CrossEU

D5.7- Exploitation Strategy (Version 1)

WP5 - Task 5.4
May 2025 [M17]

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Executive Summary

This document is the first version of the Exploitation Report, which will be updated towards the end of the Project (M35). It outlines the plan for the long-term sustainability of the Decision Support System (DSS) and the results developed under the CROSSEU project based on the outcomes of the collective exploitation workshop held in M12.

The report tracks Intellectual Property (IP) management and monitors the development of project results by partners including data, knowledge, and methodologies as detailed in Section 2. It further aims to define an exploitation strategy for the DSS, the Project's Key Exploitable Result (KER), presented in Section 3.

Engagement workshops will be organized with DSS target groups/ end-users between M24 and M30 to co-design the value proposition & business modelling of the DSS in collaboration with WP3 and WP5 to ensure the DSS developed by the project fits their needs.

Several preliminary scenarios for the exploitation and long-term financial viability of the DSS were identified, including open licensing, integration into existing platforms, institutionalisation within WEMC services, licensing to external stakeholders, commercial exploitation and policy uptake.

These scenarios will be further explored and refined over the course of the project. An action plan and associated recommendations will be developed in the coming months and informed in D5.8 (Exploitation strategy Version 2).

Finally, the report highlights the importance of coordinating with other projects to explore joint or aligned strategies, and scale the impact of CROSSEU results beyond Europe.

Keywords

Key Exploitable Results, Intellectual Property, Decision Support System

Abbreviations and acronyms

Acronym	Description
BMC	Business Model Canvas
BOKU	Universitaet für Bodenkultur Wien
BGP	Bio-geophysical risk
CCH	Climate change Hotspot
CSA	Case Study Analysis

CZU	Czech University of Life Sciences Prague
DAFNI	Data & Analytics Facility for National Infrastructure
DSS	Decision Support System
DTU	Danish Technical Institute
EDF	Electricité de France
IP	Intellectual Property
JRC	Joint Research Center
K&I	Knowledge & Innovation
KER/ ER	Key Exploitable Result / Exploitable Result
M&A	Mitigation & Adaptation
SDG	Sustainable Development Goal
SE	Socio-economic
TRL	Technology Readiness Level
UB	University of Bucharest
UCL	University College London
UEA	University of East Anglia
UKRI	United Kingdom Research & Innovation
UNIPD	Universita Degli Studi di Padova
WEMC	World Energy & Meteorology Council
WP	Work Package
WMO	World Meteorological Organization

Introduction

CROSSEU is a project funded by the European Union and aims to build a framework to allow exploration and assessment of climate resilience, including a ready-to-use Decision Support System (DSS) platform. This framework will support investment decisions, adaptation and mitigation strategies, and climate resilience policy decisions.

CROSSEU gathers 15 partners from 9 countries, with UK partners funded by UK Research and Innovation (UKRI).

To meet the project's objectives, CROSSEU is structured around 6 Work Packages (WPs). WP5 is dedicated to societal sharing, communication, dissemination, and exploitation. The main objective is to make the project and its results known to a wider audience and key stakeholders.

Deliverable 5.7 falls under WP5 and focusses specifically on the exploitation strategy of the project results. This first version, delivered in Month 17 (May 2025), captures initial exploitation activities conducted and plans for the future. It will be revised in a second version in Month 35 (November 2026) to reflect progress and impacts.

1.1.   Context

The exploitation task aims to develop a strategy for the long-term sustainability of CROSSEU's outputs beyond the duration of the project. Throughout the project, LGI and partners will work to maximize the impact of the project results for the beneficiaries, while managing and protecting the project's Intellectual Property (IP). This will involve a series of activities designed to ensure the long-term impact of the results and the provision of strategic recommendations to partners.

Exploitation can be commercial, societal, political, or aimed at improving public knowledge and action. In this report, we will explore different scenarios of exploitation to ensure the long-term sustainability of the DSS and other CROSSEU project results.

The Grant Agreement (GA) identified these 5 elements as Key Exploitable Results (KER). However, the Decision Support System (DSS) was identified as the primary Key Exploitable Result (KER) of the project, with other KERs contributing to and supporting its development. This was confirmed with WP3 partners and reaffirmed during the collective exploitation workshop, which agreed that the DSS should be the central focus of development and the key priority for ensuring the long-term sustainability of CROSSEU.
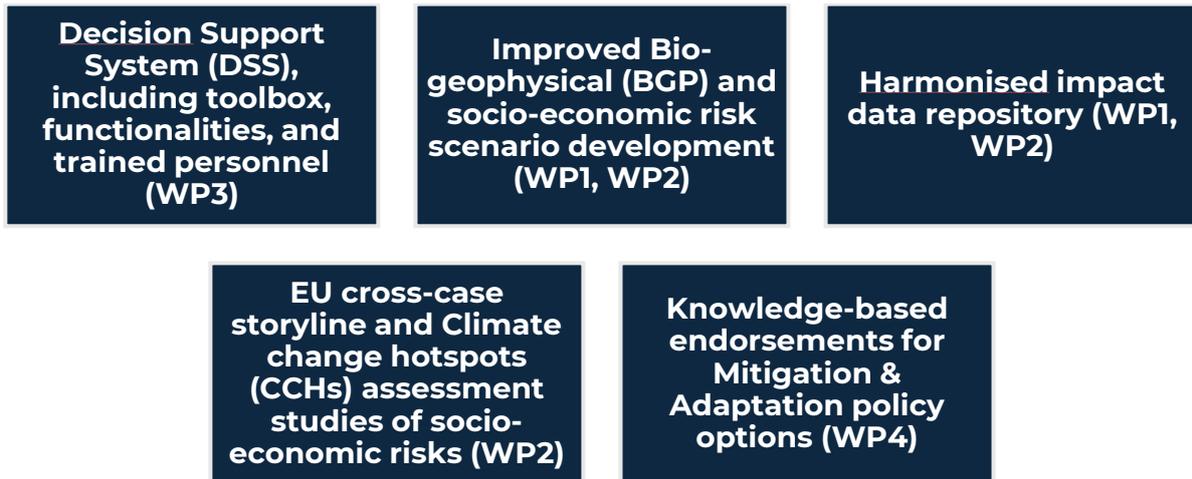
Decision Support System (DSS), including toolbox, functionalities, and trained personnel (WP3)	**Improved Bio-geophysical (BGP) and socio-economic risk scenario development (WP1, WP2)**	**Harmonised impact data repository (WP1, WP2)**

EU cross-case storyline and Climate change hotspots (CCHs) assessment studies of socio-economic risks (WP2)	**Knowledge-based endorsements for Mitigation & Adaptation policy options (WP4)**

Figure 1 List of Key Exploitable Results in the Grant Agreement

The Exploitation task is closely connected to Task 5.3 on *Dissemination, user adoption & engagement with the international community* as it will maximize the impact of non-exploitable results (such as the knowledge generated within the project) through the coordination of the participation of partners in conferences and events and publications. Additionally, engagement workshops will be co-organized with partners from WP5 and WP3 to gather feedback from potential users of the DSS and co-design the value proposition & business modelling to ensure the DSS uptake and long-term sustainability. The outcomes of this task will also help inform policy recommendations in Task 4.5.

This report is structured around two main components:

- Monitoring project results developed by partners (e.g., data, knowledge, methodologies), as detailed in Section 2. This section also presents the exploitation strategy for the non-KERs, which are intended to support the DSS and generate impact during and beyond the project's lifetime.
- Defining an exploitation strategy for the Decision Support System (DSS) as detailed in Section 3.

1.2. Methodology

Milestones

Figure 2 Milestones of the Exploitation task

Collective Exploitation workshop (M12)

The exploitation task (T5.4) was officially kicked off during the in-person consortium meeting in Prague in M13 (January 2025) and gathered around 20 participants from the CrossEU consortium.

The expected outcomes of this workshop were to:

- Have a clear list of the KER of the CROSSEU project
- Initiate discussions on the long-term exploitation view of the KER

The workshop started with a 15-minutes introduction to the objectives of the exploitation task. Three groups were then formed, each group working on one of the KERs. These three groups were chosen out of a collective discussion where the most relevant KER were identified. These are the KERs we selected to explore in more detail specifically for the duration of the workshop.

1. The DSS
2. Improved BGP and SE risks scenario-development modelling
3. EU cross-case Storyline and CCHs assessment of SE risk

For each of these KERs, the groups reflected on:

- Should we validate this result as a KER that might have impact beyond the project duration?
- What: Provide more details on this result. What does it include and what is its value proposition?
- Future: Propose an initial exploitation strategy for the long-term sustainability of the result
- How: What would be the governance of this result? Who will be owning/responsible for this result beyond the project duration?
- Possible beneficiaries

Results of the break-out groups discussions are summarised in Appendix 2.

Intellectual Property management plan

In the CROSSEU Project, Intellectual Property refers to the KERs and knowledge, methodologies and data developed in the context of the Project.

As part of the exploitation task, LGI worked to supervise the management of the Foreground intellectual property (IP) created by the consortium partners during the project. Foreground IP refers to the results produced by a beneficiary during the project's tenure and within the project scope.

IP management is an essential and continuous process in the exploitation of the results since it aims to define a strategy either to protect the results of the project (e.g., patent, copyright) or to maximise their impact (e.g., disseminate knowledge, publications).

Erreur ! Source du renvoi introuvable. summarises the Background IP, the IP supplied by the partners at the start of the project, as described in the Consortium Agreement.

Table 1 Background IP of the CROSSEU Project

Partner*	Background IP Type*	Short description	Specific restrictions and/or conditions for implementation*
WEMC	Software	Teal tool	Access Rights and usage of the tool Teal for this Project are strictly limited to the data visualisation. If required, specific additional Teal modules could be developed by the World Energy & Meteorology Council for this Project. The World Energy & Meteorology Council retains ownership of the Teal tool. The public version of Teal is free access. All other Teal users require a licence for the non-public modules/versions.
UKRI	Software	DAFNI Platform	In accordance with the DAFNI Terms and Conditions and Policies: https://docs.secure.dafni.rl.ac.uk/docs/terms-and-conditions/terms-and-conditions Access is for the duration of the Project and for the purposes of the Project only. After the end of the Project access is for the sole purpose of accessing the Results of the Project and for the lifetime of the platform only which shall be at the complete discretion of UKRI. Subject to further written agreement.
EDF	Methodology	GAM models for electricity demand	EDF will use/develop this methodology and only the results will be made available to Parties
UCL	Code	PAGE 2020 existing open-source model	Source Code will be made available for the IAF (integrated assessment framework) only.
UCL	Code	ENGAGE CGE existing model using GTAP data	Source Code and Object Code will not be made available. UCL will only supply results of the ENGAGE model for sustaining the development of the IAF (integrated assessment framework).

The Consortium Agreement also mentioned Background IP from Meteo Romania (Expertise & Knowledge) and LGI (Results-Strategies-Beneficiaries and IPR methodologies for the Exploitation task).

Open licence options will be considered in the context of the exploitation of the DSS. An open licence grants permission to access, re-use and redistribute work with few or no restrictions, and provides some benefits including (Open Knowledge Foundation, 2010):

- Ensuring broad accessibility and impact.
- Facilitating knowledge sharing and replication across regions.
- Aligning with EU and Horizon Europe policies on open science and FAIR principles (Findable, Accessible, Interoperable, Reusable).
- Allowing partners and external stakeholders to use, adapt, and share the results.
- Possibility to integrate KERs into regional policies without legal restrictions.
- Encouraging further innovation and co-creation beyond the project's lifetime.

Under open licensing, the consortium may decide to license results collectively under a shared open licence. In the case of a result developed by one organisation, that organisation owns it but agrees to open-license it. In the case of a jointly developed result (as the DSS), then all contributing organisations will share ownership but must collectively agree to release it under an open licence.

Stakeholder engagement workshops

External stakeholder engagement began from M3 and is crucial for CROSSEU's user-informed approach. As detailed in D5.1 Stakeholder Mapping and Engagement Plan:

- At least three co-design workshops will be held to engage stakeholders in testing and shaping the DSS
- Initial workshops (M3–M4) took place at both local and EU levels
- Three additional workshops are planned by M33 to present the DSS and project outcomes. Engagement workshops will be organised with DSS target groups/ end-users between M24 and M30 to co-design the value proposition & business modelling of the DSS.
- These workshops ensure that the framework and tools reflect real user needs and foster future adoption

This blend of internal and external engagement strengthens the project's foundation and prepares the ground for broader dissemination in Phase 2.

This section will be updated in the final version of the Exploitation plan.

Interconnections with other EU Projects

Interconnections will be established with sister projects including COACCH (ended in 2021) and JRC PESETA IV, and potentially CARMINE, SPARCCLE,

ACCREU and additional projects under the Adaptation Mission. The objective will be to discuss exploitation strategies, share plans and explore opportunities for aligned or joint exploitation efforts across projects. Exploratory calls with selected projects will be organized starting Month 24 (M24).

Informal discussions already took place in February 2025, as T5.4 leader coordinated efforts to organise a joint session with different projects during the European Conference on Climate Adaptation in 2025.

2. Results (non-KERs) of CROSSEU and IP management

The Foreground IP of the project, the results produced by the partners during the project's tenure and within the project scope, were collected based on the outcomes of the collective workshop. These project results are described in Erreur ! Source du renvoi introuvable.. This table will be updated throughout the Project. It will gather all Project results developed by partners during the Project, individually and jointly. To update the list of project results, bilateral meetings will be organised between LGI and each consortium partner in late 2025 or early 2026. Partners will inform their latest and expected results and will be encouraged to autonomously update the document until the end of the project. The following questions will be addressed to complete Erreur ! Source du renvoi introuvable.:

- What are the results that your organisation has developed during the project?
- Who are the beneficiaries for these results and how do you plan to protect or disseminate them?
- What are your hopes / plans to maximise the impact of these results?

The management of publications will be supervised under the Dissemination activities in T5.3.

Table 2 Foreground IP of the CROSSEU Project as of April 2025

Innovation Description			Ownership		Exploitation aspects		
Type of IP	Short Description	WP	Type of Ownership	Owning Entities	Initial Exploitation Strategy	Main Beneficiaries	Other Beneficiaries
Data	Improved Bio-geophysical (BGP) and socio-economic risk scenario development	WP1, WP2	Joint	UEA, UCL	Publications, Training, Consultancies, Research bids, Public talks	Academia (Researchers), Future research projects	Policymakers, Communities, Industries
Data	Harmonised impact data repository	WP1, WP2	Joint	UKRI	Further research based on CROSSEU models	Academia (Researchers, Students)	
Methodology	EU cross-case Storyline and Climate change hotpots (CCHs) assessment studies of socio-economic risks	WP2	Joint	DTU	Publications, Guidelines & good practices, Policy brief and recommendations • Possibility to be replicated and adapted worldwide in further contexts • Valorised in future Horizon Europe Projects linked with SDGs • Upscaling of methodology to Global South/Additional funding to test upscaling New research ideas: innovations/legislations and commercialisations	Academia (Researchers), International research (like IPCC, JRC), Scientists, practitioners	End users: Municipalities, Companies Policymakers Civil protection workers/ agencies

Innovation Description			Ownership		Exploitation aspects		
Type of IP	Short Description	WP	Type of Ownership	Owning Entities	Initial Exploitation Strategy	Main Beneficiaries	Other Beneficiaries
Knowledge	Knowledge-based endorsements for Mitigation & Adaptation policy options	WP4	Joint	BOKU	Teaching lectures, Policy briefs, publications	Academia	

3. Strategy for the long-term sustainability of the Decision Support System

3.1. Value proposition of the Decision Support System (DSS)

CROSSEU will deliver a common online DSS platform using the innovative and adaptable interface DAFNI and building on the existing user-friendly visualisation tool Teal. The DSS is therefore a combination of DAFNI plus Teal visualisation.

The DSS will:
- Allow the user to select inputs and launch model computations
- Display project research outputs in an accessible format
- Make available downloadable document for policy briefs

- Provide stakeholders with socioeconomic indicators, climate variables, and evaluations of future climate change impacts

Figure 3 DAFNI Characteristics

Figure 4 TEAL characteristics

During the workshop, the value proposition of the workshop was discussed. The DSS enables:
- Access to harmonised data
- Access to a range of scenarios
- Access to maps + Geographic Information Systems
- Technical support documentation
- Climate services
- User-friendly interface and easy access to reliable data
- Tailored science-based information for risk management in the long term
- It is more complex than what the user could develop on their own
- Improved understanding of the climate change related risks in different sectors

The DSS is designed to reach Technology Readiness Levels 6 to 7, by enabling the demonstration of the solution in a relevant environment (TRL 6) and supporting the demonstration of a functional system prototype (TRL 7).

Deliverable 3.1 Inventory of user requirements and support system processing workflow and functionalities specifies the possible use cases of

the DSS depending on its users and the stakeholder requirements, and outlines specific use by each case study.

The value proposition of the DSS will be further refined in the updated Exploitation report (M35). This work will be conducted in collaboration with WP3 partners.

3.2. Market study: Testing the value proposition with stakeholders

3.2.1. Stakeholder mapping and identification

Inputs will be included from the Deliverable 5.1 Stakeholder Mapping and Engagement Plan, as well as the stakeholder engagement activities implemented by WP3.

During the workshop, the following stakeholders for the DSS were mentioned:

- Climate resilience consultants
- CROSSEU stakeholders
- NGOs
- Farmers
- Approved users
- Case study users
- Government agencies: Met services infrastructure
- Research & Academia
- Policymakers: Practitioners, sectoral risks managers

The following list of relevant EU and International level stakeholders were identified in D5.1 to be included in the engagement activities for the DSS, as they have gathered a precious amount of data and government policies that will need to be included in the analysis.

- United Nations specialised agencies:
  - Food and Agriculture Organization of the United Nations (FAO)
  - United Nations Economic Commission for Europe (UNECE)
  - World Meteorological Organization (WMO) (CROSSEU partner)
  - United Nations Environmental Programme (UNEP)
- International climate council networks
- European Commission
  - o DG ENV - The Directorate-General for Environment
  - o DG AGRI - The Directorate-General for Agriculture and Rural Development
  - o DG CLIMA - The Directorate-General for Climate Action
  - o DG ENTR - The Directorate General Enterprise and Industry
  - o DG R&I – The Directorate-General for Research and Innovation
- European Commission's Joint Research Centre.
- European Space Agency

- European Environment agencies
- International Plant Protection Convention (IPPC)
- European Investment Bank (EIB)
- European Bank for Reconstruction and Development (EBRD)
- Forest Europe

3.2.2. Stakeholder engagement workshops

The workshops will be organised with WP5 and WP3 partners and DSS target groups/end-users between M24 and M30. This section will be updated accordingly in the final exploitation plan. The very first workshop is planned as a beta-testing session for the early version of the DSS tool, tentatively scheduled for Fall 2025, and its outcomes will be informed in the report. They will help co-design the value proposition & business model for the DSS and bring the demonstrated DSS system prototype in an operational environment (TRL7) closer to market uptake.

The Case Study Areas (CSAs) are also central to the exploitation strategy because they provide the practical settings where the DSS is tested and demonstrated. They will ensure the exploitation strategy is grounded in real-world relevance and evidence.

3.2.3. Direct beneficiaries of the DSS and their needs

The objective of this section will be to identify the right stakeholders and to interview each group to test the value proposition of the DSS

In collaboration with WP3, we will test the CROSSEU's Decision Support System with stakeholders to ensure that the framework developed by the project fits their needs.

Additionally, the CSAs provide valuable feedback loops for integrating regional and local perspectives into the DSS, enhancing its scalability and user-friendliness.

3.3.   Strategy for the exploitation of the DSS

The objective of this section will be to provide recommendations and actionable steps to ensure the long-term sustainability of the DSS.

At the time the proposal was developed, CROSSEU partners expressed interest solely in disseminating their KERs rather than commercially exploiting them. This position was reconfirmed by partners during the collective exploitation workshop.

During the workshop, project partners also suggested several strategies to maximise the impact of the DSS, including:

- Capacity building through trainings, tutorials, and toolkits to support beneficiaries in effectively using the DSS.
  - Engaging the academic sector to raise awareness of climate-related risks in higher and secondary education.
  - Applying for follow-up projects to continue and build upon the work initiated during the project.
  - Establishing connections with similar projects or initiatives to foster collaboration and knowledge exchange.

These recommendations will be considered in addition to the exploitation strategy that will be implemented.

This section outlines several scenarios for the long-term sustainability of the DSS. These scenarios will be discussed with the Coordinator, project partners, and sister projects in 2025 and beyond to identify the most plausible and strategic scenarios or potential combinations of scenarios.

The three key factors for a successful exploitation are

1. The strategic alignment of partners and their motivation to exploit
2. Testing the value proposition of the DSS with beneficiaries
3. Securing long-term strategy for financial viability

Financial viability is therefore crucial to ensure that the costs and expenses associated with the DSS are accounted for, and that the system remains sustainable over the long term. One or more of the following frameworks will be used to develop the value proposition and business model of the DSS: the Sustainable Business Model Canvas, the Flourishing Business Model Canvas, or the Triple-Layered Business Model Canvas. They are described further in Appendix 1. The selection of one of the frameworks will be based on the scenario(s) that will be selected for the DSS.

The following scenarios will be explored and developed.

Table 3 Possible exploitation scenarios to support the long-term financial viability of the DSS

	Scenario	Description
#1	DSS available in Open Licence with external funding to support financial viability	- The DSS will be available to the public for free. - The cost of maintenance and operations will be supported by an external funder. The Project will therefore identify external funding opportunities (public, private and public/private) that will support the long-term financial viability of the DSS. - The Project will need to demonstrate the DSS's impact on its beneficiaries in order to secure future funding. - The Project will also explore the options for Open-source licence: *Creative Commons (ex: CC-BY, CC-BY-SA, CC0) for methodologies, training materials; Open-source licences (e.g., MIT, GPL, or Apache) for software, digital tools; Open data licences (ODbL or CC0) for datasets* - This proposition will be discussed further and defined carefully, as some of the tools the DSS utilises are proprietary
#2	DSS integrated in existing platforms	Partnerships will be built with national Meteorological services, Risk assessment frameworks and/or other stakeholders to integrate the DSS within some existing platforms on climate adaptation/ climate risks.
#3	Institutionalisation of the DSS in WEMC set of services	- WEMC will keep hosting and maintaining the DSS beyond the project duration. - The Project will propose recommendations for WEMC to support the financial viability of the DSS.
#4	License the DSS to partners or external stakeholders	- The DSS will be licensed to stakeholders within or outside the consortium that are interested in the commercial exploitation of the DSS. - These stakeholders may include Meteorological institutions, Specialised consultancy companies.

• #5	Commercial exploitation of the DSS	-	The DSS will be financially viable thanks to the generation of revenues from its paying users.
		-	The Project will test the willingness to pay for the DSS from users and beneficiaries.
		-	Several scenarios are possible for the DSS to generate revenues. For example, the DSS may be made freely accessible to all users, while additional value-added services, offered by selected partners, could be made available for a fee. Another possibility is that a free version may be available for public institutions while companies may pay for premium features or analytics.
#6	The DSS will help influencing policies by being integrated in multi-level policy frameworks (urban development, sectoral policies etc.)	-	The Project will push to enable the integration of the DSS with existing risk management and urban planning software.
		-	Strong connections will be made with WP4.
		-	Discussions will be organised with decisionmakers at regional and national levels.

Additionally, the following questions will be considered in any exploitation scenario:

Clarifying the role of the partners beyond the project duration: Which organisations will remain involved and what responsibilities will they assume? As the DSS consists of a combination of DAFNI and Teal, options for the joint exploitation of the DSS by WEMC and UKRI will be explored.

Exploring scalability: How can the outcomes of the project be adapted and replicated beyond European regions?

- We will explore partnerships with international organisations that are active in climate adaptation and building resilience, including WMO. We will also explore partnerships with organisations and entities outside Europe to pilot and to adapt the DSS locally or regionally. The DSS must indeed be modularised to be useful to different geographical, cultural and socio-economic contexts.

- Some pilots may be led with local municipalities or non-profit organisations based on the learnings of the case studies, with an emphasis on capacity building.
- Through user engagement, co-development activities and business planning, we will support and monitor the scale-up of the DSS to achieve TRL 6–7, enabling the demonstration of the solution in a relevant environment. The CSAs are also central to the demonstration of the DSS in relevant environments, helping to reach TRL 6-7. This is vital for positioning the DSS as a market-ready system prototype.

Incorporating non-profit societal activities: Regardless of the selected scenario, complementary activities may be organised to raise awareness, build capacity, support vulnerable populations, foster community development, facilitate public consultations etc.

Recommendations will be included in the Final Exploitation report. They will include:

- Recommendations to improve the DSS based on users' needs
- Recommendations on key stakeholders to target
- Plan to implement the selected scenario(s)

4. Conclusion

This report is the first version of the Exploitation Report and will be updated towards the end of the Project (M35) in D5.8 (Exploitation strategy Version 2). It will inform the plan for the long-term sustainability of the Decision Support System (DSS) and the results developed under the CROSSEU project.

The report summarises the outcomes of the collective exploitation workshop held in January 2025, which launched the reflection on the Key Exploitable Results (KERs) and initiated early discussions on the long-term sustainability plan for the DSS. It tracks Intellectual Property (IP) management and monitors the development of project results by partners including data, knowledge, and methodologies. It further aims to define an exploitation strategy for the DSS, the Project's Key Exploitable Result (KER), presented in Section 3.

Several preliminary scenarios for the exploitation and long-term financial viability of the DSS are identified, including open licensing, integration into existing platforms, institutionalisation within WEMC services, licensing to external stakeholders, commercial exploitation and policy uptake. These scenarios will be further explored and refined over the course of the project.

References

CASE - Competencies for a sustainable socio-economic development. (2018). *Sustainable Business Model Canvas*.

Flourishing Business Model Canvas. (2024). *Flourishing Business Model Canvas*.

Joyce, P. A. (2015). *The Triple Layered Business Model Canvas: A Tool to Design More Sustainable Business Models*.

Open Knowledge Foundation. (2010). *Guide to Open Licensing*. Retrieved from Open Definition: https://opendefinition.org/guide/

Strategyzer. (2023). *The Business Model Canvas*.

Appendix

Appendix 1 – Possible Business Model Canvas (BMC) approaches to shape the DSS value proposition and business model

Business Model Canvas

The Business Model Canvas was developed by Osterwalder. It is a business tool used to visualise all the building blocks in the creation of a new business, including customers, route to market, value proposition and finance. This tool is used to map out a business or product's key actors, activities and resources, the value proposition for target customers, customer relationships, channels involved and financial matters. It helps identifying requirements to deliver the service and provides a clear visual of what the business model is and how the activities should be aligned (Strategyzer, 2023).

Key Partners	Key Activities	Value Proposition	Customer Relationships	Customer Segments
	Key Activities		Channels	
Cost Structure			Revenue Streams	

Sustainable Business Model Canvas

The Sustainable BMC integrates sustainability into the core business by focusing on the ecological and social consequences of the activity. Its objectives are to maximise positive impacts and to avoid negative impact on society and nature (CASE - Competencies for a sustainable socio-economic development, 2018). Its main differentiation with the BMC relies in the addition of the sections "Eco-social costs" and "Eco-social benefits". These categories are therefore relevant for climate services as they consider the positive as well as negative impact of CS on the environment and on society.

Key Partners	Key Activities	Value Propositions	Customer Relationships	Customer Segments
	Key Resources		Channels	
Cost Structure			Revenue Streams	
Eco-Social Costs			Eco-Social Benefits	

Flourishing Business Model Canvas

The Flourishing BMC aims to consider the complexity of the world by considering the full context of a business (Environment, Society and Economy) without leaving behind the financial sustainability. This tool strives to help designing business models that are socially beneficial, environmentally regenerative and financially viable (Flourishing Business Model Canvas, 2024).

Biophysical stocks	Process	Value	People	Actions
Ecosystem services	• Resources • Partnerships • Activities • Governance	• Value Co-creations	• Relationships • Channels • Stakeholders	Needs

		• Value Co- destructions • Products/ Service		
Outcomes				
Costs		Goals	Benefits	

Business models developed with the Flourishing Business Canvas articulate how an organisation defines and achieves its goals over time. It includes the nine questions posed by the BMC but "upgrades" them to consider the impact of the other contexts. For example, "Customer Segment" in the Sustainable BMC has been upgraded to "Stakeholder" in the Flourishing Business Canvas. The design of the Flourishing Business Canvas adopts a humanistic approach.

Triple Layered Business Model Canvas

The Triple Layered Business Model Canvas serves as a tool for exploring business model innovation with a sustainability focus. It expands upon the original business model canvas by incorporating two additional layers: an environmental layer and a social layer. When considered together, these three layers explicitly illustrate how an organisation generates economic, environmental, and social value. The environmental layer of the TLBMC is founded on a lifecycle perspective of environmental impact. Simultaneously, the social layer builds on a stakeholder management approach, and aims to explore an organisation's social impact by balancing the interests of various stakeholders (Joyce, 2015).

Supplies and Outsourcing	Production	Functional Value	End-of-Life	Use Phase
	Materials		**Distribution**	

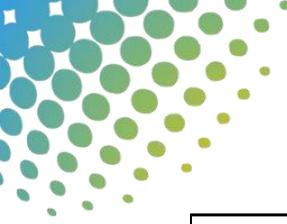| Environmental impacts	Environmental benefits

Appendix 2 – Exploitation workshop – Results of the breakout groups

DSS

WHAT	FUTURE
• Access to harmonised data • Access to scenarios • Maps + GIS • Some technical support documentation • Climate services • User-friendly interface and easy access to reliable data • Tailored science-based information for risk management on long term • More complex than what the user could develop on their own • Improved understanding of the cc related risks in different sectors • Use of Kubernetes, reliable containerised, Use of open-source and replicable components	• Tutorial : Example of how to use the DSS • Training • Higher education, Secondary education • Online training, wiki, toolkit • Follow-up projects • Networking with similar projects or initiatives • Increase awareness on cc-related risks • Look at exploitation strategies of sister projects (COACCH, PESETAS)
HOW	**Beneficiaries**
• DAFNI team (Governance) • Licences reflect use (e.g., disclaimers) • Software developers • Data providers • User feedback sheets	• Climate resilience consultants • CROSSEU stakeholders • NGOs • Farmers • Approved users • Case study users • Government agencies :Met services infrastructure • Research & Academia • Policymakers: Practitioners sectoral, risks managers

Improved BGP and SE risks scenario-development modelling

WHAT	FUTURE

• Publications • Impact stories • Models • Training	• Consultancies, research bids, teaching, public talks
HOW	**Beneficiaries**
	• Researchers • Policymakers • Communities • Industries • Future project research

EU cross-case Storyline and CCHs assessment of SE risk

WHAT	FUTURE
• Methodology approach/Framework/ Tools • Good practices examples, Guidelines • Publications • Identification of vulnerable groups : Suggestion of adaptation measures • Cross-case (First of a kind, aid in understanding feedback across sectors – transboundary) • Others: Policy recommendations, data	• To be adapted / replicated worldwide in further contexts • Valorised in future HE projects • Links with Sustainable Development Goals • Local/regional strategies • Upscaling of methodology EU8 to Global South • Future project research • CROSSEU + more funding to test upscaling • New research ideas: innovations/lé gislations, commercialisations → insurance companies
HOW	**Beneficiaries**
• Publications, journals, papers, policy briefs • Inform adaptation strategies / Update of policies • Website (via CROSSEU website) • Conference presentation (EGU 2025) • Allocation of funding • Through all CROSSEU partners • Workshops • Thanks to WMO projects (and not only)	• Research (academia), International research (Orgs like IPCC, JRC), Scientists, practitioners • End users: Municipalities, Companies • Policymakers • Civil protection workers/agencies

CROSSEU Partners

Meteo Romania	UEA University of East Anglia — NORWICH BUSINESS SCHOOL	WORLD METEOROLOGICAL ORGANIZATION
Università degli Studi di Padova — TESAF	UCL	K&I Conoscenza e Innovazione
Helmholtz-Zentrum hereon	LGi sustainable innovation	eDF
BOKU	DTU	WEMC World Energy & Meteorology Council
UKRI UK Research and Innovation	UNIVERSITY OF BUCHAREST	CZU