish an observation and evaluation plan as a guide for SIMEX aims and expected outcomes. In general, this activity lays the foundations for identifying (i) what worked well and best practices, (ii) any critical issues, gaps and areas for improvement, and (iii) recommendations (see Phase 4).

There is no single and universally shared method for this step (MSB 2011; Beerens and Tehler 2016; UCP Knowledge Network 2022; Schütte and Bach 2024), and observation and evaluation methods depend greatly on the choices made by the SIMEX planning and design team. Nonetheless, different approaches and purposes can be identified – again linked to the goals to be met – and these also depend on the available resources.

With regard to the object of the observation and evaluation process, it should be noted that:

- **Evaluation** generally runs throughout the entire SIMEX process, giving equal importance to all the phases, and therefore evaluators participate **in all the phases**, including planning and design. Thus the aim is to identify areas for improvement and the strengths of each phase (see *for instance* the case study of the IPA FF programme SIMEX, Paragraph 5.1).
- **Observation** focuses only on the implementation phase, and specifically on **analysis/assessment** of the technical aspects, with observers who only take part in the **actual simulation**. Its primary aim is to identify areas for improvement and strengths exclusively in relation to the simulation (see *for example* the case study of the IOC project SIMEX, Paragraph 5.3).

In both cases, the organisational aspect of the SIMEX remains the object of reflection and evaluation.

This step may vary based on a variety of factors, such as the roles involved in the process (e.g. a separate team of observers and evaluators, or the inclusion or absence of a facilitation team), and the **evaluation/observation techniques and the analysis applied**.

Regarding this last point, the focus may be solely on the outcome of the players' responses (whether an activity was performed and with what degree of difficulty) or also on how the outcome is reached in comparison with previously provided training solutions (whether the players are able to remember, understand, apply or elaborate previously acquired knowledge). The ways of expressing the evaluation can also vary, from a quantity-based approach deploying a gradual scale (from absent to present, from done badly to done well) to a quality-based one. These features contribute to significant variability between the methods and approaches adopted.

In general, the designing of the observation and evaluation process includes **identification of the components to be observed/evaluated and their relative indicators, as well as the formulating of questions** that the observation and evaluation process should answer, based on the overall aims and specific goals of the exercise (Thorstensson et al. 2001; Abrahamsson, Hassel, and Tehler 2010; Laurila-Pant et al. 2023). *For instance*, if the aim is to test an early warning system, the technical processes to be observed/monitored might be: issuing early warnings, communication flows, applying plans and procedures, etc.

Table 8 shows *some examples* derived from case studies, which are also described in PART 2 of these guidelines, and from the handbook on exercise evaluation developed by the Swedish Civil Contingencies Agency (2011).

SIMEX process components:

Planning and implementation process	How was the SIMEX planning and implementation process organised by the various actors responsible for each activity, and how was the SIMEX evaluated? Were the country's SIMEX practices and experiences taken into account? Was all the necessary material prepared and provided during both the planning phase and the simulation itself?
Training, if pertinent	How was the training organised? Were participants' needs assessed? Were the key stakeholders also involved as trainers? Were the core SIMEX topics adequately addressed?
Collaboration between and involvement of all participants	Was there effective collaboration between the different actors involved in the various phases?
Type and structure	Which methodology was chosen for conducting the SIMEX? To what extent did this choice and the exercise structure contribute to achieving the SIMEX goals?

Components regarding technical processes – EW-EA system:

Bulletin issuance and content clarity	Did the issued bulletin contain all the necessary information to activate early actions? Was this information correctly interpreted by the other players? Were the SOPs followed?
...	...

Table 8: Examples of components to observe and evaluate in a SIMEX process and in the technical aspects of an EW-EA system



Credits: Ahoada in Rivers state, Nigeria - Wikimedia Commons

WHO DOES WHAT

The team of experts, together with the stakeholders, establish the make-up of the evaluation and/or observation teams (see also Step 1.4). Depending on the context, these two roles may overlap or may remain distinct, thereby influencing the allocation of tasks during the design and implementation phases.

When the two teams are separate, the evaluation team is generally responsible for establishing the evaluation and/or observation plan – working with the planning and design team – as well as any forms or sheets to be used by the observers in monitoring the SIMEX (see Step 3.4).

When observation is limited to the technical aspects alone, the observers may also be members of the SIMEX planning and design team. However, if the evaluation focuses on all the phases, the two teams must necessarily comprise different figures.

It is nonetheless essential in all cases that all the SIMEX process participants – players included – have the opportunity to provide feedback during the debriefing phase, since this is useful to analysis and to improving the process itself and the various areas of investigation/testing.

ASPECTS REQUIRING SPECIFIC ATTENTION

- The evaluation and observation teams should have **training on methodological evaluation approaches and on the EWS/civil protection system** that is being tested.

- As already underlined in Step 1.4, it is important that the **evaluation and/or observation teams also includes local actors** with knowledge of the EWS/civil protection system to be tested and knowledge of the relative skills and capacities, also regarding specific processes or activities.
- As also reported by UNDRR (2020), some key events are included in the simulation in order to put pressure on specific activities or parts of the plan or procedure to be tested. These events must be known to the team and must be carefully monitored.
- In the case of a CPX where the simulation takes place at various sites, it is important to establish how to group and where to position the members of the evaluation and/or observation teams, so that all the activities are covered.

2.5 CHECKLIST – DESIGN

The checklist steps and activities do not necessarily have to be carried out in a strictly chronological order but may be focused on in parallel. It should be noted that this checklist is not an exhaustive compilation of all the aspects requiring specific attention, but those listed are nonetheless described in more detail in the single paragraphs of the steps. The checklist in Table 9 may also be supplemented with further operational information, such as the specific persons, departments or agencies responsible for the activities, any deadlines, explanatory notes, or other details useful to managing and monitoring the process.

STEP	SUB-STEP	ACTIVITY	CHECK-BOX	
STEP 2.1 DEFINING THE SCENARIO	Identifying and reconstructing the past reference event	Identify the reference event based on the SIMEX goals (geographical extent, magnitude etc.)	<input type="checkbox"/>	
		Collect physical data for event reconstruction (e.g. meteorological, hydrological and soil moisture data, hazard maps)	<input type="checkbox"/>	
		Collect impact data and information (e.g. damage, victims, real timelines)	<input type="checkbox"/>	
		Collect information on early warning and event management (early warnings, communication, activation, decision-making flows etc.)	<input type="checkbox"/>	
	Reproducing/building a realistic event	Analyse and process weather data and other specific data	<input type="checkbox"/>	
		Analyse and process potential impact data	<input type="checkbox"/>	
		Reproduce/reconstruct the EW and response management chain	<input type="checkbox"/>	
	Describing the scenario within the SIMEX masterplan	Build the timeline for developing the scenario of interest (days of simulation, time leaps, differences from real timelines etc.)	<input type="checkbox"/>	
		Prepare text-based description of the scenario (physical evolution, impacts, etc.)	<input type="checkbox"/>	
Prepare maps/graphics-based representations of the scenario		<input type="checkbox"/>		
STEP 2.2 INJECTS	Defining the timing and sequence of events based on the SIMEX goals	Identify the event categories and formulate the MEL (main events list)	<input type="checkbox"/>	
		Identify the event triggers for the players' actions and formulate the MIL (main injects list)	<input type="checkbox"/>	
		Create the MEL-MIL file, expanding the injects with various details (e.g. real and simulated day/time, communication channel, sender, recipient, contacts, title/description, goals, links to material, expected actions, status)	<input type="checkbox"/>	
	Identifying and developing simulation tools	Develop support documents to use as triggers for actions (mock bulletins, notifications, photos, etc.)	<input type="checkbox"/>	
		Define the interaction methods between the EXCON and players to supply the injects and collect responses (analogical and digital tools such as Looker Studio and Google Form)	<input type="checkbox"/>	
		Prepare additional SIMEX supervision tools	<input type="checkbox"/>	
STEP 2.3 LOGISTICS, TOOLS, EQUIPMENT, DOCUMENTS & MATERIALS	Planning of spaces and catering	Identify the SIMEX spaces and sites based on the specific goals and suitability criteria: - seating capacity - accessibility - safety - power outlets, networks and services - video conferencing and projecting systems, if required - presence of a dedicated EXCON room, if required - presence of translation booth/s and equipment, if required	<input type="checkbox"/>	
		Organise participants' groupings and transfers between the various sites (e.g. for a CPX)	<input type="checkbox"/>	
		Organise meals: - identify catering services for on-site meal provision - estimate the number of meals - establish how meals will be provided	<input type="checkbox"/>	
		Establishing the tools available to the participants	Prepare tools for communication between the EXCON, players and other roles: - set up a digital platform, if pertinent - set up dedicated email accounts for the EXCON and players - set up other tools	<input type="checkbox"/>
		Establish management tools for tracking actions (also those performed by players)	<input type="checkbox"/>	
		Identify the channels for communication between players	<input type="checkbox"/>	

STEP	SUB-STEP	ACTIVITY	CHECK-BOX
	Defining the materials for participant recognisability	Create the items for identifying the various participants: - desk nameplates/signage for the various sectors/offices involved in the simulation - badges/vests to identify roles	<input type="checkbox"/>
	Documents, material and tools available to the players	Preliminary review of procedures, plans and tools used by the stakeholders, and that might be tested during the exercise – analysis complementary to the stakeholder analysis	<input type="checkbox"/>
		Review the communication channels used in real cases – analysis complementary to stakeholder analysis	<input type="checkbox"/>
		Establish the list of documents and material potentially present in the simulation	<input type="checkbox"/>
		Draft a set of instructions to the players on the simulation rules and on the documents, material, tools and equipment to be deployed and tested	<input type="checkbox"/>
		Update the concept note or SIMEX masterplan with all the components useful to the simulation (description of scenario and main events, days of actual simulation, etc.)	<input type="checkbox"/>
STEP 2.4 OBSERVATION AND EVALUATION PLAN	Defining the observation and evaluation plan	Define the evaluation and observation approach (process evaluation vs. only simulation observation; the quality/quantity scales)	<input type="checkbox"/>
		Identify the components to be observed / evaluated and their respective indicators	<input type="checkbox"/>
		Identify the figures responsible for evaluation and observation	<input type="checkbox"/>
		Draft the observation and evaluation plan	<input type="checkbox"/>
		Prepare the evaluation and observation forms	<input type="checkbox"/>
	Establishing the observation and evaluation tools	Identify the methods for distributing the forms	<input type="checkbox"/>
		Organising the observers and evaluators	Establish site allocation for observers and evaluators

Table 9: Phase 2 Checklist – Design

2.6 KEY DOCUMENTS PRODUCED DURING THE DESIGN PHASE

It is generally necessary to provide the EXCON, facilitators, evaluators and observers with:

- Scenario and injects (MEL-MIL)
- Evaluation plan
- Evaluation and observation forms

And all participants with:

- Agenda updated with information on SIMEX site and timeline, including
 - » The speeches planned for the briefing phase and any during the training
 - » Time of simulation start and finish, and the presence of any breaks
 - » Debriefing agenda
- Logistics information, including
 - » Presence and type of meal breaks and coffee breaks

- Updated concept note (or SIMEX masterplan) with
 - » Description of the scenario and the main events that will be simulated
 - » Days of simulation
 - » Tools and equipment to be deployed
 - » Documents required from the players
 - » Components that will be evaluated
- Instructions to the players

For templates and resources useful in developing this material, please consult the information on tools and equipment in the general handbooks (e.g. ECDC 2014; IASC 2012; TWGAA 2025; WHO 2017; World Bank 2025), or on the resources developed in specific projects (e.g. Interreg Caraibes et al. 2025; OCHA and CERF 2022) or on testing certain components (ITU 2020). Some technical guides and papers are instead more specific on evaluation (Abrahamsson, Hassel, and Tehler 2010, Andreassen et al. 2024; Beerens, Tehler, and Pelzer 2020; Homeland Security 2020; Swedish Civil Contingencies Agency 2011; UCP Knowledge Network 2022) and scenario building (Moats, Chermack, and Doole 2008).

PHASE 3: IMPLEMENTATION

STEP 3.1 SET-UP AND ADMINISTRATION

ACTIVITIES

Set-up and administration encompass all the practical activities carried out prior to SIMEX implementation, such as organising the layout of the simulation spaces, the review and functional check of the tools and equipment made available to participants, and printing or preparing the required documentation. Some of the components to **check** are:

- The **spaces/sites**: check at least one day before the simulation that these comply with the requirements set out during the design phase. This means verifying, for instance, the presence of power outlets, Internet connectivity, projectors, tables, etc., but also the procedures to access the premises themselves.
- **Layout of the room/s to be used during the simulation**: players are often grouped during TTXs by macro-sector or support function, in keeping with how the real-life system is organised. If not already defined, these groupings must be established before the SIMEX and each room must be set up accordingly (e.g. tables for the support functions). It should be noted that in some cases, activation of specific support functions/operation centres might be the goal of the simulation itself, and therefore flexible space layout might be needed during the course of activities in this case.
- **Documents and other materials**: ensure that all the necessary material is ready (e.g. certificates, sign-in sheets, desk nameplates) or has already been distributed to participants (e.g. instructions, agendas). Check badges, labels, vests and any other materials required.
- Tools and equipment: check that the **EXCON tools and equipment** and those of all the participants are working and ready for use.
- Interpreting: when present, ensure that **interpreters** are ready, are adequately informed on their role during the SIMEX (including its briefings and debriefings), and have the necessary equipment (microphones, headsets, translation booth when necessary, etc.). Also check they have received the material useful to a clear and accurate translation.

- Catering: check with the catering service that the food and beverages will be provided as established during the design phase.

WHO DOES WHAT

The set-up and administration checks are usually carried out jointly by the team of experts and the local counterpart involved in organising the SIMEX.

The local counterpart plays a fundamental role in organising the rooms and the division into groups since it has a deeper knowledge of the operating context, and sometimes is also responsible for the premises where the simulation will take place.

ASPECTS REQUIRING SPECIFIC ATTENTION

- **Spaces/sites**: as already specified, participants are distributed between various sites in CPXs. Sometimes they are located at government agency offices where access is restricted or subject to security checks. In this case, which EXCON members, facilitators, observers and evaluators will be present at each site should be established in advance. It is also necessary to ensure that the access documents required are prepared and submitted sufficiently in advance.
- **Organisation into groups and communication tools**: organisation into sector, function or administrative-level groups should be conducted carefully, since this directly affects SIMEX progress, the way injects are received and processed within each group, and how communication between the different groups takes place. Regarding this latter point, when different groups are present, associating an email account to each of these might prove useful. In this case, various approaches can be adopted:
 - » **Creation of dedicated email accounts** – set up temporary email accounts for each group, to be assigned before the simulation. Distributed with the instructions, these email addresses enable participants to clearly understand who to communicate with during the simulation.
 - » **Use of contact details** – collect the email address or telephone number of at least one member of each group, and use this for communication. These details may also be collected during the briefing the day before the simulation.

- **Communications and information-sharing:** it should be remembered that any communication sent to or between participants must contain standardised wording that clearly and explicitly specifies that the communication and the information it contains refer to a simulation exercise and not a real case (e.g. include 'SIMULATION EXERCISE - SIMULATION EXERCISE').
- **Internal communication** between the EXCON, facilitators, observers and evaluators: a specified and clear communication channel must exist between those people who manage, facilitate and evaluate the simulation, so that information can be shared/exchanged during the SIMEX, without interfering with the players' activities.
- **Documents and materials:** these include, among other things, the **detailed instructions** to the players, and the forms/sheets to be compiled during observation and evaluation, and also for debriefing. Regarding **certificates**, it may be useful to:
 - » collect participants' correct names on site,
 - » specify in advance the logos and signatures that are to appear on the certificates,
 - » establish certificate distribution method (Printed or hand-delivered? By whom? Or sent via email?).
- **Interpreting:** when present, translating can be provided consecutively or simultaneously for all participants during the briefing and debriefing sessions. During the simulation itself, interpreters may be assigned to support the individual groups of facilitators, evaluators and observers during table-based discussion and to translate feedback, etc.
- **Catering:** adopting solutions that disrupt the simulation flow as little as possible is advisable. These might involve ready-to-eat meals, lunchboxes, open coffee breaks. For SIMEXs held at multiple premises, the catering service must be coordinated for each site, or by distributing lunchboxes. In the case of table-based discussion, the catering may also be arranged in a more conventional format.

STEP 3.2 TRAINING AND BRIEFING

ACTIVITIES

Training and briefing almost always precede the actual simulation itself during the implementation phase.

The **training** delivered during this phase is designed to address the learning needs identified during the planning phase (see Step 1.6). It is structured through a training plan that can be divided into distinct sessions and may draw on different training methods. The SIMEX players are usually all invited to take part in the proposed training activities. These might be **targeted activities**, if oriented to specific goals that emerged during the planning phase, **or may be general, if aimed at an overview of early warning and civil protection mechanisms**.

By way of example, the training activities may cover: how the civil protection system works, how the EWS works, the uncertainty inherent in forecasting severe weather events, activation of the civil protection system (e.g. the system of progressive operational phases, procedures at the emergency operations and coordination centres, the management of and assistance to persons in vulnerable categories), management of communication flows (to the public, and between institutions), activation and management of civil protection volunteering organisations, and coordination with other plans or identified stakeholders (e.g. schools).

The **briefing** is a key moment that may precede the SIMEX by some weeks or just a few hours. Here the **participants are provided with all the information necessary to carrying out their tasks**. Its purpose is to summarise clearly the aims and goals of the exercise, the value of this experience, the roles of the SIMEX figures, and other practical aspects, such as communication methods, the rules to follow, and the available tools. The briefing enables players to also understand that the **simulation environment is safe, and that any mistakes made during the SIMEX will contribute to improving management of future events**.

In practical terms, the briefing consists of an explanatory session covering:

- The goals, an overview (not detailed) of the simulated scenario, and the artificialities included in the SIMEX and the expected outcomes.
- Instructions to players and to facilitators, observers and evaluators.

It may also involve a 'simulation of the simulation' to facilitate all participants in taking part in the SIMEX, to provide a practical demonstration of the tools and working environments prepared for the simulation and to resolve any issues related to their use.

WHO DOES WHAT

The team of experts, along with the focal point and some key stakeholders, sees to organising and delivering the training and the briefing.

Some specific topics, such as the workings of the country's EWS and civil protection system, can be directly addressed by the stakeholders identified during the planning and design phases based on their respective competencies. In addition, in some cases, the team of experts might involve other key civil protection system figures not directly engaged in the SIMEX process to deliver specific training activities, as in the case of a local-level SIMEX. In these situations, contributions may be provided by the competent agencies for generating extreme weather and flood early warnings and bulletins, so as to support the local-level management in defining and applying procedures subsequent to early warning issuance. The briefing activities are performed mainly by the SIMEX planning and design team.

ASPECTS REQUIRING SPECIFIC ATTENTION

During the training:

- Keep the SIMEX goals clear at all times
- Use **training approaches** that combine classroom lectures with practical activities to keep participants engaged
- Assess timelines and budgets for building and delivering the training
- Provide interpretation services where necessary to enable stakeholders who are not proficient in other languages to also take part
- **Include discussion on the training outcomes** during the hot wash-up and debriefing so that these may be incorporated into the overall evaluation of the SIMEX process.

During the briefing:

- Ensure that all the **figures involved in the exercise activities are present** at the briefing (EXCON, facilitators, evaluators, observers, guest attendees, players)
- When appropriate, conduct a **'simulation of the simulation'** to give a practical presentation of certain SIMEX components (e.g. rules of engagement, tools to be used during activities), and verify that no issues arise connected with these. This may also be carried out through mini-DBX-type discussions, for instance, focused on single injects, while showing in a plenary format how the injects are delivered, how to respond to them, how to interact with the other players, how to share information, etc.
- Include a **Q&A session** to clarify any doubts that have arisen related to the activities to be put into action.



STEP 3.3 FACILITATION AND CONTROL

ACTIVITIES

As described in Step 1.4, SIMEX facilitation and control encompass the control and general supervision of the simulation, to ensure it runs effectively. Various actions fall within this set of activities, such as:

- **Controlling** the scenario through delivery of the injects based on the MEL-MIL
- **Monitoring participants' responses** to adjust the subsequent injects
- **Modulating and assessing simulation pace** in relation to player participation and the need to slow or accelerate activities to keep the scenario active
- **Playing roles** and representing stakeholders not present among the players, where required
- **Suspending the simulation** through time-breaks to overcome any difficulties and to adjust/correct some practices
- **Intervening** to provide suggestions to correct/improve the simulation.

During the SIMEX, facilitators may act at three levels, as set out in Table 10: coaching, mentoring and training.

WHO DOES WHAT

SIMEX facilitation may be carried out by a facilitation team that might operate separately from the team focusing on control and inject delivery (EXCON), particularly in exercises that are not exclusively discussion-based. When the two teams are separate:

- The EXCON leads the simulation, managing the timing of the injects identified on the MEL-MIL. It also provides additional injects to advance or adjust the simulation and to ensure that the pre-set goals are met.
- The facilitators (also coaches or trainers) monitor the SIMEX activities, managing the interactions and discussion between players, observing the dynamics within the group of participants, and providing feedback to the EXCON.

ASPECTS REQUIRING SPECIFIC ATTENTION

Regards facilitation:

- Facilitation must ensure a safe and inclusive simulation environment.
- It is advisable to have some of the **country's stakeholders in the facilitation team**, since these have greater familiarity with internal player dynamics, have a better understanding of procedures, and can intervene more effectively.

- Intervention by facilitators can vary in **intensity**, ranging from approaches with minimal impact on the simulation through to requiring its temporary suspension. It is therefore necessary to **strike an appropriate balance** by:
 - » strengthening or regulating the simulation in a way that gives players the perception of keeping control of their own actions
 - » slowing the exercise pace through careful inject distribution
 - » delivering coaching tailored to the groups' dynamics, and gradually guiding towards potential solutions
 - » intervening as a trainer and suspending the simulation also through time-breaks.

Regards control:

- Based on what is happening in the room and the feedback from the facilitation team, the EXCON might:
 - » consider **integrating or adjusting injects**, also to ensure that all players are actively participating in the simulation
 - » decide on the need to **slow the simulation** to allow participants to recover or to enable coaches/trainers to intervene
 - » consider **repeating an event** or an inject at a later stage, where possible.

STEP 3.4 OBSERVATION AND EVALUATION

ACTIVITIES

As already specified, the SIMEX activities are designed to achieve a range of goals. In order to check whether these goals have actually been met and to identify strengths and weaknesses, it is essential to carry out careful and timely monitoring of:

- the various **SIMEX process phases** (in the case of an extended evaluation)
- and/or the **simulation itself** (in the case of a technical observation).

This monitoring should keep track of the approach, all the mechanisms and the implemented actions, as under the observation and evaluation plan (see Step 2.4).

The **outcomes of this observation/evaluation will then stand as the basis to any review or follow up activities**, as well as to improving SIMEX processes. Therefore, should a civil protection system conduct a SIMEX on early warnings for hydrogeological and flood risk, for instance, by testing an early warning



Coaching

They stimulate players with questions and suggestions aimed at improving solutions or prompting subsequent steps.

Training

They encourage players to adjust their behaviours and approaches, sharing lessons learned.

Mentoring

They answer questions based on past experience.



Credits: CIMA Research Foundation

Table 10: Three levels of intervention by facilitators, adapted from the SIMEX General Handbook (MSB), produced within the PPRD East 3 Programme

message dissemination procedure, only careful monitoring can reveal problematic issues, clearly highlighting what should be changed and what already works well.

As described in Step 2.4, different observation and evaluation approaches and purposes can be identified – again in relation to the goals to be met – and these depend also on available resources and the practices developed over time by the team of experts and the key stakeholders in the various roles during the implementation phase.

Typically, **various tools can be used for monitoring during the simulation**, and these are chosen in

relation to what aspect of the SIMEX process is to be monitored and the goals to be met. The most commonly used are: questionnaires, observation forms, video and recording.

In the case of evaluation, direct observation can be integrated with interviews or focus groups involving the various actors with a role in the different SIMEX process phases.

By way of example, the following is an observation form used during the DBX with Bagnara Calabra Municipal Authority (Reggio Calabria), described among the case studies at Paragraph 5.4.2.

Questions	Answers
During which moment of the exercise is the observation conducted?	9 am-noon, 11 am-noon, Noon-1 pm, 1-2 pm
Which support functions are present at the time of observation?	Mayor/Local authority, Technical unit, Healthcare, Volunteering, Fleet and equipment, Logistics, Telecommunications, Communications assistance, Other
The support functions interact with other entities (e.g. Prefecture/Regional Authority)/ operations agencies (e.g. firefighters, police forces)	Never, Rarely, About half the time, Always, Not sure
Specify which support functions are most involved in the decision-making processes	Technical unit, Healthcare, Volunteering, Fleet and equipment, Logistics, Telecommunications, Communications assistance, Other
...	...

At simulation end, all the observation/monitoring **results are to be collected and then analysed and processed** into a document that will converge into the final SIMEX project report, together with what emerged during the briefing phase (see Step 4.1).

Monitoring of course means that the necessary knowledge base can be gained in order to identify areas for improvement and to implement the subsequent changes. These, for an EWS and civil protection system, also come in the form of updates or the development of plans and procedures, through to laws, regulations and directives.

WHO DOES WHAT

The observation and/or evaluation activities are conducted by observers and/or evaluators (see Step 1.4). In order to ensure the careful monitoring of the processes – especially technical ones – the observer/evaluator should be very familiar not only with the civil protection system in operation during the simulation but also with the mechanisms generated during real emergency events and situations.

Generally:

- The EXCON is in charge of disseminating the SIMEX masterplan to the evaluators/observers.
- The SIMEX planning and design team oversees



Greek. Fire burning down the side of a hill in Greece - Wikimedia Commons

- logistics for the observers and evaluators, including their allocation to the various workstations.
- The observation and/or evaluation team, together with the EXCON, is responsible for collecting the monitoring results.

ASPECTS REQUIRING SPECIFIC ATTENTION

Monitoring is a sensitive activity in that it underpins the reporting on the SIMEX activities and potentially lays the groundwork for a process of restructuring, changes and implementations. Therefore, the following are points that require particular attention:

- **Observation framework** – The aspects/ components to be observed must be structured in a way pertinent to and coherent with the system under analysis, so as to facilitate observation of what actually happens. In fact, the answers must allow the observers to report what they find clearly and objectively.
- **Observers/ Evaluators** – Each of these should be selected and assigned to a sector consistent with their competencies and experience (e.g. if SIMEX focus is on a flood risk warning issuance, observers should originate from the hydro-meteorological services). The observers may be divided up into topic-related groups.

- **Logistics** – This aspect must be properly organised, especially when the simulation takes place at various sites across an area.
- **Dissemination of the SIMEX masterplan** also to the observers – This is useful to observers understanding not only their own roles but also the SIMEX goals.

3.5 CHECKLIST – IMPLEMENTATION

The checklist steps and activities do not necessarily have to be carried out in a strictly chronological order but may be focused on in parallel. It should be noted that this checklist is not an exhaustive compilation of all the aspects requiring specific attention, but those listed are described in more detail in the single paragraphs of the steps. Nonetheless, not all the components are always applicable. The checklist in Table 11 may also be supplemented with further operational information, such as specifying the persons, departments or agencies responsible for the activities, any deadlines, explanatory notes, or other details useful to managing and monitoring the process.

STEP	SUB-STEP	ACTIVITY	CHECK-BOX	
STEP 3.1 SET-UP & ADMINISTRATION	Checking set-up – at least one day prior to implementation	Check room/s for the SIMEX – for all the sites involved	<input type="checkbox"/>	
		Check documents and materials: Certificates Sign-in sheets Desk nameplates Badges Agenda Other material	<input type="checkbox"/>	
		Check functioning of tools and equipment	<input type="checkbox"/>	
		Share material with interpreters	<input type="checkbox"/>	
		Check the catering service	<input type="checkbox"/>	
		Setting up simulation mode	Organise the players and divide into sector-based groups, if required	<input type="checkbox"/>
			Collect contact details	<input type="checkbox"/>
	Create dedicated email accounts, if required		<input type="checkbox"/>	
	STEP 3.2 TRAINING & BRIEFING	Implementing the training agenda	Prepare the training material to be used	<input type="checkbox"/>
			Conducting the briefing	<input type="checkbox"/>
Conducting the briefing		Prepare the material and a general presentation of the SIMEX (goals, outline scenario, roles, rules, artificialities included and expected outcomes)	<input type="checkbox"/>	
		Present the simulation instructions	<input type="checkbox"/>	
STEP 3.3 FACILITATION & MONITORING	Organising SIMEX control and monitoring tools	Organise a simulation of the simulation, if required	<input type="checkbox"/>	
		Check the use and functioning of the EXCON tools for controlling the scenario and for sending the injects	<input type="checkbox"/>	
		Check the use and functioning of the tools for real-time monitoring of the simulation, including those for receiving the responses to injects	<input type="checkbox"/>	
	Defining and validating facilitation methods	Establish the rules to be used to modulate and evaluate simulation pace (rules for the time-breaks, external stimuli, etc.)	<input type="checkbox"/>	
		Establish the rules to be used for interaction with the players during the simulation (e.g. coaching, training, mentoring)	<input type="checkbox"/>	
		Establish any roles that might be introduced to facilitate the simulation, and their use	<input type="checkbox"/>	
STEP 3.4 OBSERVATION & EVALUATION	Organising the operational observation and evaluation of the simulation	Check which observers and evaluators are present, and where	<input type="checkbox"/>	
		Check the questionnaires, forms and other tools to record observations (to evaluate goals and performance), and check how they are used	<input type="checkbox"/>	
		Check the means for collecting the answers to the questionnaires, forms and other observation tools (to evaluate goals and performance), and check how they are used	<input type="checkbox"/>	
		Check other tools for the SIMEX evaluation phase, and check how they are used	<input type="checkbox"/>	

Table 11: Phase 3 Checklist – Implementation

PHASE 3: DEBRIEFING AND FOLLOW-UP

STEP 4.1 DEBRIEFING AND FEEDBACK

ACTIVITIES

Debriefing is the stage of the SIMEX where all **participants have the opportunity to share on their own experience, and to provide feedback on the simulation as a whole but also on its defined and agreed goals** (Savoia, Agboola, and Biddinger 2012). Details of when and for how long to stage the debriefing should be established during the planning stage, and should be included in the agenda that will be shared with participants along with the invitations. This helps ensure full participant attendance also during the briefing phase.

Also known as after-action review (AAR), the debriefing phase comprises two distinct moments: the hot-wash debriefing, or **hot wash-up**, conducted immediately after the simulation or on the following day; and a **cold debriefing**, held after more structured analysis of the simulation exercise.

Several key aspects need to be defined in order to organise an effective (hot or cold) debriefing:

- **Debriefing technique** – Debriefings can be conducted in a variety of ways, also depending on the number and type of participants, and the complexity of the SIMEX itself. A useful practice is to start with preliminary discussion in small groups, followed by plenary feedback. This allows everyone to express their opinions on the specific topics while also enabling collective reflection. The debriefing sub-group composition may mirror the sub-groups of players during the SIMEX (where applicable), or it may be structured differently at the EXCON's discretion and depending on the overall time available. Immediate feedback on the observations collected by the EXCON, facilitators, evaluators and observers can also be valuable, while a final report captures more detailed comments.
- **Allotting time** – The time available must be appropriately balanced between group discussion, plenary feedback, summing up and the Q&A session.

- **Topics for discussion** – The debriefing is useful not only for gathering feedback on the running and execution of the simulation itself (including the briefing and training phases) but also for collecting first-hand information from the participants on aspects connected with the actual goals of the SIMEX. These might include, *for instance*, aspects connected with planning, dissemination, interpretation and uses of early warning bulletins, or the use of risk information for situational assessment.
- **Questions to ask** – Key questions can be identified for each topic, such as: What went well? What could be improved? What recommendations arise?
- **Feedback collection methods** – The information gathered during the debriefing should be documented, *for example* through feedback forms or flipcharts that can be photographed. This material enhances the analysis of the responses to the injects and the evaluation and observation forms.

WHO DOES WHAT

The EXCON, together with the facilitation team, where present, divides the participants into groups, guides discussion, ensures that everybody has the opportunity to contribute, and provides its own feedback.

All the other participants provide their own feedback respecting the set methods.

ASPECTS REQUIRING SPECIFIC ATTENTION

- The debriefing must be perceived as a **safe space**. If sensitive issues are to be addressed, these should be discussed on a one-to-one basis with the relative participants.
- When establishing the time to allot, attention should be given to leaving adequate space to everyone to contribute. In addition, the overall debriefing time will directly depend on SIMEX type. *For instance*, the time might be shorter for a DBX than for a CPX.
- The debriefing is a **valuable moment for exchange between the various actors**, who may not frequently have the opportunity to interact with each other. In any case, following on from an

intense SIMEX phase, setting a maximum number of hours for the debriefing is advisable, to take participant fatigue into account.

- Besides feedback and experience-sharing, including a moment for **open plenary discussion** can also be useful.
- **Sharing discussion topics** with participants in advance, or even within the instructions list or during the initial briefing, is recommended.
- The debriefing should be held as close as possible to the SIMEX, while key aspects are still fresh in all participants' minds.

STEP 4.2 FINAL REPORT AND ACTION PLAN

ACTIVITIES

The final report, and its associated action plan, stands as the last step in the SIMEX project. This is essentially **a synthesis report setting out the best practices, issues and weaknesses identified during the entire exercise process, with recommendations and specific suggestions.**

It is produced following analysis of the SIMEX and the documents/material received, including the evaluation forms, the responses to the injects, the observations and the feedback collected during the after-action review.

The final report may be presented together with a structured **action plan outlining implementation times for the recommendations made on various timescales** (short-, medium- and long-term) and the relative institutions and agencies responsible for the action required. This section may also include proposals to change or update preparedness and emergency plans, such as suggestions to develop or improve certain procedures that the SIMEX highlighted as missing or existing only as informal undocumented practices.

In any case, the scope and focus of the report are determined by the general purpose of the SIMEX and its specific goals.

WHO DOES WHAT

The group of experts leads the drafting of the action plan, drawing on the analysis derived from the work by the players, evaluators/observers and facilities to assess strengths and weaknesses and to develop recommendations.

The local counterpart is responsible for checking and validating the report, for proposing additions, and for distributing it to the key stakeholders and policy-makers. Specifically, the local counterpart may adopt the action plan as a tool for leverage on policy-makers, to promote change through funding requests, development of new procedures, agreements and plans, and other aspects highlighted by the SIMEX.

ASPECTS REQUIRING SPECIFIC ATTENTION

- **Identifying the exact target audience of the final report** is essential. If high-level policy-makers are among this, preparation of an executive summary or a concise report – ideally in the form of a policy brief – written in clear language is recommended.
- Adequate **time** needs to be dedicated not only to analysing SIMEX outcomes but also **to drafting the report and its validation by the local counterpart in the country concerned**, which may be represented by the project focal point and the key stakeholders who actively took part in co-designing the exercise process and not only in SIMEX implementation. This final report in fact acts as the foundations to planning future activities.
- All the materials used during analysis should be attached to the report, organising and reviewing them appropriately to ensure their clarity and ease of consultation.
- To ensure that the recommendations are actually useful to improving procedures and planning, the SIMEX analysis must be accompanied by solid institutional and procedural knowledge of the EWS and civil protection system in the country where the SIMEX took place. This task can be greatly facilitated through the presence and active involvement of focal points, external experts or local stakeholders during the entire exercise process, including the results analysis phase.

4.3 CHECKLIST – DEBRIEFING AND FOLLOW-UP

The checklist steps and activities do not necessarily have to be carried out in a strictly chronological order but may be focused on in parallel. It should be noted that this checklist is not an exhaustive compilation of all the aspects requiring specific attention, but those listed are nonetheless described in more detail in the

single paragraphs of the steps. Table 12 may also be supplemented with further operational information, such as specifying the persons, departments or agencies responsible for the activities, any deadlines, explanatory notes, or other details useful to managing and monitoring the process.

STEP	SUB-STEP	ACTIVITY	CHECK-BOX
STEP 4.1 DEBRIEFING & FEEDBACK	Organising the hot-wash debriefing	Establish the debriefing techniques and timeline	<input type="checkbox"/>
		Establish the topics to discuss and the questions to ask	<input type="checkbox"/>
		Establish how feedback will be collected	<input type="checkbox"/>
	Organising the cold debriefing	Establish the debriefing techniques and timeline	<input type="checkbox"/>
		Establish the topics to discuss and the questions to ask	<input type="checkbox"/>
		Establish how feedback will be collected	<input type="checkbox"/>
STEP 4.2 FINAL REPORT & ACTION PLAN	Analysing the SIMEX	Analyse players' reactions	<input type="checkbox"/>
		Analyse the documents and material produced by the players during the SIMEX (e.g. early warnings, situational reports, notifications)	<input type="checkbox"/>
		Analyse the observation and evaluation forms	<input type="checkbox"/>
		Analyse the feedback (from all participants) collected during the debriefing sessions	<input type="checkbox"/>
	Drafting the final report and action plan	Establish the proposals for recommendations	<input type="checkbox"/>
		Check the report and have it validated by the local counterpart	<input type="checkbox"/>
		Consolidate the final report and the action plan by evaluating the need for a synthesis report	<input type="checkbox"/>

Table 12: Phase 4 Checklist – Debriefing and Follow-up

PART 2

PRACTICAL CASES IMPLEMENTED BY CIMA RESEARCH FOUNDATION



PART 2: CASE STUDIES

This section presents a series of SIMEX processes developed by CIMA Research Foundation in recent years, often in conjunction with other project partners at national and international levels. The purpose of this compilation is to provide an overview of the different experiences gained, highlighting the specific features of each process in relation to implementation context, specific goals, overall project aims, the stakeholders involved, and the follow-up activities.

The processes described were conducted across a variety of geographical contexts, both within and outside of Italy, and a variety of methods and approaches were adopted. Despite their diversity in design and specific aims, all the processes shared the common target of civil protection and early warning systems, aiming to test, strengthen and optimise coordination, analysis and response capacities regarding foreseeable events.

The case set analysed comprises a variety of SIMEX types, including:

- **Command-post exercises** (CPXs), such as those planned and implemented in the Western Balkans and Turkey under the IPA FF programme, aimed at testing the link between early warnings and activation of preventive early action in flood scenarios. Therefore, these exercises focused on the use of the information and early warning issued by hydro-meteorological centres, and coordination and the decision-making processes at the various command centres at the different territorial levels.
- **Discussion-based exercises** (DBXs) organised in local contexts such as the one for Bagnara Calabria Municipal Authority, for the purpose of improving coordination between local-level stakeholders and for testing and developing civil protection procedures.
- **Table-top exercises** (TTXs), structured in different ways within projects such as IOC and PPRD East 3, for the purpose of providing an operational evaluation of the overall system or for testing specific processes and systems introduced under the programme.

As clearly emerges, **most of these SIMEX processes were embedded within a broader project context, with various overall aims**, such as assessment of existing capacities and operating processes, capacity-development through training solutions or the development of models, procedures and plans.

As a consequence, the departure point for each SIMEX process varied significantly, reflecting the specific features of its local context and the maturity level of the system being tested. Another determining factor was the stakeholders' degree of familiarity with this type of activity: in some cases, the key stakeholders and players had prior experience of structured simulation exercises, while in others a preliminary step of awareness-raising and training was necessary to ensure participation effectiveness and the full value of the experience.

Nonetheless, all the processes described were developed around the four phases set out in these guidelines, with less or more time allocated to certain steps depending on the existing knowledge level, the tools already available to the team of experts, and the support provided by the project focal point.

5. Case study files

These files provide a concise overview of each exercise process, subdivided into the four phases: Planning, Design, Implementation, and Debriefing and Follow-up. **Every case study file has been conceived to provide a comprehensive snapshot of the SIMEX**, outlining the information for each step described in these guidelines and highlighting the strengths and weaknesses of the activities carried out. An effort has been made to estimate the human resources and execution timelines for the whole process. Nevertheless, it should be noted that, in some cases, the timelines overlap with those of the broader projects the SIMEX processes were embedded in. Table 13 shows the file template used to describe the case studies.

GENERAL INFORMATION	
This section presents the background information on the SIMEX process and the reference project	
General topic	Overall focus of the exercise
Site	Country or specific site where the SIMEX took place
Exercise type	CPX, DBX or TTX, and presence of field activities or VIPs
Risks tested	Risk scenario types addressed and simulated
Territory scale	Level of territorial involvement (local, sub-national, national, international)
Purpose of exercise process	Baseline analysis of existing conditions at project outset Operational assessment to support initial analysis/knowledge base Validation of models, procedures, plans or changes introduced by the project
Level of system knowledge	The team of experts' prior degree of familiarity with the system to be tested, deriving from previous experiences, training pathways and analysis, etc. carried out within the reference project
Level of system maturity	Low/none Medium: some EWS components exist, but the system is still under development High: already developed but still improving
Period & duration	Timeframe and actual duration of the exercise process
PHASE 1: PLANNING	
<i>[approximate duration of phase]</i>	
Consultations	Number and type of consultations used to define and design all the SIMEX components The people involved, such as project focal points, key stakeholders and members of the team of experts Aims and topics discussed during the consultations
Goals	Overall aims and specific goals agreed with the project focal point and key stakeholders during the planning stage
Project budget & resources	Amount of resources, including human resources, involved throughout the entire process and, where possible, broken down into phases and budget component allocations (translating, teleconferencing systems, travel, etc.)
Teams, figures & roles	The teams, figures and roles defined during the exercise process and their composition, including the SIMEX planning and design team, the exercise control team (EXCON), facilitators, observers/evaluators and players
Stakeholder analysis	Whether this was conducted during the SIMEX process or partially performed outside of it
Recognising training needs	Topics and issues identified for the training activities to support the exercise process
Conceptualisation & agenda framework	Main aspects presented in the concept note, structure of the implementation phase, number of days of simulation, training activities, briefings and debriefings, interpreting services, etc.
Key documents produced:	Documents shared with project focal point and the key stakeholders during this planning phase, such as the concept note and invitations to the players
Lessons learned:	Noteworthy aspects, both positive and negative

PHASE 2: DESIGN	
<i>[approximate duration of phase]</i>	
Scenario & days of simulation	General description of the scenario, including 'simulated' days, artificialities included and specific aspects tested
Injects	Description of the main developed events, information of interest on the injects
Logistics, tools, equipment, documents & materials	Information on <ul style="list-style-type: none"> • Set-up of spaces • Participant recognisability • Documents and material available to players • Tools and equipment available to players • Other documents, such as certificates • Tools and equipment for participants
Observation/evaluation plan	Evaluation and observation goals, analysis and assessment methods, etc.
Key documents produced:	SIMEX masterplan, instructions to the players etc.
Lessons learned:	Noteworthy aspects, both positive and negative
PHASE 3: IMPLEMENTATION	
<i>[approximate duration of phase]</i>	
Set-up & administration	Aspects defined before the actual simulation, such as allocation to working groups, setting up of rooms
Training & briefing	Topics addressed during the training, and the approach used for briefings
Facilitation	Facilitation approaches adopted during the SIMEX, the inclusion of time-breaks etc.
Observation & evaluation	Use of forms, interviews, etc.
Lessons learned:	Noteworthy aspects, both positive and negative
PHASE 4: DEBRIEFING AND FOLLOW-UP	
<i>[approximate duration of phase]</i>	
Debriefing & feedback	Approach used for the debriefing sessions and for collecting feedback from all the participants
Final report & action plan	Main contents of the document produced at the end of the exercise process
Key documents produced:	Report on the SIMEX, synthesis report/policy brief, etc.
Lessons learned:	Noteworthy aspects, both positive and negative

Table 13: Template of case study file for describing the case studies

5.1 CPXs within the IPA FF programme

GENERAL INFORMATION	
SIMEX project built by CIMA Research Foundation (CIMA) and the Italian Civil Protection Department (ICPD) as part of the IPA FF programme co-funded by the European Union (specifically by DG ECHO), as part of Work Package 1.3 (support in the development of procedures and agreements to include EWS in emergency response planning regarding floods). The project was developed with a pan-regional view, while implementation involved the individual countries (Albania, Montenegro, Bosnia and Herzegovina, Kosovo*, North Macedonia, and Turkey).	
General topic	Early warning systems (EWS) and activation of preparedness and emergency plans
Site	Albania (Tirana + Fier), Bosnia and Herzegovina (Sarajevo + Bihać, FBiH, and Višegrad, RS), Montenegro (Rozaje), Kosovo* (Pristina + Vushtrri), North Macedonia (Skopje), Turkey (Ankara + Rize)
Exercise type	Command-post exercise (CPX)
Risks tested	Flooding, flash floods
Territory scale	National (sub-national where existing) and local
Purpose of exercise process	Operations evaluation as support to initial analysis/assessment
Level of system knowledge	Preliminary analysis was conducted for each country through desk reviews, an EWS assessment tool used by the various actors at the different territorial levels, and online and in-person workshops. For each country, the preliminary analysis was concluded with an EWS assessment report validated by the national coordinator, and identification of a pilot case and a working group with representatives from the key EW-EAS authorities (from June 2021, with the first national meetings in March 2022, with a pan-regional workshop in Tirana)
Level of system maturity	From low (fragmented and highly reactive) to medium (with some components and processes, but poorly integrated with each other) depending on the country
Period & duration	February 2022 - November 2022

PHASE 1: PLANNING [March - August 2022]	
Consultations	Minimum of 3 meetings, as per the project, with at least one in person. The meetings generally involved members of the SIMEX planning and design team, made up of: the national programme coordinator and representatives from the working group (key EWS stakeholders, including representatives for the local territorial level and for the national hydro-meteorological services); for the consortium, CIMA + ICPD + evaluation team representatives + local support consultant. The purposes of the consultations were to: <ul style="list-style-type: none"> • present the SIMEX project, with the proposed approach (national and local-level CPX, with use of the actors' sites/spaces and tools/equipment, in the local language) • share the overall aims and co-define the specific goals • establish the outline scenario and collect the key information for building the injects • identify the actors
Goals	General: in the case of hydrological and flood risk, to test the communication chain between the coordination centres and to check preparedness and emergency plans, with a particular focus on early warning and early action.

Project budget & resources	For the planning, design and implementation of the entire SIMEX project: 3 CIMA experts + 3 ICPD experts + 1 member of management + 5 local experts (1 per country) For evaluation and observation in all phases: total experts involved - 3 from Romanian Inspectorate for Emergency Situations (IGSU), 4 from ICPD, 1 from CIMA, 2 from Italian regional authorities. During implementation, by the consortium: 2 CPXs organised back to back during the same week, with mobilisation of 7 EXCON/facilitation experts + 3 evaluation team (EET) members + 1 local expert <ul style="list-style-type: none"> • Catering services and room hire • Simultaneous translation • Teleconferencing system for training and hot-wash debriefing • Travel and personnel expenses
Teams, figures & roles	For each CPX: <ul style="list-style-type: none"> • Planning and EXCON team: 8 members in planning and implementation (3 CIMA, 3 ICPD, 1 local expert, 1 national programme coordinator + some key stakeholders). • Facilitators: the same as the EXCON. • Observers/evaluators (indicated as EET): 3 EET members + 1 local evaluator. Evaluators and observers were the same. • Players: an average of 20 people per CPX, including working group members + representatives for key institutions and agencies (civil protection emergency operations rooms/coordination centres at national, regional and municipal levels, hydro-meteorological services) – about 200 players in total from 35 different institutions and agencies.
Stakeholder analysis	This was conducted as part of the preliminary analysis through desk reviews, questionnaires, an EWS assessment tool used by the various actors at the different territorial levels, and online and in-person workshops. EW dissemination and communication flows were checked during the consultations.
Recognising training needs	These were established based on the WP and SIMEX goals. Short training workshop on Day 1.
Conceptualisation & agenda framework	Two days of implementation, which included the training: <ul style="list-style-type: none"> • Day 1 – preparatory and training workshop: discussion on the EW-EAS and the specific CPX goals; presentation of the CPX; sending of the first inject • Day 2 – 3 hours of simulation, followed by hot-wash debriefing to discuss the preliminary outcomes with all the actors.
Key documents produced:	<ul style="list-style-type: none"> • Concept note for the design of the regional-level CPXs • EWS and communication flows checked • Concept note with outline agenda for each SIMEX • A shared Excel worksheet showing the components to design and define: goals, EXCON composition, players (institutions and agencies), outline scenario, response model, workshop topics and key speakers
Lessons learned:	<ul style="list-style-type: none"> • The CPX-type SIMEX showed as a cost-effective method for testing communication flows and decision-making processes, as well as an opportunity for identifying strengths and areas for improvement. • The CPX-type SIMEX was chosen to involve the local authorities but with a limited organisational effort. • The importance of planning the SIMEX in conjunction with other key institutions was recognised, as was the need to carefully establish certain core components (e.g. defining of goals, scenarios and actors). • Conducting the CPXs in the local language was essential for ensuring exercise ownership and effectiveness. This choice required a translating service and the local expert's support in translating/observing the simulation during the pilot case. • Some partners had limited experience of SIMEXs and would have benefitted from initial training on simulations in general, with more in-depth discussion on existing methods, distinguishing features, etc. (one partner initially believed a DBX and not a CPX was being organised).

PHASE 2: DESIGN [March - August 2022]

Scenario & days of simulation	For each CPX, the scenario was developed around the pilot case, based on relevant past events, simulating a 1.5/2-day event with escalating weather and hydrological conditions, and a progressive response from local to national level. Weather- and water-related information was reconstructed from open data or was provided by hydro-meteorological institutes, while effects on the ground were derived from public or shared reports. Main events: early warning (forecasts, bulletins and dissemination), activation of civil protection procedures, national-level support (subsidiarity mechanisms).
Injects	The injects were to test the entire early warning system, including the issuing of early warnings, their dissemination, the communication flows between the various emergency coordination centres, and activation of civil protection procedures: <ul style="list-style-type: none"> Weather- and water-related data: to trigger preparedness and early warning issuance Field data and effects in the ground: to trigger risk assessment, coordination between the various institutions and territorial levels, and notifications to the public
Logistics, tools, equipment, documents & materials	<ul style="list-style-type: none"> National- and local-level briefing and hot-wash spaces equipped with: tables in a U configuration, a teleconferencing system and hybrid translation. Participant recognisability: badges worn during the simulation, desk nameplates in workshops. Documents available to players: maps, plans and procedures. Other materials: printed instructions and the email addresses of the EXCON and the other players. Tools and equipment for participants: their own PCs, email accounts (only the EXCON ones were specially created), telephones.
Observation/evaluation plan	Plan for evaluating all phases of the process developed by the EET in conjunction with the EXCON. Plan components included: <ul style="list-style-type: none"> Defining the framework based on performance, evaluating efficiency (e.g. if the injects elicited appropriate responses), effectiveness (e.g. SIMEX relevance regarding goals) and usefulness (e.g. outcomes aligned with the overall SIMEX aim). 2 evaluation checklists, one on planning and design aspects, the other on CPX execution. Answer method – description and numerical evaluations. Steps expected for the evaluation – at least 1 coordination meeting for EET members to share method and tools, 1 meeting with each country's local evaluator, gathering of feedback during the hot-wash debriefing, and SIMEX analysis to be presented during the after-action review and included in the evaluation report.
Key documents produced:	<ul style="list-style-type: none"> SIMEX masterplan for each CPX: figures/roles present in the CPX, analysis of stakeholders and the EWS and civil protection system, outline scenario with the key events, summary of the planning phase with number of consultations and aims, list of institutions and agencies involved in the CPX, evaluation plan components, agenda. Consolidated agenda for invitations, also specifying working language and translation requirements. MEL-MIL with injects to be emailed.
Lessons learned:	<ul style="list-style-type: none"> Staging the CPX across various municipal areas required activation of a hybrid teleconferencing system with a translation service. Difficulties were encountered in finding companies capable of providing this service, especially in more remote areas. Some partners expressed interest in organising longer CPXs, deploying TTXs as introductory tools to familiarise participants before the actual simulation. Opting for a simple scenario with the focus on specific system actors was dictated by available resources as well as the regional and replicable nature of the project. Nevertheless, more complex scenarios could have involved a greater number of actors and distinct support functions, could have tested multiple communication channels and could have placed the system under stress through cascading events. The CPXs stirred interest in full-scale exercises, characterised by complex and cross-border scenarios, and these would enable more comprehensive testing of the system.

PHASE 3: IMPLEMENTATION [June - September 2022]

Set-up & administration	The day before the workshop: <ul style="list-style-type: none"> Room set-up for workshop and hot-wash debriefing; check on catering arrangements. Day 1, upon workshop conclusion: Division of EXCON and EET for allocation to national and local sites (if the pilot case was far from the capital, division was prior to the start of the implementation phase) and, when feasible, between emergency coordination centres and hydro-meteorological institutes. Collecting of email addresses and phone numbers for communication and notifications.
Training & briefing	Half of Day 1 was allotted to training, with topics proposed by the CIMA + ICPD team of experts and confirmed during the consultations. A typical agenda was: <ul style="list-style-type: none"> EWS (by hydro-meteorological institutes) Preparedness and emergency planning (by civil protection agency) The CPX project Starting the simulation by sending the first inject (after collecting email addresses etc.)
Facilitation	This was conducted mainly by ICPD experts with support from both the local expert and the national coordinator, who assisted in communicating in the local language. Time-breaks were used for reflection on specific practices and to clarify some steps that took place through oral communication (which therefore were not recorded through email nor automatically translated).
Observation & evaluation	The EET was located at multiple sites (half at national and half at local sites). Notes and interviews were used in answering the checklists. Part of the EXCON overlapped with the observation team during the simulation (taking notes).
Lessons learned:	<ul style="list-style-type: none"> The presence of an expert and a local evaluator was crucial to properly understanding the actions by the participants and to interacting with them. Real-time injects and phone calls made the SIMEX more realistic and dynamic. SIMEX interpretation varied among partners, and was influenced by their previous experience and their capacity to simulate scenarios. The SIMEXs were seen in some countries as an opportunity to demonstrate response capacity.

PHASE 4: DEBRIEFING AND FOLLOW-UP

[hot wash-up immediately after the CPX, pan-regional after-action review in November 2022]

Debriefing & feedback	This was separated into two moments – <ul style="list-style-type: none"> Hot-wash debriefing for each CPX, on Day 2 of the implementation phase, straight after the simulation: free-flowing discussion on the actions introduced by each actor and on any documents produced. In November 2022, a pan-regional after-action review – Day 1: a) session on CPX methodology; b) working groups on areas for improvement and strengths; c) presentation of the EET's report and the findings. Lessons learned/recommendations on topics related to communication flows and data-sharing, early warnings from hydro-meteorological and civil protection institutes, EW-EA mechanisms and planning. Day 2: training on EW-EA with experience-sharing by Italy + discussion on the next steps.
Final report & action plan	Analysis of the individual CPXs was used to: <ul style="list-style-type: none"> develop region-wide recommendations, to be included in the evaluation report develop the general criteria for an effective link between EW and EA for flood risk (supplemented with a literature review etc.) develop the Training of Trainings in the WP.
Key documents produced:	Pan-regional evaluation report with the recommendations.
Lessons learned:	<ul style="list-style-type: none"> The EET's work was recognised as valuable in experience-sharing and lessons learned at a pan-regional level, but some partners expressed the desire for more in-depth analysis of strengths and weaknesses, with specific recommendations to improve their own systems. Some partners suggested engaging a greater number of their system experts – also those external to the project – in evaluating the CPX. Catering services and packed lunches were introduced following the first round of simulations. The hot-wash debriefing needed to be better structured. Findings analysis was resource-intensive due to the lack of a structured observation tool for technical processes.

5.2 TTXs within the PPRD East 3 programme

First cycle of PPRD East 3: the EXCON operated fully from remote

This case study file shows some components of the first SIMEX cycle, carried out entirely with a remote format. Please refer to the MSB and Italian Red Cross documents for details of the planning and design phases.

GENERAL INFORMATION

Simulation exercises conducted by the consortium led by the Swedish Civil Contingency Agency (MSB) and comprising CIMA Research Foundation (CIMA), Italian Red Cross (IRC), Emergency Services Academy Finland (Pelastusopisto) and Ministry of Interior of the Slovak Republic, as part of the 'PPRD East 3' programme, co-funded by the European Union. The first SIMEX cycle was aimed at capacity assessment of the disaster risk management and civil protection systems of the countries involved (Armenia, Georgia, Moldova and Ukraine).

General topic	Knowledge base and analysis of the civil protection and disaster risk management operating capacities of the project's beneficiary countries.
Site	Fully remote for the consortium. The SIMEXs were guided and monitored entirely from remote (due to COVID-19). The players were generally gathered at a single site in the country. Countries involved: Moldova, Ukraine, Georgia, Armenia.
Exercise type	Table-top exercise (TTX) with some discussion sessions
Risks tested	Floods, wildfires, multi-hazard risks (flood risk or wildfire risk combined with healthcare risk and misinformation, and secondary impacts)
Territory scale	National
Purpose of exercise process	Baseline analysis of existing conditions
Level of system knowledge	Assessment of the contemporary situation was conducted for each country during the initial phase of the project, and this assessment included strengths and areas for improvement in order to create a road map. This system analysis set out from the reports drafted during the previous PPRD East programmes and was consolidated through the results of the analysis performed using the tools developed by the consortium and through interviews with key stakeholders. In some cases, the initial assessment converged into a report shared with the focal points.
Level of system maturity	Variable, but generally low (poorly developed) regarding EWS, and medium (fragmented and reactive) in emergency management
Period & duration	About 6-7 months for the whole cycle and to complete the reports, as per the programme, May - October/November 2021

PHASE 1: PLANNING *[About 1-2 months prior to each TTX]*

Consultations	The consultations with the focal points were useful to sharing SIMEX methodology and the goals, and to identifying the actors to engage.
Goals	The SIMEX was embedded within the broader evaluation of the operating capacities of national systems in managing national-level emergencies, including activation of international support. The TTX goals were, among others, to test and observe the capacity to: <ul style="list-style-type: none"> • receive and transmit data and EWs, as well as initiate response actions based on preparedness and emergency plans (including volunteer coordination); • ensure inter-institutional and multi-stakeholder coordination; • request and receive international support; • communicate with the public and the media in a coordinated manner. One key goal was to gather together existing national-level plans and procedures.
Project budget & resources	<ul style="list-style-type: none"> • Number of human resources (limited to CIMA Research Foundation's contribution): 3-5 persons depending on the scenario, as members of the EXCON, observers and evaluators during SIMEX implementation; an additional 1-3 persons were involved in building the scenarios and the injects during the planning and design phases. • Catering services for each country's players, generally grouped at the national operations room. • Connecting up via Zoom and the teleconferencing system.

Teams, figures & roles

- EXCON: when feasible, 1 representative for each consortium member - CIMA, Italian Red Cross, MSB, Emergency Services Academy Finland, Ministry of Interior of the Slovak Republic. In any case, a total of 5 consortium members + 4 focal points (1 per country).
- Facilitators: intended here as responsible for the overall management of the SIMEX cycle and for facilitating the after-action review (AAR).
- Observers/evaluators: at least 1 per work package (WP), from among the consortium partners, for a total 12 persons: WP C, Emergency preparedness - Planning and response; WP D, Development of civil protection agencies - Emergency operations centres, public awareness and institutional coordination; WP E, Inclusive civil protection - Civil society and volunteering; WP F, Regional cooperation - UCPM; WP G, Early warning systems - Development and enhancement of EW systems; WP H, Risk management - Multi-hazard analysis and damage assessment.
- Players: country-specific, but generally engaged from among the following:
 - national civil protection agency representatives
 - competent ministries
 - institutions and organisations involved in managing the relevant scenarios
 - hydro-meteorological services
 - civil society organisations and national Red Cross societies.
- A total of 119 players took part in the first cycle (Armenia, Georgia, Moldova and Ukraine), from 43 different institutions and agencies.

Stakeholder analysis Conducted through a specific tool and interviews before the first SIMEX cycle

Recognising training needs Absent. An expressed intent of the TTX was to identify any training needs in the various areas tested.

Conceptualisation & agenda framework The simulations were held over 2 consecutive days (6 hours per day). On Day 1, activities focused mainly on system preparedness. On Day 2, activities centred on response and requests for international assistance triggered by an escalation in the scenario.

Key documents produced:

- Concept note and stakeholder identification
- Specification of the SIMEX management tools and data collection from remote (Google Looker Studio)

Lessons learned:

- Organising a cycle of simulation exercises managed fully from remote required extreme flexibility from the countries and the team of experts, as well as a significant coordination effort.

PHASE 2: DESIGN *[About 1-2 months prior to each TTX]*

Scenario & days of simulation	The scenarios for the PPRD EAST 3 TTXs were designed considering the following aspects: <ul style="list-style-type: none"> • Realistic scenarios involving critical issues (preferably based on real past events) • Proximity to national borders and simulation of cross-border activities • The scenario had to be such to require activation of the European Union Civil Protection Mechanism (UCPM) and management of the incoming international teams (Host Nation Support). Various scenarios for the countries involved in the project were developed, and these focused mainly on two hazards: flood risk and wildfire risk. Past events and incidents with significant impact on the territory were analysed. In some cases, the situation was intentionally intensified, to make the simulation more complex and engaging.
Injects	The purpose of the injects was to supply raw and unprocessed information to the participants, to prompt their responses and activation of procedures, while also assessing communication flows and the application of specific SOPs or pertinent legislation. The injects were built primarily by CIMA (on EW-EA), IRC (on response) and MSB (for HSN) to evaluate the following areas of interest: <ul style="list-style-type: none"> • Management of weather- and water-related data and EW-EA strategies • Management of natural disaster response • Multi-hazard risk management capacities • Communication management during an event • Activation of the UCPM and use of the HNS guidelines. In reacting to the injects, the participants were required to indicate whether they based their responses on: a SOP, a regulation/administrative rule, or operational judgement. This enabled the EXCON to understand how the various countries responded to these events.
Logistics, tools, equipment, documents & materials	<ul style="list-style-type: none"> • Spaces equipped with: video conferencing system, PCs, tables • Documents available to players: natural disaster management procedures and regulations in use in the country • Tools available to players: Google Form for responding to the simulation injects • Other material: instructions to the players • Tools for participants: Google Form/Google Looker Studio for visualising the virtual EXCON

Observation/evaluation plan	The purposes of observing the SIMEX activities were to: <ul style="list-style-type: none"> Identify strengths and areas for improvement in terms of human resources, capacities and consolidated practices; Identify the areas with further training needs. The observation plan was subdivided based on the project WPs, with the criteria developed by the experts for each WP (activities performed without difficulty, with some difficulty, with great difficulty; unable to perform activities): <ul style="list-style-type: none"> WP C: Emergency preparedness - Planning and response WP D: Development of civil protection agencies – Emergency operations centres, public awareness and institutional coordination WP E: Inclusive civil protection - Civil society and volunteering WP F: Regional cooperation - UCPM WP G: Early warning systems - Development and enhancement of EW systems WP H: Risk management - Multi-hazard analysis and damage assessment.
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Key documents produced:	<ul style="list-style-type: none"> Scenarios developed for the simulation Main events list and main injects list Activity observation plan Instructions to the players
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Lessons learned:	<ul style="list-style-type: none"> The importance of open data for building pertinent scenarios
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PHASE 3: IMPLEMENTATION [May - July 2021]

Set-up & administration	Given the health emergency due to the pandemic, the exercises were conducted fully from remote. The EXCON was connected with the participants' simulation via video conferencing and followed their responses to the injects thanks to the virtual EXCON. The players were divided into working groups (Met Office, Emergency Management Authorities, Response etc.) before the simulation, which were assigned email accounts. Receipt of and response to the injects took place via email and Google Form, as did communication between services within the same group.
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Training & briefing	Training was absent; pre-simulation briefing to illustrate how the SIMEX would work.
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Facilitation	EXCON and facilitators were not physically with the players; hence the time-breaks in the simulation were scheduled along with the conference call meetings, to take stock of the situation regarding the actions put into play by the participants. The country's focal point usually saw to assessment and reported to the EXCON, facilitators and observers what was happening during the simulation.
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Observation & evaluation	The observers monitored the TTX by analysing the responses provided through Google Looker Studio, and they evaluated the SIMEX outcomes based on their WPs of reference.
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Lessons learned:	<ul style="list-style-type: none"> Keeping track of what was not recorded through the tool was challenging The focal point's presence in person was vital The use of time-breaks during the simulation to discuss what was being simulated and any problems arising was crucial to having control of the situation The use of data-collection software for conducting the simulation remotely enabled the constant monitoring of the flow of written information exchanged between the various groups of players.
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PHASE 4: DEBRIEFING AND FOLLOW-UP [3-4 months]

Debriefing & feedback	A hot-wash debriefing with comments by the observers was conducted remotely after the SIMEX and involved all the exercise participants.
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Final report & action plan	A document was drafted for every TTX, using infographics with explanatory notes to report the observations of each WP. Every report clearly indicated the regulatory framework used by the players during the simulation and the areas where a lack of procedures was observed. A pan-regional synthesis report on the findings was drafted for all the SIMEXs in order to strengthen the programme training plan.
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Key documents produced:	Automatic Looker report with all the players' reactions to the injects, and some statistics. Report for each TTX, including analysis of the indicators used for observation, a pan-regional report, and consolidated road maps and training plan based on the findings.
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Lessons learned:	<ul style="list-style-type: none"> The entire TTX should be analysed as early as possible: the TTX reports were drafted long after conclusion of the exercise cycle, often by other consortium experts and primarily based on the virtual reports and the observations collected via online forms. Some data and observations were checked only at a later date, through the technical advisory missions in the various countries.
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TTXs within the PPRD East 3 programme

Second cycle of PPRD East 3: hybrid SIMEXs

GENERAL INFORMATION

Simulation exercises conducted by the consortium led by the Swedish Civil Contingency Agency (MSB), and comprising CIMA Research Foundation (CIMA), Italian Red Cross (IRC), Emergency Services Academy Finland (Pelastusopisto) and Ministry of Interior of the Slovak Republic, as part of the 'PPRD East 3' programme, co-funded by the European Union. The second cycle of TTXs (1 per country) was staged at the end of the programme to evaluate the outcomes, and for comparison with the assessment of the first TTX cycle (conducted and managed fully from remote).

General topic	Testing of plans and procedures improved/developed under the programme, specifically regarding early warning and early action (EW-EA), response, host nation support (HNS) and volunteers coordination
Site	Armenia, Azerbaijan, Georgia, Moldova, Ukraine (only an FX conducted by IRC)
Exercise type	Table-top exercise (TTX), with demonstration field activities (Armenia and Georgia) + VIP events (Armenia)
Risks tested	Wildfires and floods
Territory scale	Local, national and international (request for international assistance and initial activation of HNS procedures)
Purpose of exercise process	To validate models, procedures, plans or changes introduced by the project or occurring in a system that participants were already very familiar with.
Level of system knowledge	Advanced. Cycle of SIMEXs conducted almost 4 years after programme implementation, with analysis and training activities carried out through various national and pan-regional workshops, missions, seminars, TTXs, 1 FSX, and experience-sharing.
Level of system maturity	Low (poorly developed/not institutionalised) for EWS and medium (fragmented and reactive) for emergency response management, despite the changes introduced
Period & duration	SIMEX project developed at programme end, from December 2023 (EXCON team formed) to July 2024 (delivery of the first TTX draft reports). Action plan developed parallel to programme end: September 2024 through delivery of the Advisory Documents discussed during the closing conference.

PHASE 1: PLANNING [December 2023 - June 2024]

Consultations	Two (1 pan-regional and 1 in person in the country of implementation) with the focal points/national coordinators, local experts and, where possible, the key stakeholders; to share working method and outline scenario, and to establish actors. Weekly meetings with the local experts and the consortium's working group, comprising representatives for each WP, from February to June 2024.
Goals	To check programme outcomes and partner status. Specific goals set by each WP, based on the training paths developed.
Project budget & resources	For the planning, design and implementation of the whole SIMEX process: 1 team leader, 2-3 members of management, 1 MSB EXCON head, 3 EXCON members, minimum of 7 experts from the various WPs, 2 observation/assessment experts + 1 SIMEX process evaluation expert, 5 local experts + other support persons. The planning and design team was made up of EXCON members and representatives from the various WPs. During implementation: <ul style="list-style-type: none"> • Catering services and room hire • Translating and teleconferencing system for the hot wash-up • Travel and personnel expenses
Teams, figures & roles	Average numbers involved in the entire process: <ul style="list-style-type: none"> • EXCON consortium: minimum of 3 persons for each TTX (group made up of 1 MSB EXCON head + 3 staff members for the Slovak partner) • Local EXCON support: at least 1 person from local civil protection + 1 local expert contracted by MSB for each country • Scenario-building: 2 CIMA members (1 DRA expert + 1 EWS expert) • Facilitators/coaches also participating as observers/evaluators: an average of 1 per WP (7 persons) + back-up persons • 1 coordinator for the observation/analysis process: not always in person • 1 evaluation expert (from remote) • 1 communication expert, not always in person • IT remote support for the virtual EXCON: 2 IRC members • Players: an average of 50 per TTX, representatives from national and local civil protection agencies, forestry agencies, hydro-meteorological services, Red Cross/Red Crescent, national and local emergency operations services (including drone pilots).
Stakeholder analysis	Already available in the programme
Recognising training needs	Not applicable. The TTX was conducted at the end of a lengthy training process.
Conceptualisation & agenda framework	TTX simulated at local (pilot case) and national levels, developing the SIMEX storyline based on the risk scenario formulated during the DRA training activities. EXCON team and facilitators/coaches subdivided between the two territorial levels. Demonstration field activities (use of drone) carried out in Georgia and Armenia, and VIP programme in Armenia (cancelled due to floods concurrent to the TTX). Two days of simulation followed by after-action review: <ul style="list-style-type: none"> Day 0: EXCON internal briefing Day 1: first day of simulation (8 hours) followed by after-action review Day 2: second day of simulation (8 hours) followed by after-action review Day 3: final after-action review (local + national)
Key documents produced:	<ul style="list-style-type: none"> • Presentation of the concept note during the steering committee meeting • Creation of the first version of the handbook
Lessons learned:	<ul style="list-style-type: none"> • Many of the consortium experts engaged for the first and second TTX cycles were not the same ones, resulting in delays in aligning the whole team in building the simulation project. Also some of the focal points and key stakeholders identified for each country changed during the course of the programme. • Some experts were engaged in the SIMEX project very late, resulting in delays. • Involvement of local-level representatives in the planning was limited, even though the design process incorporated some inputs gathered during prior workshops in the pilot cases.

PHASE 2: DESIGN [March 2023 - June 2024]

Scenario & days of simulation	Scenario developed from the risk scenario built for the National Disaster Risk Assessment (NDRA). Event of national relevance but developed during the pilot case. Wildfire (Armenia, Azerbaijan, Georgia) or flooding (Moldova). Duration of simulated event varied from 2 to 4 days (2 days of actual simulation), with time leaps for activities connected with damage assessment.
Injects	<ul style="list-style-type: none"> • Created mainly by CIMA + IRC based on the scenario, with input also from other WPs. MEL-MIL developed around 3 events: (Early) Warning and Forecast, Processing and Sharing, (Early) Activation and Action. • Specific injects for: <ul style="list-style-type: none"> » EW generation and dissemination » Communication and notifications to the public » EA triggering and response management » Volunteers » Risk analysis and damage data management » Communication and data-sharing between different territorial levels and different agencies » International requests » Management of cross-border communication
Logistics, tools, equipment, documents & materials	<ul style="list-style-type: none"> • Debriefing spaces equipped with: teleconferencing systems, and tables in a U configuration • Participant recognisability: desk nameplates during the debriefing, vests for the EXCON and facilitators/coaches during the simulation. Players wearing their uniforms, if applicable • Documents available to players: instructions • Tools and equipment available to players: PCs, maps and tools/equipment normally used in their work activities • Other documents: certificates • Tools and equipment for participants: the virtual EXCON accessible also to the facilitators/coaches, dedicated email accounts created for the players group (Met Office, National and Municipal Emergency Agency, national Red Cross, local Red Cross, local authorities), forms for collecting observations, feedback from the daily AAR from all participants, and feedback from the evaluation process. Tools and equipment for participants: their own PCs, email accounts (only the EXCON ones were specially created), telephones.
Observation/evaluation plan	<ul style="list-style-type: none"> • Worksheets created by each WP • WP C: Emergency preparedness - Planning and response • WP D: Development of civil protection agencies - Emergency operations centres, public awareness and institutional coordination. • WP E: Inclusive civil protection - Civil society and volunteering • WP F: Regional cooperation - UCPM. • WP G: Early warning systems - Development and enhancement of EW systems • WP H: Risk management - Multi-hazard analysis and damage assessment
Key documents produced:	<ul style="list-style-type: none"> • Concept note, and consolidated agenda with instructions for participants and logistics • Consolidated handbook • Observation/assessment forms, evaluation forms, AAR forms • MEL-MIL associated with the virtual EXCON
Lessons learned:	<ul style="list-style-type: none"> • Design was facilitated by the team of experts' in-depth knowledge of the systems being tested. Many of the injects were specifically developed for tools created within the programme or to check plans and procedures that had been extensively discussed during the numerous field missions. • The risk scenario was realistic and had been used during the training phase as an example of a national-relevance risk scenario. Nevertheless, since it had originally been conceived for the NDRA, it had to be adapted to be used as a SIMEX scenario, integrating specific components of the EWS introduced by the programme, as well as aspects connected with cross-border escalation in some contexts. • The time available for setting up the entire SIMEX structure was sometimes limited, particularly regards the need to share the scenario with all the experts involved in the simulation as coaches and observers.

PHASE 3: IMPLEMENTATION [June - July 2024]

Set-up & administration	Day Minus 1: internal briefing (EXCON and facilitators/coaches/trainers) + definition of logistics and details with local experts. Day 0: EXCON briefing with local counterpart (focal points); checking inject flow; establishing the groups (generally hydro-meteorological services, local civil protection agencies, national civil protection agencies, national and local Red Cross, field operations); configuring email accounts and scheduling automatic email delivery. Days 1 and 2: allocating players to working groups, and simulation.
Training & briefing	<ul style="list-style-type: none"> No training conducted Briefing involving all actors 30mins/1hr before the simulation, on Day 1
Facilitation	<p>Performed by</p> <ul style="list-style-type: none"> EXCON: modifying the inject times, creating new injects when necessary, and imposing time-breaks to enable the WP experts to conduct training. WP experts: prompting the players through questions and suggestions towards solutions (coaching). Sometimes delivering in-depth training on certain project tools or demonstration activities (drones).
Observation & evaluation	<ul style="list-style-type: none"> Form-based answers for activity assessment during implementation: after every activity/set of responses, each WP expert conducted evaluation in relation to the defined goals. Observation activities were, in some cases, complemented by on-site interviews/questions by the experts. Interviews with WP experts + local representatives to evaluate the whole process, integrated with answers collected through specific forms both before and after the 2 days of simulation.
Lessons learned:	<ul style="list-style-type: none"> When deploying hybrid tools, a 'simulation of the simulation' needs to be staged with all participants, including players and experts. Although they had been involved in many training activities and a previous cycle of exercises, not all the countries showed the same aptitude during the simulation. Prior specific training on the simulation itself would have been advisable in some cases. Some verbal communication/notifications, institutional emails and phone calls were not captured by the inject tracking system. Division into working groups also proved challenging when multiple services from the same institution/agency were participating as players. Visualising the evaluations made during the simulation enabled the EXCON to adjust the injects. The experts were able to focus on specific groups of players and actions.

PHASE 4: DEBRIEFING AND FOLLOW-UP [June - September 2024]

Debriefing & feedback	<p><u>Hot-wash debriefing and feedback</u> The participants divided into two groups each day: facilitators/coaches and consortium members in one group and players and the focal point in the other, to reflect on what had been done. The daily after-action review (AAR) enabled feedback to be collected from all participants. Typical questions were: What should have happened? What happened? Why? What can we improve and what should we keep? How? What do we want to share with others? Answers were grouped into: continue doing; stop doing; start doing. Final AAR on Day 3: a round of evaluations detailed by the experts in each WP, plus feedback collected from the local contingent. AAR was conducted keeping the national and local contingents together (with some representatives travelling from one site to another), and not all the players were present for this reason. <u>Cold debriefing, regional</u> Coinciding with the final project meeting and discussion of the Advisory Documents.</p>
Final report & action plan	<ul style="list-style-type: none"> TTX evaluation report: structured by WP, with an evaluation section and one on cross-cutting topics (gender, environment, rights) Advisory Document: recommendations regarding the programme areas of interest
Key documents produced:	TTX assessment report for each country; general report on the TTX; Advisory Document for each country, based on the TTX outcomes and subsequent to the activities carried out during the programme, and structured with the proposal of detailed actions to develop for various risk management areas.
Lessons learned:	<ul style="list-style-type: none"> The AAR conducted at the end of each day was very useful to correcting certain practices then put in place the next day. The TTX analysis performed by each WP expert immediately following the TTX enabled the drafting of detailed information-rich reports. The external evaluation team then enhanced these reports with analysis of the SIMEX process as a whole. The cold debriefing conducted at project end enabled discussion of the Advisory Document with each country's key stakeholders.

5.3 Seychelles TTX as part of the IOC - UNDRR project

GENERAL INFORMATION

SIMEX built by CIMA Research Foundation (CIMA) in conjunction with the Regional Centre for Mapping of Resources for Development (RCMRD) as part of the 'Resilience-building and Disaster Response Management in the Indian Ocean (RDRM-IO)' programme co-funded by the European Union in partnership with the Indian Ocean Commission (IOC), PIROI and UNDRR.

General topic	Early warning and early action systems (EW-EAS)
Site	Seychelles
Exercise type	Table-top exercise (TTX)
Risks tested	Flooding + extreme tide and wave events
Territory scale	From national to local
Purpose of exercise process	Operations assessment and support to initial analysis/knowledge base
Level of system knowledge	Preliminary analysis through a desk review and a round of on-site consultations (between December 2023 and April 2024)
Level of system maturity	Medium
Period & duration	Implementation before the rainy season. SIMEX process lasted from June 2024 to December 2024

PHASE 1: PLANNING [June 2024 - September 2024]

Consultations	<p>Planning meetings with Disaster Risk Management Division (DRMD) and Seychelles Meteorological Agency (SMA) on a weekly basis (at least 7 meeting in 1.5 months). The consultations were used to:</p> <ul style="list-style-type: none"> Discuss the proposed SIMEX methodology Establish the risk types to develop in the scenario Assess SIMEX experience accrued on specific topics by the project focal points and key stakeholders, as well as by the other actors to engage Define involvement of key actors in the EXCON during the implementation phase Share key documents
Goals	Testing and mapping the capacity of the national EW system to issue early and effective warnings in the case of flooding or extreme tide and wave events. The focus was on the command chain, roles, responsibilities and the interactions between the various actors, institutions and agencies involved in notification generation and issuance, and the coordinated activation of early action.
Project budget & resources	<ul style="list-style-type: none"> 2 CIMA experts + 2 RCMRD experts for both planning and implementation Catering services and room hire (co-funded by UNDRR due to budget shortfall) Travel and personnel expenses
Teams, figures & roles	<ul style="list-style-type: none"> EXCON: 7 members during the planning phase (4 from team of experts + 2 DRMD + 1 SMA) + 2 from team of experts during the implementation phase. Facilitators: 1 from team of experts + 1 from DRMD (they also acted as observers/evaluators). Observers/evaluators: 2 from team of experts + 1 from DRMD + 1 from SMA + 1 external consultant. Players: about 60 persons from key EW-EAS institutions – DRMD, SMA, Seychelles National Emergency Operations Centre (NEOC)/ National Incident Command System, Ministry of Local Government & Community Affairs, Red Cross Society of Seychelles (RCSS), early warning responders, Public Utilities Corporation (PUC), Ministry of Education.
Stakeholder analysis	Conducted during the preliminary analysis through structured mapping charts
Recognising training needs	Intensive training was not scheduled. A short workshop planned in agreement with the key stakeholders was held on Day 1. Its topics aligned with the overall TTX aims.

Conceptualisation & agenda framework	<p>2.5 days of implementation, which included the training:</p> <ul style="list-style-type: none"> • Day 1 - preparatory training workshop – discussion on the EW-EAS and the specific TTX goals, presentation of the tools and 'simulation of the simulation'. • Day 2 - simulation. • Day 3 - after-action review to discuss the preliminary findings with all the actors.
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Key documents produced:	<ul style="list-style-type: none"> • Concept note and agenda • Chart for mapping stakeholders
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Lessons learned:	<ul style="list-style-type: none"> • Involving the local pilot cases proved essential to effectively testing communication flows and the command chain, and for checking capacities at various territorial levels. This aspect lengthened the time required to design the SIMEX. • Including DRMD and SMA within the EXCON/facilitators and observers group strengthened TTX ownership and created a safer environment for the simulation and the evaluation. • A clear list and understanding of the institutions/agencies taking part and of any groups of players is essential for facilitating implementation and for creating appropriate injects for each (for instance, the Ministry of Education was not present on the participant list and therefore injects had to be created on the spot to enable it to take part).
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PHASE 2: DESIGN [September 2024]

Scenario & days of simulation	<p>Scenario based on a relevant past event (December 2023), and built with support from SMA. Simulation of a 1.5-day escalating hydro-meteorological event, resulting in gradually increasing levels of early warnings issued by SMA (yellow, orange and red), with progressive activation and testing of the response mechanisms of the entire disaster risk management system, from the local to the national level.</p>
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Injects	<p>Injects were to test various sectorial capabilities and the overall system capacity regarding:</p> <ul style="list-style-type: none"> • Weather reports - to trigger preparedness and early warning issuance • Transport and communication channels - transport in the northern areas is usually affected by debris during heavy rainfall, also leading to road blockages • Public services, such as schools • Settlements and/or tourism facilities • Cascading impacts such as landslides and strong winds • Collapse of the industrial framework (potential risk evaluation)
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Logistics, tools, equipment, documents & materials	<ul style="list-style-type: none"> • Spaces equipped with: tables arranged in a circle, microphones, video projector, video conferencing system, Internet connection, water, coffee and food • Participant recognisability: desk nameplates for the various roles • Documents available to players: existing maps, plans and procedures • Tools available to players: logbook • Other documents: instructions presented during implementation, diplomas/certificates • Tools for participants: specifically created email accounts for sending injects and information-sharing
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Observation/evaluation plan	<p>Evaluated/observed components: assessment of the technical processes during the implementation phase and general SIMEX organisation.</p>
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Observation/evaluation plan	<p>Technical processes evaluated (what went well, what could be improved, recommendations):</p> <ul style="list-style-type: none"> • Issuance and interpretation of hydro-meteorological bulletins • EW dissemination, and resources and communication flows • Command and control chains at all institutional levels, including subsidiarity • Assessment of hazard and risk information • Activation of early action and preparedness and emergency plans
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Key documents produced:	<ul style="list-style-type: none"> • MEL-MIL • Observation/evaluation forms
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Lessons learned:	<ul style="list-style-type: none"> • The consultations with the main stakeholders and the sharing of pertinent planning-phase documents are essential to drafting tailored injects (e.g. retrospective analysis of hazardous events). • The instructions to the players and the agenda should be shared with all the participants, well in advance (also specifying the tools to be used during the exercise, the plans/procedures to be tested, etc.). • The choice of communication channels to be used during the SIMEX – especially how to send injects and how to receive observed responses – is crucial (issues emerged in the Seychelles connected with email use). In addition, logbook use has to be agreed on, and the instructions to participants need to be included.
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PHASE 3: IMPLEMENTATION [2 - 4 October 2024]

Set-up & administration	<p>The day before the preparatory sessions:</p> <ul style="list-style-type: none"> • Checking the spaces/sites and catering arrangements • Final meeting with the EXCON/facilitators group and observers/evaluators to check coordination alignment and the list of participants and players
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Set-up & administration	<p>The day before the simulation:</p> <ul style="list-style-type: none"> • Allocating players to working groups • Setting up dedicated email accounts for the simulation • Setting up the logbook as a tool for the simulation • Collecting the participants' exact names for the certificates • Coordination on logos for the certificates
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Training & briefing	<p>The entire first day of implementation was given over to training and the briefing. The general training topic was EW-EAS and preparedness and response to disaster risk. The specific topics addressed were developed by the key institutions in the Seychelles:</p> <ul style="list-style-type: none"> • SMA activities and bulletin issuance (by SMA) • Disaster risk reduction and management (by DRMD) • Preparedness and local-level response (by local authorities) • National Emergency Operations Centre (by NEOC) • Introduction to simulation exercises (by CIMA)
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Training & briefing	<p>In terms of SIMEX briefing, the following aspects were addressed:</p> <ul style="list-style-type: none"> • Introduction to the TTX and simulation instructions • 'Simulation of the simulation'
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Facilitation	<p>Facilitation was managed mainly by local facilitators. Time-breaks were included to reflect on some unclear/poorly structured practices and to correct these during the subsequent SIMEX phases. Some injects were created on the spot to enable the simulation of some support functions not planned for during TTX design.</p>
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Observation & evaluation	<ul style="list-style-type: none"> • The team of experts could read the players' reactions in real time as the EXCON was systematically copied in during written communication between them. • Receipt of the periodic situation reports sent by the national-level players during full activation of the Seychelles National Emergency Operations Centre (NEOC). • Notes were taken during the simulation by listening to the discussions between the various players, grouped by support function. • At simulation end, the players completed their situation reports by including all the actions carried out regarding the received injects, specifying who had done what and based on which request/trigger. • Technical processes were evaluated at simulation end, by bringing together all this information.
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Lessons learned:	<ul style="list-style-type: none"> • The pre-simulation training proved to be an excellent opportunity for refreshing on the main tools, procedures and plans, and for discussing specific cross-cutting aspects involving multiple stakeholders (e.g. colour-coded EWs). Allocating more time to training would have been beneficial. • Simulating the progressive activation of the NEOC in the Seychelles enabled testing of local-level response to the EWs and of the capacity of the NEOC itself in terms of activation/deactivation mechanisms. • The 'simulation of the simulation' was useful to guiding participants towards the right mindset, making them more aware of available tools and therefore achieving a smoother simulation on the following day. • The time-breaks proved very useful for reflecting on some unclear/poorly structured practices and for correcting these during the subsequent SIMEX phases. These breaks also served as training/coaching sessions. • The presence of 'local' facilitators fostered more open and honest discussion between the participants. • The greater the number of actors involved, the greater the amount of idle time for some players. It should therefore be explained in advance that this might occur, or the EXCON's capacity should be strengthened.
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PHASE 4: DEBRIEFING AND FOLLOW-UP [October - November 2024]

Debriefing & feedback

In-person hot-wash debriefing on Day 3: working groups + plenary.

Participants worked within their respective groups and discussed what went well, what could be improved and potential recommendations regarding all the topics identified through the evaluation forms. Following this group work, a plenary session was held to share and discuss the outcomes and findings of the simulation.

All the evaluation forms were collected and assessed.

Final report & action plan

As per the project, the following documents were produced:

- Report on the TTX, including a description of all the SIMEX phases and the strengths, weaknesses and recommendations to improve the country's EW-EAS with regard to the risks addressed.
- Synthesis report/policy brief.

Key documents produced:

- Report on the TTX
- Synthesis report/policy brief

Lessons learned:

- The consultations with the country to share the report did not take place due to the tight timescale. More time needs to be allocated to Phase 4 for drafting of a rough version of the final report and to initiate the process of discussion with and validation by the key stakeholders.
- The hot-wash debriefing structured as group work plus a plenary worked well and fostered 'open' evaluation (thanks also to the group work) and the general sharing of what has to be improved (plenary), highlighting the aspects common to all system actors, as well as more specific needs in certain sectors.



Credits: Assessment of early warning systems in four Indian Ocean Islands States

5.4 TTXs within the Italian Civil Protection Department national context

TTX with Savona Municipal Authority

GENERAL INFORMATION

SIMEX conducted by CIMA Research Foundation in conjunction with Savona Municipal Authority.

General topic	Reviewing the municipal preparedness and emergency plan and updating the 'schools-Savona Municipal Authority protocol'
Site	Savona
Exercise type	Table-top exercise (TTX)
Risks tested	Hydrological and flooding
Territory scale	Local
Purpose of exercise process	To update disaster risk management and civil protection planning and develop new operational protocols (schools safety protocol)
Level of system knowledge	Preliminary analysis conducted through review of the official documents and interviews with department directors, officials and administrative personnel from the various pertinent municipal authority sectors.
Level of system maturity	Medium
Period & duration	May 2022 - November 2022

PHASE 1: PLANNING [September 2022 - October 2022]

Consultations	Planning meetings with policy-makers, directors, officials and administrative personnel from the various municipal authority sectors involved, in various capacities, in the civil protection process.
Goals	<ul style="list-style-type: none"> • Enabling training and knowledge-updating at all levels of the local civil protection system • Assessing the decision-making process and mechanisms for coordination between the actors • Strengthening internal coordination as well as coordination with other sectors/institutions • Validating the tools and processes used for collecting and organising information
Project budget & resources	<p>The CIMA group:</p> <ul style="list-style-type: none"> • 2 senior technical experts • 1 senior legal/administration expert • 2 technical experts • 2 legal/administration experts • Mission, transfer and personnel expenses
Teams, figures & roles	<ul style="list-style-type: none"> • EXCON: 2 members during planning + 2 from team of experts during implementation • Facilitators: 1 senior technical expert • Observers/evaluators: 4 from team of experts • Guest attendees: 5 persons from the following agencies or services: Environmental Services and Technological Systems; Municipal Buildings and Cemeteries Service; Financial Resources Service; Adult Social Vulnerability, Emergency and Inclusion; Red Cross Liguria • Players: 4 policy-makers from Savona Municipal Authority and 7 technical and administrative officials relative to the Municipal Operations Centre support functions
Stakeholder analysis	This was conducted during the preliminary analysis by consulting the municipal preparedness and emergency plan.
Recognising training needs	This took place after the TTX: a non-intensive training course was planned in agreement with the key stakeholders.
Conceptualisation & agenda framework	<p>The agenda was established in consultation with the focal point for Savona Municipal Authority and was set out over two days:</p> <ul style="list-style-type: none"> • Day 1: 25/11/2022 – SIMEX presentation to local authority stakeholders • Day 2: 30/11/2022 – TTX simulation and hot-wash debriefing

Lessons learned:

- Having a clear understanding of what the actors do operatively during civil protection activities is necessary. This assessment should nonetheless be made downstream of the preparedness and emergency plan procedures, in order to verify whether the officials adopt the prescribed actions. This aspect required additional time during SIMEX design.
- Involving all the departments and services connected with municipal-level civil protection is important.
- The presence of guest attendees within the SIMEX process was deemed important in ensuring coordination between local authority action and the actors operating on the ground and not directly involved in decision-making.

PHASE 2: DESIGN [October 2022 - November 2022]

Scenario & days of simulation

The scenario proposed was based on the reference event of 4 October 2021: between 3 and 4 October 2021 a series of self-generating thunderstorms formed off the Ligurian coast. Simulation of a 2-day escalating hydro-meteorological event, which resulted in a yellow-level early warning for thunderstorm risk; this progressively tested the emergency response mechanisms of the entire management system.

Injects

Injects were to test various sectorial capabilities and overall system capacity regarding:

- Meteorology - to trigger early warning issuance
- Monitoring and surveillance
- Power supply outage
- Regional Operations Room information requests
- ECC activation by the Prefecture

Logistics, tools, equipment, documents & materials

- Spaces equipped with: tables arranged in a circle, microphones, video projector, video conferencing system, Internet connection, water, coffee and food.
- Documents available to players: existing maps, plans and procedures, and official documents used during past events.

Observation/evaluation plan

Evaluated/observed components: assessment of the technical processes during the implementation phase and general SIMEX organisation.

Technical processes evaluated (what went well, what could be improved, recommendations):

- Issuance and interpretation of hydro-meteorological bulletins
- EW dissemination, and resources and communication flows
- Command and control chain at all institutional levels, including subsidiarity
- Assessment of hazard and risk information
- Activation of early action and preparedness and emergency plans

Lessons learned:

- The consultations with the main stakeholders and the sharing of pertinent planning-phase documents were essential to drafting tailored injects (e.g. retrospective analysis of hazardous events).
- The instructions to the players and the agenda should be shared with all the participants, well in advance (also specifying the tools to be used during the simulation, the plans/procedures to be tested, etc.).

PHASE 3: IMPLEMENTATION [25 - 30 November 2022]

Set-up & administration

A week before the preparatory sessions:

- Checking the spaces/sites
- Explaining the scenario
- Final meeting with the EXCON/facilitators group and observers/evaluators to check coordination alignment and the list of participants and players

Training & briefing

The SIMEX briefing focused on the following aspects:

- Introduction to the TTX
- Instructions for the simulation

Facilitation

Facilitation was managed primarily by 2 experts from the CIMA team.

Observation & evaluation

Notes were taken during the simulation

Lessons learned:

- The time-breaks were very useful for reflecting on some unclear/poorly structured practices and for correcting these during the subsequent SIMEX phases.
- These breaks also served as training/coaching sessions.
- The presence of facilitators enabled more open and honest discussion between the participants.
- The greater the number of actors involved, the greater the amount of idle time for some players. It should therefore be explained in advance that this might occur, or the EXCON's capacity should be strengthened.

PHASE 4: DEBRIEFING AND FOLLOW-UP [18 November 2023]

Debriefing & feedback

Participants worked on and discussed what went well, what could be improved and potential recommendations regarding all the topics identified through the evaluation forms.

Final report & action plan

As per the project, a report on the TTX was drafted

Key documents produced:

- Report on the TTX

Lessons learned:

- The consultations were useful in laying the groundwork during the meetings and the subsequent activities. In particular, the TTX also paved the way for the subsequent FSX on 27/04/2023.



Credits: TTX Bagnara Calabria

5.4 TTXs within the Italian Civil Protection Department national context

DBX with Bagnara Calabria Municipal Authority (Reggio Calabria)

GENERAL INFORMATION

Simulation exercise as part of the training days with Bagnara Calabria Municipal Authority developed by CIMA Research Foundation (CIMA) in conjunction with Calabria Regional Civil Protection Department, Italian Civil Protection Department (ICPD), and the ICPD inclusion project 'Able to Protect', within the CIMA-ICPD agreement.

General topic Participatory planning process regarding disaster risk management and civil protection

Site Bagnara Calabria (in the province of Reggio Calabria)

Exercise type Discussion-based exercise (DBX)

Risks tested Hydrogeological and flooding

Territory scale Local

Purpose of exercise process Operative assessment as support to initial analysis/knowledge base and training of MOC members

Level of system knowledge Preliminary analysis conducted through review of the official documents and interviews with directors, officials and administrative personnel from the various pertinent municipal authority sectors

Level of system maturity Medium

Period & duration October 2023

PHASE 1: PLANNING [October 2023]

Consultations	Consultations on the SIMEX were kept to a minimum, given the many previous review and analysis meetings involving the local civil protection system and the policy-makers, directors, officials and administrative personnel of the pertinent departments of the local authority and Calabria Regional Authority.
Goals	<ul style="list-style-type: none"> To test the municipal response model and, specifically, activation of actions in the event of a weather-related or hydrological EW by the organisations involved in the SIMEX; To test the municipal preparedness and emergency plan; To check communication flows and quality of the information exchanged between components of the Municipal Operations Centre.
Project budget & resources	The CIMA group: <ul style="list-style-type: none"> 3 technical experts Mission, transfer and personnel expenses
Teams, figures & roles	<ul style="list-style-type: none"> EXCON and planning team: 2 from team of experts Facilitators: 1 from team of experts Observers/evaluators: <ul style="list-style-type: none"> 1 from CIMA 1 from ICPD 1 official for the Able to Protect project 2 officials from Calabria Regional Authority Players: <ul style="list-style-type: none"> Mayor General Affairs, Demographic Services and IT Department Human Resources Department Finance Department – Taxation, Trade and Legal Affairs Building, Planning and Land Management Department – State Property, Environment and Cemetery Services Public Works and Maintenance Department – Port Authority – Civil Protection Local Police Agency Volunteer organisations, primarily the Bagnara Calabra unit of the Italian Red Cross.
Stakeholder analysis	Conducted outside of the exercise process, this took place within the preliminary analysis and through consultation of the municipal preparedness and emergency plan, through participatory meetings preceding the SIMEX activities and as part of the 'Stretto 2022' SIMEX regarding the Strait of Messina.
Recognising training needs	Conducted outside of the exercise process, this took place within the 'Stretto 2022' SIMEX regarding the Strait of Messina. As regards the DBX, training was scheduled for the day before the simulation, in agreement with the key stakeholders.
Conceptualisation & agenda framework	Implementation days: <ul style="list-style-type: none"> Day 1 – Training and SIMEX presentation to municipal-level stakeholders Day 2 – Simulation exercise Day 2 – Hot-wash debriefing After-action review a week later
Lessons learned:	<ul style="list-style-type: none"> Before setting up the SIMEX project, understanding how the civil protection service is structured and the relationships and interactions with other agencies and organisations was strategic and constructive.

PHASE 2: DESIGN [March 2023 - June 2024]

Scenario & days of simulation	The scenario proposed was based on the reference event of 24-30 October 2021: Between 24 and 30 October 2021, a 'Medicane' – a tropics-like cyclone bringing strong winds and torrential rain – formed just off the Calabrian coast. Simulation of a 3-day escalating hydro-meteorological event, which resulted in an orange-level early warning that was later downgraded to yellow; this progressively tested the emergency response mechanisms of the entire management system. The actual simulation lasted 3 hours.
Injects	Injects were to test various sectorial capabilities and overall system capacity regarding: <ul style="list-style-type: none"> Communication related to forecasting, monitoring and surveillance Communication and notifications to local residents with disabilities and to the education sector Communication with organisations (Regional Operations Room, Monitoring and Forecasting Centre, etc.) Communication and notifications on effects on the ground Communication with the press and management of information to the public.

Logistics, tools, equipment, documents & materials	<ul style="list-style-type: none"> Spaces equipped with: tables in a U configuration, a video projector Documents and materials available to players: existing maps, plans and procedures (not used during the simulation)
Observation/evaluation plan	<p>Components evaluated/observed: analysis of the technical processes during the implementation phase and general SIMEX organisation.</p> <p>Technical processes evaluated (what went well, what could be improved, recommendations):</p> <ul style="list-style-type: none"> Interpreting/understanding the hydro-meteorological bulletin Early Warning dissemination and resources and communication flows Command and control chain at all institutional levels, including subsidiarity Assessment of hazard and risk information Decision-making, and activation of early action and the municipal preparedness and emergency plan

PHASE 3: IMPLEMENTATION [11 October 2023]

Set-up & administration	The day before the preparatory sessions: <ul style="list-style-type: none"> Checking the spaces/sites Final meeting with the EXCON/facilitators group to check coordination alignment and the list of participants and players Meeting with observers/evaluators for final check of coordination alignment and the list of participants and players
Training & briefing	The following aspects were addressed during the SIMEX briefing: <ul style="list-style-type: none"> Introduction to the DBX Instructions for the simulation
Facilitation	Facilitation was managed mainly by 2 CIMA team experts. Time-breaks were included to discuss and reflect on some unclear/poorly structured practices and to correct these during the subsequent SIMEX phases.
Observation & evaluation	Notes were taken during the simulation and online forms were filled out to gather information and suggestions.
Lessons learned:	<ul style="list-style-type: none"> The time-breaks proved very useful for reflecting on some unclear/poorly structured practices and for correcting these during the subsequent SIMEX phases. These breaks also served as training/coaching sessions.

PHASE 4: DEBRIEFING AND FOLLOW-UP [October - November 2023]

Debriefing & feedback	Participants worked on and discussed what went well, what could be improved and potential recommendations regarding all the topics identified through the evaluation forms.
Final report & action plan	As per the project, the following document was produced: <ul style="list-style-type: none"> Report on the DBX
Key documents produced:	<ul style="list-style-type: none"> Report on the DBX
Lessons learned:	<ul style="list-style-type: none"> The consultations were useful in laying the groundwork during the meetings and the subsequent activities. In particular, the DBX also paved the way for the subsequent participatory meetings.

PART 3

REFERENCES



Reference framework

Early warning systems

These guidelines are based on an international framework that defines an early warning system (EWS) as an integrated system of processes for assessing risk, hazard monitoring and event prediction, as well as early warning and alert, and communication, planning and activation of preparedness and emergency plans and actions (UNDRR 2017).

This approach is fully consistent with the Sendai Framework for Disaster Risk Reduction 2015-2030 (UN General Assembly 2015) which, under Target G, emphasises the importance of increasing the availability of and access to multi-hazard early warning systems and of integrating disaster risk information in decision-making processes. In addition, the initiative 'Early Warnings for All' (EW4ALL), launched in 2022 by the United Nations Secretary-General (WMO 2022), reinforces the need to link early warnings with early and targeted action to save human lives, particularly in the context of climate change.

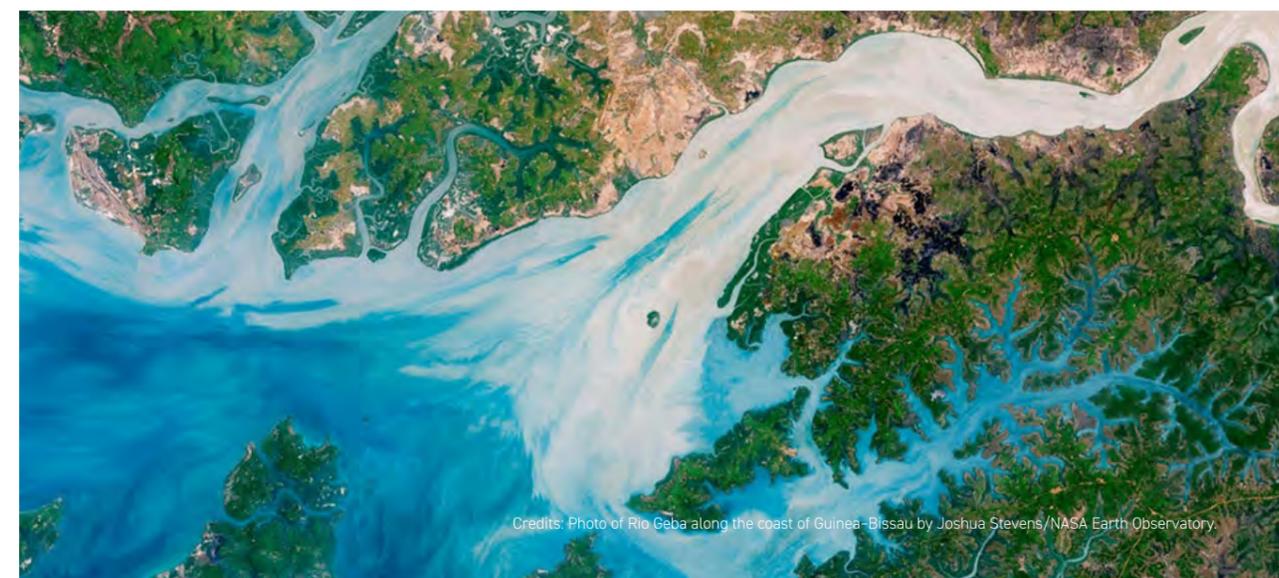
At the European level, directives and strategies such as the EU Floods Directive (Directive 2007/60/EC) and the Joint Communication 'A Strategic Approach to Resilience in the EU's External Action' underscore the need for early warning systems to be accompanied by concrete and operational early action measures.

The five Disaster Resilience Goals promoted by DG ECHO (Commission Recommendation on European Union disaster resilience goals 2023) place particular attention on the early warning component, through the objective of strengthening risk forecasting and communication mechanisms to ensure that early warnings are prompt, clear and action-oriented. These goals explicitly support the interconnection between forecasting, preparedness, alert, response and protection, with the aim of building a coherent and responsive system.

Notes on simulation exercise categories

Various SIMEX types exist, featuring different operating methods and complexity levels. Nonetheless, the terms used to describe them are not always interpreted in the same way by all. It is therefore essential to reach an agreed meaning, clarifying goals and characteristics of the SIMEX type concerned, in order to ensure effective planning and execution.

There are four main categories of simulation exercise, as defined by UNDRR (2020), and the relative descriptions included in the Italian Directive on Emergency Planning (Direttiva del PCM 2021), and based on the UCPM model. These are shown in Table 14, with reference made to the specific civil protection and disaster risk management simulation exercises.



Credits: Photo of Rio Geba along the coast of Guinea-Bissau by Joshua Stevens/NASA Earth Observatory.

UNDRR, 2020 existing simulation exercise categories	Italian Directive on Emergency Planning, 2021 simulation exercise categories
<p>Table-Top Exercise (TTX): Facilitated discussion in a low-stress environment, where the goal is to identify problems, refine existing operational plans and better understand responsibilities, roles and procedures. It does not require an existing preparedness and emergency plan to be in place. It lasts a few hours.</p>	<p>Table-Top Exercise (TTX): An artificial environment is simulated and this fully or partially reproduces event scenarios in order to test decision-making processes that refer to existing preparedness and emergency plans or response models. A TTX may be deployed to test and/or develop standard operating procedures and plans. Within an established timeframe ranging from a few hours to one day, participants jointly examine or discuss how they intend to manage a variety of assigned problems or tasks. TTXs also require participants to manage and produce the connected documentation.</p> <p>Discussion-Based Exercise (DBX): It is primarily aimed at assessment and discussion of specific procedures and activities. Therefore, this type of exercise involves joint discussion and deliberation between the simulation exercise participants.</p>
<p>Drill: A supervised activity to test specific operations or functions. It uses real resources and aims to improve a part of the overall preparedness and emergency plan. It lasts from an hour to a full day</p>	<p>--</p>
<p>Functional Exercise: A fully simulated interactive exercise that tests the capability of an organisation to respond to a simulated event. It involves multiple functions, roles and responsibilities under pressure, to identify gaps in the plan and improve it. This type can run from a few hours to some days</p>	<p>Command-Post Exercise (CPX): This is conducted at various levels of emergency operations centres, with simulation of, for instance, managing and mobilising resources in order to check interactions and communication between the various centres, and to test decision-making processes, coordination system activation times and response procedures. This type of exercise does not involve real actions in the field except for the staffing and operating of the activated operations centres.</p> <p>It falls under the Functional Exercise category.</p>
<p>Field Exercise (FX): It simulates real events with realistic response conditions. It evaluates operational capability typically involving multiple agencies, resources and personnel physically in the field. It can take some hours or several days.</p>	<p>Field Exercise (FX): This simulates the phases of activation, mobilisation and operational deployment of trained teams or modules, involving real actions in the field as well as the activation of emergency operations centres and/or interaction with the relevant stakeholders and authorities for testing specific aspects or for achieving set training goals. This simulation exercise type is comparable to an emergency response drill.</p> <p>Full-Scale Exercise (FSX): All the various civil protection activities are simulated, from prevention and early warning through to management of the emergency within the simulated scenario. In addition to activation of the communications network and the operations centres at all the relevant territorial levels, real actions are conducted in the field, ranging from deployment of resources to involvement of the public.</p>

Table 14: Types and definitions of simulation exercises

These guidelines focus particularly on DBX, TTX and CPX types of simulation exercise. For clarity in the use of terms, discussion-based exercises (DBXs) are included as a subcategory of TTXs since they are marked by a lower level of complexity and a purpose oriented to reflection and debate between participants.

Depending on the type and scale of the simulated event and the territorial level that is tested, simulation exercises can also be differentiated into SIMEXs that are (i) national and involve the system at different territorial levels, and are organised in agreement with other agencies, or (ii) sub-national/regional/local if tested only at these levels.

In practice, although a generally common code exists, hybrid approaches are sometimes used, remaining flexible and adaptable to context and goals. In fact, TTXs cover a broad spectrum of approaches, adapting to different tools and participants, as is highlighted by the case studies presented in these guidelines. For instance, a TTX may be structured with all participants present in the same room but subdivided into groups (as in the IOC and PPRD East 3 cases) or organised at various territorial levels, where interaction is through pre-established communication channels or a fully digital context. Instead, DBXs have a slimmer format, where discussion is almost always in plenary form and the scenario is presented to all participants simultaneously, fostering direct and immediate discussion.

Glossary

Simulation exercise/ SIMEX

The actual implementation of the exercise process, the simulation. SIMEX is the acronym (SIMulation EXercise).

Exercise process/ SIMEX process

The process including all the phases of simulation exercise planning, design and implementation, followed by debriefing and follow-up. The SIMEX process phases are derived from UNDRR (2020).

Reference project/ programme

A broader project/programme within which the SIMEX process may be included.

SIMEX masterplan

Document setting out the goals, methods and the key elements of the simulation exercise, including the outline SIMEX scenario.

Early warning system

Integrated system for hazard monitoring, forecasting and prediction, for disaster risk assessment, communication and preparedness activities systems and processes that enables individuals, communities, governments, businesses and others to take timely action to reduce disaster risks in advance of hazardous events.. It may also be referred to as EW-EAS (early warning to early action system) or with the abbreviation EWS.

Final report

A synthesis report drafted upon SIMEX conclusion and which sets out the best practices, issues and weaknesses identified during the entire exercise process, with specific recommendations and suggestions. This latter part may also be in the form of a separate document called 'action plan'.

Action plan

Document containing specific recommendations and suggestions subsequent to the SIMEX process. It may be an integral part of the final report.

MEL-MIL

Main events list and main injects list. This combined document contains the events and injects for the players (with the expected subsequent actions).

Team of experts

Project members with the mandate to organise the SIMEX process (e.g. CIMA Research Foundation), and whose duty it is to engage with the project focal point and the key stakeholders on the planning, design, implementation and follow-up aspects of the exercise process (see Step1.1 on consultations).

Project focal point

Local project contact. Usually appointed at project outset, this figure is responsible for managing and coordinating project activities in the country where the exercise is to be conducted, and is also tasked with engaging and coordinating key stakeholders.

Key stakeholders

Counterpart in the country where the exercise takes place. They include a limited number of system representatives (e.g. civil protection/disaster risk management and early warning system authorities for the relative territory) and contribute to the planning, design, implementation, debriefing and follow-up of the SIMEX process, together with the team of experts. Along with the focal point, the key stakeholders are the main interlocutors for the team of experts.

SIMEX planning and design team

Group appointed for planning and designing the SIMEX. During implementation, its members go to join the other SIMEX operations teams (EXCON, facilitators, observers). It may include members of the team of experts and key stakeholders (see Step 1.4).

EXCON

Team appointed to conduct the simulation exercise (see Step 1.4). It may include members of the team of experts and key stakeholders.

Facilitators/ facilitation team

Team appointed to facilitate the simulation exercise (see Step 1.4). It may include members of the team of experts and key stakeholders.

Evaluators/ evaluation team/ EET

Team appointed to evaluate the entire SIMEX process (see Step 1.4).

Observers/ observation team

Team appointed to observe/monitor the simulation exercise (see Step 2.4). It may include members of the team of experts and key stakeholders.

Guest attendees

These are involved into the simulation exercise by a player during the response to specific injects, to observe specific activities involving them (see Step 1.4). They do not an active role during the simulation Players Those simulating their roles during the simulation exercise (see Step 1.4), responding to the injects sent by the EXCON.

Participants

All the people, roles and figures (players, EXCON etc.) engaged in the simulation exercise.

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