

RIO CEIRA: THE HISTORY, THE ENVIRONMENT AND THE POPULATIONS

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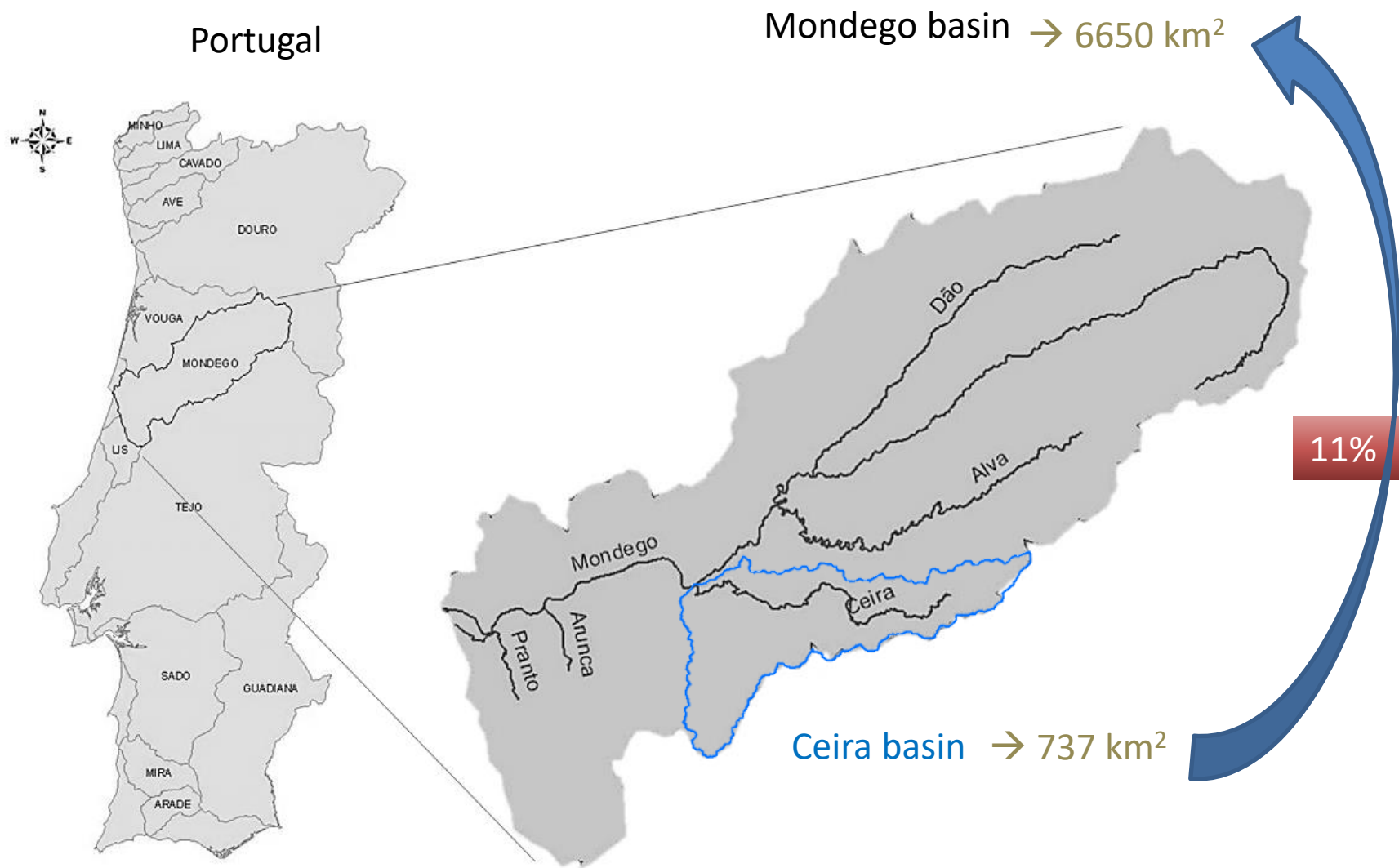


EEA Financial Mechanism 2014 – 2021

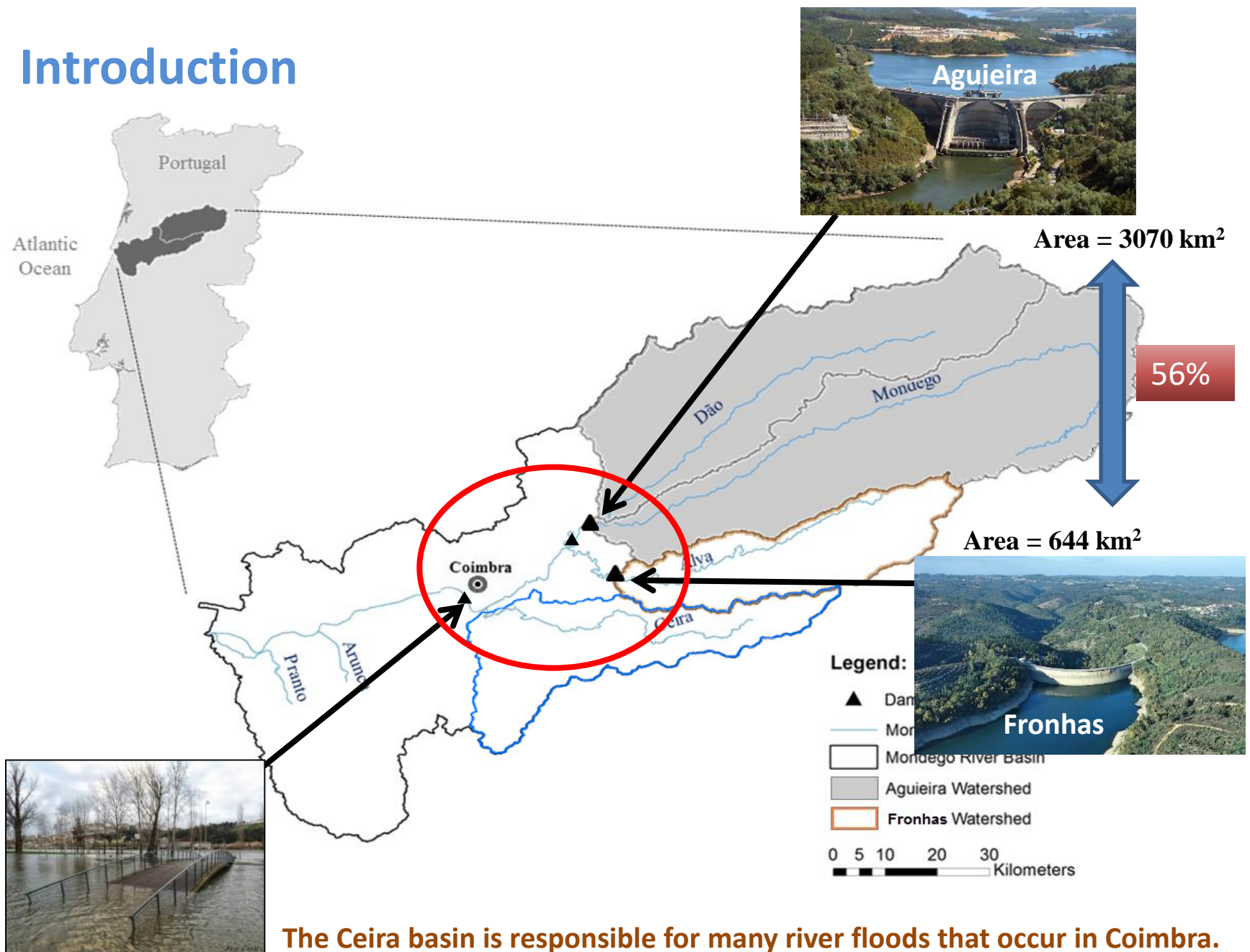
Programme title: Environment, Climate Change and Low Carbon Economy

Programme areas: Environment and Ecosystems and Climate Change Mitigation and Adaptation

Introduction



Introduction



Introduction



Previous study (FEUP):

“Flood forecasting and warning in regularized river basins. Application to the Mondego River Basin.” (Mendes, 2017 - PhD Thesis)



Reservoir management model for flood situations, using hydrological forecasts

*“A reservoirs management model is a key piece in a **forecasting and decision support system for flood control** in regularized river basins”*

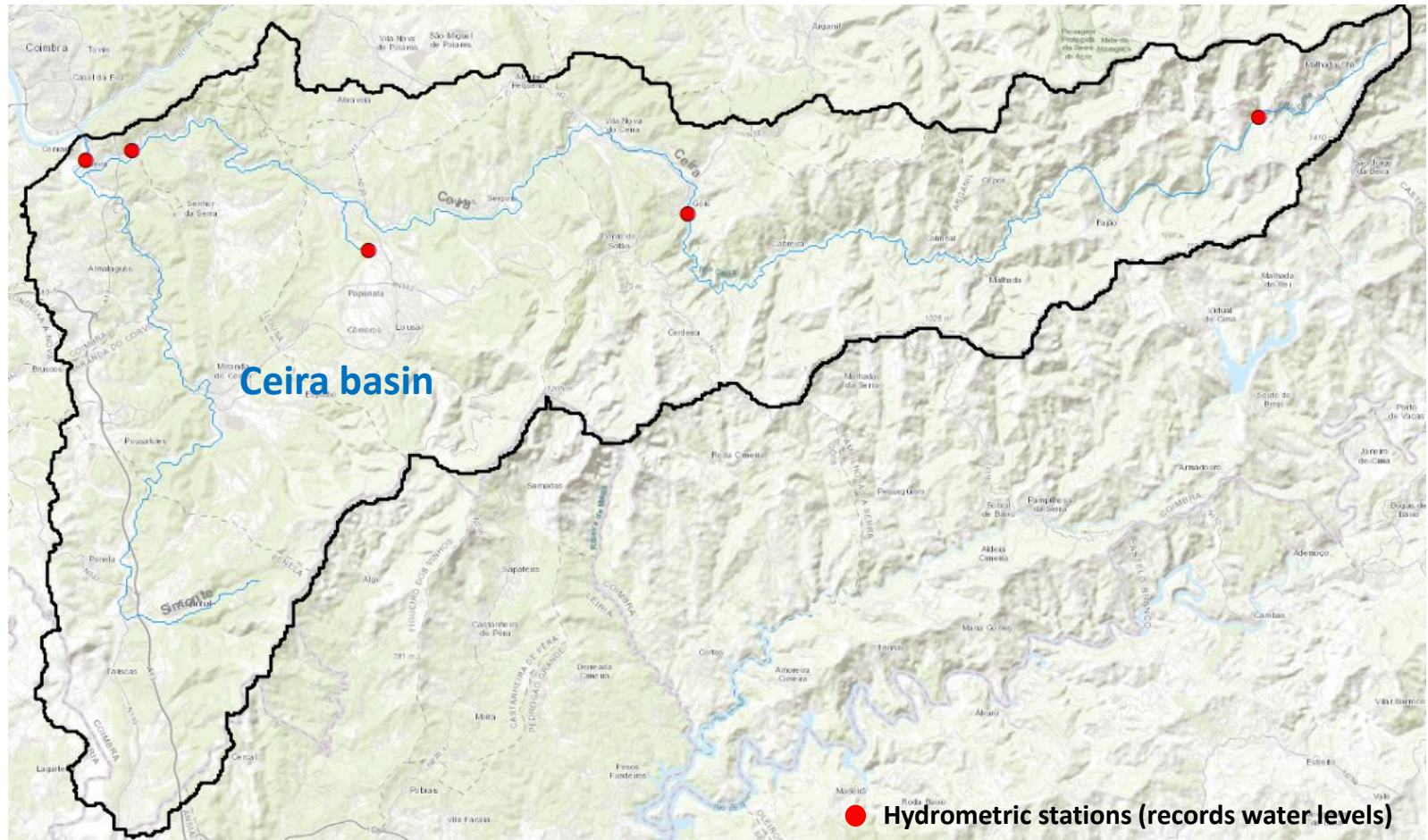


However, **the flood problems** of the Mondego river, especially in Coimbra, **are very dependent on the flows of the river Ceira**, since this river is not regularized.

An improvement in the flow forecasts of the river Ceira will allow a better use of the reservoirs management model and, therefore, a better control of the floods in Coimbra.

The Ceira basin is responsible for many river floods that occur in Coimbra.

Introduction

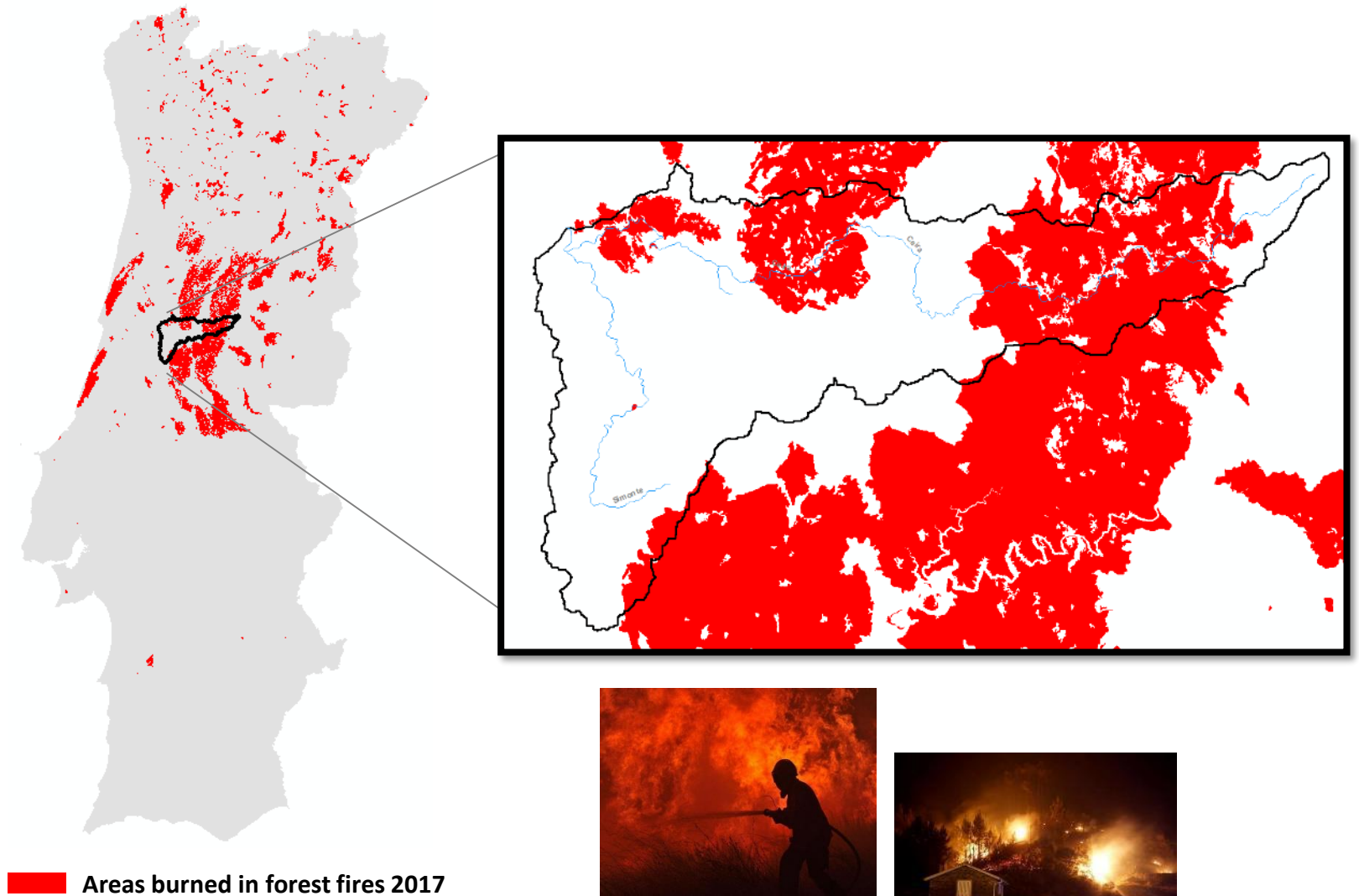


The river flow monitoring network in the Ceira river basin has several weaknesses.

Outdated flow curves

Many record failures

Introduction





Project

Title:

“Rio Ceira” – The history, the Environment and the Populations – Green Infrastructures recovery, climate change awareness and vulnerability to climate change reduced in Ceira’s River Basin.

Promoter:

Portuguese Environment Agency (APA)

Partners:

University of Porto (FEUP), Engenho e Rio Company (Erio), Lousitânia Association and the Municipalities of Arganil, Góis, Lousã and Pampilhosa da Serra

Donor project partner :

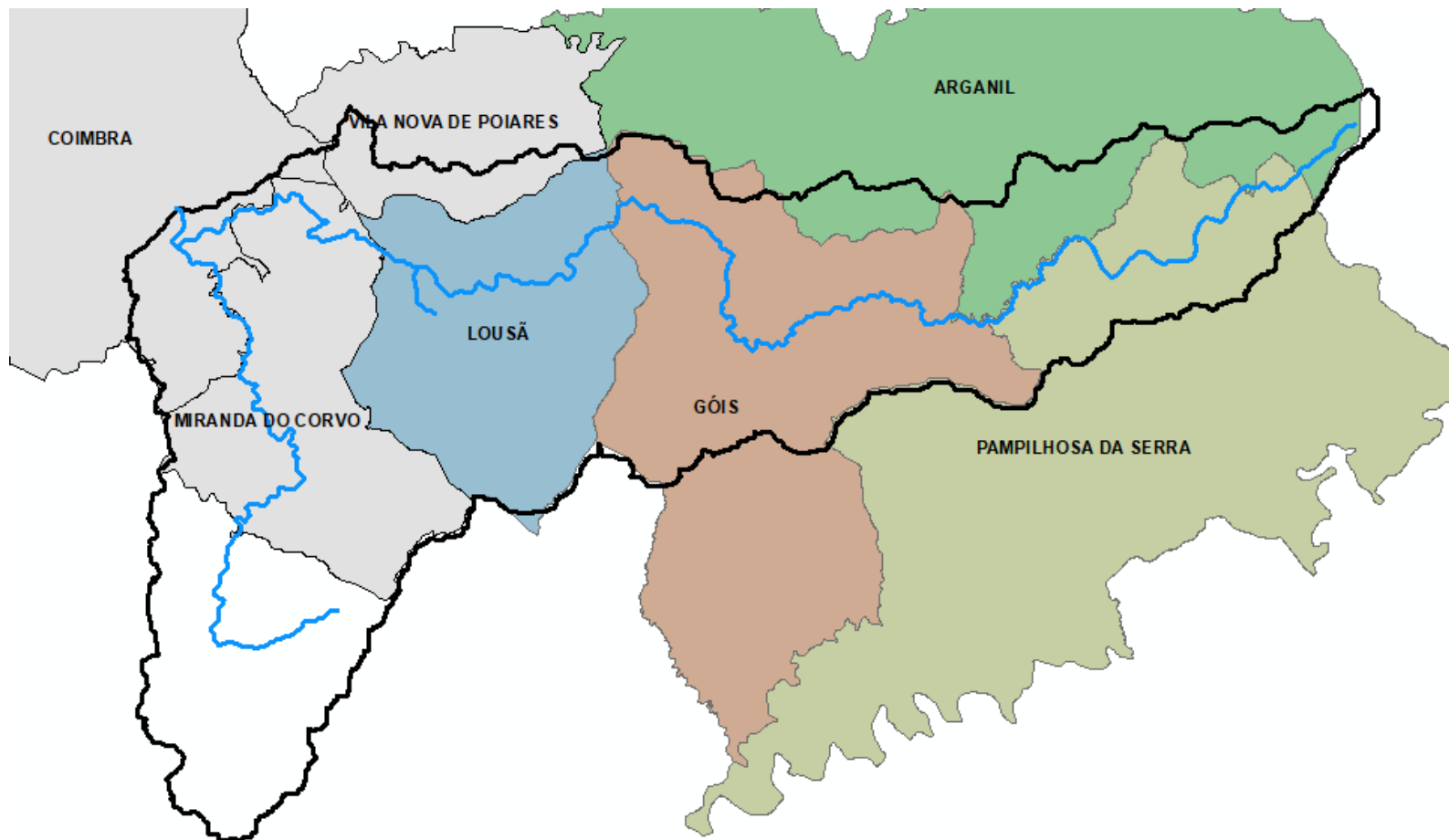
Norwegian Directorate for Civil Protection and Emergency Planning (DSB)

Project grant amount: € 1 900 000

Estimated duration: 36 months

Project

Municipalities partners





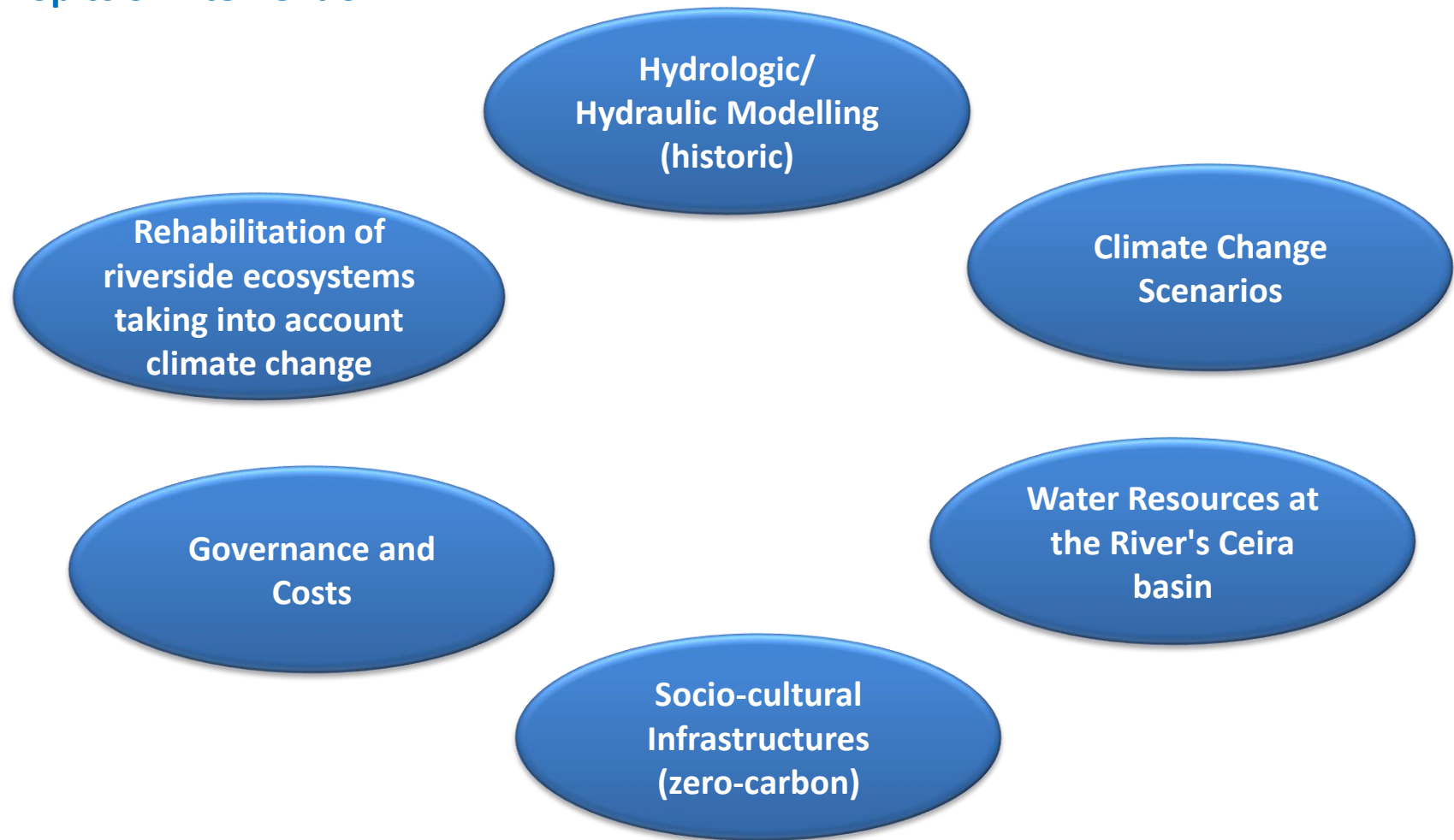
Project

Main components:

- The **hydrological component** aims to characterize the behaviour of the river basin, including flow regime studies and the implementation of a monitoring system in order to prevent effects of extreme events (floods and droughts). To achieve this it is proposed to create a flow monitoring program;
- The **ecosystem component** intends to enhance the role of green infrastructures in adaptation to climate changes. It is designed to rehabilitate ecosystem services building resilience. The rehabilitation and defence of river basin is the principle of climate change adaptation in this Project;
- The **cultural component** is a key driver to raise climate change awareness. The approach for the involvement of local population is built on the preservation of some historical elements. A focus on the recovery of traditional good practices, with relevance for the potential of River Guards, is a visible aspect for a new governance model based in proximity.

Project

Topics of Intervention:



Project

Topics of Intervention / Activities:

Hydrologic/
Hydraulic Modelling
(historic)

Rehabilitation of
riverside ecosystems
taking into account
climate change

Climate Change
Scenarios

Governance and
Costs

Water Resources at
the River's Ceira
basin

Socio-cultural
Infrastructures
(zero-carbon)

Project

Topics of Intervention / Activities:

Hydrologic/ **Hydraulic** Modelling
(historic)

Activities	Executor / Partners
Hydrometeorological and physiographical data collection and processing	APA / FEUP
Hydrological modelling + Hydraulic modelling	FEUP
Outcome analysis / Model(s) calibration	APA / FEUP
Estimation of flood flows based on historic data	FEUP



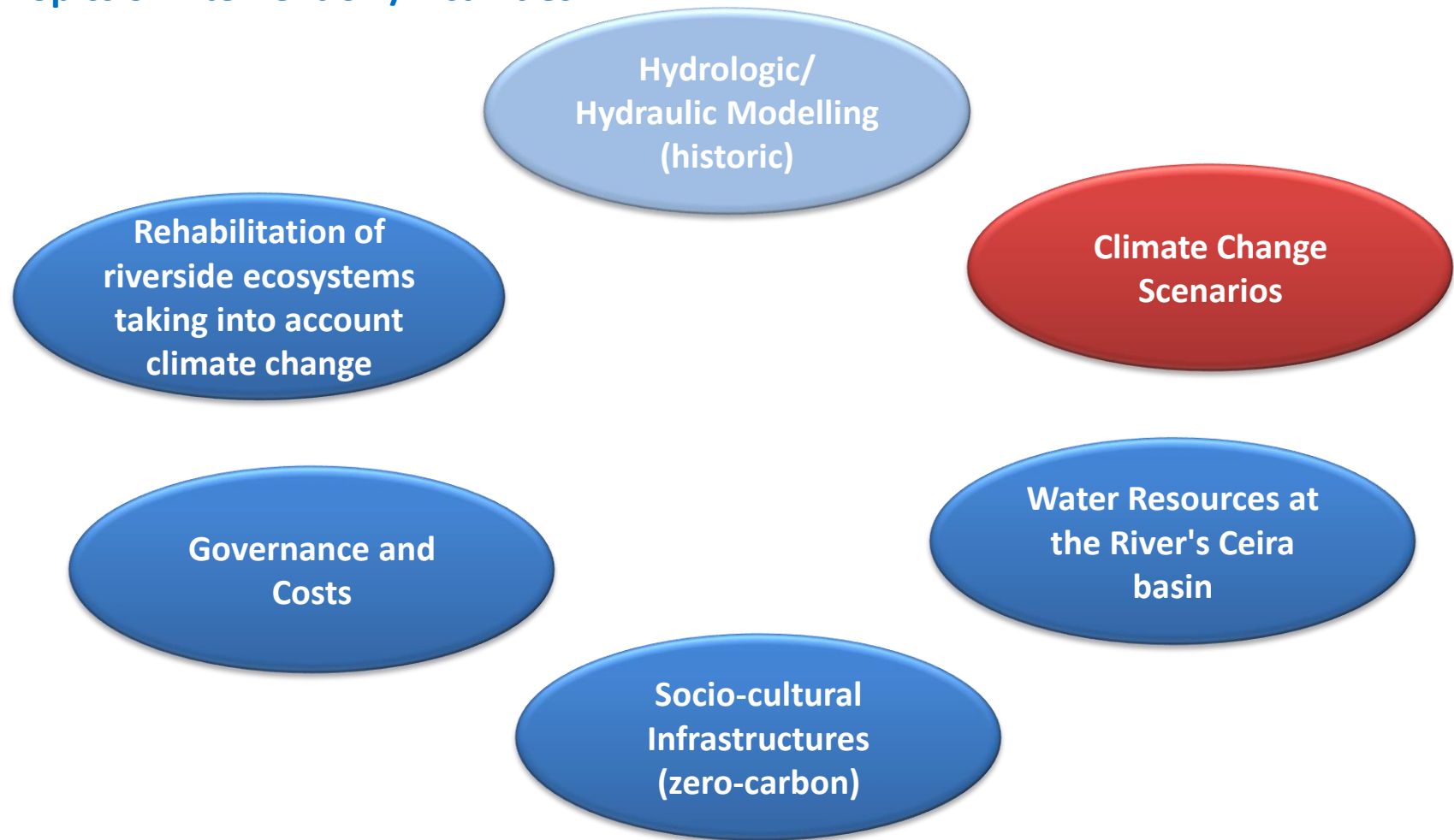
Flood mapping



Flood forecasting system

Project

Topics of Intervention / Activities:



Project

Topics of Intervention / Activities:

Climate Change Scenarios

Activities	Executor / Partners
Climatic projections data collection	APA / FEUP
Regionalisation of data (downscaling)	FEUP
Analysis of climate scenarios (precipitation and temperature)	APA / FEUP
Generation of future flow time series taking into account different climate scenarios	FEUP



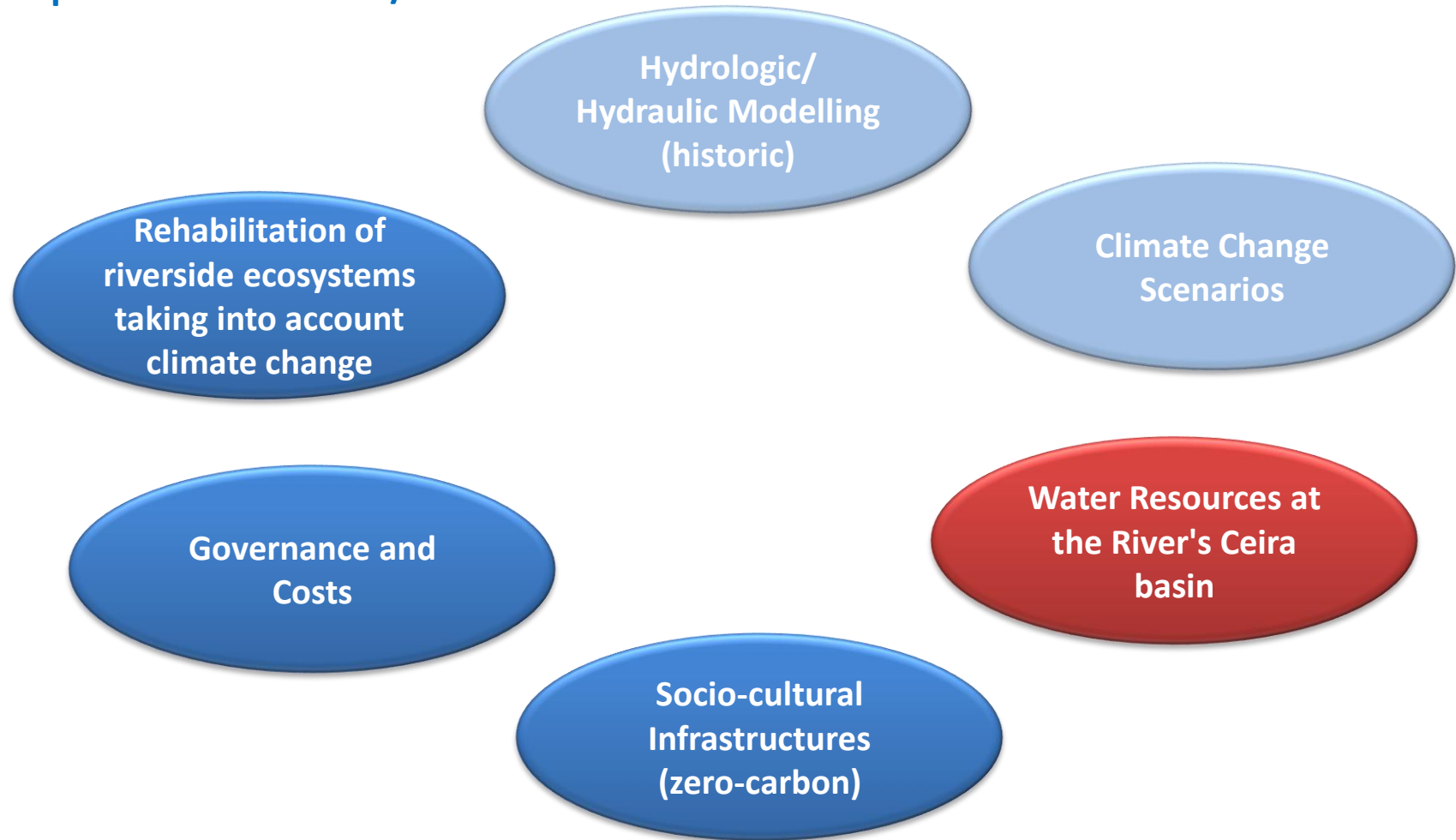
Assessment of CC
impacts on flood
situations

Assessment of CC
on drought and
scarcity periods

Assessment of the
impact of climate
change on ecosystems

Project

Topics of Intervention / Activities:



Project

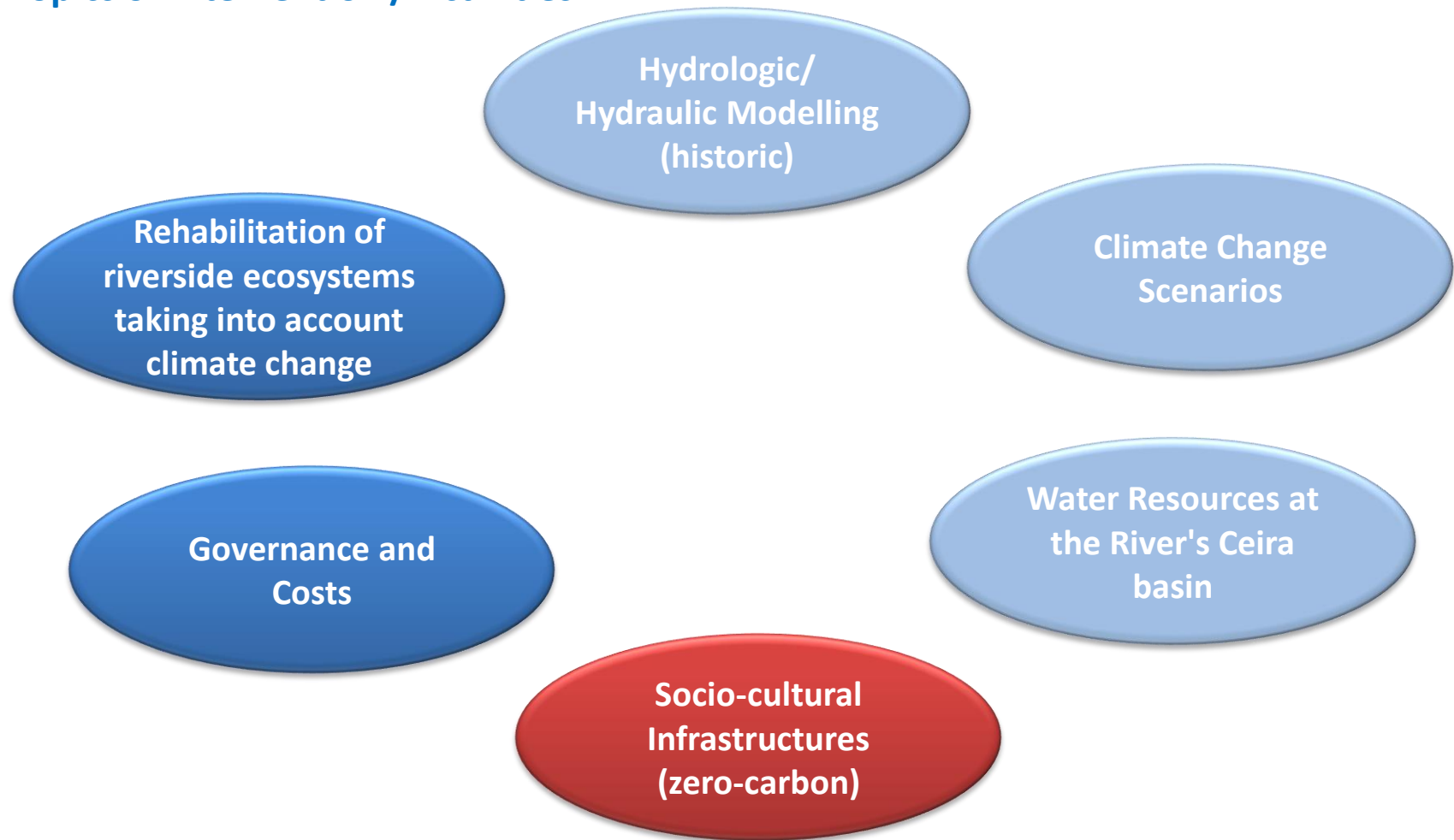
Topics of Intervention / Activities:

Water Resources at the
River's Ceira basin

Activities	Executor / Partners
Installation of hydrological monitoring stations	APA / FEUP
Hydrological Monitoring (flows and water levels)	APA
Assessment of established/reserved flows and ecological flow regimes	APA / FEUP
Fluvial rehabilitation projects	FEUP
Implementation of fluvial rehabilitation projects	Municipalities

Project

Topics of Intervention / Activities:



Project

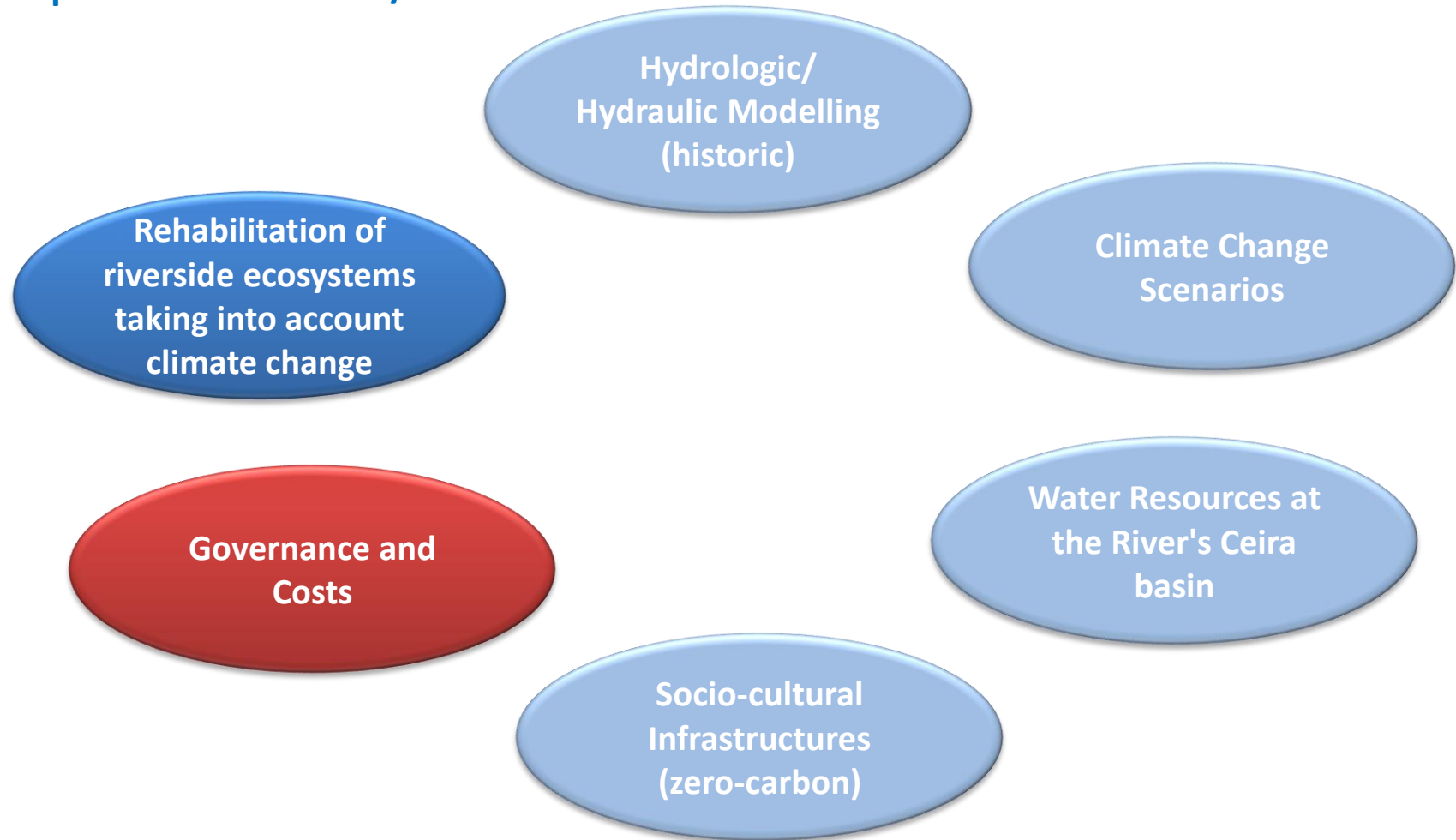
Topics of Intervention / Activities:

**Socio-cultural Infrastructures
(zero-carbon)**

Activities	Executor / Partners
Data collection	Lousitânea/ Municipalities
Preliminary study of actions	Lousitânea/ Municipalities
Infrastructures rehabilitation projects	Lousitânea/ Municipalities
Implementation of infrastructures rehabilitation projects	Lousitânea/ Municipalities

Project

Topics of Intervention / Activities:



Project

Topics of Intervention / Activities:

Governance and Costs

Activities	Executor / Partners
Data collection	APA/ Municipalities/ FEUP/ Erio
Nature surveillance	Municipalities
Fostering Climate Change Adaptation at the River basin and Municipal Levels	FEUP
Actions of public participation	Municipalities/ Erio
Follow-up of project indicators	Municipalities/ FEUP
Economic and financial assessment of the project	Municipalities/ FEUP
Monitoring data collection	River Guards
Development of monitoring activities of fluvial interventions	River Guards
Implementation of public awareness actions addressed to water resources users	River Guards
Development and implementation of action protocols to deal with disaster situations	River Guards
Contribution to best practices on fluvial rehabilitation implementation	River Guards
Implementation of products and services promoting actions which enhance the fluvial corridor valorisation	APA/ River Guards/ Erio/ FEUP
Implementation of river basin management actions which enhance climate change proof of the fluvial corridor	APA

Project

Topics of Intervention / Activities:

Rehabilitation of
riverside ecosystems
taking into account
climate change

Hydrologic/
Hydraulic Modelling
(historic)

Climate Change
Scenarios

Governance and
Costs

Water Resources at
the River's Ceira
basin

Socio-cultural
Infrastructures
(zero-carbon)

Project

Rehabilitation of riverside ecosystems taking into account climate change

Topics of Intervention / Activities:

Activities	Executor / Partners
Requalification of the riparian gallery	APA/ Erio/ Municipalities
Containment of invasive alien species	APA/ Erio/ Municipalities
Improvement of habitats heterogeneity and of ecological corridor	APA/ Erio
Increase the resilience of indigenous flora and fauna countering with the effects of climate change	APA/ Erio
Improvement of fluvial connectivity (whether transverse or longitudinal)	APA/ Erio
Promotion of public participation processes at riverside environment	All
Requalification of the riparian gallery	APA/ Erio/ Municipalities
Containment of invasive alien species	APA/ Erio/ Municipalities
Improvement of habitats heterogeneity and of ecological corridor	APA/ Erio
Increase the resilience of indigenous flora and fauna countering with the effects of climate change	APA/ Erio
Improvement of fluvial connectivity (whether transverse or longitudinal)	APA/ Erio
Promotion of public participation processes at riverside environment	All
Requalification of the riparian gallery	APA/ Erio/ Municipalities

Thank you!

Partners:

