



D 6.6 | Summary results of the case studies

WP6 – Case studies-local evaluation

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8	GMV Aerospace and Defence SAU	GMV	Spain	
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Table of Contents

Document History	3
List of Organizations	5
Abbreviation and Acronyms	7
Executive Summary	8
1. Introduction	9
2 Applied methodologies.....	9
2.1 Risk identification, assessment and quantification.....	9
2.2 Analysis of land-based adaptation and mitigation capacities at local scale.....	10
2.3 Matchmaking of land use-based solutions with case studies.....	11
2.4 Development of the local models in the six case studies	12
2.5 Evaluation of local solutions to provide recommendations	13
3 Policy briefs per case study.....	13
4 Conclusions	14
5 References	14
Annexes	15
Annex I: Summary results of Gotland case study (CS1): Policy Brief.....	15
Annex II: Summary results of Tarn-et-Garonne case study (CS2): Policy Brief.....	15
Annex III: Summary results of Southern Great Plain case study (CS3): Policy Brief.....	15
Annex IV: Summary results of Valle d'Aosta case study (CS4): Policy Brief.....	15
Annex V: Summary results of Almería case study (CS5): Policy Brief.....	15
Annex VI: Summary results of Azores case study (CS6): Policy Brief.....	15

Abbreviation and Acronyms

Acronym	Description
CS	Case Study
CSX	Case Study number X
ECV	Essential Climate Variable
EUC	End-Users Community
GIS	Geographic Information System
IC	Impact Chain
KPI	Key Performance Indicator
LAMS	Land use-based Adaptation and Mitigation Solutions
MCA	Multi-Criteria Analysis
RCP	Representative Concentration Pathways
RES	Renewable Energy Sources
SD	Systems Dynamics
SSP	Shared Socio-economic Pathway
WP	Work Package

Executive Summary

This document reports the outcomes of Task 6.5 “Evaluation of local solutions to provide recommendations”. It integrates the results that are useful for policymaking in the six analysed case studies: Gotland (Sweden) – Northern case study (CS1), Tarn-et-Garonne (France) – Atlantic case study (CS2), Southern Great Plain (Hungary) – East of EU case study (CS3), Valle D’Aosta (Italy) – Alpine - Mountain (CS4), Almeria (Spain) – Mediterranean case study (CS5) and Azores Archipelago (Portugal) – Small Islands case study (CS6).

This report is structured into different policy briefs summarizing the main achievements per case study. Each policy brief document integrates results from the local SD models as a useful engine to test the effects of LAMS, the results of the dialogue with the stakeholders in the workshops, risk and vulnerabilities and the climate implications in critical sectors like agriculture using AquaCrop to evaluate yield simulations. The results highlight the most relevant and suitable solutions, retrieved by assessing the results of the model simulations of policy-action scenarios in the SD model and the prioritization from local stakeholders collected in the consultations. A summary of the vulnerabilities, barriers and opportunities to implement the solutions is also provided.

Finally, policy recommendations outline the essential strategy for the future at case study level, considering the analysis developed in the project, the sectors identified as priority for the local society, and the actions that can support climate change resilience in each case studies.

1. Introduction

The objective of this deliverable is to summarize the results for each the case studies developed under Work Package (WP) 6. The deliverable builds on earlier tasks translating the findings into a set of policy briefs. Each policy brief presents a concise overview of the case study, outlining its key climate risks and challenges, proposing tailored solution packages to address them, and emphasizing the policy recommendations developed in D6.5.

2 Applied methodologies

In this section, the applied methods followed in the activities of WP6 are summarized. The next subsections include the methodologies used for risk identification, assessment and quantification (T6.1), followed by land-based adaptation and mitigation capacities (T6.2), and the definition of packages of solutions at the case study level (T6.3) during Workshop 4. The development of the local SD model is also briefly defined (T6.4). This model was subsequently applied to simulate policy scenarios derived from storylines, which were developed using policy insights and policy statements evaluated for each case study during Workshop 5 (T6.5). The outcomes of the scenario simulations were essential for defining policy recommendations at case study level (T6.5), which are also briefly presented in this section. The results generated through these activities provided valuable information for the development of policy briefs for each case study.

2.1 Risk identification, assessment and quantification

Climate risk identification, assessment, and quantification at local scale were the main outputs of Task 6.1. The methodology for identifying climate risk, developed under Task 5.2, applies the IPCC's propeller framework, which defines risk through its components: hazard, exposure, and vulnerability (sensitivity and adaptive capacity).

A participatory process was also implemented including three engagement activities (two online and one presential) with the end-user community (EUC)/stakeholders. These activities were used to identify local challenges, followed by collecting stakeholders' feedback on LAMS and the identification of the most vulnerable sectors. In particular, the third consultation was dedicated to the definition of the most relevant risks, through stakeholders' evaluation and modification of the Impact Chains created by the case study leaders. This led to the co-development of the local risk assessment (T6.1). An impact chain manual (Annex III of D5.2) and a workshop guideline (Annex I of D6.2) were developed to guide the case study leaders in the creation of impact chains and to carry out the stakeholders consultation. The results

coming from the consultation and the impact chains development were included in D6.1 and Annexes I to VI of D6.1.

Once the impact chains were developed, the risk quantification began with the collection of available data for hazards, exposure, and vulnerability factors. The data were processed and the three risk components were combined following an indicator-based approach. D6.1 includes examples of results for normalized hazards as geolocated maps and vulnerability as geolocated maps and radial graphs. Additional hazard results such as hazard exceedance probability and multi-hazard assessment are included in Annex VIII of D6.1, while heatmaps of risk for each CS are comprised in Annex IX of D6.1. All the geolocated maps of hazard, exposure, vulnerability and risk are included in the RethinkAction platform for each CS.

2.2 Analysis of land-based adaptation and mitigation capacities at local scale

The main objective of Task 6.2 was to assess adaptation and mitigation potentials and capacities at the case study level. The methodology implemented was developed in WP5, where decision rules and multi-criteria analysis were applied to integrate different suitability factors and restrictions for the implementation of land-based adaptation and mitigation measures.

Initially, 27 land-use-based solutions were selected from the LAMS catalogue (D4.6) (Chiriaco et al., 2025) for implementation in the local SD models. Their suitability factors were incorporated into the models to assess adaptation and mitigation potential, as well as the impacts of these solutions on the baseline. These factors reflect land and resource requirements, including potential implementation constraints, and were also used to develop 13 suitability maps.

The maximum mitigation potential was identified for LAMS 3, 22, 23, and 44, based on the suitability maps. Additional calculations were carried out for several agricultural LAMS (1, 2, 4–11) across all cropland and/or grassland. These analyses estimated the mitigation potential that could be achieved if the LAMS were implemented across the entire suitable area. The results can be found in Annex I of D6.5.

When assessing mitigation, the methodology separates what could be achieved in theory under ideal conditions (potential) from what is realistically achievable in practice, given the resources and constraints of each region (capacity). Current emissions and soil and biomass carbon stocks were used to create a baseline, which was then contrasted with possible future results under various LAMS scenarios. The analysis separates the land-based emissions and sequestration (agriculture, forestry, land-use change) from energy-related emissions, where renewable deployment on land substitutes fossil fuel use following IPCC 2006 guidelines (Eggleston et al., 2006). This “bottom-up” approach

allowed estimation of mitigation potentials in each case study area while acknowledging that actual outcomes depend on economic, social, political, and environmental constraints.

On the adaptation side, the framework evaluates hazards, exposure, and vulnerability at baseline and then tests how LAMS can alter these conditions. Adaptive capacity is assessed through four key dimensions e.g. resources, governance, knowledge, and technology, taking both expert judgment and stakeholder input into account. Stakeholder workshops were central to the process, providing insights into feasibility, synergies and trade-offs, and producing priority lists of measures tailored to local conditions.

The proposed methodology combines scientific modelling with participatory evaluation to provide a consistent framework for assessing how LAMS can contribute to both adaptation and mitigation, linking theoretical potential to practical realities and anticipating the effects of climate change.

2.3 Matchmaking of land use-based solutions with case studies

Following the co-creation approach, Task 6.3 aimed to identify and align the portfolio of solutions from the LAMS catalogue (WP4) with the specific needs and requirements of each case study, while also addressing the vulnerable sectors identified in Task 6.1. This is intended to support the development of RethinkAction cross-sectoral decision-making platform tailored to the needs of different end-users. Within the RethinkAction platform, users first select the most relevant sector and, rank objectives and priorities for their case study. They can then review the package of solutions proposed by the platform and modify it by adding or removing LAMS to create a package aligned with their objectives and priorities.

The algorithm behind the definition of the package of solutions per case study is based on objectives and priorities of LAMS implementation defined in Workshop 4. These predefined results were developed through a hybrid format (online/in-person) engagement strategy under WP2 (T2.4). To collect structured inputs for each CS, an Online Survey Tool was developed in Excel format. The survey tool was originally designed for individual contributions but later applied in sector groups (“policy sector rooms”), reflecting the most vulnerable sectors of each case study. It guided participants through exercises such as ranking objectives, ranking criteria, assessing the contribution of LAMS to these objectives, and refining packages of solutions. This information is presented in detail in Annex I of D6.3.

The outcome was the co-development of solution packages that combined stakeholder preferences with predefined objectives and criteria. The algorithm integrated in the survey tool allowed to generate preliminary packages, which stakeholders then reviewed, adjusted, and ranked during the workshops.

This ranking process was identified as the key outputs of Task 6.3, as it provided a list of most relevant LAMS to each local context. Additional exercises also collected information on LAMS already implemented or planned, as well as proposals for new measures not originally in the catalogue.

Beyond solution selection, the task also contributed to refining the understanding of drivers and barriers of LAMS implementation. Stakeholders identified favourable and unfavourable conditions across institutional, financial, technical, and socio-cultural dimensions, and these were categorised for integration in the adaptation database. In this way, Task 6.3 bridges local stakeholder knowledge with modelling tools, ensuring that the proposed solutions are both technically sound and socially feasible.

2.4 Development of the local models in the six case studies

The objective of Task 6.4 was to develop system dynamics (SD) models for each case study to evaluate the impact of LAMS implementation on Key Performance Indicators (KPIs) defined in WP4, thereby supporting local decision-making. These models serve as tools to explore the interactions between land, water, energy, and greenhouse gas emissions under different policy choices through “what if?” explorative scenarios. To achieve this, the models were structured into four modules: land-use, water, energy, and greenhouse gas accounting.

Each module focuses on its specific domain but is interconnected with the others through feedback loops and shared variables, ensuring that changes in one sector also influence the others.

The models were informed by multiple sources of data. In particular, they integrate the outcomes of earlier work packages, including the LAMS catalogue (Task 4.4) and the suitability maps (Task 3.3), alongside stakeholder knowledge and local data. This included maps and GIS analysis, climate scenarios (SSPs), and statistics at the national and regional levels and outputs from sectoral models such as AquaCrop-OSPy for crop yields (Kelly and Foster, 2021). Where local data were missing, we adjusted national data down to the case study scale. Socio-economic drivers such as population were introduced as exogenous variable using projected values according to SSP scenarios (SSP1-2.6, SSP2-4.5, SSP5-8.5).

Finally, the models went through several iterations of calibration and validation, using historical data whenever available, as well as expert and stakeholder validations. The results were compared against independent sources to check for consistency. Although data gaps remain, the SD model provides a flexible way to test different policy scenarios, combining scientific analysis with stakeholder priorities. The SD models are included in the RethinkAction integrated assessment platform developed in WP7.

2.5 Evaluation of local solutions to provide recommendations

Task 6.5 focuses on evaluating scenarios of suitable land-based adaptation and mitigation solutions to develop recommendations for each case study. The approach used to define these policy recommendations, summarized in this section, is described in detail in D6.5. At first, the ranking of policy insights, obtained from D6.3, was considered to develop shared policy statements in Workshop 5 and then storylines at the case study level. The content of the storyline was used to define potential policy scenarios for 3 different level of policy implementation. These scenarios were simulated in the local SD models described in the previous section. The outputs of these models were then assessed against a set of Key Performance Indicators (KPIs) and presented to case study leaders to receive their feedback. This rigorous process supported the formulation of policy recommendations that are grounded in both modelling evidence and stakeholder priorities.

3 Policy briefs per case study

The policy briefs developed under Task 6.5 summarize the most relevant local-scale outcomes of the project, with a focus on the results that inform policy recommendations. The six policy briefs, one for each case study, include the following sections:

- **Executive summary** provides an overview of the case study and outlines the main focus of the document.
- **Key findings** section, presents the recommended actions for improving conditions in vulnerable sectors, considering also the lessons learned from co-creation activities with stakeholders.
- **Background and policy context** section explains the critical role of land use-based adaptation and mitigation solutions in addressing climate change. It also describes the most relevant characteristics of the case study, with particular attention to land use types.
- **Climate and geographic focus for LAMS** defines the region's climatic characteristics and future projections, highlighting potential changes and worsening conditions due to climate change.
- **Bridging Science and Society for Climate-Resilience Development** details the methodology used to generate policy recommendations. It integrates lessons from co-creation activities with stakeholders and outcomes from project activities such as ECVs, suitability maps, AquaCrop results, risk assessments, and especially the local SD model, which formed the basis for the policy recommendations.



- **Translating Data into Action** summarizes the most relevant findings, focusing on essential climate variables such as mean temperature, precipitation, and wind, including projected anomalies where future trends are compared to historical ones. It also reports AquaCrop model results, analyzes vulnerable sectors linked to local SD model variables, and presents impact chains related to specific risks in the case study. Finally, it identifies the most relevant LAMS for vulnerable sectors in the case study.
- **Conclusions** highlights the key challenges identified in the case study and outlines the recommended actions to improve local conditions.

4 Conclusions

The main focus of this D6.6 is to make a summary results of the case studies including the information about the results obtained related to climate change impacts risks and vulnerabilities perceived at six case study level, land-based adaptation and mitigation solutions adopted to deal with climate risks, and policy recommendations adopted to deal with the future climate scenarios.

Therefore, this deliverable makes an overall summary of the results that are relevant for decision-making in the fight against climate change. The findings are integrated in policy briefs per case study. The policy briefs developed are annexed to this deliverable, offering key insights from each case study and pointing towards strategies that balance trade-offs, capture synergies, and strengthen the basis for effective climate policy making at case study level.

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Annexes

This main document integrates the six annexes that are listed below. These annexes have been developed as supplementary documents, providing functional summary documents per case study that help to improve the understanding of the results obtained in Task 6.5.

Annex I: Summary results of Gotland case study (CS1): Policy Brief

Annex II: Summary results of Tarn-et-Garonne case study (CS2): Policy Brief

Annex III: Summary results of Southern Great Plain case study (CS3): Policy Brief

Annex IV: Summary results of Valle d’Aosta case study (CS4): Policy Brief

Annex V: Summary results of Almería case study (CS5): Policy Brief

Annex VI: Summary results of Azores case study (CS6): Policy Brief



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