

D7.13- Report on Steering and Advisory activities v1

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HISTORY OF CHANGES

Date	Version	Authors	Change Description
31/05/2024	1.0	EG, UNISTRA, GMV	First version of the document



TABLE OF CONTENTS

1	Introduction.....	6
1.1	Scope of the Document	6
1.2	Definition, Abbreviations and Acronyms	6
1.3	Applicable and Reference Documents	8
2	Project Objective	9
3	Steering Committee and Advisory Board Activities	10
3.1	Advisory Board composition	10
3.2	Engagement plan and interactions	12
3.3	Advisory boards meetings.....	17
3.3.1	User Requirement Review (URR)	17
3.3.1.1	Participants	17
3.3.1.2	Agenda	18
3.3.1.3	Outputs	18
3.3.2	Preliminary Design Review (PDR).....	19
3.3.2.1	Participants	19
3.3.2.2	Agenda	20
3.3.2.3	Outputs	20
3.3.3	Demo Design Review (DDR)	21
3.3.3.1	Participants	21
3.3.3.2	Agenda	22
3.3.3.3	Outputs	22
3.4	Participation in other events	23
3.4.1	Upcoming scheduled conferences	24
4	End-user involvement in the demonstration process.....	26
4.1	Overview of the demonstrators	26
4.2	Urban Flood demonstrator scenarios	27
4.3	Water and Food Security demonstrator scenarios	31
4.4	User Requirements: Validation Questionnaire	33
5	Conclusions	33



LIST OF FIGURES

Figure 1: AB engagement plan – Year 1	12
Figure 2: AB engagement plan – Year 2	13
Figure 3: AB engagement plan – Year 3	13

LIST OF TABLES

Table 1: Definitions, Abbreviations and Acronyms	6
Table 2: Centaur Advisory Board Members	11
Table 3: AB interactions performed and ongoing	16
Table 4: Mapping between use cases and CEMS RM activations.	27



ABSTRACT

The present document represents the deliverable D7.13 - Report on Steering and Advisory activities v1 of CENTAUR project and is produced under the Work Package WP7 - Project Management.

This document, after introducing the steering committee and the consortium board, describing their members and their roles, goes through all their activities and interactions of the CENTAUR team members up to M18.

A second and final version of the deliverable will be produced in M36, summarizing all the interaction activities between Centaur Member and Steering Committee and Advisory Board throughout the project.



1 INTRODUCTION

1.1 SCOPE OF THE DOCUMENT

The purpose of the document is to summarize all the interactions and activities in which the SC and AB have been involved up to M18 and outline future activities.

After outlining their composition, the commitment plan for the entire project will be presented. All milestones that have been achieved in the form of meetings with the SC and AB team are then described.

All conferences held up to M18 and future conferences where the CENTAUR project was presented are then listed in order to raise awareness and to enlarge the user community.

Finally, the involvement of the AB members during the demonstration process is reported: after describing, for each of the UF & WFS scenarios the role of the AB, the questionnaire with which users will be engaged during the validation phase is described.

1.2 DEFINITION, ABBREVIATIONS AND ACRONYMS

Table 1: Definitions, Abbreviations and Acronyms

Abbreviation/acronym	Definition
AB	Advisory Board
AI	Artificial Intelligence
CB	Consortium Board
Copernicus EMS or CEMS	Copernicus Emergency Management Service
D	Deliverables
DMP	Data Management Plan
DEM	Digital Elevation Model
DTM	Digital Terrain Model
EC	European Commission
EW	Early Warning
ECMWF	European Centre for Medium-Range Weather Forecasts
EFAS	European Flood Awareness System



EO	Earth Observation
EU	European Union
EW	Early Warning
FAIR	Findable, Accessible, Interoperable and Reusable
InSAR	Interferometric Synthetic Aperture Radar
KPI	Key Performance Indicators
M	Month
ML	Machine Learning
NDVI	Normalized difference vegetation index
NWI	National Wetland Inventory
PMP	Project Management Plan
QA	Quality Assurance
RPI	Risk Priority Index
SAR	Synthetic Aperture Radar
SC	Steering Committee
SESA	Copernicus Service on Support to EU External and Security Actions
TL	Task Leader
UF	Urban Flood
(V) HR	(Very) High Resolution
VTC	Virtual Teleconference
WBS	Work Breakdown Structure
WFS	Water and Food Security
WP	Work Package
WPL	Work Package Leader



1.3 APPLICABLE AND REFERENCE DOCUMENTS

ID	Document name
[AD1]	CENTAUR - 101082720 – Grant Agreement
[AD2]	HORIZON-CL4-2021-SPACE-01 - Strategic Autonomy in Developing, Deploying and Using Global Space-based Infrastructures, Services, Application and Data 2021, available at https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl4-2021-space-01-12

ID	Document name
[RD01]	Copernicus Emergency Management Service – Rapid Mapping and Risk & Recovery: https://emergency.copernicus.eu/
[RD02]	Copernicus Service on Support to EU External and Security Actions: https://sesa.security.copernicus.eu/
[RD03]	D1.1 – Report on Urban Flood and Water & Food security indicators
[RD04]	D1.2 – Report on CENTAUR use cases and Indexes definition
[RD05]	Centaur Consortium Agreement – Version 1 – 21 st June 2023



2 PROJECT OBJECTIVE

Climate change impact on human lives and security is continuously growing. Over the last 50 years, more than 11000 reported disasters related to extreme weather and climate conditions have caused over 2 million deaths (WMO, 2021). In the last twenty years the number of major floods has become more than double. Climate change is increasingly acknowledged within the EU's integrated approach to security. The related environmental degradation is recognized as a threat multiplier and an aggravating factor for political instability with serious implications for peace and security worldwide.

CENTAUR's overall objective is to respond to societal challenges arising from climate change threats by developing and demonstrating new service components for the Copernicus Emergency Management Service (CEMS) and the Copernicus Service on Support to EU External and Security Actions (SESA), aiming to:

- Improving situational awareness and preparedness around climate change and its impact on complex emergencies and multi-dimensional (security) crises.
- Anticipating the occurrence and possible knock-on effects of crisis events, particularly those triggered by climatic extremes, thus contributing to resilience and effective adaptation.

In the emergency domain, CENTAUR will address the flood-related threats to population, assets and infrastructures in urban areas. In the Security domain, CENTAUR will address water & food insecurity. The two work streams will be connected via a cross-cutting component focusing on exposure and vulnerability to climate change, as well as resilience and societal capacity for managing environmental risks and social conflict. Across work streams, indicators and models will be validated by different methods.

CENTAUR will integrate data coming from multiple heterogeneous sources, with a specific focus on those generated by other Copernicus services and, in particular, those of the Climate Change Service. It will combine these with meteorological data, socio-economic data, and data coming from new sensors (e.g. traditional and social media). Thus, it will enhance current capacities to produce composite risk indexes and to perform multi-criteria analyses in the emergency and security domains.



3 STEERING COMMITTEE AND ADVISORY BOARD ACTIVITIES

3.1 ADVISORY BOARD COMPOSITION

Within CENTAUR project, the Advisory Board (AB) was initially composed by 16 members, identified among United Nations (UN) agencies, Non-Governmental Organizations (NGO), Civil Protections, Copernicus EMS and SESA end-users, who have already signed a LoI during the technical offer preparation phase. Nevertheless, some circumstances have caused the actual composition of the AB to be reduced.

In fact, according to the new model of the CA ([RD05]), each member of the AB should sign a Non-Disclosure Agreement (NDA) for the confidentiality of data used. Some issues in collecting signatures were faced from the UN users' side. Therefore, the involvement of all the UN end-users remained on-hold for the purpose of configuration of a potential solution. It was proposed to consider a smaller group of users that will be involved in dedicated users' workshops as kind of "demonstrator users only" to whom public deliverables will be shared too. These dedicated users' workshops will be scheduled aside to AB sessions already planned with the Advisory Board members. Up to the end of M18, this remains a point of discussion with the EC officer.

In addition, due to internal commitments within the institution itself, the Consortium was forced to suspend cooperation, with the Italian Civil Protection - Piedmont Regional Department (IT), at least for the time being.

At the same time, new opportunities for the involvement of relevant users were encountered as the two here below:

- United Nations Children's Fund (UNICEF), the Climate Change Innovation Portfolio Office.
- World Food Program (WFP), the Mozambique WFP division.

Based on the evidence gathered from the user questionnaires shared with the end-users in the context of WP1 and CENTAUR requirements collected accordingly ([RD03]), the users were classified into two groups, considering the interest they express in the Copernicus EMS and SESA services:

- **Advisors:** this category of users will provide expert guidance, strategic insights, and information recommendations to ensure the design and development activities of the project are well aligned with their expectations. They mostly advice from a user perspective, highlighting and clarifying the information needs and operational requirements. They can also provide suggestions related to technical decisions, service design, user engagement, project communication and promotion. More specifically they will provide support on dataset selection, interface, and information requirements, building use cases, testing, and validating results showcased.
- **Demonstrators:** this category of Advisory Board members plays a crucial role in evaluation and valuation the functionality, performance and user experience of the results and outcomes of the project. They will participate in demonstration and workshop events to provide constructive feedback on the prototype platform features, enabling verification and validation of new datasets, tools, and products. They should assess aspects such as usability, fit-for-purpose, compatibility, and reliability, helping to identify new requirements or improvement ideas.

More information about the questionnaire and the results of the questionnaire can be found in [RD02].

Furthermore, a specific CENTAUR thematic area was associated with each AB member as reported in Table 2.

Table 2: Centaur Advisory Board Members

CENTAUR Advisory Board members	Role in CENTAUR		Thematic area	
	Advisor	Demonstrator	Urban Flood	Water & Food Insecurity
Italian Civil Protection – Piedmont Regional Department (IT) >> on hold	✓		✓	
Municipality of Turin	✓		✓	
Helpcode - NGO active in the education and training for children. Emergency and Security management (IT)	✓		✓	✓
Danish Refugee Council - Division of Evidence, Knowledge & Learning (D)		✓		✓
German Foreign Office - Data Science Division (DE)	✓			✓
Rediam - Red de Información Ambiental de Andalucía Environmental information (ES)		✓	✓	
Caisse centrale de réassurance (CCR) - Public Insurance Company (FR)	✓		✓	
United Nations Environment Programme (UNEP) - Climate Change and Security Programme (International) >> on hold	✓			✓
United Nations High Commissioner for Refugees (UNHCR) - Special Advisor for Climate Action (International) >> on hold	✓	✓		✓
International Commission for the Protection of the Danube River International Commission for the (ICPDR) - Water Quality and Water Management (International)		✓	✓	
United Nations Support Office in Somalia (UNSOS)	✓	✓		✓
EU Situation Room (EEAS)	✓			✓
JRC - Disaster Risk Management Unit Copernicus EMS service operations (EC)	✓	✓	✓	
Directorate General of Civil Protection and Emergencies, Ministero dell'interno, Governo Spagnolo	✓		✓	
Wav-e	✓	✓	✓	✓

3.2 ENGAGEMENT PLAN AND INTERACTIONS

A user engagement plan was shared with the AB members, so that they could be aware in advance of a potential involvement frequency throughout the project (Figure 1, Figure 2, Figure 3). Particularly, the User Requirements Review Meeting (URR) was carried out on the 6th of June 2023, with the aim of revising and finalizing the requirements collected by the end-users through the dedicated questionnaires. Conversely, the Preliminary Design review (PDR) meeting was performed on the 17th of October 2023, with the main objective of sharing the preliminary design of the innovative indicators identified and the preliminary platform functionalities according to the requirements collection.

The Demo Design Review (DDR) took place instead on 15th of April 2024, with the main goal to outline the cold case implementation and sharing updates on innovative identified indicators and their integration on the service delivery platform.

More details about these interactions will be provided in section 3.3 Advisory boards meetings

				AB members involvement through CENTAUR (Y1)											
				Dec-22			Jun-23			Oct-23					
N.	Users engagement meetings	Topic/Description	Attendance	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
1	User Requirement Review - URR	Users' requirements finalization and refinement.	Remotely												
2	Preliminary Design Review - PDR	Progress meeting: preliminary design and content overview provided to the users.	Remotely												
3	Demo Design Review - DDR	Cold cases implementation review: areas of interest, datasets available, timeframe and any other demo detail, users interaction and validation criteria.	Remotely												
4	Workshop 1	Cold cases demonstration: testing, validation, users' feedback for improvements.	Remotely												
5	Demo Review Cold Cases - DRCC	Enhanced Cold cases demonstration: implementing feedback from Workshop 1.	Remotely												
6	Preliminary Demo Results Evaluation - PDRE	Hot cases demonstration: testing, validation, users' feedback for improvements.	Remotely												
7	Final Demo Review - FDR	Enhanced Hot cases demonstration: implementing feedback from PDRE.	Remotely												
8	Workshop 2	Final demonstration: overall testing and key findings from users' experience (after some time left to the users for testing the service).	In presence												
CENTAUR Milestone															
Workshop Session															

Figure 1: AB engagement plan – Year 1

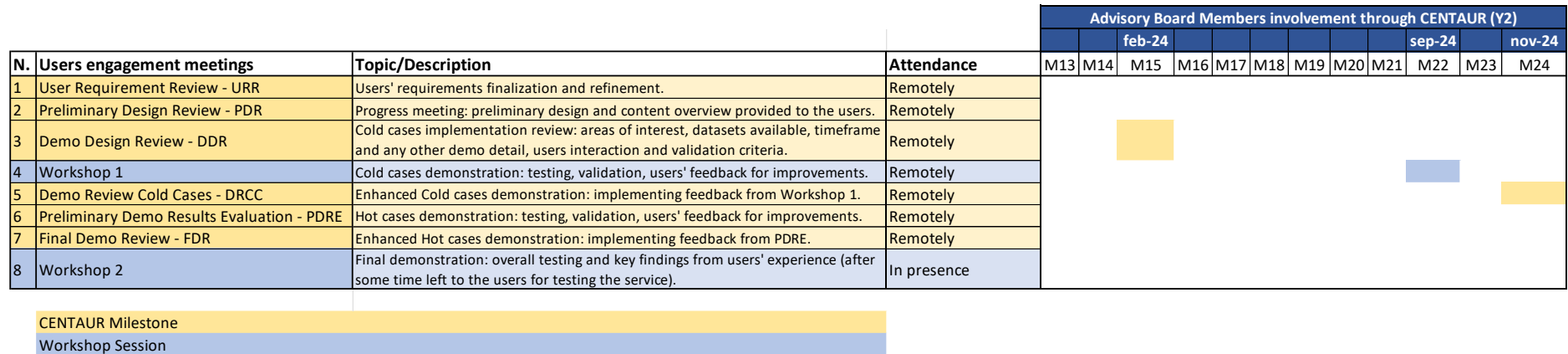


Figure 2: AB engagement plan – Year 2

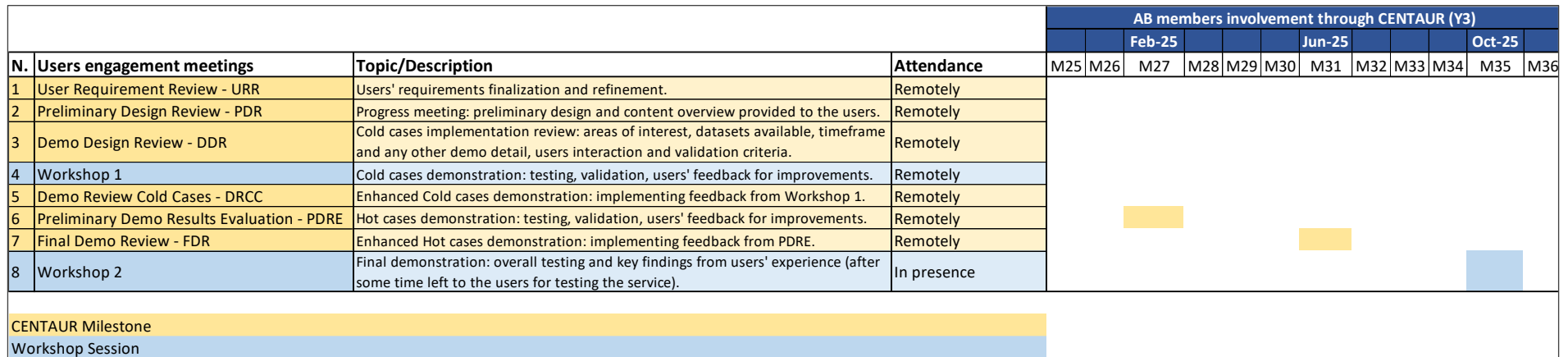


Figure 3: AB engagement plan – Year 3

In Table 3, it is provided a list of interactions performed and ongoing from the SC with the AB members.

AB member	Interactions
EEAS	<p>The ongoing high-level dialogues between EEAS and SatCen present great potential in the context of climate security. These exchanges play a pivotal role in deepening the understanding of the complex dynamics between climate change and its security implications. The insights gained from these interactions could greatly enhance the progress of the CENTAUR project. What is even more noteworthy is the commitment to sustaining these interactions in the coming months, facilitating an ongoing exchange of ideas and expertise.</p>
UNSOS	<p>Further bilateral meetings are planned to continue informing UNSOS - United Nations Support Office in Somalia about the CENTAUR project's progress and showcasing its status. These meetings will aim to collect and gather valuable feedback from participants.</p>
<p>Italian Civil Protection – Piedmont Regional Department (IT)</p> <p>Municipality of Turin (IT)</p>	<p>The Italian Civil Protection at the regional and local levels has been informed about the CENTAUR project, its objectives, expected outcomes, thematic areas focusing on Urban Floods, and the milestones achieved so far, as well as those that lie ahead. Ithaca, as the reference partner and participant in the Italian Use Case of the project, has informed Civil Protection about the potential contributions they could bring to the project. This includes facilitating access to the local data, providing feedback on the outputs, and sharing insights on how the extracted information can be integrated into local and regional alert systems for improved communication with citizens. The involvement of Civil Protection at Piedmont Regional Department is on hold until further notice (no NDA signed). In line with this, the user feedback phase of the demo execution of the cold case in Ceva Centre will be lacking.</p> <p>The Municipality of Turin has already signed the NDA. As a member of the Advisory Board committed to following the implementation of Italian use cases in the Piedmont Region, the Municipality of Turin provided support by facilitating bureaucratic procedures for LiDAR data acquisition in the Ceva urban area, in line with their commitment to the data collection process. Moreover, the Municipality will be supporting the user feedback phase of the demo execution of the cold case in Turin Centre - Meisino.</p>
<p>CCR</p> <p>ICPDR</p>	<p>The Caisse Centrale de Réassurance (CCR) was first contacted by CLS during the tendering phase to discuss their involvement in CENTAUR’s advisory board and their interest for a CENTAUR Use Case in France. As a major actor of the public-sector reinsurance, CCR provides cedants in France with coverage against natural catastrophes.</p> <p>The main interactions with the CCR to this day include:</p> <p>Sharing information about the CENTAUR project (documentation, objectives, products, calendar), with a focus on the urban flood theme.</p> <p>Sharing administrative information and documents regarding the CCR’s involvement in CENTAUR advisory board.</p> <p>Discussion about the French Use case location and event, and the added value brought by both CCR and CENTAUR, including the possibility for CCR to perform an evaluation of CENTAUR results by comparison with their own data and model.</p>



AB member	Interactions
	<p>Participation of CCR to the User Requirements Review Meeting, and contribution to the user requirement questionnaire.</p> <p>The International Commission for the protection of the Danube River (ICPDR) was also contacted by CLS during the proposal to discuss their interest in joining CENTAUR advisory board as experts of the Urban Flood component. To date, the interactions with ICPDR are the following:</p> <p>Sharing information about the CENTAUR project (documentation, objectives, products, calendar), with a focus on the urban flood theme, as well as sharing administrative documents to formalize ICPDR's involvement in CENTAUR.</p> <p>Discussion about a potential use case in the Danube River basin based on passed CEMS activations, unfortunately the most relevant events were too old to be selected for the project. Contribution of the ICPDR Flood protection Expert Group to the user requirements questionnaire on the Urban flood component.</p> <p>ICPDR participation to the User Requirements Review Meeting and Preliminary Design Review Meeting.</p> <p>CLS and CCR organized another meeting to discuss the details of the use case in France after the presentation done during the Preliminary Design Review. CCR shared their knowledge of the selected event, confirming the extension of the study area to more impacted municipalities. CCR also reiterated their willingness to participate in the evaluation and validation of the CENTAUR products on the use case.</p>
<p>GFFO DRC</p>	<p>ADE organised 2 bilateral meetings with members of the Advisory Board (Danish Refugee Council and the German Foreign Office's stabilisation unit), presenting the project in more depth and facilitating an exchange on needs and research priorities between project partners and stakeholders.</p>
<p>WAV-e Helpcode JRC</p>	<p>e-GEOS organised three bilateral meetings with WAV-e, Helpcode and JRC with the objectives of introducing the project, sharing some introductory materials, gathering their needs and knowledge of Copernicus services. These three users were involved in the URR meeting and will be involved in the further project meetings and workshops ad per the users' engagement plan already shared.</p>
<p>REDIAM Directorate General of Civil Protection and Emergencies, Ministry of the Interior (Ministerio del Interior, MIR) of Spain</p>	<p>TRACASA Global has organised two bilateral meetings with the Spanish Directorate General of Civil Protection and Emergencies and the Environmental Information Network of Andalusia (Red de Información Ambiental de Andalucía, REDIAM) to understand their knowledge and use of current COPERNICUS products, present CENAUR to them and gather their needs and requirements related to this project. To strengthen the relationship, the communication, dissemination and outreach material created in WP6 has been shared with the Spanish members of the AB. TRACASA Global, as leader partner of the Ebro Basin Use case, has asked the Spanish Directorate General of Civil Protection and Emergencies its collaboration to access to the data acquired in the Zaragoza area by Ebro Hydrographic Confederation (Confederación Hidrográfica del Ebro, CHE) during the flood event occurred in April 2018.</p>
<p>GIS (UN)</p>	<p>The end-user will be involved in a second phase of the project due to the availability.</p>



AB member	Interactions
UNEP UNHCR UNICEF WFP	UN end-users, as mentioned in the above, are currently on hold due to the issue faced with the NDA signature. However, an initial interaction was performed sharing introductory CENTAUR material and understanding their interest in collaborating into the project, as well as the role and thematic area covered. UNEP provided feedback to the users' requirements questionnaire.

Table 3: AB interactions performed and ongoing



3.3 ADVISORY BOARDS MEETINGS

Further than meeting the User Advisory Board regularly, they were continuously kept updated by sending them the minutes of the meetings, presentations, newsletters, board notes, and deliverables.

3.3.1 USER REQUIREMENT REVIEW (URR)

The first Advisory Board Meeting was held on the 8th of June 2023 (9:30-12:15 – CET Time) through VTC with the aim of:

- Giving an overview of the project
- Collecting user expectations
- Keeping an open dialogue and collecting feedback.

3.3.1.1 PARTICIPANTS

Advisory Board Members	Consortium Members
Helpcode	e-GEOS
Joint Research Centre - JRC	SatCen
Spanish Directorate General of Civil Protection and Emergencies	UNISTRA/SERTIT
United Nations Support Office in Somalia – UNSOS	ITHACA
Caisse Centrale de Réassurance – CCR	CLS
WAV-e	GMV
International Commission for the Protection of the Danube River - ICPDR	Tracasa
	ECMWF
	VITO
	Adelphi
	Hensoldt
	SpaceTec



3.3.1.2 AGENDA

CENTAUR - Copernicus ENhanced Tool for Anticipative response to climate change in the emergency and secURity domain AGENDA for the User Requirement Review Meeting (URR) Milestone #1						
Date: 8 th June 2023						
Venue: Remote connection (link shared in the calendar invitation)						
Time			Sessions			
Start	End	Duration	Intro & Project status	Points of discussion	Attendance	
9:30	9:45	0:15	Intro	Greet & meet	Project consortium & AB members	
9:45	10:00	0:15	Project status & URR meeting	Milestones, deliverables, URR objectives		
Start	End	Duration	Analysis of requirements and use cases definition	Points of discussion	Attendance	
10:00	10:15	00:15	User questionnaire	Questionnaire overview and key findings	Project consortium & AB members	
10:15	10:45	00:30	User requirements consolidation	Open discussion to refine/consolidate users' requirements		
10:45	11:00	00:15	Use Cases	Addressing use cases and conceptual model		
11:00	11:30	00:30	Q&A	Open discussion on the above		
Start	End	Duration	Closing remarks	Points of discussion	Attendance	
11:30	11:45	00:15	Exploitation strategy	Focusing on the Key Exploitable Results presently	Project consortium & AB members	
11:45	12:00	00:15	Communication material	Sharing flyer, websites and further material		
12:00	12:15	00:15	Conclusions	Addressing next steps		

3.3.1.3 OUTPUTS

Main conclusions:

- i) main interest expressed into the Operational tool based on an Early-Warning System including both, more precise meteorological data and Alerting when Pre-defined Triggers and Drivers for Crises are met;
- ii) high interest in obtaining a Catalogue of Datasets for water and food insecurity, especially Water Availability and Crop Production Monitoring;
- iii) operational tool is required to be functional at a local scale analysis, through an online information access (e.g., Geoportal), and with an alert system that will notify users of any event of interest.

With regard to urban flooding, users expressed the following expectations:

- i) the development of urban flood indicators, urban flood mapping, assess urban flood impacts on population and assets, etc;
- ii) the automatic characterization of river overflow and pluvial runoff floods in urban areas (SAR and optical imagery, HR and VHR);
- iii) the improvement into flood extent definition in urban areas.

Meanwhile regarding Water & food insecurity thematic, users expressed the following expectations:

- i) near-real time and projected geospatial data;
- ii) improvement in predictive capacities for climate security events;
- iii) tools and services for support to local administration in urban planning and climate change adaptation;



- iv) innovative ways of analyzing the links between climate change, environmental degradation, conflict, and displacement.

3.3.2 PRELIMINARY DESIGN REVIEW (PDR)

The second Advisory Board Meeting was held on the 17th of October 2023 (14:00-16:00 – CET Time) through VTC with the aim of:

- Providing an overview of centaur conceptual model’s design
- Outline innovative indicators identified, designed and under development
- Sharing the use cases progresses, incorporating the User Requirements already expressed.

3.3.2.1 PARTICIPANTS

Advisory Board Members	Consortium Members
Helpcode	e-GEOS
Joint Research Centre - JRC	SatCen
Spanish Directorate General of Civil Protection and Emergencies	UNISTRA/SERTIT
United Nations Support Office in Somalia – UNSOS	ITHACA
Caisse Centrale de Réassurance – CCR	CLS
WAV-e	GMV
International Commission for the Protection of the Danube River - ICPDR	Tracasa
Directorate General of Civil Protection and Emergencies - REDIAM	ECMWF
German Federal Foreign Office - Data Science Division	VITO
	Adelphi
	Hensoldt
	SpaceTec
	Cherrydata
	DLR



3.3.2.2 AGENDA

CENTAUR - Copernicus ENhanced Tool for Anticipative response to climate change in the emergency and secURity domain						
AGENDA for the Preliminary Design Review Meeting (PDR)						
Milestone #2						
Date: 17 th October 2023						
Venue: Remote connection (link shared in the calendar invitation)						
Time			Sessions			
Start	End	Duration	Intro & Project status	Points of discussion	Attendance	
14:00	14:05	0:05	Intro	Greet & meet	Project consortium & AB members	
14:05	14:20	0:15	Project status & PDR meeting	Milestones, deliverables, PDR objectives		
Start	End	Duration		Points of discussion	Attendance	
14:20	14:50	00:30	CENTAUR Conceptual model >> Adelphi	Overview of both UF and WFS model: - UF&WFS indicators interaction. - Crisis indexes produced.	Project consortium & AB members	
14:50	15:20	00:30	Innovative indicators: overview & design	Focus on the design of CENTAUR indicators: - Urban Flood (10min) >> e-GEOS - Water&Food Security (10min) >> VITO - related socio-economic/political (10min) >> Adelphi		
15:20	15:40	00:20	Use Cases: overview & design >> SERTIT	Showcase the status of CENTAUR Use Cases design		
Start	End	Duration	Closing remarks	Points of discussion	Attendance	
15:40	16:00	00:20	Conclusions & open discussion	Addressing next steps	Project consortium & AB members	

3.3.2.3 OUTPUTS

The end-users expressed the following points regarding conceptual models:

- Urban Floods:
 - o No discussion.
- Water & Food Security:
 - o Further information is required on the reference data sets used for declaring an alert.
 - o The consortium should indicate national stakeholders involved in defining threshold values for declaring an alert. It is suggested to avoid custom thresholds set empirically by the consortium.

As for indicators, several suggestions were proposed:

- Urban Floods:
 - o Envision a strategy for collecting national DTMs and water gauges other than contacting the end-user.
 - o Better indicate delays caused by the absence of Sentinel-1B, resulting in a reduced availability of InSAR-compatible images for mapping flood water in urban settings.
- Water & Food Security:
 - o Instead of the NDVI, the NWI should be used to measure water content in vegetation. Indeed, the NDVI is used to measure chlorophyll, which is not a direct proxy for water content.



Finally, use cases were discussed. The AB had no suggestions or questions on this score.

3.3.3 DEMO DESIGN REVIEW (DDR)

The third Advisory Board Meeting was held on the 15th of April 2024 (14:00-16:00 – CET Time) through VTC with the aim of:

- Sharing updates on identified indicators and their pipeline generation.
- Sharing updates on the service delivery platform and the related indicator integration.
- Outline the cold case implementation.

3.3.3.1 PARTICIPANTS

Advisory Board Members	Consortium Members
Helpcode	e-GEOS
Joint Research Centre - JRC	SatCen
Danish Refugee Council – DRC	UNISTRA/SERTIT
United Nations Support Office in Somalia – UNSOS	ITHACA
Caisse Centrale de Réassurance – CCR	CLS
WAV-e	GMV
International Commission for the Protection of the Danube River - ICPDR	Tracasa
Directorate General of Civil Protection and Emergencies - REDIAM	ECMWF
	VITO
	Adelphi
	Hensoldt
	SpaceTec
	Cherrydata



3.3.3.2 AGENDA

CENTAUR - Copernicus Enhanced Tool for Anticipative response to climate change in the emergency and security domain					
AGENDA for the Demo Design Review Meeting (DDR)					
Milestone #3					
Date: 15 th April 2024					
Venue: Remote connection (link shared in the calendar invitation)					
Time			Sessions		
Start	End	Duration	Intro & Project status	Points of discussion	Attendance
14:00	14:05	0:05	Intro	Greet & meet	Project consortium & AB members
14:05	14:10	0:05	Project status & DDR meeting	Milestones, deliverables, DDR objectives	
Start	End	Duration		Points of discussion	Attendance
14:10	14:25	00:15	CENTAUR Products Overview Updates	Updates on CENTAUR indicators and service pipeline generation: - Urban Flood >> e-GEOS - Water&Food Security >> VITO - related socio-economic/political >> Adelphi	Project consortium & AB members
14:25	14:35	00:10	Platform Design Development and indicators integration	- Updates on platform design and development >> GMV - Indicators integration >> GMV	
14:35	14:50	00:15	Intermediate Q&A session	Addressing questions	
14:50	15:40	00:50	Demonstration plan for cold cases	<ul style="list-style-type: none"> Demo objectives 5' >> SERTIT Use case presentation 10' >> UF SERTIT, WFS Adelphi Cold case demo plan 15' >> SERTIT Demo execution 10' >> GMV Demo validation & user feedback 10' >> Tracasa 	
Start	End	Duration	Closing remarks	Points of discussion	Attendance
15:40	16:00	00:20	Conclusions & open discussion	Addressing next steps	Project consortium & AB members

3.3.3.3 OUTPUTS

Main conclusions:

- The selection of 8 use cases, 5 for UF and 3 for WFS, would be sufficient in demonstrating the feasibility of the effectiveness of CENTAUR in a pre-operational way and when the platform is up and running, they would test in a more operational way.
- AB members are interested not only in viewing the data on the CENTAUR platform, but also in accessing the data by downloading them via FTP.



3.4 PARTICIPATION IN OTHER EVENTS

To raise awareness and to enlarge the user community, CENTAUR was presented to several users at different events. Some of the events where CENTAUR has participated and presented the project are described in the following sections.

▪ COPERNICUS EMERGENCY MANAGEMENT SERVICE GENERAL ASSEMBLY

The Copernicus Emergency Management Service General Assembly took place online on 13 and 14 October 2022 and was organised by the European Commission's Joint Research Centre (JRC).

The Assembly brought together experts, users and policy makers to celebrate together the 10th anniversary of the emergency service, showcasing CEMS contribution in improving emergency response and disaster risk management during this first decade. The CENTAUR project participated in the event and presented its future activities as a Copernicus EMS evolution project during the second day of the workshop.

▪ 2ND AND 3RD COPERNICUS EMS GLOBAL FLOOD FORECASTING & MONITORING ANNUAL MEETING

Both the events were held online, the 2nd Annual Meeting on 8 and 9 February 2023, while the 3rd one on 5 and 6 March 2024. Both were organised by the European Commission's Joint Research Centre (JRC).

The meetings focused on advances in global flood forecasting and monitoring, as well as sessions on recent developments in the CEMS Global Flood Awareness System (GloFAS) and Global Flood Monitoring (GFM) products, use cases and applications. The CENTAUR project participated presenting the conceptual model and illustrating the indicators that the project team is currently developing. In addition, CENTAUR representatives explained the project's approach by providing use cases illustrating how these indicators will be tested and how they will improve the ability to effectively map urban flooding, thus contributing to improved flood forecasting and monitoring capabilities.

▪ 19TH OPEN SESSION OF UN SPACE

The in-person event held in Brindisi (Italy) on 19 October 2023, was hosted by the Service for Geospatial, Information and Telecommunication Technologies at the United Nations Global Service Centre (UNGSC) and the Italian Space Agency (ASI).

The event brought together a diverse group of experts and stakeholders focused on Earth Observation and integrated applications for disaster risk management and sustainable development. The CENTAUR team gave an overview of the project and how it aims to respond to the threats posed by climate change. In particular, the presentation focused on two key elements: CENTAUR conceptual models and use cases.

▪ BE-RESILIENT REGIONAL FORUM

The in-person event held in Cape Town (South Africa) was hosted by the UNESCO Regional Office for Southern Africa between 1 and 3 November 2023.

The forum aimed to increase community resilience with a focus on climate strategies, to address the region's severe floods and droughts. CENTAUR was presented as a solution to improve preparedness and early warning for these challenges. A key finding was the unfamiliarity of practitioners and communities with such tools, indicating the need for targeted strategies to bridge this knowledge gap, a key task for the CENTAUR project team.



- **COPERNICUS IN LATAM: FROM EARTH OBSERVATION TO THE END USER**

The in-person event held in Santiago (Chile) was hosted by Universidad de Chile between 7 and 10 November 2023.

The event focused on the use of Copernicus-based data and applications across a range of sectors. CENTAUR representatives presented the main objectives of the project and the expected results in relation to urban floods and food and water security.

- **5TH GLOBAL FOOD SECURITY CONFERENCE**

The in-person event was held in Leuven (Belgium) between 9 and 12 April 2024. It was hosted by KU Leuven, Wageningen University & Research and Elsevier, and this year's theme was "Towards equitable, sustainable and resilient food systems".

The conference brought together experts with a scientific, business and policy-making background to discuss topics such as achieving net zero, sustainability, and resilience of food systems. CENTAUR had the opportunity to present at the poster session and share insights into our project objectives, highlighting our work on the development of an agricultural drought risk indicator. Overall, the event was successful, with attendees showing genuine interest in our project and its potential impact on global food security efforts.

- **HUMANITARIAN NETWORKS AND PARTNERSHIPS WEEK (HNPW)**

The hybrid event was organised by the Leading Edge Programme – a global initiative of the United Nations Office for the Coordination of Humanitarian Affairs (OCHA) with the active and committed participation of donor governments – from 29 April and 10 May 2024 in Geneva (Switzerland).

The event served as an important platform for stakeholders from various sectors, including the United Nations, country representatives, NGOs, the private sector, the military, and researchers, to come together and address humanitarian challenges. Throughout the event, several sessions focused on the use of data, including satellite imagery, to support humanitarian action. Overall, the HNPW provided a great opportunity for our CENTAUR representatives to engage in discussions, gain insights, and be inspired by fellow data analysts and humanitarian practitioners. Going forward, this information will help strengthen the way we approach and communicate data with humanitarian stakeholders.

3.4.1 UPCOMING SCHEDULED CONFERENCES

- **EU CIVIL PROTECTION FORUM 2024**

The in-person forum is the key event for the civil protection community. It is a hub for knowledge exchange, cooperation and networking among European civil protection stakeholders. It addresses key policy and operational questions, inspires future developments, and creates networks and opportunities for collaboration in the field of disaster risk management.

The Forum is organised by the European Commission's Directorate-General for European Civil Protection and Humanitarian Aid Operations (ECHO) and will take place in Bruxelles (Belgium) on 4 and 5 June 2024.

CENTAUR representatives will attend the Forum as participants, taking the opportunity to engage in discussions, gain insights, be inspired, and approach potential stakeholders.



- **XX CONGRESS OF THE SPANISH ASSOCIATION OF REMOTE SENSING**

At the face-to-face event to be held in Cádiz (Spain) from 4 to 7 June 2024, CENTAUR representatives will present the project's first scientific paper, which will be presented at the Emergencies poster session on 6 June.

The congress will be an opportunity to raise awareness of the project as well as engage in discussions, and approach potential stakeholders.



4 END-USER INVOLVEMENT IN THE DEMONSTRATION PROCESS

In addition to communication channels mentioned in previous chapters, the consortium also interacts with end-users through demonstrators. They correspond to areas of interest, where crises have occurred, are occurring today, or will occur in the future.

Demonstrators, or use cases, play a crucial role in CENTAUR, for several key reasons:

- 1) **Testing and validation:** Novel methodologies and products are deployed in real-world scenarios. This ensures that theoretical designs work under actual operating conditions.
- 2) **Problem solving and innovation:** Unforeseen issues can be identified in the development process, to enable adjustments and foster innovation as solutions.
- 3) **End-user engagement and feedback:** By interacting with the consortium through demonstrators, end-users can provide valuable feedback to improve crisis products. Engaging stakeholders in this way helps align the development process with their needs and expectations, potentially increasing the adoption and success rate of CENTAUR.

Moreover, several members of the AB correspond to end-users with whom the consortium can interact to get access to national or local data, ask for support or recommendations, and solicit for the assessment of the CENTAUR portfolio.

4.1 OVERVIEW OF THE DEMONSTRATORS

End-users and Advisory Board (AB) members will be solicited twice during the project's duration, specifically within the framework of the demonstrators. Two development phases have been identified:

- The cold case phase, spanning months 16 to 21 of the project (March 2024 to August 2024).
- The hot case phase, spanning months 22 to 33 of the project (September 2024 to October 2025).

The D4.3 CENTAUR demonstration operational report and validation results for the cold cases are planned for delivery in M18 (May 2024), coinciding with the early onset of the cold phase. A revised version, D4.3v2, will be delivered at the end of the cold case phase, aligning with the milestone DR - CC Demo Review Cold Cases. Although the D4.2 CENTAUR demonstration plan v2 (hot case) is also scheduled for M18 (May 2024). Lessons have been learned as feedback from the cold cases are crucial.

The cold case demonstrators were designed to highlight the **potential of CENTAUR to support the evolution of Copernicus' CEMS and SESA portfolios** with reliable and robust indicators and services. They aim to demonstrate the contribution of CENTAUR to advancing technological solutions, addressing key socio-economic and ecological challenges, and guide stakeholders and policymakers to make well-informed decisions regarding urban flood and water & food security management.

The purpose of the **cold cases** is to test the **delivery of the product and service prototypes** set up in WP1, 2 and 3 with a relatively relaxed timetable and in an iterative way.

During April/Early May, GMV, as Task 4.3 demo execution leader, has done multiple checks on data, metadata, ftp organisation, testing platform progress and prod platform plan as these are required before T4.3 Demo execution can start. The outputs of these preliminary checks found discrepancies as WP2, WP3 and WP4 run in parallel, and mitigation solutions have been implemented. As such, the start of the demo execution verifications during the cold case phase has been delayed. The actual demo execution, the "upload" and the "delivery check" of the final indicators (products) (with all requirements), will start when these previous tasks are completed and allow the starting of the demo execution.

At the end of the cold phase a workshop (#1) with the AB will take place to showcase the products on the platform and the delivery checks performed as well as the notification system. The integration of initial end-user feedback from this workshop and via questionnaires will translate into adjustments prior to the hot cases.

In contrast, the **hot cases** are designed to **test the operational readiness of products and services**, by delivering them on a tighter schedule, in line with end-user operational needs. Thus, the hot case phase will see the generation of pre-operational products and services, which can be integrated into existing Copernicus services, as part of *WP5 – Analysis of the integration in the operational set up of Copernicus EMS and SEA, impact and further exploitation*.

At the beginning of a demonstrator, consortium partners responsible for a specific use case are requested to contact the relevant end-users or AB members, to indicate they should expect the delivery of products to assess. During the execution of a use case, a platform will be made available to end-users so they can visualise or collect indicators and indexes.

4.2 URBAN FLOOD DEMONSTRATOR SCENARIOS

In the context of UF scenarios, it is important to indicate that they all refer to **past Copernicus CEMS activations**. Indeed, CEMS' Rapid Mapping (RM) service delivered several crisis information layers on these use cases, leveraged extensively either as input or validation data.

Table 4 shows the mapping between use cases and CEMS activations. Further details are available in D1.2.

Table 4: Mapping between use cases and CEMS RM activations.

Use case	AOI	CEMS activation
Spain	Zaragoza, Ebro basin	EMSR555 https://emergency.copernicus.eu/mapping/list-of-components/EMSR555
Italy	Turin Centre – Meisino	EMSR192 https://emergency.copernicus.eu/mapping/list-of-components/EMSR192
Italy	Ceva Centre	EMSR468 https://emergency.copernicus.eu/mapping/list-of-components/EMSR468
Germany	Bad Neuenahr-Ahrweiler	EMSR517 https://emergency.copernicus.eu/mapping/list-of-components/EMSR517
France	Dax, Landes	EMSR492 https://emergency.copernicus.eu/mapping/list-of-components/EMSR492
Mozambique	Beira	EMSR348 https://emergency.copernicus.eu/mapping/list-of-components/EMSR348



Use Case Country	Description	AB member	AB Contact	Role in CENTAUR	Ref. Partner
Ebro Basin, Spain	<p>Most intense flood episodes: occurred in 2015, 2018, 2021 (heavy rains and fast melting snow, severe effects on agriculture, population and infrastructures.</p> <p>CEMS RM activations: EMSR118, EMSR120, EMSR279, EMSR555.</p> <p>Data availability: cadaster, land cover, soils, infrastructure, edaphology and hydrography, amongst others (Navarra region); meteorological data acquired by the Government of Navarra and the National Meteorological Agency (Agencia Estatal de Meteorología, AEMET) and up-to-date hydrological data provided by the Ebro Hydrographic Confederation; LiDAR coverages of Navarre 2017 and Pamplona urban area of 2021, acquired at a minimum density of 14 point/m² and 50 point/m², respectively.</p> <p>CENTAUR development: The above combined cold case datasets enable model training, preparing for a highly likely up-and-coming hot spot during the project where the system can be validated.</p>	Directorate General of Civil Protection and Emergencies, Ministero dell'interno, Governo Spagnolo	Ariane Alvarez	<p>ADVISOR</p> <ul style="list-style-type: none"> ➤ Interest in the concrete application of the project results to real scenarios. <p>DEMONSTRATOR</p> <ul style="list-style-type: none"> ➤ Support demonstration and future application. ➤ Providing feedback. 	Tracasa (B.B. Beroiz)



<p>Piedmont, Italy:</p> <p>Turin Centre – Meisino and Ceva Centre</p>	<p>Most intense flood episodes: Important flood events occurred in the past due to intense precipitations that led to the fluvial flood of the Po and Tanaro rivers – two important watercourses of the Piedmont Region. Latest events in 2016 and 2020.</p> <p>CEMS activation(s): EMSR192 and EMSR468</p> <p>Data availability: Recent LIDAR data with an average density of 20 points/m2 over Turin city, together with detailed infrastructure, hydrography, LULC and meteorological data (for Turin) and photogrammetric data (acquired for the CENTAUR over Ceva urban area).</p> <p>CENTAUR development: testing the integration of datasets above in the flood modelling, for high-definition 3D model of urban area.</p>	<p>Municipality of Turin (IT)</p> <p>Italian Civil Protection – Piedmont Regional Department (IT)</p>	<p>Francesco Tresso</p> <p>Marco Gabusi</p>	<p>ADVISOR</p> <ul style="list-style-type: none"> ➤ Support the Cold Case. ➤ Facilitate data access. 	<p>ITHACA (P. Boccardo)</p>
<p>Flood in Landes, France (January 2021)</p>	<p>Most intense flood episodes: December 2020 until end of February 2021. Due to increased precipitations, the cities located along the courses of the Midouze and Adour were flooded several times during the winter.</p> <p>CEMS activation: EMSR492</p> <p>Data availability: France national datasets such as BD Topo (buildings, roads, infrastructures...) and RGE Alti (elevation data 1m resolution). Lidar HD data should be made available during the lifetime of the demonstrations.</p> <p>CCR will also support the validation process by providing an assesment of the products quality by comparison with their impact database and flood model.</p> <p>CENTAUR development: integrate the above in the forecast and flood modelling and prepare for a potential hot case where the centaur system can be activated.</p>	<p>Caisse Centrale de Réassurance – CCR (FR)</p>	<p>Luc Baudoux</p>	<p>ADVISOR</p> <ul style="list-style-type: none"> ➤ Support the cold case design, implementation and validation. ➤ Provide comparison with CCR data on impact of the flood in urban areas. 	<p>CLS (V. Gastal)</p>

Cold case

Cold case
+
Hot case

German Floods (July 2021)	<p>Most intense flood episodes: catastrophic rains, 13th July 2021, led to devastating flood events destroying many areas, Ahr Valley (tributaries of Rhine in the Saar, Rhineland Palatinate, North Rhine-Westphalia States).</p> <p>CEMS RM activation: EMSR517 triggered by the German Joint Information and Situation Centre (GMLZ).</p>	German Foreign Office - Data Science Division (DE)	Thomas Meyer	<p>ADVISOR</p> <ul style="list-style-type: none"> ➤ Facilitate geo-data access (July 2021 floods). <p>DEMONSTRATOR</p> <ul style="list-style-type: none"> ➤ Support the demonstration. ➤ Provide feedback. 	<p>Adelphi (A. Detges)</p> <p>SatCen (Y. Arnaud)</p>
	<p>Data availability: the authorized user made aerial imagery available to CEMS RM to supplement the satellite data coverage. Now, this highly engaged user, in a joint effort with the Service Provider, is highly motivated to explore innovation in CEMS RM products and is willing to make aerial imagery, pre and post LIDAR, differential LIDAR DEMs and river gauge measurements available.</p> <p>CENTAUR development: employ the above to realize detailed forecast and enhanced modelling, in combination with traditional and social media enrichment for enhanced products, especially in and around urban areas.</p>	International Commission for the Protection of the Danube River International Commission for the (ICPDR) - Water Quality and Water Management (International)	Igor Liska	<p>DEMONSTRATOR</p> <ul style="list-style-type: none"> ➤ Support the demonstration and provide feedback 	<p>CLS (V. Gastal)</p>
Mozambique	<p>Most intense flood episodes: hit by several Tropical Cyclones. Idai TC (2019) brought huge precipitations over Beira hinterland and the lower ocean city-side, including slums.</p> <p>CEMS activation(s): EMSR348</p> <p>CENTAUR development: integrating ICEYE VHR InSAR data combined with a 3D modelling of the city to better estimate the flood extent and associate potential urban impacts. This cold case scenario could be a hot case scenario within the projects' lifespan, supported by the recent integration of ICEYE data within Copernicus Space Component Data Access.</p>	Helpcode - NGO active in the education and training for children. Emergency and Security management (IT)	Alessandro Guarino	<p>ADVISOR >> TBC</p> <p>DEMONSTRATOR</p> <ul style="list-style-type: none"> ➤ Support the demonstration and provide feedback 	<p>e-GEOS (C. Sciarretta)</p>

4.3 WATER AND FOOD SECURITY DEMONSTRATOR SCENARIOS

The focus of WFS scenarios lies in country-scale analyses, even though the system could be able of zooming into the next finer administrative level for specific indicators and services, depending on data availability and system capabilities.

Use Case Country	Description	AB member	AB contact	Role in CENTAUR	Ref. Partner
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="background-color: #003366; color: white; padding: 5px; margin-bottom: 5px;">Cold case</div> <div style="font-size: 2em; color: white; margin-bottom: 5px;">+</div> <div style="background-color: #C85133; color: white; padding: 5px;">Hot case</div> </div> <p>Mali</p>	<p>Lies between the most arid and the rainy equatorial regions, water is seasonally scarce and precipitations increasingly unpredictable, often marked by low and high extremes.</p> <p>Climate change effects are intensifying conflict between communities, increasing poverty and weakening traditional means of survival. The recent increase of farmer-herder conflicts in the western Sahel is exacerbated by violent extremists and other armed groups operating in the area.</p> <p>A Mali demonstrator represents the Sahel.</p>	<p>German Foreign Office - Data Science Division (DE)</p>	<p>Thomas Meyer</p>	<p>DEMONSTRATOR</p> <ul style="list-style-type: none"> ➤ Support the demonstration. <p>Provide feedback.</p>	<p>Adelphi (A. Detges)</p> <p>SatCen (Y. Arnaud)</p>
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="background-color: #003366; color: white; padding: 5px; margin-bottom: 5px;">Cold case</div> <div style="font-size: 2em; color: white; margin-bottom: 5px;">+</div> <div style="background-color: #C85133; color: white; padding: 5px;">Hot case</div> </div> <p>Somalia</p>	<p>Below average rainfall during the rainy season led to worsening droughts in different parts of the country.</p> <p>This situation forced tens of thousands of people to leave their homes, in search of water, food and work, mostly to urban areas. These climate impacts are usually used by armed groups (i.e. Al Shabaab)</p>	<p>United Nations Support Office in Somalia (UNSOS)</p>	<p>Jasenko Udovicic</p>	<p>ADVISOR</p> <ul style="list-style-type: none"> ➤ Interest in the project, providing data and building scenarios; Bridge with local organizations. <p>DEMONSTRATOR</p>	<p>SatCen (Y. Arnaud)</p>



	<p>to position themselves as aid providers after severe impacts of droughts and floods.</p> <p>Outputs of this demonstrator could also be exported to other countries in the Horn of Africa.</p>			<ul style="list-style-type: none"> ➤ Support the demonstration. ➤ Provide feedback 	
Mozambique	<p>Composed mostly of coastal lowlands, Mozambique is highly exposed and vulnerable to temperature increases, cyclones and tropical storms.</p> <p>Over 80% of the population depend on agriculture for their livelihoods.</p> <p>Much food storage, fisheries infrastructure and livestock assets are washed away and thousands of hectares of crops are destroyed due to flooding¹⁷.</p> <p>In addition, since 2017, an Islamic group has staged a destabilizing insurgency in the predominantly Muslim Northern Province of Cabo Delgado.</p>	<p>Helpcode - NGO active in the education and training for children. Emergency and Security management (IT)</p>	Alessandro Guarino	<p>ADVISOR >> TBC</p> <p>DEMONSTRATOR</p> <ul style="list-style-type: none"> ➤ Support the demonstration and provide feedback 	e-GEOS (C. Sciarretta)

4.4 USER REQUIREMENTS: VALIDATION QUESTIONNAIRE

In addition to workshops and meetings, validation questionnaires are a direct channel for gathering feedback from end-users about their experiences and satisfaction with the tools and services provided by CENTAUR. This feedback is crucial for understanding whether the project's resulting products align with the actual needs and expectations of those it aims to serve.

At the end of each demonstrator, consortium partners responsible for a specific use case are requested to contact the relevant end-users or AB members to share validation questionnaires. They will be interviewed on several topics, including:

- Personal information and relationship to the project.
- Opinion on how CENTAUR could improve standard Copernicus EMS and SESA portfolios, as well as their early warning components.
- Opinion on the CENTAUR online platform, including accessibility, navigability, features and functions.
- In-depth assessment of each product, including availability timeliness, understanding, format, importance, compliance with requirements and potential impact.
- Overall evaluation.

The bulk of this interaction with the end-users is likely to take place at the end of the execution phase in late June.

5 CONCLUSIONS

The engagement of the interested users was based on continuous contact with the users and their involvement in relevant activities. During these contacts, the CENTAUR Consortium informed the end-users about the CENTAUR progress and milestones and their valuable feedback were collected and implemented during the project.

This is intended as a cyclic and incremental process in which, fed by the results and perspectives of the project, the interest and engagement of the users are raised. For this reason, in the months M18-M36, 3 more meetings and 2 workshops are planned, the results of which will be described in D7.14 Report on Steering and Advisory Activities v2.

At the same time, the team worked to promote the goals, limitations and achievements of the CENTAUR project at other events to raise awareness and expand the user community. In addition, the Consortium has already planned to participate in future events, the outcomes and uptakes of which will be described in the final version of this document.



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