ENI CBCMED
Cooperating across borders in the Mediterranean

Project funded by the EUROPEAN UNION

REGIONE AUTÒNOMA DE SARDIGNA
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MED4EBM

Mediterranean Forum For Applied Ecosystem-Based Management

Results and Achievements in the Gulf of Corigliano

Matteo Onori – GIS & DB Expert
Amici della Terra

PROGES PROGETTI DI SVILUPPO

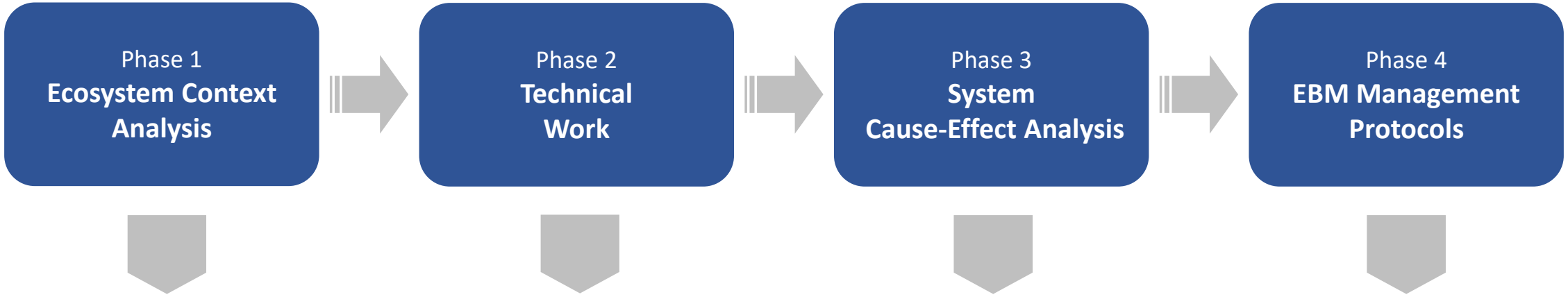
AMICI della TERRA

THE ROYAL MARINE CONSERVATION SOCIETY OF JORDAN
JREDS

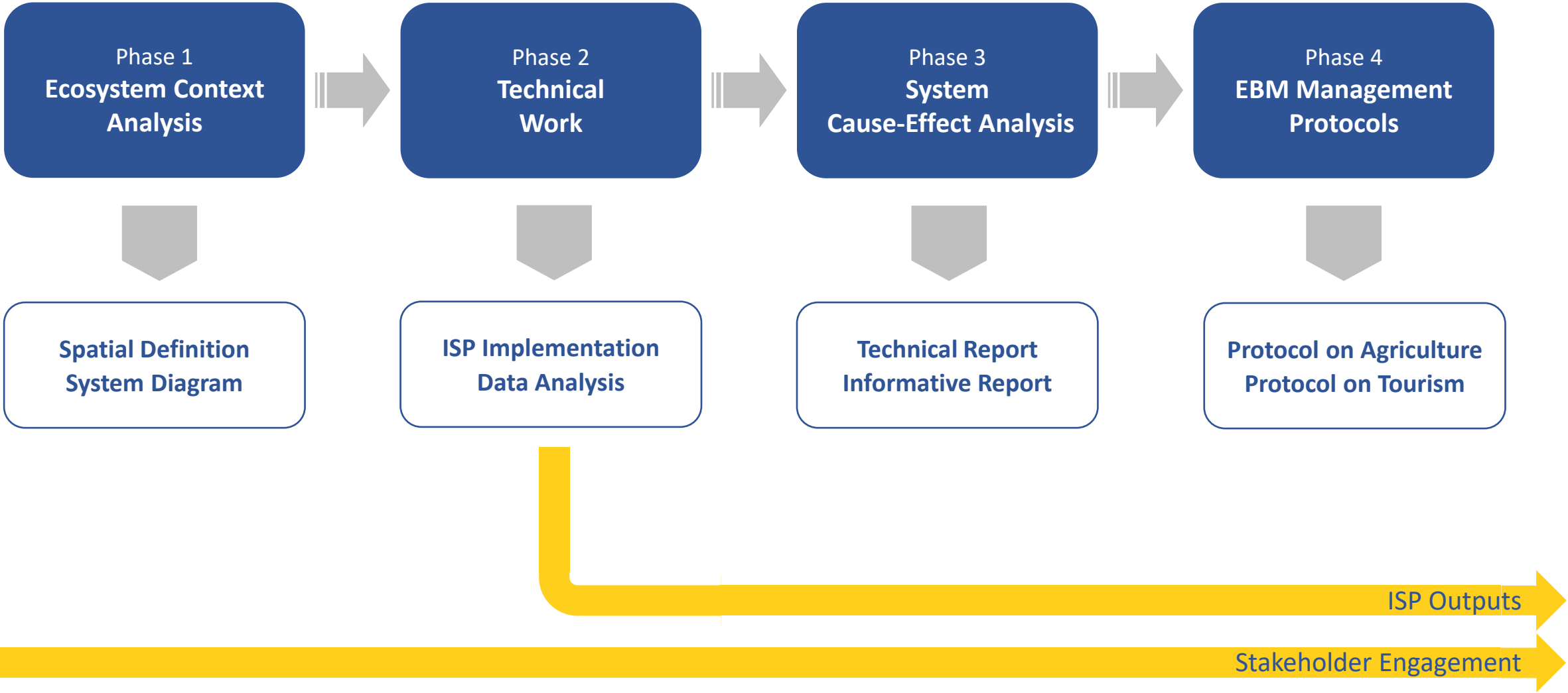
TYRE COAST NATURE RESERVE

INSTM

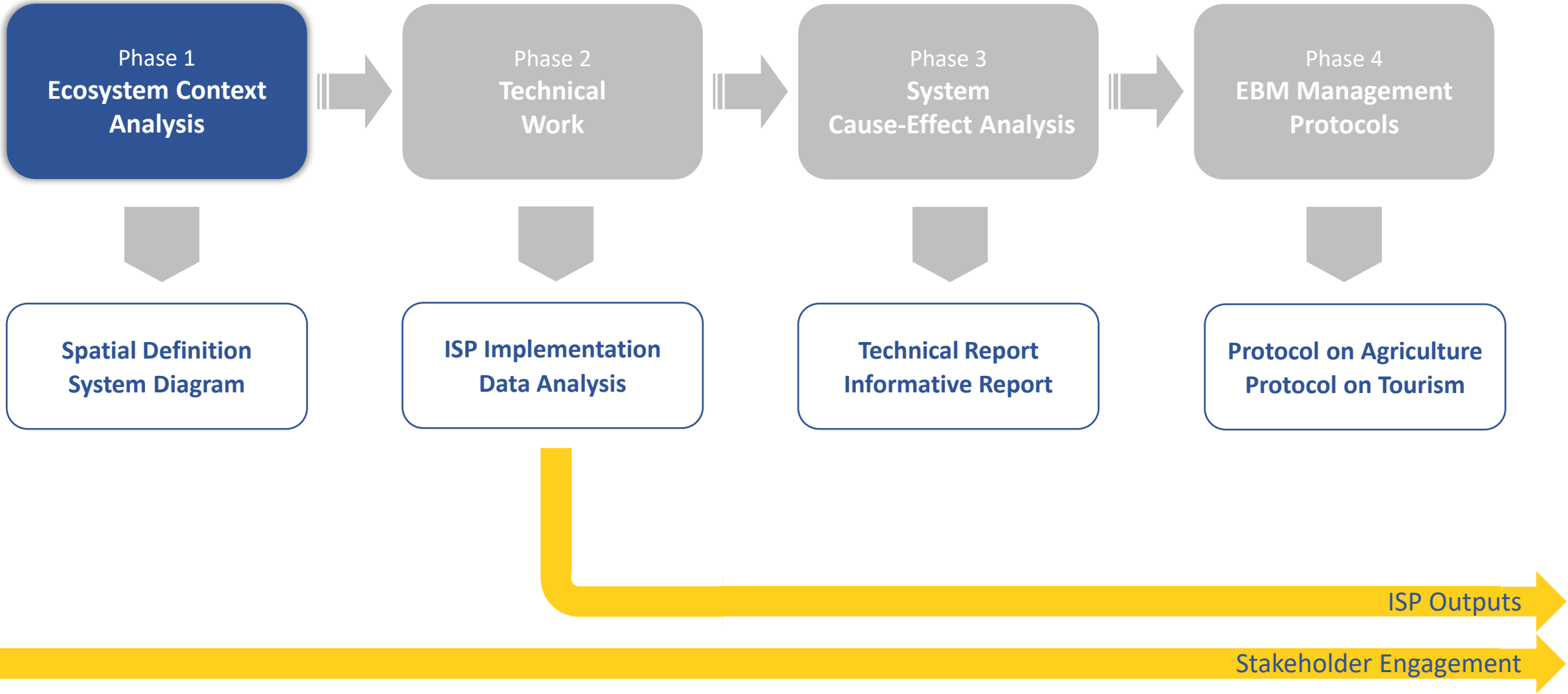
EBM Implementation Phases



EBM Implementation Phases



EBM Implementation Phases



Ecosystem Context Analysis

1) Spatial Definition: in which target area the EBM approach should be applied?

Tarsia Lake
4,34 km^2

Mouth of
Crati River
2,08 km^2

- They are situated in Calabria, in the province of Cosenza (biggest and most populated in the Region).
- Nature Reserves established in 1990 and managed by Amici della Terra.
- Special Areas of Conservation (SAC) in Natura 2000 framework according to Habitats Directive 92/43/CEE.

Ecosystem Context Analysis

1) Spatial Definition: is it enough to apply the EBM methodology within these two protected Areas?

Management is possible and already in place

- These areas are already **managed** by the Park Authority and are highly **regulated** ("Piano di Assetto Naturalistico" and Natura 2000 framework).
- In these areas ecosystem pressures coming from the inside are minimal, with almost absent anthropogenic presence.

For EBM, considering <u>just</u> these areas is not enough

- These areas are not isolated, but they are open to **external influences**. Indeed, both Nature Reserves are experiencing pressure from outside.
- In EBM, all the elements that determine the ecosystem status of an area need to be taken into consideration **as a whole set of interconnected components**.

It is not possible to apply EBM without considering what is outside the Reserves.

Ecosystem Context Analysis

1) Spatial Definition: in which target area the EBM approach should be applied?

Nature Reserves

6,4 km^2

Extended Area

890,4 km^2

- The extended area is 150 times bigger than the Nature Reserves combined.
- The new area includes 10 municipalities and 120.000 inhabitants.
- The largest and most populated are Corigliano-Rossano and Cassano all'Ionio, that collaborated effectively to implement EBM in the target area.

Ecosystem Context Analysis

1) Spatial Definition: Why this specific area was chosen?

A. Geomorphology

- The area mostly corresponds to the Sibari Plain, the largest plain in Calabria.
- It is an alluvial plain formed from the sediments of the rivers, mostly of Crati River (the longest in Calabria) and its tributaries.
- This geomorphological uniqueness makes it ideal for the description of its environmental components.

Ecosystem Context Analysis

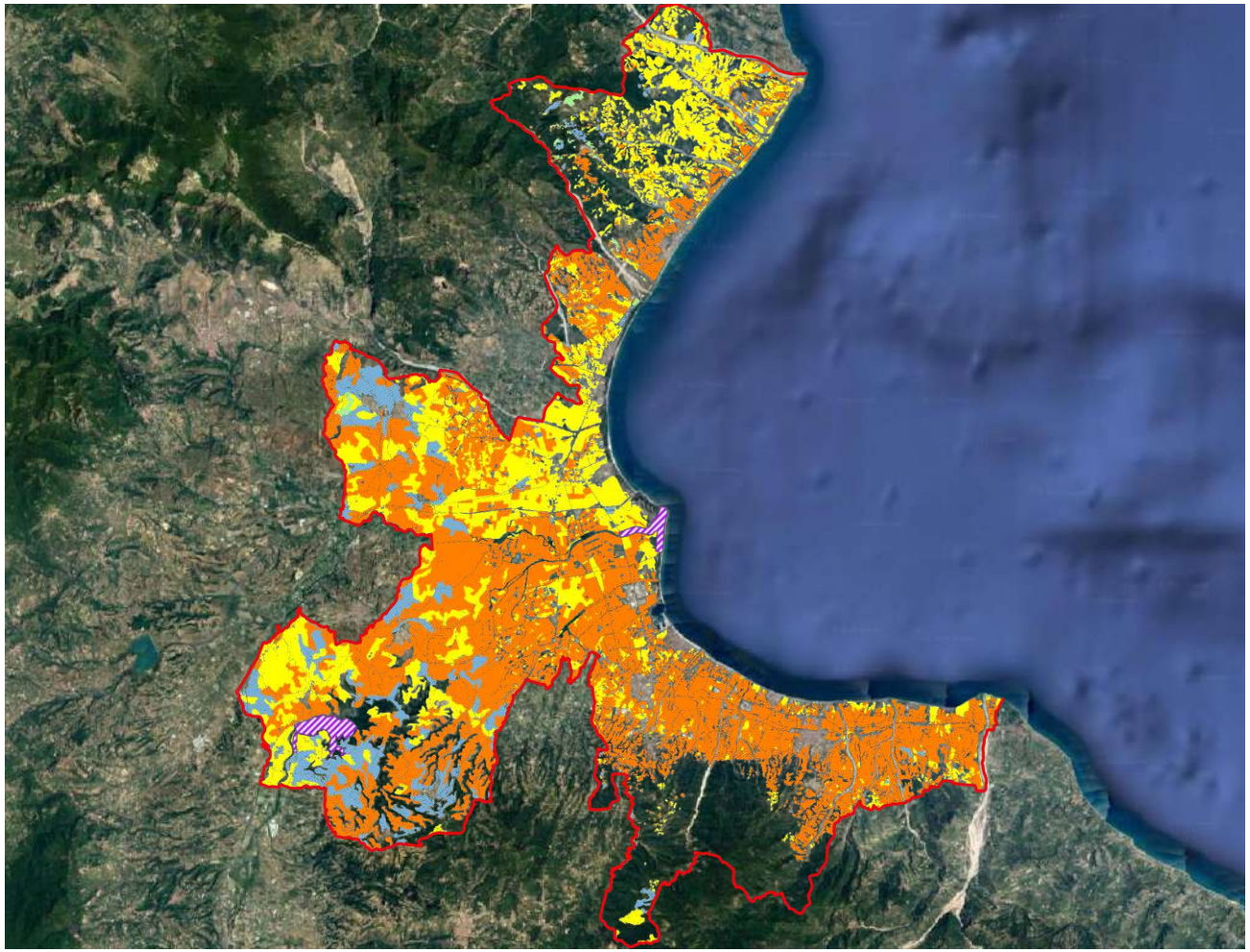
1) Spatial Definition: Why this specific area was chosen?

B. Functionality: Agriculture

- It hosts a widespread agricultural activity, also thanks to the abundance of water.

- 65% of the area is used as Agricultural Land:
  - 58% Utilized Agricultural Area (UAA)
  - 7% Other Agricultural Area

- Most of the UAA is composed of citrus groves and olive groves, among the most profitable activities in the area.



Ecosystem Context Analysis

1) Spatial Definition: Why this specific area was chosen?

C. Functionality: Tourism

- It is a very important economic sector, concentrated spatially (along the coast) and temporally (during the summer season).
- 27,000 hotel beds clustered along the coastline, without considering the phenomenon of second houses.
- Agriculture and Tourism are the human activities that generate the greatest pressure on the Reserves.

Ecosystem Context Analysis

Expanding the implementation of EBM to a larger area introduced increased complexity and various challenges:

Ecosystem Complexity

- The description of the ecosystem is not limited to the **environmental components**, but also takes into account the **socio-economic components**.
- There are many more components and many **more connections** linking them, resulting in a more complex ecosystem.

Data Gathering

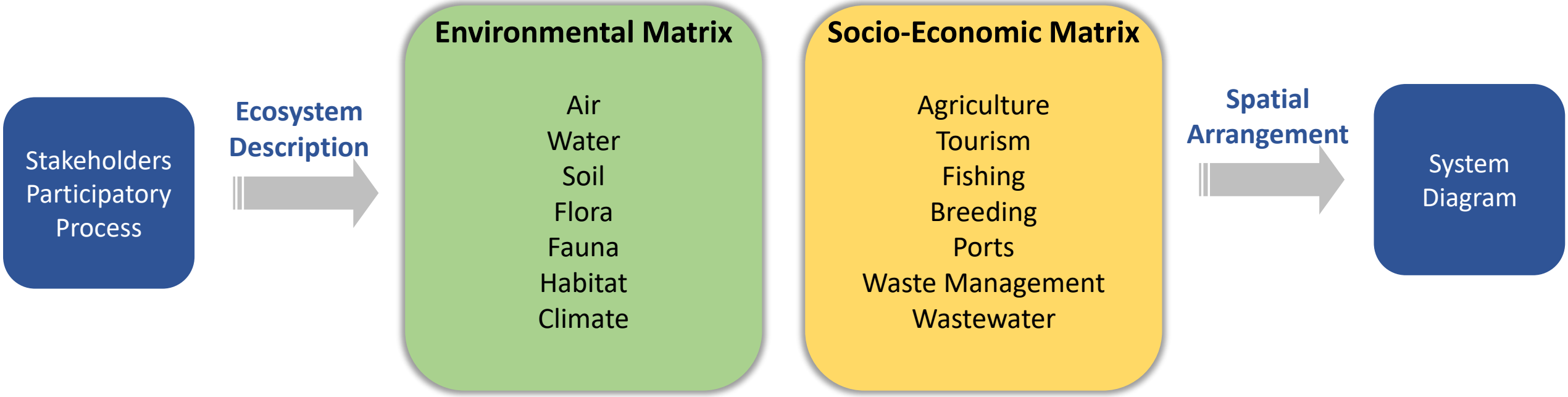
- **More data are needed** to describe the many components and their connections, increasing the difficulty of data gathering process.
- This poses a problem on **data management**, especially in creating a system that is sustainable and updatable in the future.

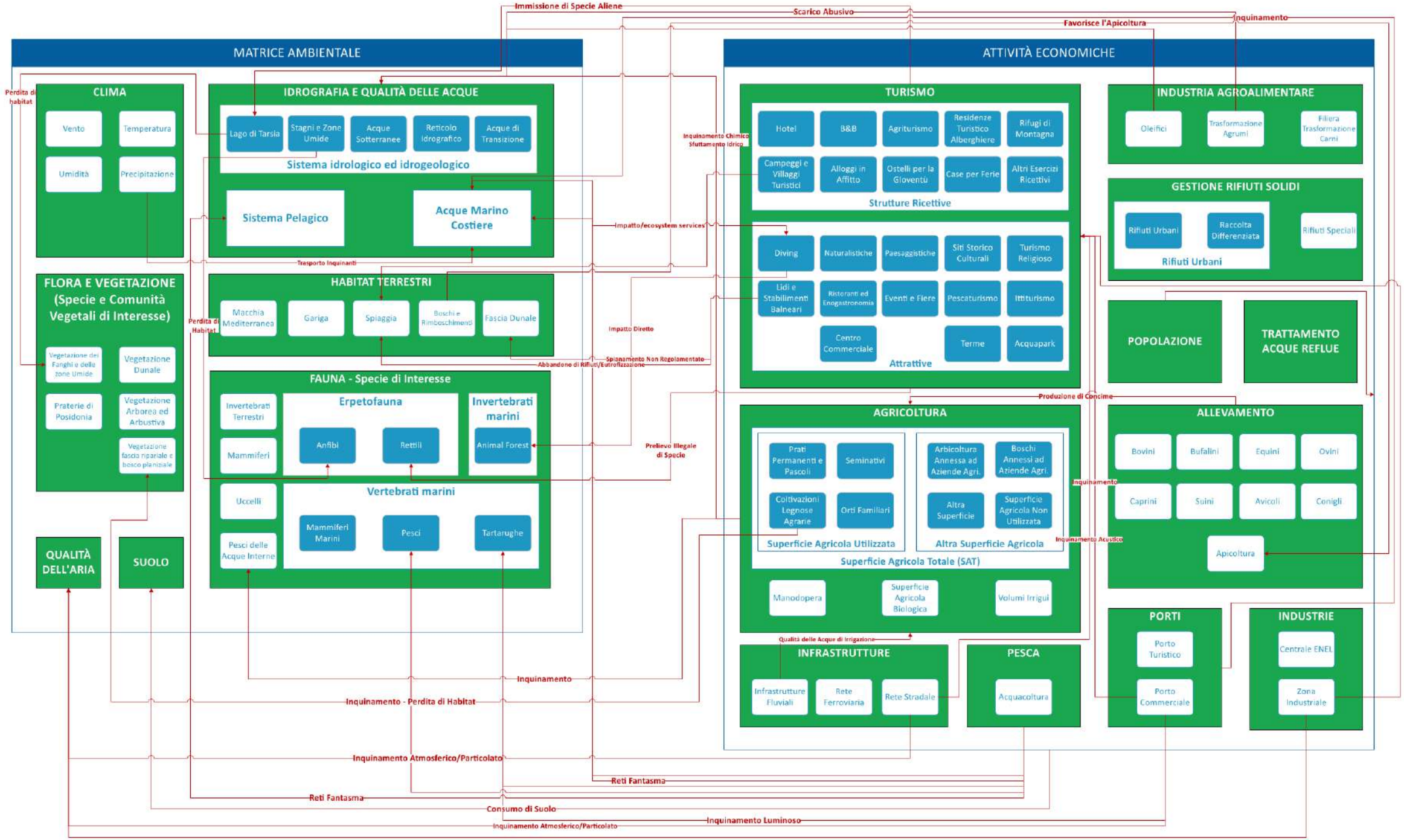
Stakeholder Engagement

- By applying EBM just in the Nature Reserves, there is only one main stakeholder to interface with: the Park Authority.
- With an extended area, there are many **more stakeholders** of different types (regional Institutes and Agencies, Municipalities, associations, local communities…)

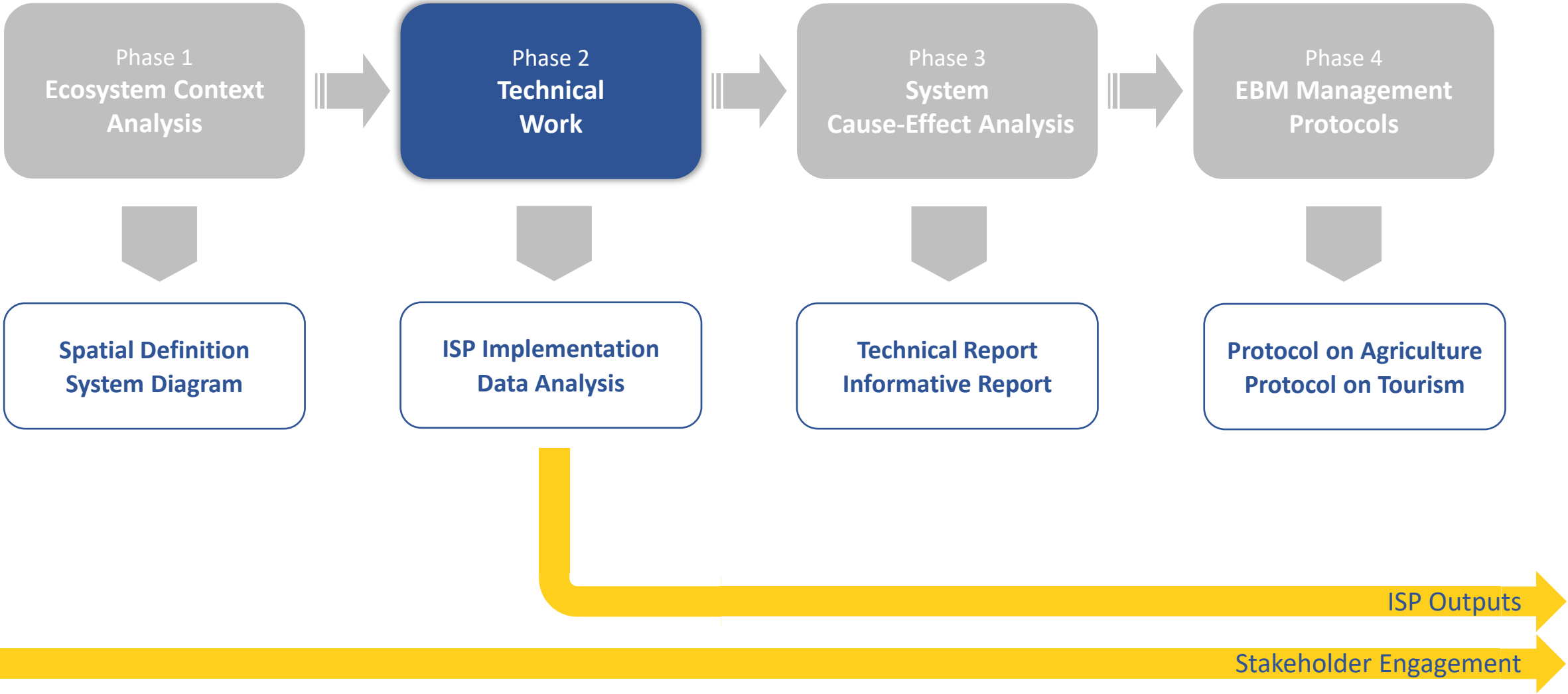
Ecosystem Context Analysis

2) System Diagram: Identification of the Ecosystem Components

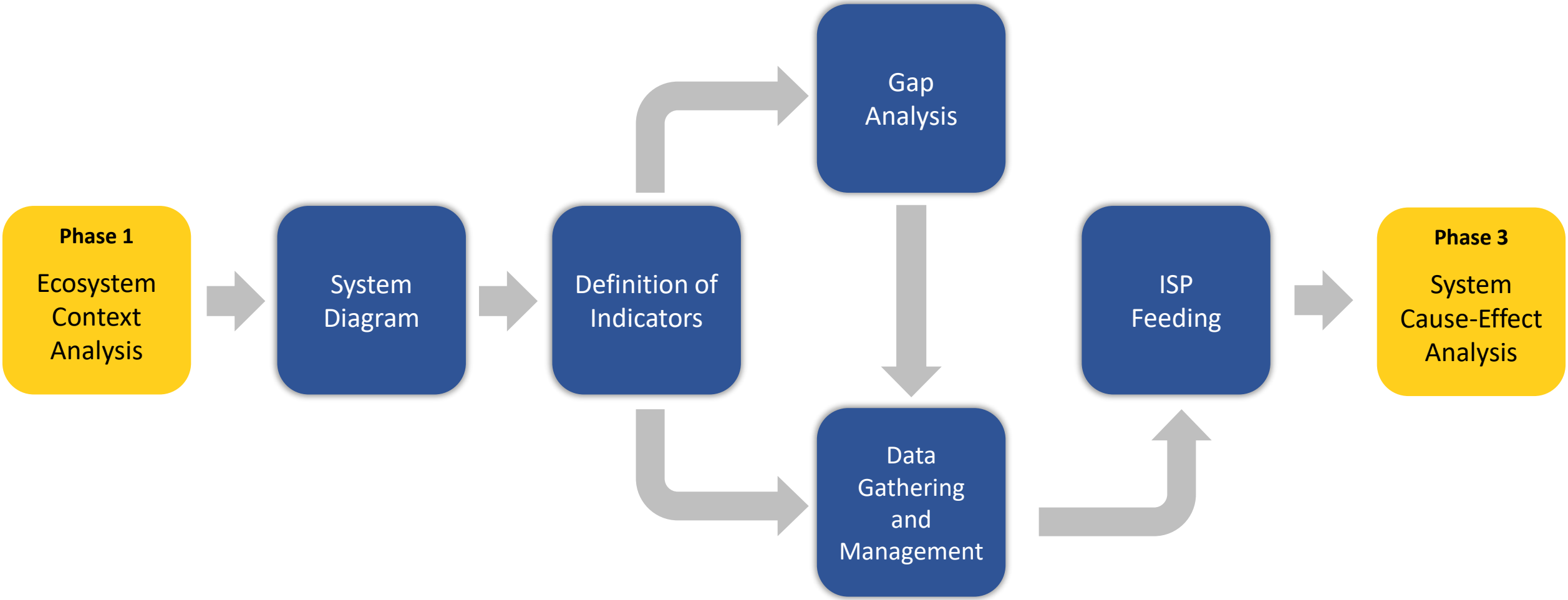



Immissione di Specie Aliene
Scarico Abusivo
Favorisce l'Apicoltura
Inquinamento
MATRICE AMBIENTALE
ATTIVITÀ ECONOMICHE
Perdita di habitat
CLIMA
Vento
Temperatura
Umidità
Precipitazione
IDROGRAFIA E QUALITÀ DELLE ACQUE
Lago di Tarsia
Stagni e Zone Umide
Acque Sotterranee
Reticolo Idrografico
Acque di Transizione
Sistema idrologico ed idrogeologico
Sistema Pelagico
Acque Marino Costiere
Inquinamento Chimico
Sfruttamento Idrico
Impatto/ecosystem services
Trasporto Inquinanti
TURISMO
Hotel
B&B
Agriturismo
Residenze Turistico Alberghiere
Rifugi di Montagna
Campeggi e Villaggi Turistici
Alloggi in Affitto
Ostelli per la Gioventù
Case per Ferie
Altri Esercizi Ricettivi
Strutture Ricettive
Diving
Naturalistiche
Paesaggistiche
Siti Storico Culturali
Turismo Religioso
Lidi e Stabilimenti Balneari
Ristoranti ed Enogastronomia
Eventi e Fiere
Pescaturismo
Ittiturismo
Centro Commerciale
Terme
Acquapark
Attrattive
INDUSTRIA AGROALIMENTARE
Oleifici
Trasformazione Agrumi
Filiera Trasformazione Carni
GESTIONE RIFIUTI SOLIDI
Rifiuti Urbani
Raccolta Differenziata
Rifiuti Speciali
Rifiuti Urbani
POPOLAZIONE
TRATTAMENTO ACQUE REFLUE
FLORA E VEGETAZIONE (Specie e Comunità Vegetali di Interesse)
Vegetazione dei Fanghi e delle zone Umide
Vegetazione Dunale
Praterie di Posidonia
Vegetazione Arborea ed Arbustiva
Vegetazione fascia ripariale e bosco planiziale
Perdita di Habitat
HABITAT TERRESTRI
Macchia Mediterranea
Garriga
Spiaggia
Boschi e Rimboschimenti
Fascia Dunale
Impatto Diretto
Spianamento Non Regolamentato
Abbandono di Rifiuti/Eutrofizzazione
FAUNA - Specie di Interesse
Invertebrati Terrestri
Mammiferi
Uccelli
Pesci delle Acque Interne
Erpetofauna
Anfibi
Rettili
Invertebrati marini
Animal Forest
Vertebrati marini
Mammiferi Marini
Pesci
Tartarughe
Prelievo Illegale di Specie
Produzione di Concime
AGRICOLTURA
Prati Permanenti e Pascoli
Seminativi
Coltivazioni Legnose Agrarie
Orti Familiari
Superficie Agricola Utilizzata
Arbicoltura Annessa ad Aziende Agri.
Boschi Annessi ad Aziende Agri.
Altra Superficie
Superficie Agricola Non Utilizzata
Altra Superficie Agricola
Superficie Agricola Totale (SAT)
Manodopera
Superficie Agricola Biologica
Volumi Irrigui
Inquinamento
Inquinamento Acustico
ALLEVAMENTO
Bovini
Bufalini
Equini
Ovini
Caprini
Suini
Avicoli
Conigli
Apicoltura
QUALITÀ DELL'ARIA
SUOLO
Qualità delle Acque di Irrigazione
INFRASTRUTTURE
Infrastrutture Fluviali
Rete Ferroviaria
Rete Stradale
PESCA
Acquacoltura
PORTI
Porto Turistico
Porto Commerciale
INDUSTRIE
Centrale ENEL
Zona Industriale
Inquinamento
Inquinamento - Perdita di Habitat
Inquinamento Atmosferico/Particolato
Reti Fantasma
Reti Fantasma
Consumo di Suolo
Inquinamento Luminoso
Inquinamento Atmosferico/Particolato

EBM Implementation Phases



Technical Work



Technical Work

It is possible to speak about **technical achievements** concerning how and with what the system was implemented:

HOW

For the implementation of the system, **two objectives** have been pursued:

1
Sustainability

- A **self-sustaining platform** that gathered inputs from stakeholders and institutions (system diagram, provision of data).
- The system has **not been weighed down** with useless or out of context data that would make the ecosystem analysis more time-consuming.
- A **data repository** has been established containing metadata and procedures for interpret, modify, update all data in the future.

Technical Work

It is possible to speak about **technical achievements** concerning how and with what the system was implemented:

HOW

For the implementation of the system, **two objectives** have been pursued:

2
Efficiency

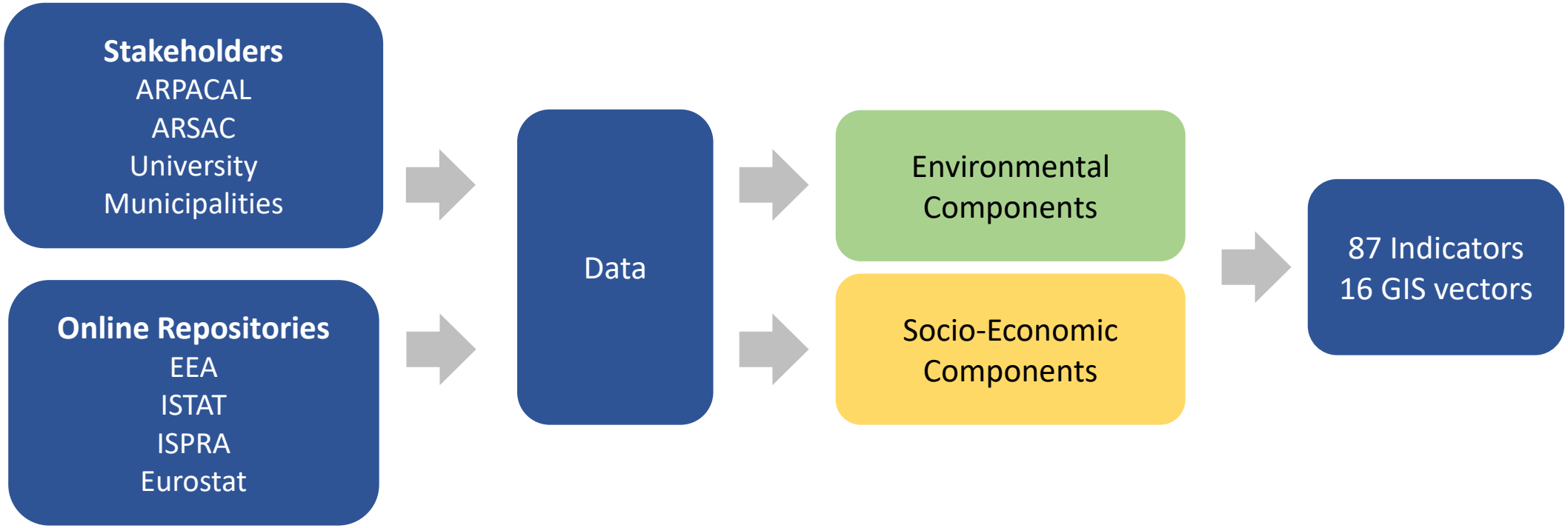
- **Nomenclature** has been arranged to match with data provided by the official institutions that are responsible for producing data.
- Priority was given to data allowing an immediate and **comprehensible assessment** of ecosystem phenomena.
- Effort was put to improve data visualization through **charts and maps** in order to facilitate the ecosystem assessment.

Technical Work

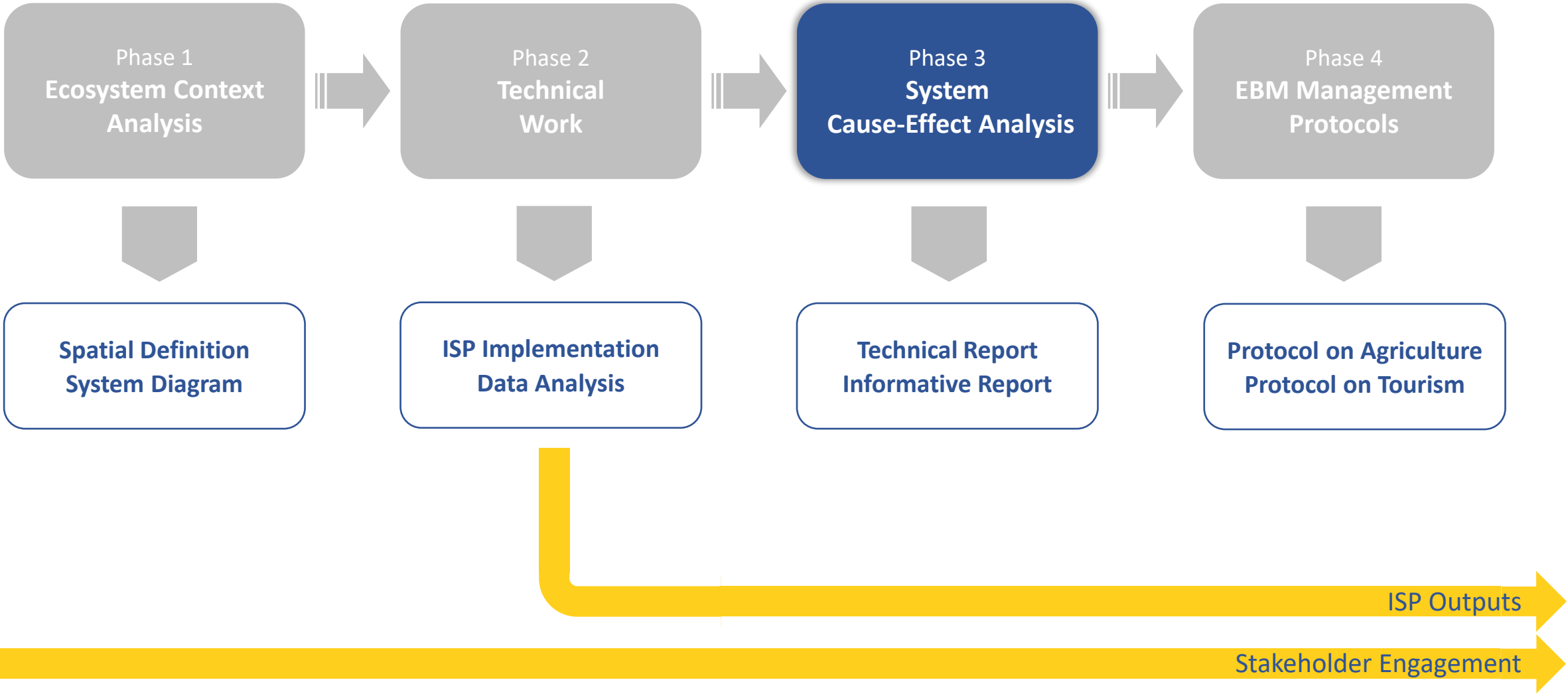
It is possible to speak about **technical achievements** concerning how and with what the system was implemented:

WHAT

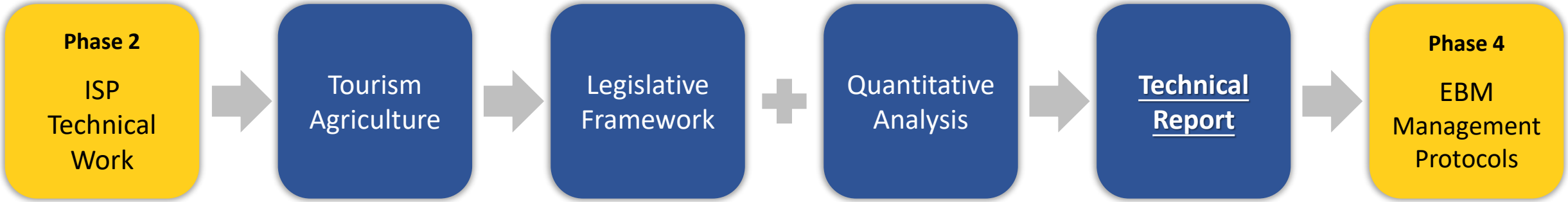
We needed data that could be linked to the Environmental and Socio-Economic components:



EBM Implementation Phases

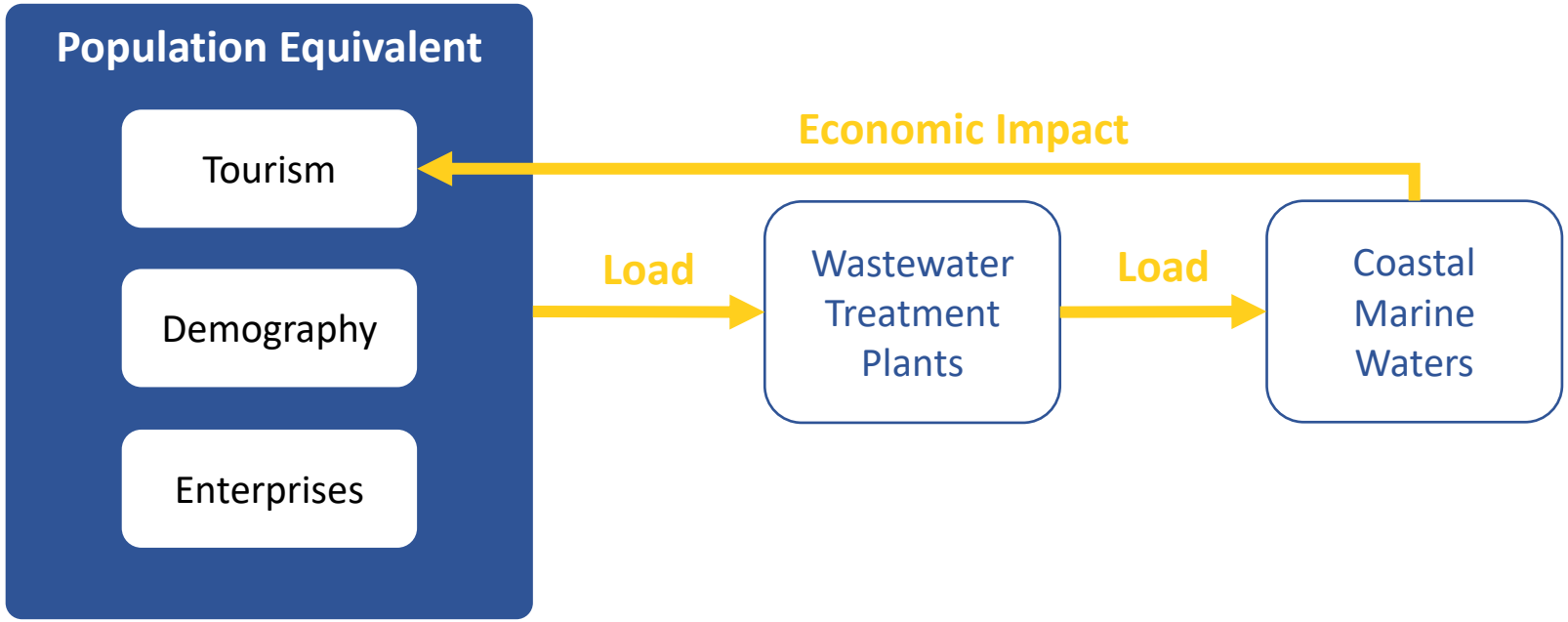


System Cause-Effect Analysis

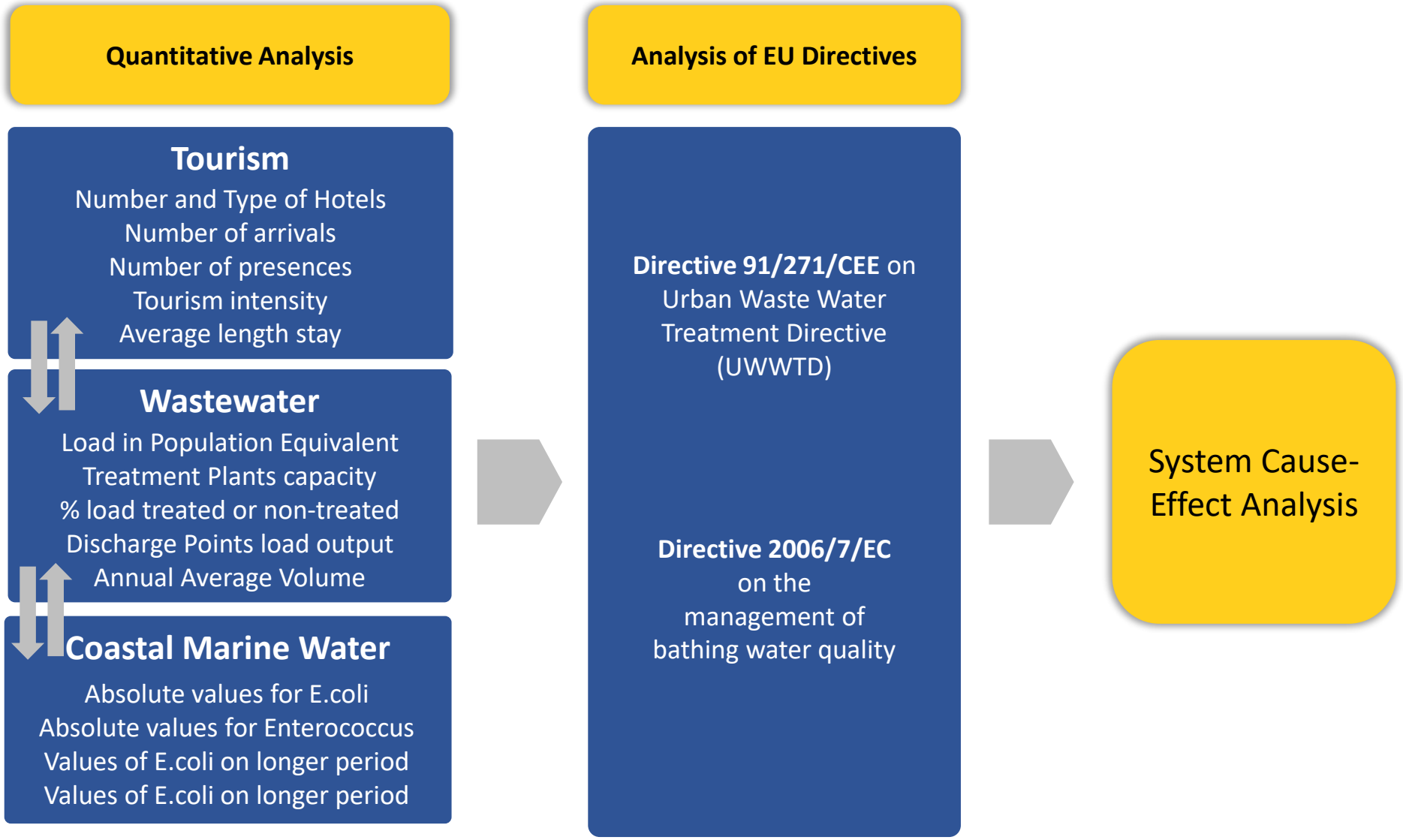


Tourism Conceptual Diagram

The first driver generating pressure is **tourism**:

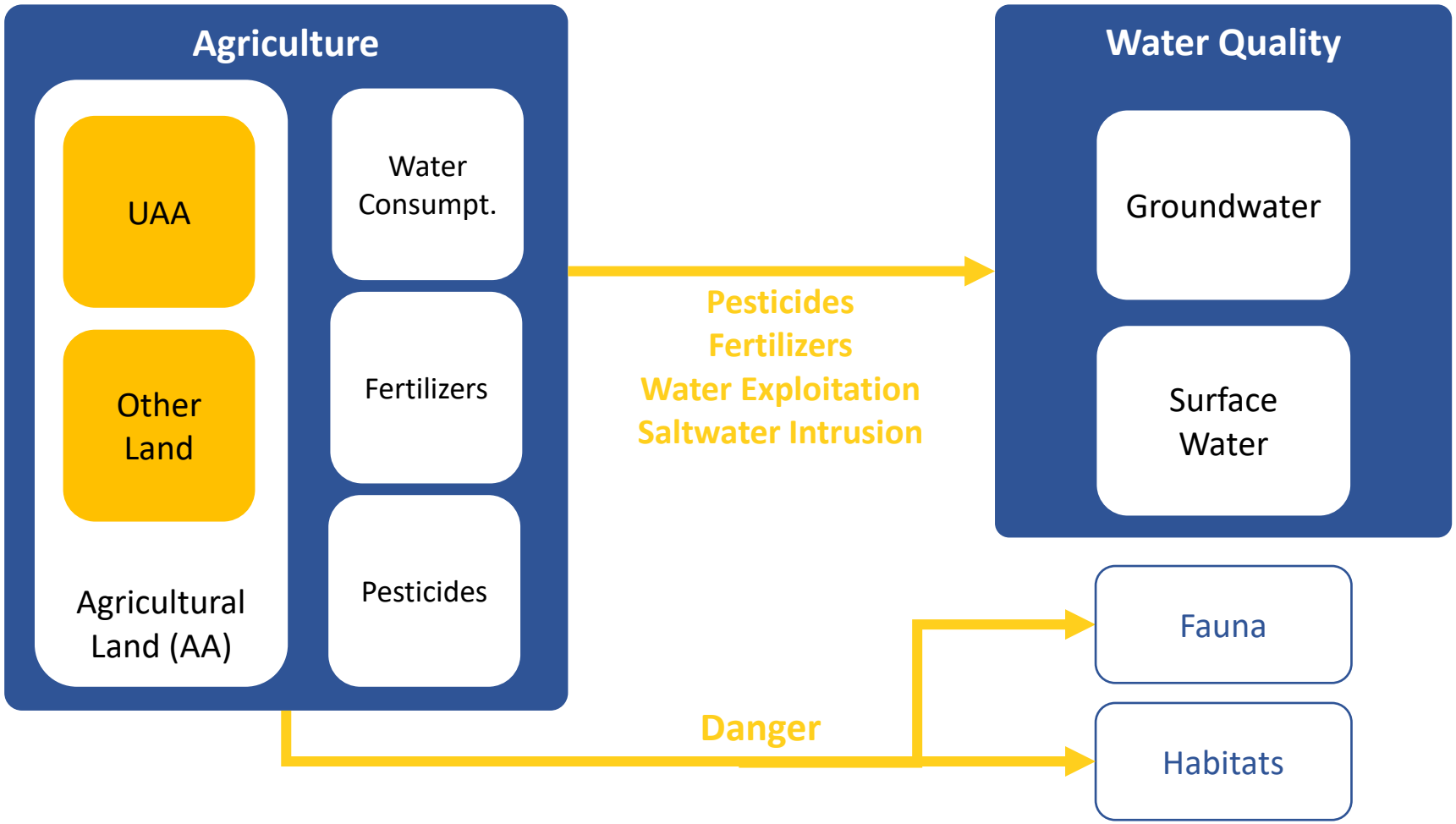


Tourism: Cause-Effect Analysis Example

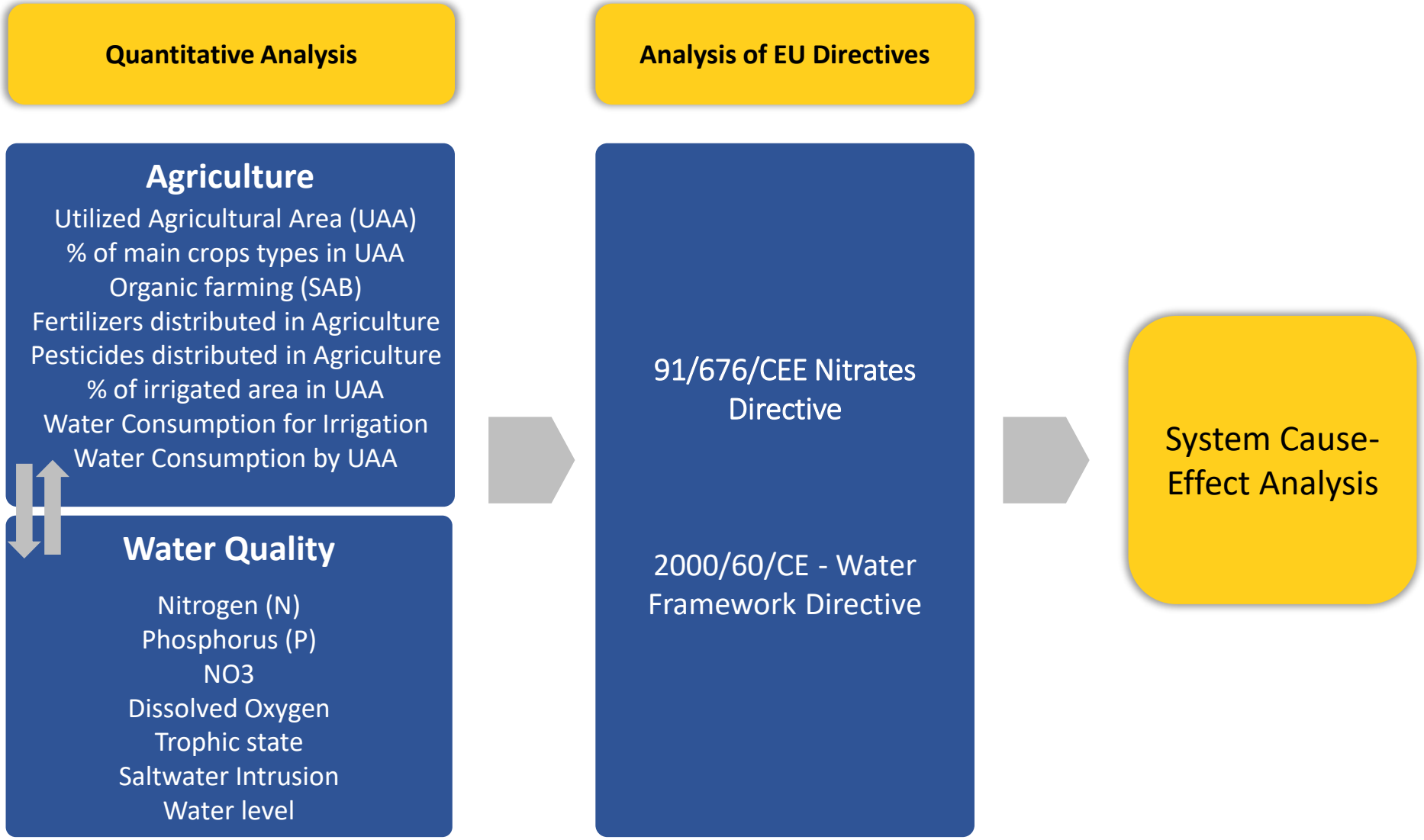


Agriculture Conceptual Diagram

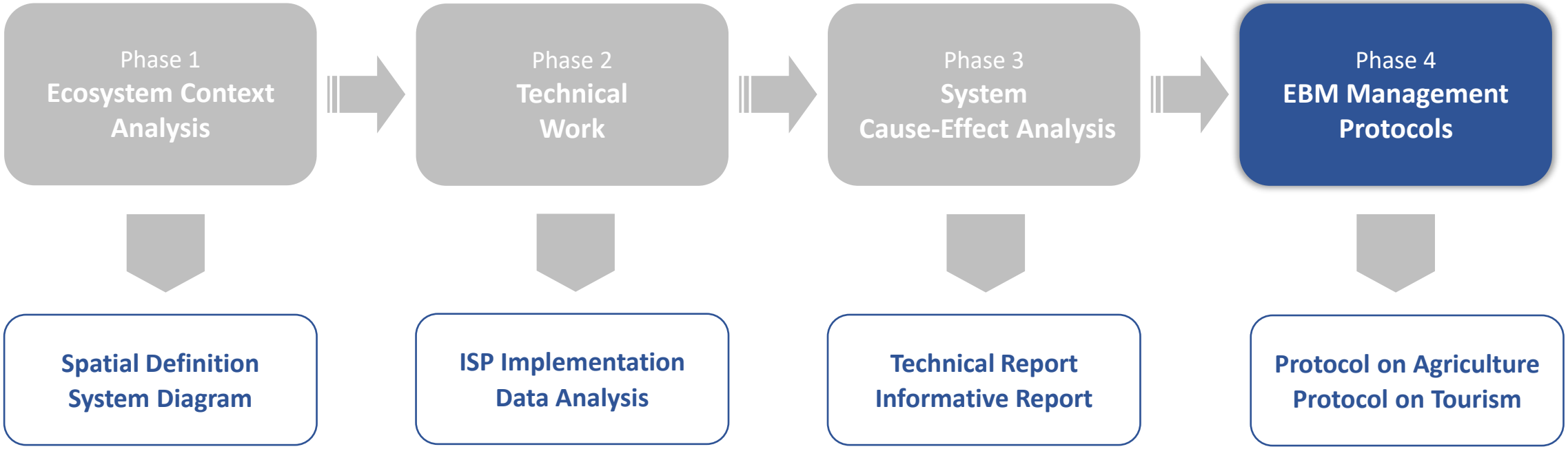
The second driver generating pressure is **Agriculture**:



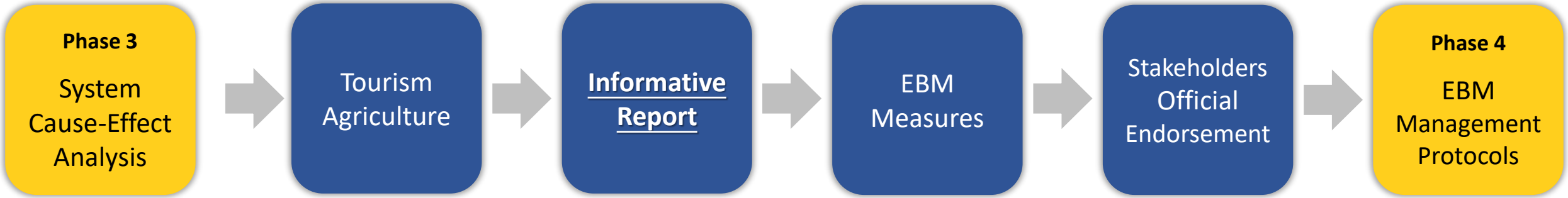
Agriculture: Cause-Effect Analysis Example



EBM Implementation Phases



EBM Protocols



EBM Protocols

At first glance, there are two major reasons why EBM protocols might seem unnecessary in the target area:

Legislative Framework

- The **legislation** at the regional, national and European level already **exists** and it was detailed during the System Cause-Effect Analysis.
- A **framework** for the regulation of human activities, such as **tourism** and **agriculture**, that impact natural environments **is already provided**.

Monitoring Protocol

- The systematic **guidelines and procedures** designed to collect, analyze, and report data about the environments are already set.
- **Institutions** and entities in charge of collecting data and publish data are already identified.

EBM Protocols

Given these considerations, **why are protocols still needed**?

Legislative Framework

- A **framework for collaboration** and coordination among the network of **stakeholders** (government agencies, non-governmental organizations, local communities, and scientific institutions) **is missing**.
- There is a **lack of integrated management measures** that consider all ecosystem components and dynamics in a project area.

Monitoring Protocol

- Even with establish collecting procedures, data are sometimes **not available**, don't have the adequate **spatial or temporal resolution**, or are in a format that make non sustainable the implementation of the system.
- When available, data are collected in **separate data banks** without any effort for an integrated analysis and EBM assessment.

EBM Protocols

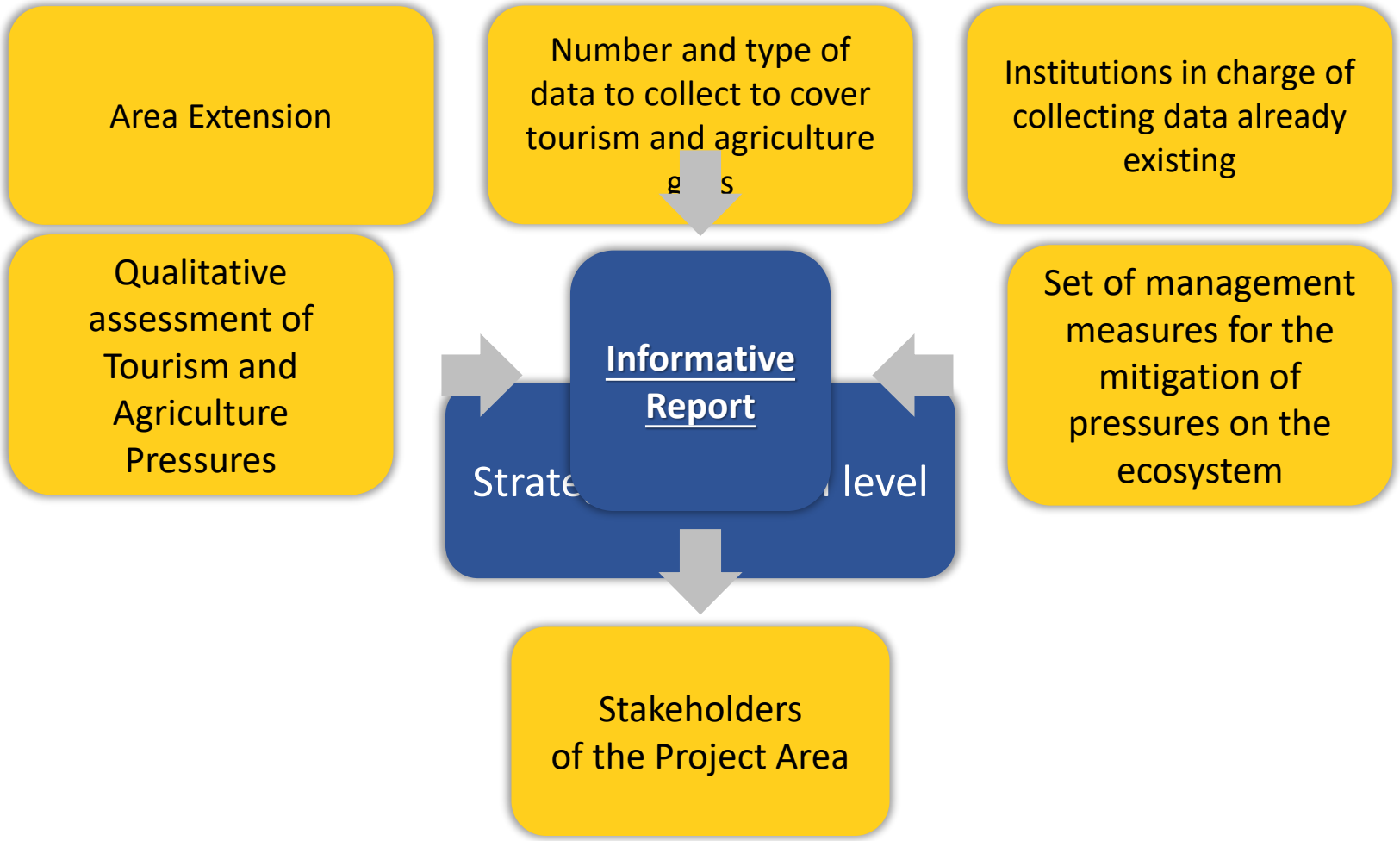
Working purely on monitoring protocols was not an option for **three reasons**:

- Area Extension
- Number and type of data to collect to cover tourism and agriculture gaps
- Institutions in charge of collecting data already existing

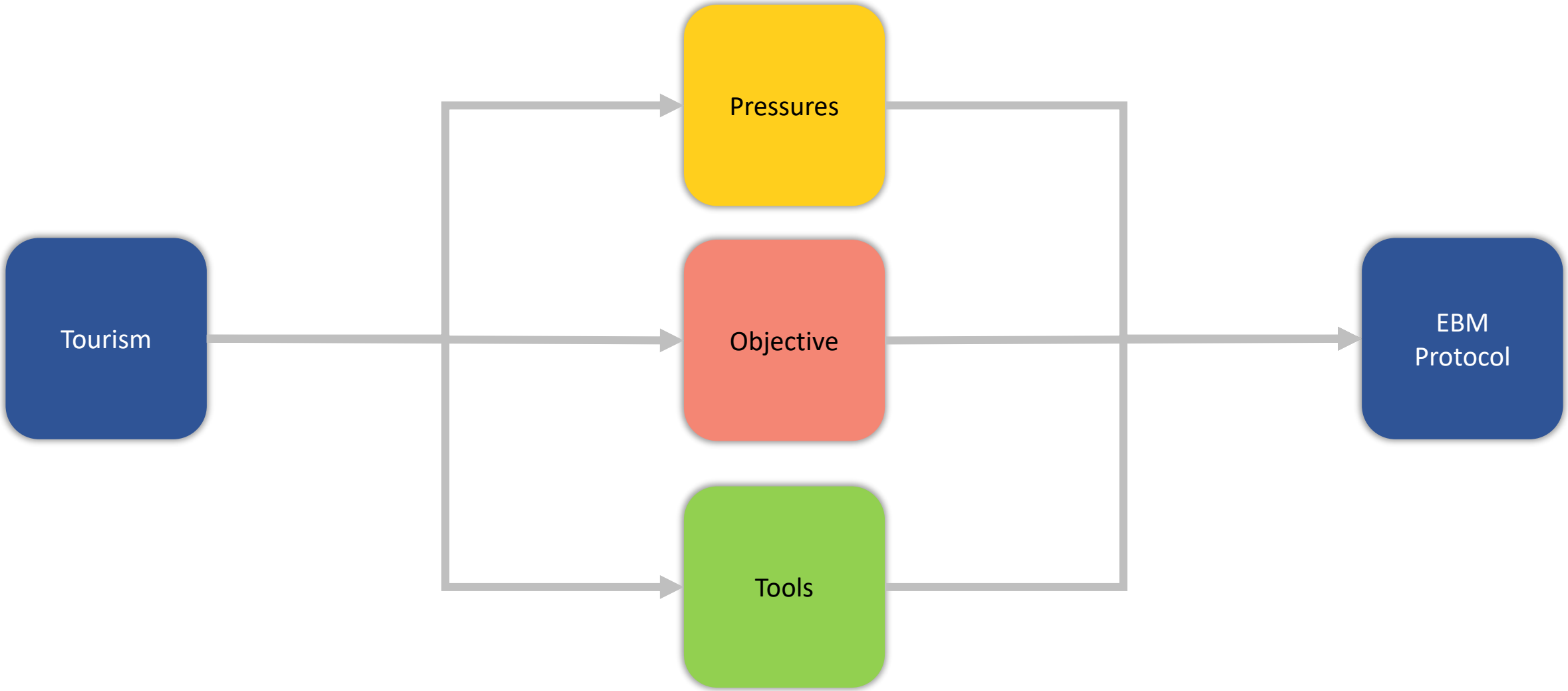
Strategy at political level

EBM Protocols

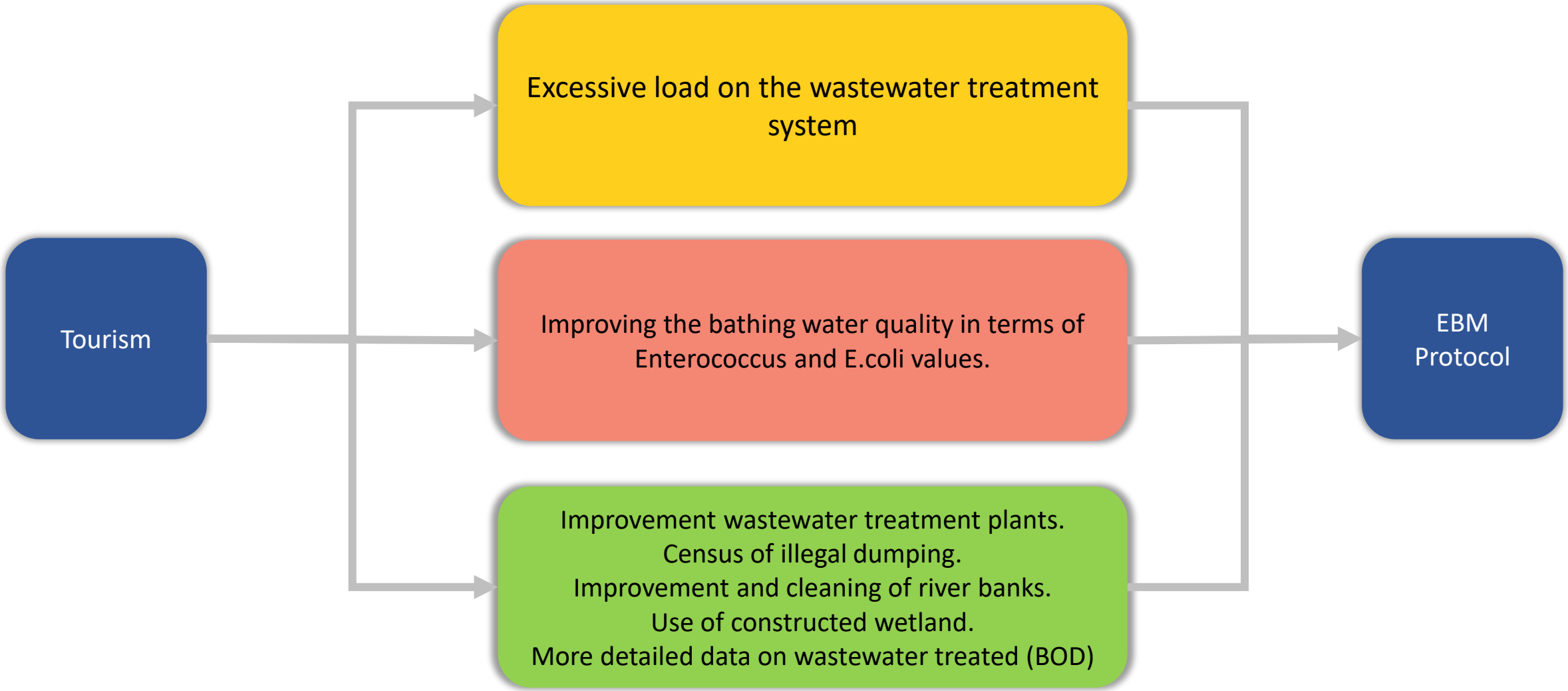
Working purely on monitoring protocols was not an option for **three reasons**:



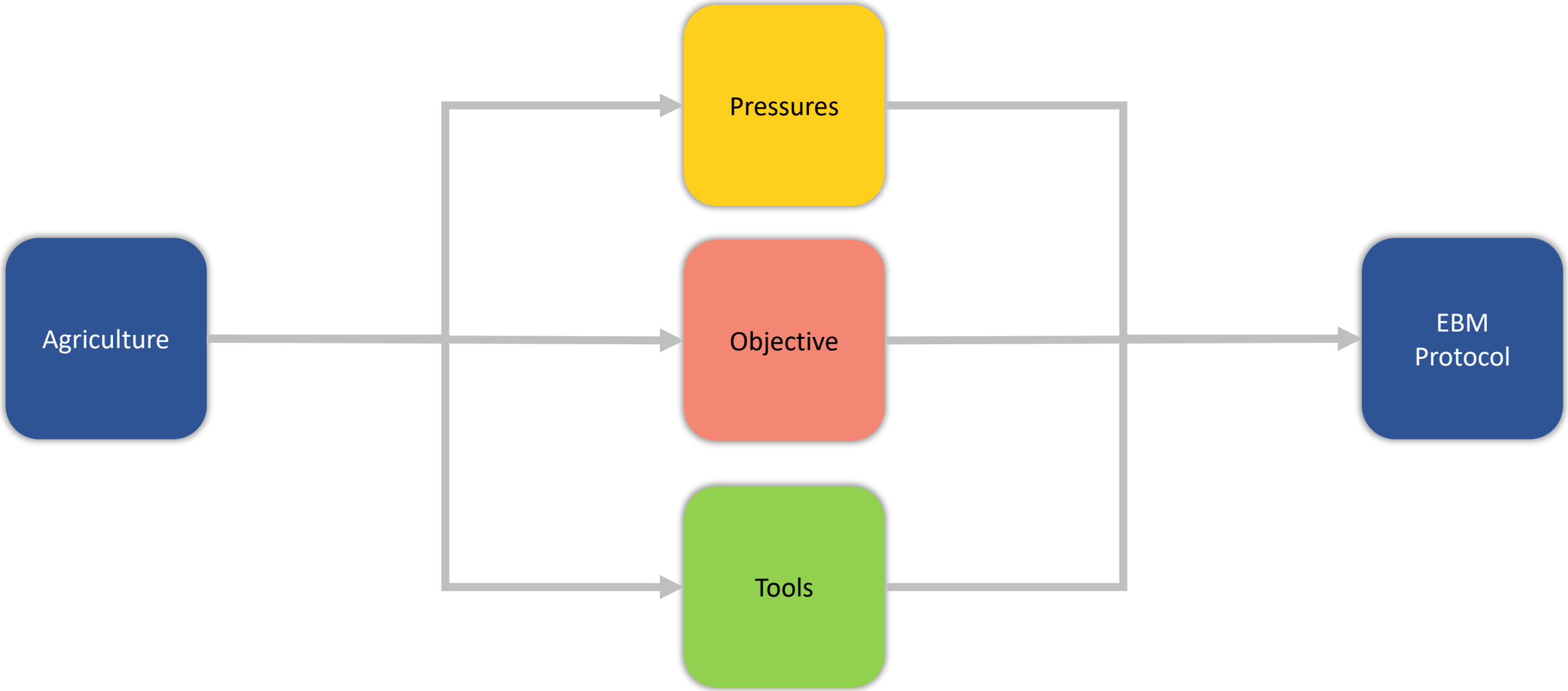
Informative Report Measures Structure



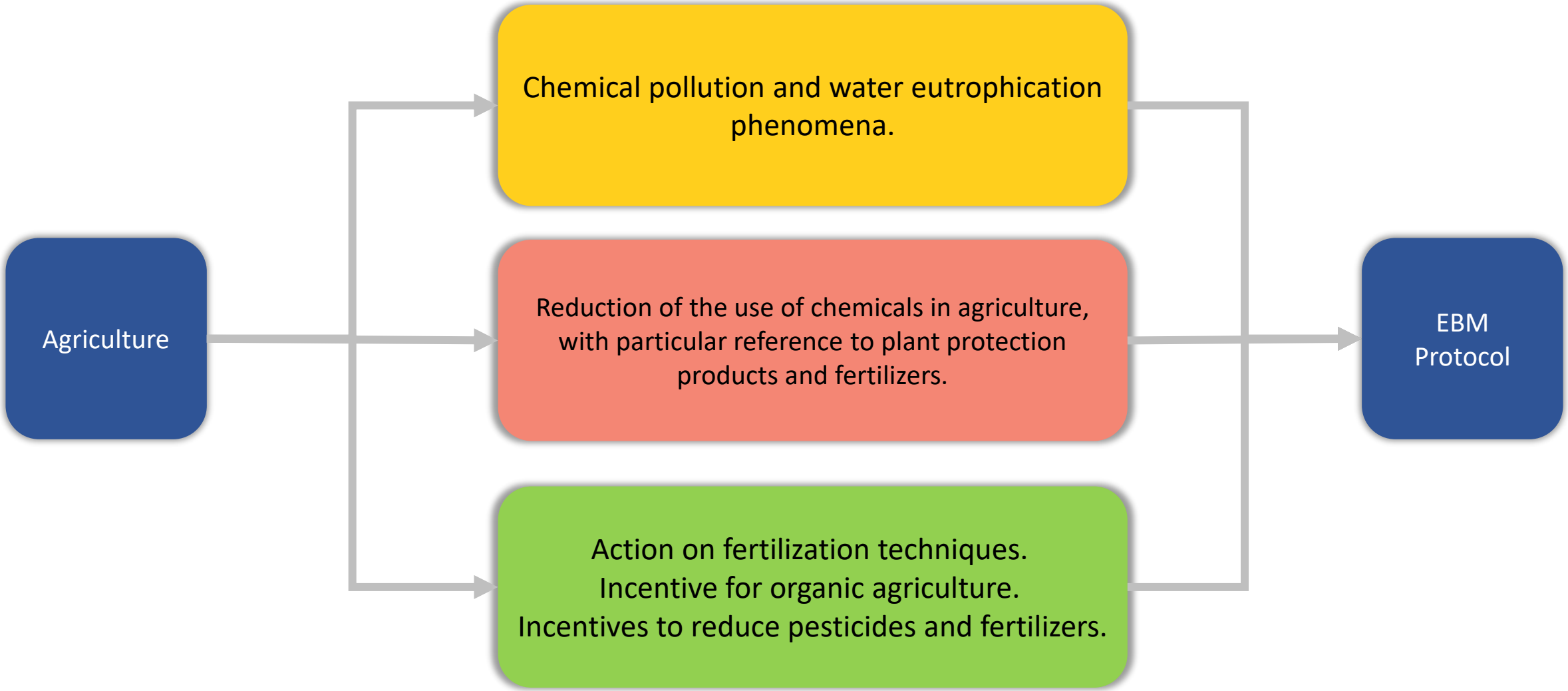
Informative Report Measures Example



Informative Report Measures Structure



Informative Report Measures Example



Stakeholders Official Endorsement

After the sharing of the Informative Report, we received from the stakeholders

9+3 official letters of endorsement

9
Project
Area
Stakeholders

1) EBM Methodology: They recognize the importance of the EBM methodology applied in the target area and of the ISP system.

2) EBM Measures: They will give their political and technical support to the implementation of the management measures identified in the document.

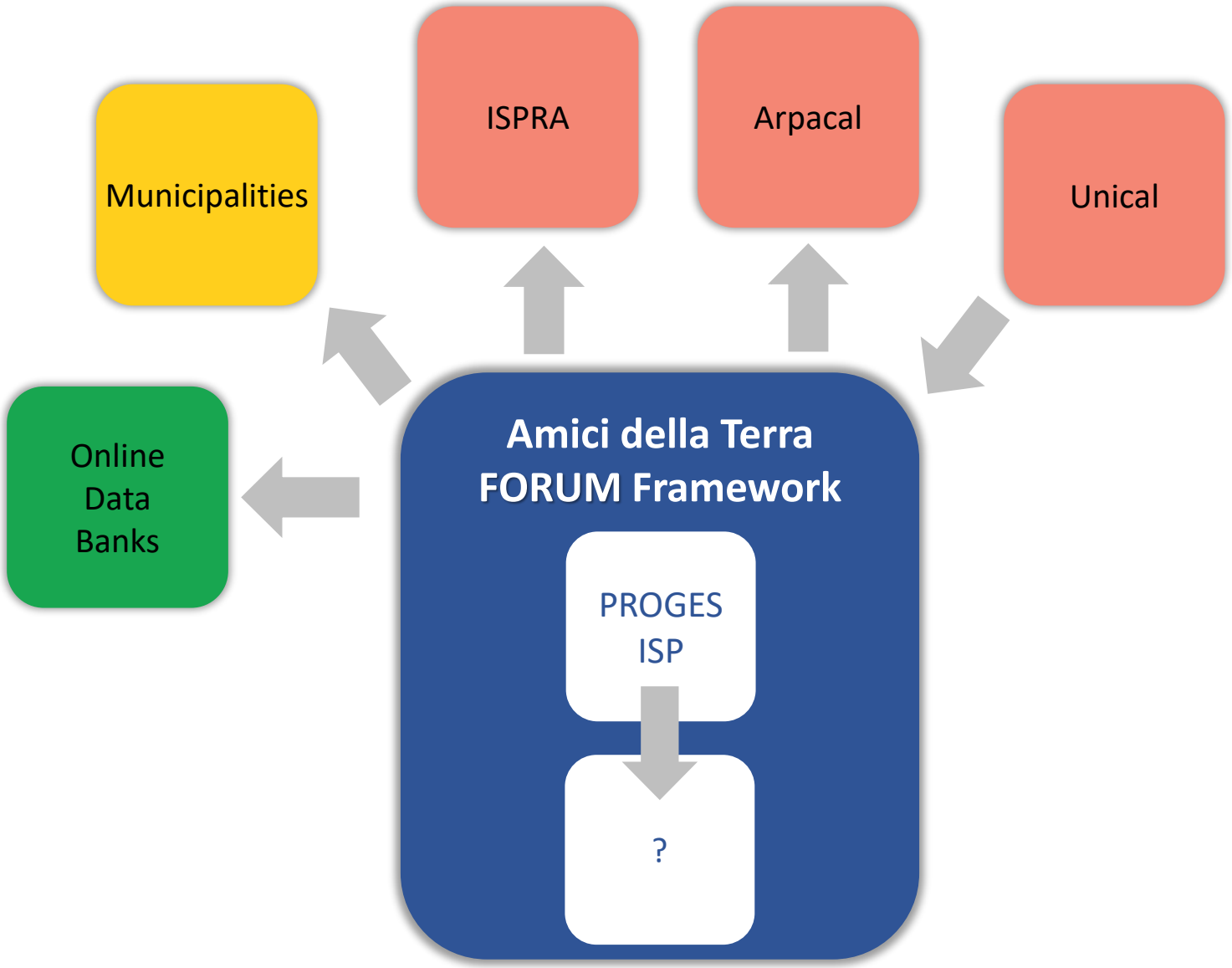
3) EBM Protocols: they committed to continuously share data regarding environmental monitoring for which the data has not yet been published.

4) FORUM: They have officially joined the Forum, that is a cooperation and coordination platform, based in the Italian Nature Reserves.

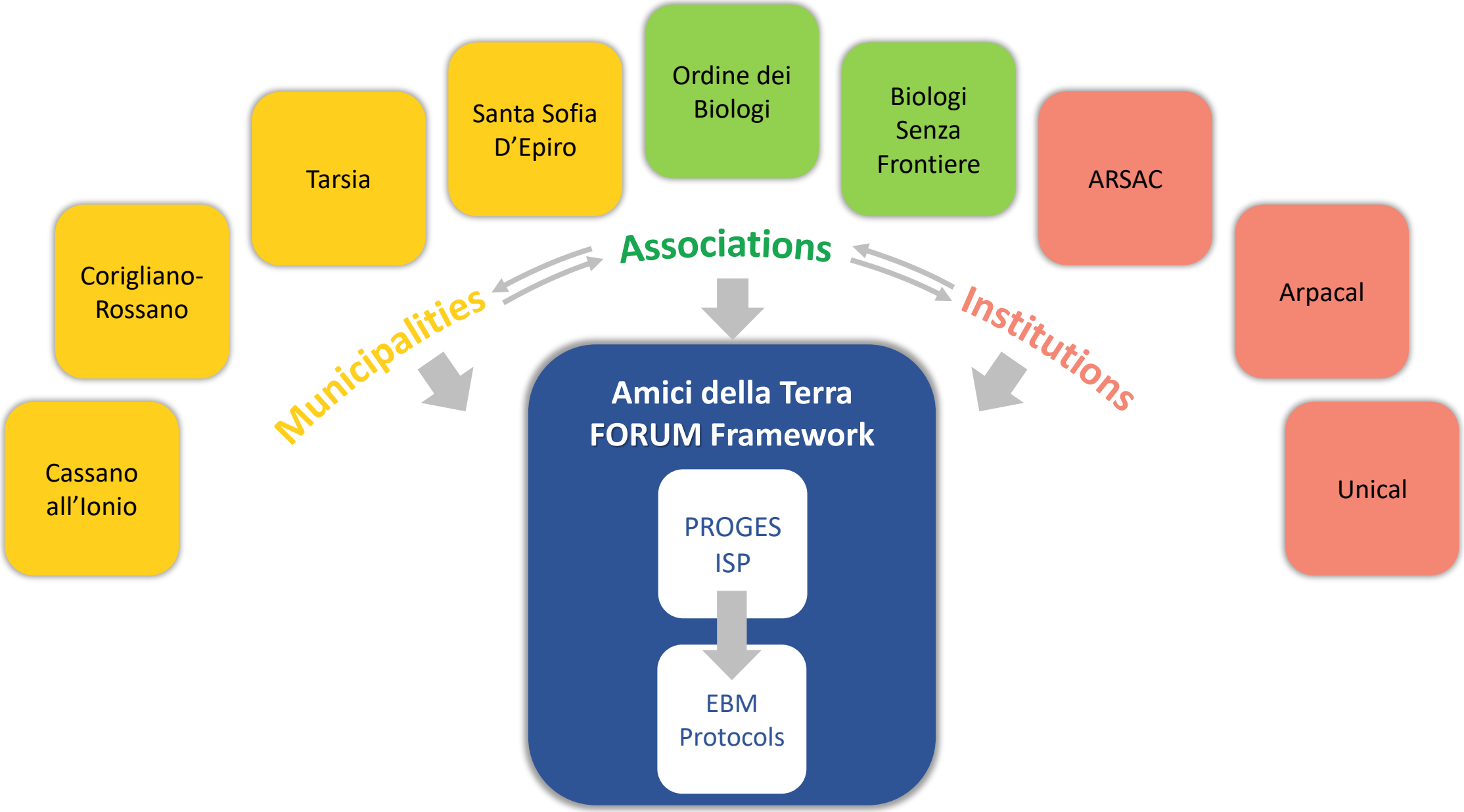
5) NEW POSSIBILITIES: They expressed interest in implementing the same methodology in other parts of Italy.

3
Non Project
Area
Stakeholders

Before EBM Protocols and Stakeholder Endorsment



With EBM Protocols and Stakeholder Endorsment



Achievements Resume

EBM Methodology Implementation

Sustainable ISP Implementation

Integrated System Cause-Effect Analysis

Stakeholders Endorsement

EBM Protocols

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Cooperating across borders in the Mediterranean

Project funded by the EUROPEAN UNION

REGIONE AUTÒNOMA DE SARDIGNA
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Thank You

PROGES
PROGETTI DI SVILUPPO

AMICI della TERRA

الجمعية الملكية لحماية البيئة البحرية
THE ROYAL MARINE CONSERVATION SOCIETY OF JORDAN
JREDS

TYRE COAST NATURE RESERVE
محمية شاطئ صور الطبيعية

INSTM