



JERICO-DS DELIVERABLE

Joint European Research Infrastructure of Coastal Observatories - Design Study

DELIVERABLE #, WP# and full title	JERICO-DS D14/D.4.3 - WP4 "Sustainability - Comprehensive Business Plan for the JERICO-RI"
5 Key words	Business Plan Sustainability Finances Services
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Submission date (dd/mm/yyyy)	31/01/2024

Nature

X R = Report, ☐ **P = Prototype**, ☐ **D= Demonstrator**, ☐ **O = Other**

Dissemination level :

X PU ☐ **PP** ☐ **RE** ☐ **CO**

PU = Public, PP = Restricted to other programme participants (including the Commission Services), RE = Restricted to a group specified by the consortium (including the Commission Services), CO = Confidential, only for members of the consortium (including the Commission Services)

GRANT N°: 951799

PROJECT ACRONYME : JERICO-DS

PROJECT NAME : Joint European Research Infrastructure network of Coastal Observatories - Design Study

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DOCUMENT TECHNICAL DESCRIPTION

Document ID	JERICO-DS-WP4-D14/D4.3-310124_V1.1
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REVISION HISTORY

Revision	Date	Modification	Author
V1.0	22/11/2023	First Draft	Paul Gaughan
V1.1	31/01/2024	Final Draft	Paul Gaughan

APPROVALS

	Name	Organisation	Date	Visa
Coordinator	Delauney Laurent	Ifremer	31/01/2024	X
WP Leaders	Paul Gaughan	Marine Institute	30/01/2024	X

Diffusion list

Consortium beneficiaries	Third parties	Associated Partners	other
X			

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1. Executive Summary

The JERICO-RI Business Plan outlines the strategic roadmap for a Marine Coastal Observation European Research Infrastructure (JERICO-RI) and serves as a guide for its establishment and operation. The plan aims to provide a clear understanding of the objectives, strategies, governance structure, financial framework, and implementation activities of JERICO-RI. The Business Plan presents the strategy of JERICO-RI towards climate and innovation business areas, creating values for stakeholders as well as long-term sustainability, including JERICO-RI's governance set-up and its financial plan.

JERICO-RI is a state-of-the-art research infrastructure that focuses on marine coastal areas in Europe. It aims to address the scientific challenges and gaps in marine coastal research by offering advanced facilities, resources, and services to researchers and stakeholders. By fostering multidisciplinary collaboration and providing access to cutting-edge technologies, JERICO-RI strives to facilitate innovative research and promote sustainable development in coastal environments.

The primary purpose of the Business Plan is to outline the vision and long-term goals of JERICO-RI. It emphasises the value-added contributions that JERICO-RI brings to the European environmental research landscape, as well as its alignment with key research policies and priorities. The plan describes the infrastructure's unique features, including its facilities, service offerings, integrated regional sites, and pilot supersites.

Moreover, the Business Plan highlights the user strategy of JERICO-RI, focusing on its value proposition, user community, and the products and services it offers. It addresses market trends, market outlook, and the access mode for researchers to utilise JERICO-RI's resources. The plan also outlines the communication and branding strategy to effectively engage with users and stakeholders.

Additionally, the Business Plan covers important aspects such as governance and organisation structure, financial management and control, human resources management, and the funding framework. It provides a five-year financial plan, taking into account the expected revenues, costs, and in-kind contributions. The plan also highlights the implementation activities, including a joint development activity plan and key performance indicators to measure the progress and success of JERICO-RI.

This Business Plan proposes inventive design solutions and Business Plan scenarios, carefully selecting those that seamlessly align with both national strategies and the overarching pan-EU vision for JERICO-RI. This collaborative effort is closely tied to the proposed funding model, ensuring that the envisioned infrastructure is economically viable and well-aligned with the financial strategies outlined.

Overall, the JERICO-RI Business Plan serves as a comprehensive roadmap that ensures the successful establishment, operation, and sustainability of the research infrastructure. It outlines the strategies, resources, and partnerships necessary to address scientific challenges, support innovative research, and contribute to European environmental research policies and priorities in marine coastal areas.

2. Glossary of Terms

JERICO-RI is developing an **ontology** to specifically identify key terms and provide a simple definition of those terms. The key Business Plan terminology, abbreviations and acronyms are described and defined below.

AISBL Association Internationale Sans But Lucratif

Assembly of members: one representative from each Member State (the national delegate) that may be accompanied by one or more advisors. The national delegate is appointed by the Member State. (Member State and Member terms should be defined).

Benefit-cost ratio (BCR) is an indicator showing the relationship between the relative costs and benefits of a proposed project, expressed in monetary or qualitative terms. If a project has a BCR greater than 1.0, the project is expected to deliver a positive net present value.

Benefit In-Kind (BIK) refers to the non-financial in-kind contributions made by JERICO-RI members to sustain the operation and services of JERICO-RI

Business Model Canvas (BMC): a business model describes the rationale of how an organisation creates, delivers and captures value. The Business Model Canvas concept was developed in 2010 as a tool used to describe, analyse and design business models.

Central Management Office (CMO) performs the administrative functions of JERICO-RI (legal, contract, financial accounting, HR).

Cost Benefit Analysis(CBA) is a process used to measure the benefits of a decision or taking action minus the costs associated with taking that action.

Director General: the legally responsible Head of JERICO-RI appointed by the Assembly of Members for a fixed period.

ERIC European Research Infrastructure Consortium

ESFRI European Strategy Forum on Research Infrastructures

ESFRI Application refers to the application submitted by the JERICO-RI partners in 2021 to the ESFRI Roadmap.

ESFRI Roadmap: a strategic document published by the European Strategy Forum on Research Infrastructures (ESFRI) that identifies and prioritises key research infrastructure projects across Europe to support scientific excellence and address major societal challenges.

Expert Center: a group of experts responsible for discussion and strategy within some specific key scientific or technological domains, needed for activities and the generation and operation of specific centers. An expert center can be virtual or physical.

Executive Committee: a collegial body including the Nation Infrastructure Representative elected from their national peers, according to specific rules + Offices' managers, for the operation and management of the JERICO-RI.

Excellence Driven: access mode based on the scientific excellence, originality, quality and technical and ethical feasibility of the users' request for access.

FAIR Data: data that follows the guidelines for Findability, Accessibility, Interoperability, and Reusability.

Governance: the system by which an organisation makes and implements decisions to achieve its goals.

IRS Integrated Regional Sites

Internal driven: access mode provided to other JERICO-RI Members using JERICO-RI facilities based on availability, feasibility, and not given priority over requests from other access modes. The costs will be paid using JERICO-RI points system.

JERICO-CORE: the unified central hub of JERICO-RI to discover, access, manage and interact with JERICO-RI resources including services, datasets, software's, best practises, manuals, publications, organisations, projects, observatories, equipment's, data servers, e-libraries, support, training, and similar assets.

JERICO-RI: Joint European Research Infrastructure network for Coastal Observatories - Research Infrastructure.

KPI: Key Performance Indicator, a quantifiable measure of performance over time for a specific objective.

Market driven: access mode that provides access to infrastructure defined through an agreement between the user and JERICO-RI and may lead to a confidential fee.

National Nodes: In the context of a future JERICO-RI ERIC that will be composed of distributed infrastructures, a "National Node" refers to a specific component or unit of the overall infrastructure that is located within a particular member country. These nodes play a crucial role in the distributed model of ERICs, functioning as the points of contact, operation, or service delivery within their respective nations.

Office: performs the managerial function of planning, organising, directing and controlling (An office can be distributed or centralised work virtually and/or physically);

RI: Research Infrastructure

Scientific, Technical and Ethical Advisory Committee: a collegial body appointed according to specific rules to provide advice to JERICO's governing bodies to the Assembly of Members. The AC is an independent body. The AC is appointed by the Assembly of members following the proposal of the ExCo.

Service Office manages different Expert Centers all related to one area of service.

Services: actions and activities carried out for the benefit of targeted users and providing assistance to these users. They can be internal if addressing internal needs of the JERICO-RI or external when addressing JERICO-RI external users' needs.

Wide Mode: access mode that reaches the maximum users for free use of data resources and digital services and not limited to a geographical location.

3. JERICO-RI Business Plan Objectives

3.1 Introduction

In the dynamic landscape of marine science and research, the JERICO-RI (Joint European Research Infrastructure network for Coastal Observatories - Research Infrastructure) stands as a cornerstone of innovation and discovery. As an integrated, multidisciplinary, and multiplatform research infrastructure, JERICO-RI has consistently pushed the boundaries of coastal marine system exploration, providing invaluable insights into the complex, interconnected ecosystems that define our coastal regions.

The development and sustainability of a research infrastructure of JERICO-RI's magnitude requires a clear and strategic roadmap. This comprehensive Business Plan seeks to establish that roadmap, guiding the infrastructure through its mission to holistically appraise coastal marine system changes, fostering international collaboration and providing state-of-the-art facilities, resources, and data. It serves as a blueprint for managing JERICO-RI effectively, optimising its resources, and ensuring its long-term viability.

Sustainability is defined as the capacity for an RI to remain **operative**, **effective** and **competitive** over its lifetime (OECD 2017). The European Investment Bank (EIB, 2017) defines **sustainability** of an RI as underpinned by the application of practices such as:

- Ensuring strong governance, transparency and accountability for the use of public funds;
- Integrating high environmental, technical and social standards into business activities, by linking research to innovation outcomes;
- Minimising risks and delivering results.

There are a number of challenges to be addressed to achieve sustainability. The key criteria for achieving the sustainability of JERICO-RI are:

- Scientific Excellence,
- Robust Business Plan,
- Adequate funding.

A robust fit for purpose **Business Plan** is a demonstration of JERICO-RI's scientific excellence, whilst **adequate funding** is the tool that delivers effective **scientific excellence**. The Business Plan design addresses the issue of what the development process of the JERICO-RI requires to succeed through the different phases of a RI's lifecycle, i.e. preparatory, implementation, operational, upgrade and decommissioning. The Business Plan will focus on the area of funding approval for the RI through the identification of partners, development of the RI infrastructure and platforms, incorporation of data policies and engagement with the funding community. A credible business plan for the JERICO-RI has been designed to enable the RI to achieve its goals through negotiating and securing the required funds. It will also evaluate the timing and agreements of public budget commitments for the RI partners, fully define and cost the project by identifying a top-level breakdown of cost elements with overall order of magnitude estimates (including for the RI Central Management Office, National Nodes and main infrastructure upgrades).

It will also link to a task (JERICO-DS MS4.5 Financial Risk Assessment) on addressing issues such as the short horizons of operating budgets and their impacts on RI sustainability. The Business Plan will further develop outputs from the cost-benefit analysis carried out in JERICO-NEXT D1.3 and will draw from JERICO-S3 task 9.4 by covering both the investment (CAPEX) and operational expenditure (OPEX) for the RI, and outline projected income

streams. The Business Plan will be the technical document used as a reference to analyse the required resources needed for the detailed preparatory/implementation phases of JERICO-RI. It will also incorporate an assessment of the potential of the JERICO-RI as an innovation hub. The strategy for business development and confirmation of commitments will be explained and the expected daily functioning of the RI, i.e. its governance structure, human resource policy, procurement policy, and financial management – focusing on cost control, cost efficiency and transparency, will be designed.

3.2 Business Plan Objectives

In this document, we outline the key objectives of the JERICO-RI Business Plan, each aimed at enhancing our infrastructure's impact and reach in the global marine science community. The objectives listed below reflect the focus areas of the JERICO-RI consortium, which are based on developing and strengthening to ensure the long-term successful operation and sustainability of JERICO-RI.

- 1. Sustainability and Growth:** Our primary goal is to chart a path for JERICO-RI's sustained growth and relevance. This plan addresses the financial, operational, and organisational strategies necessary to ensure that JERICO-RI becomes a sustainable, vibrant and dynamic player in coastal marine research.
- 2. Stakeholder Engagement:** JERICO-RI thrives on collaboration. We will detail how we intend to cultivate strong partnerships and collaborations with our stakeholders, including research institutions, government bodies, industry players, and international researchers, to further the goals of our infrastructure.
- 3. Resource Allocation:** Efficient resource allocation is central to maximising JERICO-RI's effectiveness. This Business Plan provides a framework for managing key resources, including personnel, technology, and funding, ensuring they align with our mission and objectives.
- 4. Infrastructure Development:** JERICO-RI aims to continually enhance its capabilities. We outline a strategic approach to infrastructure development, encompassing equipment upgrades, technology integration, and the expansion of the observation network.
- 5. Governance and Compliance:** The effective governance and compliance of our infrastructure are vital to its success. This plan will outline mechanisms to ensure ethical, legal, and regulatory compliance.
- 5. Financial Sustainability:** Ensuring the financial sustainability of JERICO-RI is of paramount concern. The Business Plan will detail strategies for diversifying funding sources, managing costs, and optimising budget allocation to meet our long-term financial goals.
- 6. Data Accessibility and Impact:** JERICO-RI is committed to open access and impactful research. We will discuss measures to ensure the accessibility of our data and the promotion of our research outcomes, thereby increasing our global influence.
- 7. Financial Risk Management:** Recognising the importance of mitigating potential risks, this plan addresses risk assessment and management strategies, safeguarding JERICO-RI's operations against unforeseen challenges.

Box 3.1 The JERICO-RI Business Plan objectives.

This comprehensive Business Plan is supported by ongoing work in the **JERICO-S3** project Task 9.4 which involves developing the RI Business Plan. This work is primarily focused on development of the relevant RI Services and the user strategy. The elaboration of services is a strategic implementation of efficient fit-for-purpose products which are being developed and enhanced by the JERICO-RI partners.

JERICO-RI is, in the domain of coastal observation, answering two major needs that are complementary:

- Address the main scientific challenges relevant to the global and EU integrated landscape of marine and environmental initiatives. JERICO-RI Services are envisioned as a pan-European Coastal Ocean Integrated component of this landscape.
- The socio-economic impact of the RI. JERICO-RI aims to deliver scientific achievements to the broad range of socio-economic activities which rely on coastal and marine science among Europe.

These needs are taken into account in the strategy for the elaboration of products and services roadmap, meaning the setting of priorities and targets on the short and long term.

The RI Business Plan was further developed in an ESFRI Application made by the JERICO-RI partners in 2021 and continues to develop and be iteratively refined and improved through ongoing research activities in the JERICO-S3 and JERICO-DS projects. A particular focus on the financial sustainability and risk through each phase of the RI development has been carried out as part of JERICO-DS Work Package 4.

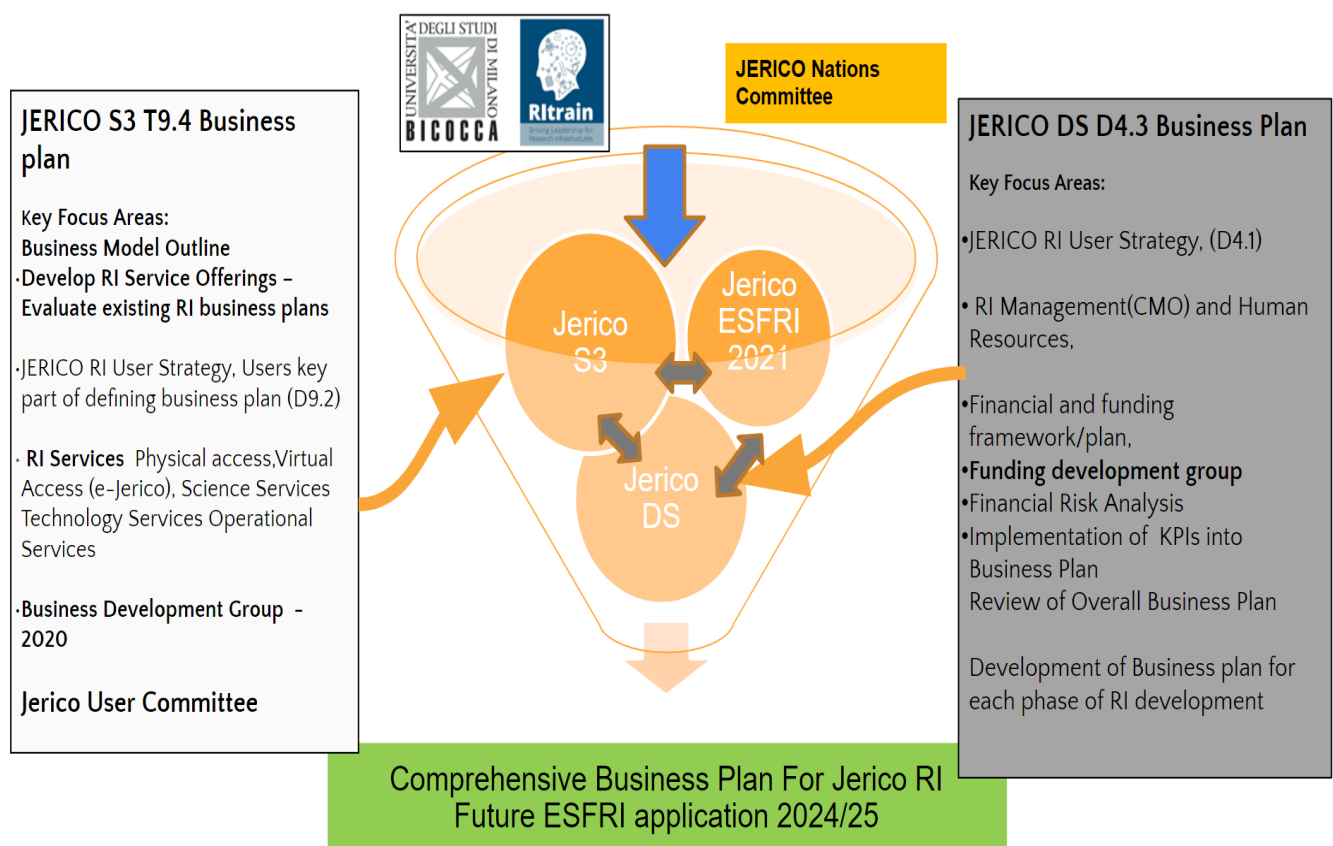


Figure 1.1 Overview of JERICO-RI development strategy and the interconnected outputs of JERICO-DS and JERICO-S3 and ESFRI roadmap application.



Figure 1.2 Illustration of the development timeline for the JERICO-RI Business Plan over the JERICO-DS and JERICO-S3 project life cycles with relevant WP4 Deliverables 4.1, 4.2 & 4.3.

3.3 Intended Audience of the Business Plan

The Business Plan is targeted at a broad range of stakeholders covering the quadruple helix groups of **government, academia, industry and the public** (Table 3.1). This will include both experts in coastal ocean observations and non-experts. The core business of JERICO-RI is to provide a range of services to users from these stakeholder groups. This Business Plan provides the context and background story behind the establishment of a JERICO-RI; describes the initial services offered and the users of these services; and outlines the costs to provide the services and how they will be funded.

Table 3.1 Key target audiences of the JERICO-RI Business Plan.

Who is the intended audience for the JERICO Business plan?	Area of Interest in the Business Plan
Researchers and Scientists: Academia and Educational Institutions:	The Business Plan is designed to attract marine researchers and scientists who are interested in utilising the infrastructure and facilities offered by the RI. The Business Plan highlights the opportunities for research partnerships, joint projects, and knowledge exchange programs that can enhance the educational offerings and research capabilities of these institutions.
Policy and Decision-Making Bodies: Funding Agencies and Governments:	Funding agencies and government bodies responsible for allocating resources to scientific research initiatives. The Business Plan outlines the potential impact of the infrastructure on advancing marine science, its relevance to national and international research priorities, and the potential return on investment in terms of scientific breakthroughs and societal benefits. The plan emphasises the potential for contributing to evidence-based policymaking and the RIs capacity to address critical environmental and sustainability challenges.
Maritime Industry and Private Sector:	Businesses and industries associated with marine science, such as marine technology companies, environmental consulting firms, and offshore energy companies, may be potential collaborators or users of the RI infrastructure. The Business Plan outlines opportunities for industry partnerships, technology transfer, and commercialisation of research findings.
International Marine Research Community:	Collaborative research networks, international organisations, and research institutions. The Business Plan highlights the RIs commitment to international collaboration , its potential to attract global research talent, and its ability to foster cross-border cooperation.
National Scientific experts & JERICO-RI Partners Representatives:	Scientific users - limited financial expertise but experience in setting up European Research Infrastructure Consortia Re: Governance and Strategy.
ESFRI Roadmap Evaluators:	Mixture of Scientific and Governance/Financial expertise. The reviewers will decide if JERICO-RI has reached a maturity level in terms of governance/financial commitments from Member states/scientific and technological excellence to enter the ESFRI roadmap.

3.4 Business Plan Success Criteria

Defining the key success criteria of this Business Plan provides a structured and measurable framework for guiding and evaluating the progress and development of JERICO-RI. The key success criteria (Table 3.2) ensures that efforts are focused on the most critical areas, facilitating effective communication and decision-making, and ultimately increasing the

likelihood of achieving desired outcomes. **The Business Plan is a key enabler of moving JERICO-RI from a project-based network towards the establishment of JERICO-RI as a mature and sustainable operational Research Infrastructure.** The importance of defining key success criteria is closely related to the success of the JERICO-RI.

The overarching goal driving the success criteria of the Business Plan is the sustainability of JERICO-RI. Financial sustainability is the ability to maintain a financial capacity over time (short and long period), where financial capacity consists of resources that give an organisation the ability to seize opportunities and react to unexpected threats (Bowman, 2011).

The sustainability model is underpinned by the following **5 Pillars**, whose development and status are clearly described in this Business Plan to illustrate the maturity and capability of JERICO-RI to move beyond its design phase and into the next phases of its development life cycle.

- **Long-Term Commitment from Members-** Secure a long-term commitment of Members,
- **Strong Diversification of Financial Resources-** large revenue portfolio,
- **RI Own Income Generation-** freedom to react to unfavourable conditions,
- **Strategic and Financial Planning-** Financial planning means determining whether the RI has sufficient available resources,
- **Measurement of Impact-** Demonstrate the impact of the RI outputs to the larger society.

Table 3.2 Key Success Criteria of JERICO-RI Business plan.

Key Success Criteria of JERICO-RI Business Plan	Relevance to JERICO-RI Sustainability Plan	Relevant JERICO-RI Business Plan Chapter
Clarity of Purpose and Goals	Guides research efforts and resource allocation. JERICO-RI's mission and goals must be well-defined to direct its coastal observation research effectively.	Chapter 3 Chapter 4
Measuring Progress and Performance	Tracks progress towards scientific objectives. JERICO-RI relies on measuring progress to ensure that its coastal observation research is on track and aligns with its objectives.	Chapter 8
Focus, Prioritisation, and Resource Allocation	Directs research efforts and allocates resources for critical coastal observation activities. JERICO-RI must prioritise research areas and allocate resources efficiently to achieve its research goals.	Chapter 7
Accountability and Responsibility	Ensures individuals and teams are responsible for specific research tasks. Accountability is crucial within JERICO-RI to ensure that researchers take ownership of their contributions to coastal observation research.	Chapter 6
Effective Decision-Making	Informs strategic decisions regarding research direction, resource allocation, and project management. Effective decision-making is essential for JERICO-RI to make informed choices about research direction and allocation of resources.	Chapter 6

Risk Management and Adaptability	Identifies potential risks and allows for proactive planning and adaptation to changing research circumstances or needs. Given the dynamic nature of coastal observation, JERICO-RI must manage risks and adapt to changing research conditions effectively.	Chapter 9
Motivation and Engagement	Fosters a motivated and engaged research community, leading to increased productivity and collaboration. Motivated and engaged researchers are more likely to collaborate effectively within JERICO-RI and produce high-quality research.	Chapter 5
Communication and Transparency	Facilitates effective communication within the JERICO-RI community. Clear communication and transparency are essential for effective collaboration and coordination among researchers within JERICO-RI.	Chapter 5
Alignment with Stakeholder Expectations	Ensures research aligns with the needs and expectations of stakeholders. Aligning research with stakeholder expectations is vital for ensuring that JERICO-RI's coastal observation efforts meet the demands of relevant stakeholders.	Chapter 5
Demonstration of Value and Impact	Quantifies and demonstrates the value and impact of coastal observation research. Demonstrating the value and impact of research is crucial for securing support and funding for JERICO-RI's initiatives.	Chapter 8
Continuous Improvement	Encourages ongoing assessment and improvement of research activities and infrastructure. Continuous improvement is a fundamental principle for JERICO-RI to enhance the quality of its coastal observation research and infrastructure continually.	Chapter 6

4. JERICO-RI Objectives and Strategy

4.1 Our Context

The coastal ocean is located as a continuum at the intersection between continental domain, the open ocean, the ground and atmospheric system and in the immediate vicinity of dense human populations. The coastal ocean is a complex environment under diversified forcing pressures, presenting important impacts on socio-economics which are also observed at nested spatio-temporal scales.

These impacts are acting at:

- Local scale: in various places, and thus are nation relevant, like problems of coastal erosion,
- Regional, and thus transboundary, like harmful algal blooms,
- Pan-European, like those related to the effect of climate change.

The coastal ocean is the most productive part of the world ocean and is one of the major sources of food for humans. Biological productivity in coastal waters results from a complex interplay between biological, biogeochemical and physical processes. The coastal ocean is providing a large variety of other ecosystem services including:

- Transportation,
- Availability and access to raw materials and resources for industry,
- Repository and dilution of contaminants,
- Leisure and cultural resources.

The coastal ocean is by far the most economically valuable component of the world ocean and the economic values of the littoral components can be comparable and even higher than the highest ones of continental biomes. The exploitation of these services results in the densification of human coastal populations and the intensification of their activities (one human being out of 2 lives close to the coast). The coastal ocean is therefore the component of the world ocean most affected by anthropogenic disturbances. **JERICO-RI is an essential component of the EU efforts to a better understanding of coastal marine systems.** It aims to be the future coastal component of the European Ocean Observing System (EOOS, 2023) and part of the Global Ocean Observing System (GOOS). The specificities of the coastal ocean had led the EU to invest in a complex endeavour for the coordination and harmonisation of coastal observing capacities in view of enabling multidisciplinary observations over a wide range of spatio-temporal scales.



Figure 4.1 JERICO-RI - The multi-Platform European Coastal Ocean Observing System.

4.2 Foundations of the JERICO-RI Strategy

4.2.1 The Vision and Mission of JERICO-RI

Vision: By 2030, the JERICO-RI will be the European gateway to long-term scientific observations and related services for European coastal marine systems at the convergence between the land, open ocean and atmosphere; empowering European research excellence and expertise for the benefit of society.

Mission: JERICO-RI is an integrated pan-European multidisciplinary and multiplatform research infrastructure dedicated to a holistic appraisal of coastal marine system changes. It is seamlessly bridging existing continental, atmospheric and open ocean RIs, thus filling a key gap in the ESFRI landscape. JERICO-RI establishes the framework upon which coastal marine systems are observed, analysed, understood and forecasted.

Question: Why is JERICO-RI unique?

Answer: JERICO-RI provides a multidisciplinary, multiplatform, holistic appraisal of the coastal marine system by enabling:

- Physical integration: a system of local and regional platforms.
- Virtual integration: building on national and EU e-Infrastructures.
- Geopolitical integration: building on national capacities to harness the potential of a pan-European coastal observation system and integrate seamlessly as the coastal component of the proposed EOOS.
- An integrated multiplatform approach that addresses the complexity of the coastal ocean in time and in space. JERICO-RI fills a gap in the Land-Ocean Interface in the existing European Research Infrastructure Landscape integrating, quality assuring, harmonising and distributing datasets, activities, and services provided by the Central Facilities and National Facilities, located in 17 European countries.
- Open-access to state-of-the art and innovative facilities, resources, FAIR data and fit-for-purpose services, fostering international science collaboration.
- A better understanding of the functioning of coastal marine systems and thus to a better assessment of their changes caused by the combined effects of natural and anthropogenic changes.
- Efficient management of major ecosystem services and environmental risks, leading to an improved knowledge framework for sustainable development in coastal areas and the emergence of a dynamic coastal blue economy.

Box 4.2 Unique Selling points of JERICO-RI

4.2.2 JERICO-RI Values

JERICO-RI will be governed by the following values, which have been redefined and updated based on work on the long-term scientific plan JERICO-DS D1.3. The following five new JERICO-RI Values are proposed:

1. **JERICO-RI cares about the marine environment:** it contributes to the understanding and monitoring of the changes of coastal marine systems; it provides data-driven information for the protection and the sustainable management of coastal resources.
2. **JERICO-RI defines scientific excellence through a regional approach:** it identifies scientific marine coastal challenges common to regional sites, gathering all major coastal observing systems throughout Europe; it has a strong scientific community

and leadership developed and demonstrated during several previous EU-funded projects.

3. **JERICO-RI implements multiplatform and multidisciplinary observation systems:** it uses scientifically sound observations of physical, chemical and biological parameters and innovative biogeochemical observing technologies. It recognizes that scientific excellence in coastal areas can be achieved only through multisystems as these areas are characterised by many high-variable scales, both in time and in space.
4. **JERICO-RI seeks for collaboration and co-creation:** it interacts with many other environmental RIs to take a holistic approach to the marine environment, from the coastline to the open sea, as a global ecosystem. It listens to its stakeholders and users to include their feedback in its future development.
5. **JERICO-RI removes barriers:** it enables open-access to state-of-the-art and innovative facilities, resources, FAIR data and fit-for-purpose services. It encourages transparent policies for the access, recruitment procurement and its governance; it promotes equal opportunities for its members considering gender equality and under-represented communities.

4.3 The Feasibility of JERICO-RI

The specificities of the coastal ocean have led the EU to invest in a complex endeavour for the coordination and harmonisation of coastal observing capacities in view of enabling multidisciplinary observations over a wide range of spatio-temporal scales.

JERICO-RI has been supported by: (1) three successive 4-year European Commission funded projects to start constructing a pan-European coastal RI involving 40 partners from 17 EU countries, and (2) a design study project (JERICO-DS) dedicated to achieve the design phase of a sustained JERICO-RI and start the preparatory phase. Figure 4.1 shows the development of the JERICO-RI projects towards an established RI.

JERICO-FP7 (Infra-IA): FIRST STEP AND INFANCY 2011-2014

Project Description: 27 partners from 17 countries. The JERICO-RI consortium was formed from the existing and unconnected communities that were mainly relying on automated high-frequency (HF) observation systems: ferryboxes, gliders and fixed platforms like buoys. It provided a preliminary definition of coastal observation systems that deliver high-frequency in-situ physical and biogeochemical data, in the coastal domain. After this preliminary integration and harmonisation process, the consortium agreed on the need to better include the observation of the biology compartment with an ecosystem approach.

JERICO-NEXT (Infra-IA): SECOND STEP 2015-2019

Project Description: 34 partners from 15 countries. An ecosystem approach was applied according to five main scientific topics: (i) pelagic biodiversity focused on phytoplankton and eutrophication, (ii) benthic biodiversity focused on habitats, (iii) chemical contaminants (mainly organic), (iv) carbon cycle and carbonate system, (v) hydrography and transport with some applications to operational oceanography and forecasting. The JERICO-RI also integrated new systems: HF radars and coastal cabled observatories. First bricks were also laid to build a sustainable RI by **elaborating a cost-business analysis** and proposing a first scientific approach complying with the general JERICO-RI mission.

JERICO-S3 (Infra-IA): THIRD STEP 2020-2024

Project Description: 39 partners from 17 countries. It is targeting a more science-integrative approach to better observe the coastal ecosystem, raising up scientific excellence, with consideration of regional and local ecosystems; the preliminary development of an e-infrastructure supporting scientists and users by offering access to dedicated services; progress on the design of

the RI and its strategy for sustainability. JERICO-S3 furthers collaborations with other marine RI initiatives to jointly progress on the structuring of the EU marine framework within (CMEMS, EUROARGO, EMSO, ICOS, EMBRC) and outside Europe.

Besides the scientific advancement, these three projects built a general strategy for the establishment of a European Research Infrastructure (JERICO-RI). Further, conceptual and technical progress as well as a part of the design phase of the RI are currently ongoing through the third I3 program (JERICO-S3).

JERICO-DS (Infra-DEV): DESIGN Achievement OF THE RI 2020-2024

Project Description: with a partnership organised according to 14 involved countries, it includes seven national coastal observing RIs thanks to the maturity of the consortium. It develops the design phase and initiates some tasks of the preparatory phase of the ESFRI process. It works with a bi-directional approach, i.e. between national RIs and the pan-European dimension, to coordinate national engagements towards legally bound commitments.

Box 4.3 Steps towards JERICO-RI becoming a sustainable pan-European coastal observation research infrastructure

As a benefit of this long-term effort, since 2011, JERICO-RI has developed a unique position, filling in a major gap in the landscape of European Environment RIs. JERICO-RI has developed the conceptual and practical expertise **aiming in providing high-quality coastal observations and services to the marine scientific community at large and to a range of local, regional, national and European end-users.**

Moreover, several European countries have recently restructured their national effort to better address their coastal priorities into National Research Infrastructures (NRIs) dedicated to national coastal observation, which clearly constitutes the national basis of JERICO-RI. JERICO-RI has the advantage of relying on nine previous and formal NRIs dedicated to coastal observation and science. This is supplemented by the establishment of the JERICO Nations Committee which has identified National Representatives for each of the 17 nations engaged in JERICO-RI.

As a result of these investments, a well organised, coherent JERICO-RI capitalises on a robust foundation of Member States' established and recognised NRIs. These dynamic communities of actors have gained official recognition and sustained resources from their respective nations' political entities. This has prepared the terrain to achieve the ambition of a pan-European RI. The privileged contacts of the nationally-recognised entities with national funding agencies and relevant State ministries (or equivalent) provide the strength and unity of voice essential in a rapidly evolving context. These established NRIs are facilitators for other Member States with the serious ambition of further developing their national observation systems and integrating JERICO-RI.

The establishment of JERICO-RI as a fully integrated European RI on coastal observation relies on the strong scientific achievements of the consortium's European nations. JERICO-RI capitalises on well-established NRIs on coastal observation and benefits from their long-term experience and expertise.

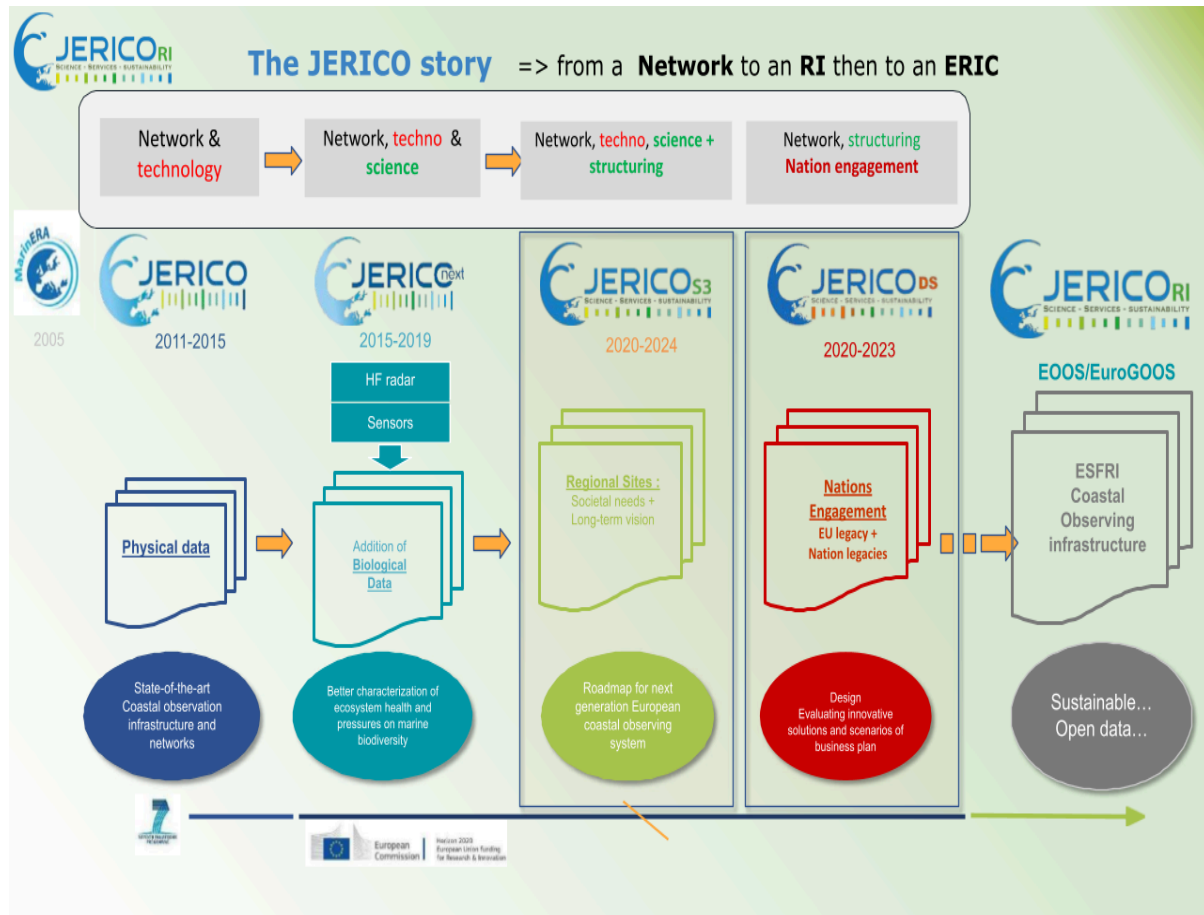


Figure 4.1 Development of the JERICO-RI from 2011-2023 (Network to a Research Infrastructure).

- ILICO, *France*
- CNR-OGS network of observations builds on the RITMARE effort, *Italy*
- POSEIDON / HIMIOFOTS, *Greece*
- EirOOS Irish Ocean Observing Systems, *Ireland*
- COSYNA, *Germany*
- FINMARI, *Finland*
- KKOBS, Marine Component of the Estonian Environmental Observatory, *Estonia*
- MARINE OBSERVATION SYSTEM, MOS, *Sweden*
- MONIZEE, *Portugal*
- ICTS-SOCIB, *Spain*
- COASTWATCH, *Norway*
- RBINS+VLIZ+ Meet Net Vlaamse Banken, *Belgium*
- MWTL + WOT, *Netherlands*
- Coastal RI, *Croatia*

Box 4.4 The 14 national coastal research infrastructures involved in JERICO-RI.

The feasibility of JERICO-RI is further attested by the favourable development of key performance indicators (KPIs, discussed further in Section 8.3). Over the last decade, the number of accessible JERICO-RI research facilities continues to rise as does virtual access capabilities, the breadth and diversity of variables measured, the involvement with the private sector and the production of valuable scientific knowledge. As indicated above in Box 4.4,

the involvement of nation-supported entities and infrastructures is projected to rise, riding on the political support secured by JERICO-RI's initial members - there is no question of the added value and necessity of this level of organisation to address national and global issues. Despite the multiplicity of drivers (and levels of organisation), the JERICO-RI community shares many common goals, presenting both strong leverage and insurance for JERICO-RI's success.

4.4 Scientific challenges and gaps addressed

JERICO-RI is dedicated to the observation of European coastal marine systems. It fills a gap in the landscape amongst existing current European RIs for the **coastal ocean**, which constitutes a major stake for society. In order to do so, JERICO-RI has identified three **Key Scientific Challenges** (KSC) to be tackled through its operation. In order to do so, the JERICO-RI scientific strategy is based on the main specificities of the coastal ocean. This strategy is based on a common bedrock which is the need of integration (disciplines, technologies, observations, etc.) on which **three** main pillars are standing:

1. **Fostering of societal impact,**
2. **Development of innovative technologies,**
3. **Interfacing with other initiatives, to support the implementation of a joint observing system at a regional level.**

Europe still lacks an integrated RI addressing the complexity of marine coastal systems and the diversity of scientific/environmental issues and stakeholders within different national frameworks. **JERICO-RI aims to fill this critical gap.** As a result, it will enable cutting-edge European coastal research to reach a sound understanding of changes and adaptations of marine coastal systems.

The three KSCs, further divided into 16 **Specific Scientific Challenges** (SSC) have been defined, based on the synthesis of a global list of regional practical Research Actions (RA). In the following, we will analyse how these different challenges are currently addressed by each region.

The JERICO-RI has researched various hierarchical and organisational observation network models, especially including the termed **Pilot Super Sites** (PSS) and **Integrated Regional Sites** (IRS). PSS observations and products are sustained, fit-for-purpose and multidisciplinary. Their transnational, cross-sectoral and pan-European aspects are being further developed. IRSs explore the integration of established coastal observation programs through multinational collaborative activities.

The JERICO-RI approach follows a principle "regional approach to the management of our seas". JERICO-RI promotes the overall organisation, integration and interoperability of the coastal observations at national, regional, interregional and pan-European levels. JERICO-RI's target is to provide consistent and comparable data to answer complex science questions. This may be achieved by integrating the key regional observatories as a hierarchical and coordinated observation network based on Supersites, Advanced observatories and Standard observatories, working at nested and superimposed spatiotemporal scales.

Table 4.1 Key Scientific Challenges and Specific Scientific Challenges currently addressed for each geographical region: (from JERICOS3-D1.1).

KSCs	Specific Scientific Challenges	Pilote Super Sites					Integrated Regional Sites				
		North S	EC	NWM	CS	BS/GF	BOB	NAS	IAM	K/S	Nor S
Assessing and predicting changes under the combined influence of global and local drivers	Land-Ocean Continuum										
	Sea-atmosphere interface										
	Connectivity and transport										
	Biodiversity										
	Primary productivity										
	Ecosystem functioning										
	Carbon budget and carbonate system										
Assessing the impacts of extreme events	Extreme events: impacts on ecosystems										
	Extreme events: coastal hazards										
	Harmful Algal Blooms										
Unravelling the impacts of natural and anthropogenic changes	Climate change impacts										
	Eutrophication										
	Impact of big cities										
	Litter and plastic										
	Contamination										
	Unravelling impacts										

4.5 JERICO-RI Objectives

The objectives of the JERICO-RI are strategically developed to advance the field of coastal marine research and observation. By prioritising scientific excellence, data harmonisation, and collaborative synergies, the RI seeks to address complex challenges in coastal seas. Its commitment to open access, adaptability, and user-driven services reflects a dedication to inclusivity and effective stakeholder engagement. With a clear focus on protecting our marine environment, the RI plays a pivotal role in shaping a sustainable future for coastal regions, underscoring its significance in the global scientific community. The objectives are:

- Scientific Excellence:** Scientifically sound multidisciplinary observations of physical, chemical and biological parameters and in the innovation in key areas of biogeochemical observing technologies, are needed to meet the complex scientific challenges in the coastal seas.
- Harmonise:** Reliability, compatibility and reusability of pan-European coastal observation data may be obtained only through a strong joint effort at EU level to harmonise observations, from the sensors to the data analysis.
- Co-create:** Synergy and collaboration enhance efficiency and power of the coastal community.
- Collaborate:** Effective collaboration with all environmental RIs is important to take a holistic approach to the ocean environment, from the coastline to the open sea, as a global ecosystem.
- Openness:** Provision of **FAIR** data and free access to systems are the measures of RI effectiveness.

6. **Prospectivity:** Clear foresight and an understanding of the need for changes are needed to keep the RI at the state of the art.
7. **User-driven:** JERICO-RI is designed to be service-oriented to support its stakeholders and users.
8. **An RI of equality opportunities:** JERICO-RI is for everyone. The equal opportunity, gender balance and ethical policies outlined in JERICO-DS D5.2 provide a framework for promoting fairness, inclusivity, ethical conduct, and environmental sustainability throughout JERICO-RI's life cycle.
9. **Common future:** Our joint marine environment must be protected, and a coastal RI is an essential tool for coastal management and sustainable development in Europe, providing high-quality marine observations, supporting policy frameworks, and contributing to the blue economy.

Box 4.5 List of key JERICO-RI Objectives.

The Business Plan has been carefully designed to help achieve these objectives in its dedicated analysis of the RI finances, services, operations, governance and decision-making methodologies and frameworks developed for JERICO-RI.

5. JERICO-RI Business model outline

To frame the JERICO-RI sustainability concept, a business model outline has been developed. A business model describes the rationale of how an organisation creates, delivers and captures value. The Business Model Canvas (BMC) concept was developed in 2010 as a tool used to describe, analyse and design business models (Osterwalder and Pigneur, 2010). It consists of nine key interlinked elements or building blocks. These are: **Key Partners, Key Activities, Key Resources, Value Proposition, Customer Relationships, Channels, Customer Segments, Cost Structure and Revenue Streams**. The business model canvas for JERICO-RI was developed as part of the Business Plan training provided to JERICO-RI partners by the University of Milan-Bicocca in 2022.

The JERICO-RI business model incorporates key elements of the Business Model Canvas concept to clearly demonstrate the ecosystem approach to the JERICO-RI design and the relationships between the key elements of the infrastructure design and how they will function. The objective of the JERICO-RI business model is to provide a blueprint for the JERICO-RI strategy to be implemented through its **organisational structures, processes, and systems**.

The original Osterwalder's Business Model Canvas (Osterwalder and Pigneur, 2010) is a widely used tool for developing and visualising business models. The Business model headings defined below show how the methodology was applied in the JERICO-RI Business Plan. Each heading was analysed from a JERICO-RI perspective to build up a picture of the structure and design of the JERICO-RI business Model (Figure 5.1).

Key Partners: describes the network of suppliers and partners whose involvement is essential for the successful operation of the organisation (e.g. government agencies, research institutes, suppliers of sensors). For JERICO-RI the key partners are listed in Figure 5.1.

Services (Key Activities): describes what must be done to provide the RI products/services.

Key Resources: describes the assets and resources required to deliver the product/service (e.g. personnel, equipment, finances/funding).

Value Proposition: describes the products and services provided, their value added and benefits/impact for customers. The Value Propositions Building Block describes the bundle of products and services that create value for a specific Customer Segment. It solves a customer problem or satisfies a customer need for both Internal and External users

Customer Relationships: describes how to build and maintain relationships with customers/users (e.g. personal interaction at conferences, workshops, etc).

Expert Centers (Channels): describes how the products and services are distributed and delivered to customers/users (e.g. intermediary service providers, website). Through which Channels do our Customer Segments want to be reached? How are we reaching them now? How are our Channels integrated? Which ones work best? Which ones are most cost-efficient? How are we integrating them with RI User routines?

Customer Segments describes the different groups of customers/users that will use the products and services (e.g. scientists, government agencies, private companies). The information in this section is based on information gathered in JERICO-S3 D9.1.

JERICO-RI Cost Book (Cost Structure) describes all the costs associated with delivering products and services (e.g. cost of equipment, personnel, etc). For JERICO-RI, the cost structure refers to the capital expenditure (upgrades, sensors, equipment, hardware) and operational expenditure (personnel, IT and data management) of the national infrastructures, the cost of service provision and the annual operational costs of the central hub (personnel, event organisation, travel, etc). The cost structure is covered in more detail in Section 6: Funding and Financial Framework.

Revenue Streams describes all revenue generated from the product/service and related activities (e.g. Physical Access Services). For JERICO-RI, the revenue streams include annual host country, member and observer monetary contributions; national research infrastructure funding; European and regional funding programmes and income from industry partnerships and collaboration. More of the detail on funders is in the ESFRI application (section D2.2).

Box 5.1 Definition of Business Model Canvas Headings

By completing each section of the Business Model Canvas (BMC), a comprehensive understanding of how JERICO-RI creates, delivers, and captures value was identified. This canvas has helped visualise the various components of the BMC and ensures that all aspects of the business are considered in the development of the JERICO-RI Business Plan.

This is an ongoing iterative process and the latest version of the JERICO-RI business model was developed using the business model canvas methodology, as seen in Fig 5.1. The BMC is a dynamic circular model with a flow between the various elements. The full details of the business model development process using the BMC methodology are fully described in JERICO-S3 D9.3.

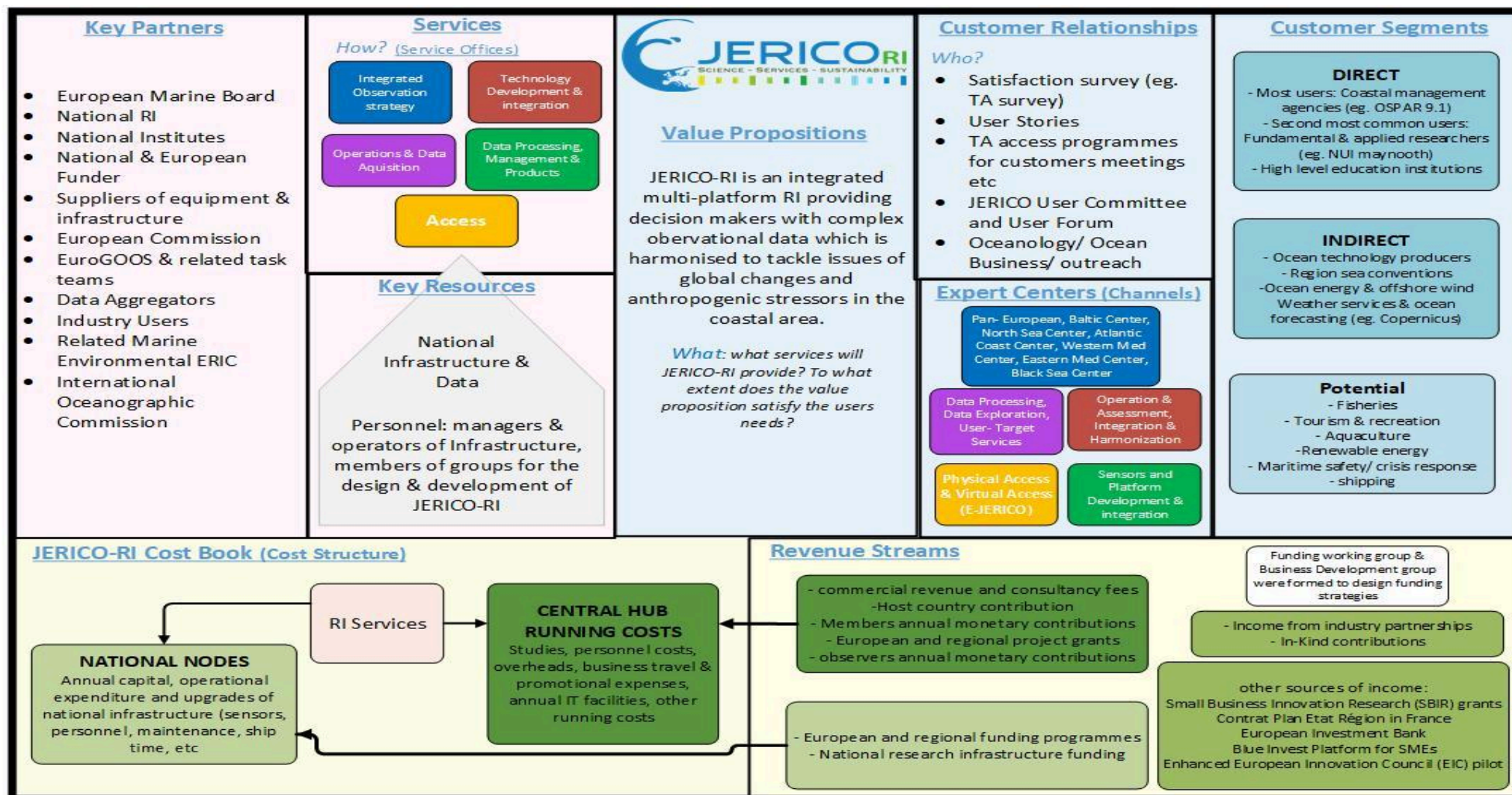


Figure 5.1: Illustration of the Business Model Canvas with the 9 Canvas Headings and how they are applied to JERICO-RI.

5.1 The Value Proposition for JERICO-RI

The Business Model Canvas (BMC) has enabled a comprehensive definition of the JERICO-RI Value Proposition to evolve during the JERICO-DS project lifecycle. The BMC framework charts the evolution of the value proposition based on the initial perspectives of the consortium partners in and subsequent refinement based on feedback from continuous engagement with different categories of users and stakeholders as reported.

The JERICO-RI Value proposition:

“JERICO-RI is an integrated multi-platform Research Infrastructure providing decision makers with complex observational data which is harmonised to tackle issues of global changes and anthropogenic stressors in the coastal area. JERICO-RI empowers a comprehensive understanding of how coastal marine systems respond to both natural and human-induced pressures. Through a systematic methodology integrating monitoring, observation, exploration, and analysis, JERICO-RI delivers trustworthy insights into the structure and dynamics of coastal marine ecosystems amidst global change. With expertise spanning environmental sciences, cutting-edge technologies, and data sciences, JERICO-RI conducts observations on an international, regional, and local scale. This is made possible by a diverse array of platforms and multidisciplinary observation systems, ensuring a holistic understanding of coastal environments.”

5.2 Key Drivers for the Strategic Development and Design of JERICO-RI Services

JERICO-RI Services are defined as actions and activities carried out for the benefit of targeted users and providing assistance to these users. They can be internal if addressing internal needs of the JERICO-RI members or external when addressing JERICO-RI external users' (non-members) needs.

For example, internal needs can be related to the day-to-day operations of the RI, as well as with research and operational issues, while external user needs are only related to products and services offered by the RI. It is envisaged that some services will be developed exclusively for the members of the RI. This can provide a 'pull factor' as external users will see a clear benefit in joining the RI and not remain as simple external users. A concept of a barter system is discussed in Appendix 3 to provide a potential mechanism to deliver these services to internal JERICO-RI users linked to the Benefit In-Kind Policy outlined in Appendix 4.

Services are represented in the Business Model Canvas as the **“How”** JERICO-RI will deliver on its value proposition. The following key drivers were considered in the identification and development of JERICO-RI Services:

- How to address the main scientific challenges relevant to the global and EU integrated landscape of marine and environmental initiatives.
- To be driven by the JERICO-RI User Strategy to implement a sustainable User-Driven Research Infrastructure.
- To be implemented in collaboration with users and stakeholders thanks to services designed and developed through their representation in the JERICO-RI User Committee (JUC).

These drivers form the basis on which relies the strategy for services elaboration. These drivers are tempered by constraints such as available budgets, resourcing and timelines related to the project life cycle development of the RI.

Taking into account these drivers, the “**What**” must be answered: what services will JERICO-RI provide and to what extent does the value proposition satisfy the users' needs? To satisfy this, the specific types of services are defined as core services that JERICO-RI will deliver to its users:

- Access to Infrastructure:
 - Physical and remote access to infrastructure and calibration facilities,
 - Virtual Access via the JERICO-CORE Virtual Research Environment (VRE).
- Harmonisation/standardisation interoperable Data,
- Virtual/real-time/ continuous access to data,
- Access to knowledge (expert advice training) and high-level education (both technical & scientific”).

Important drivers of the services to be developed by JERICO-RI include:

- JERICO-S3 key exploitable resources (KER's) - see **Table 5.1**,
- Transnational Access Programmes run by JERICO-RI projects (2012-2023),
- Virtual Access Platforms operated by JERICO-RI projects (2015-2023),
- Development of JERICO-CORE (e-JERICO, VRE) as the unified central hub to discover, access, manage and interact with JERICO-RI resources.

The services will be delivered under the management of five Service Offices (Figure 5.2) which are proposed to oversee the JERICO-RI Service offerings:

1. Integrated Observation Strategy,
2. Technology Development and Integration,
3. Operations and Data Acquisition,
4. Data Processing, Management and Products,
5. Access.

These Service Offices will then be further distilled into Expert Centers (Figure 5.3) for management at a more granular level.

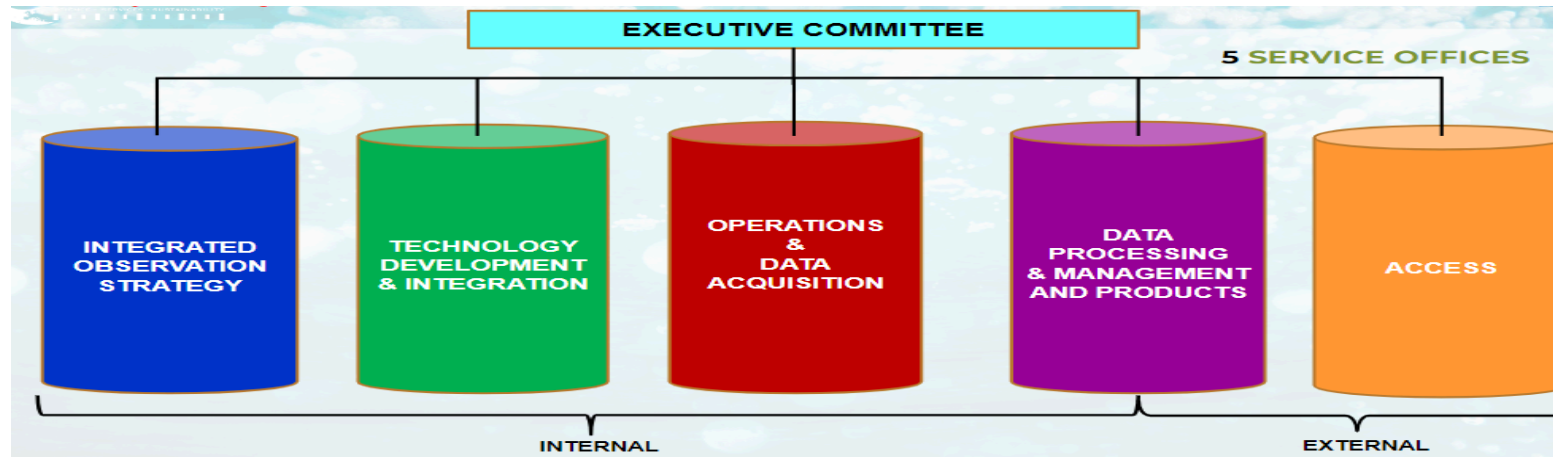
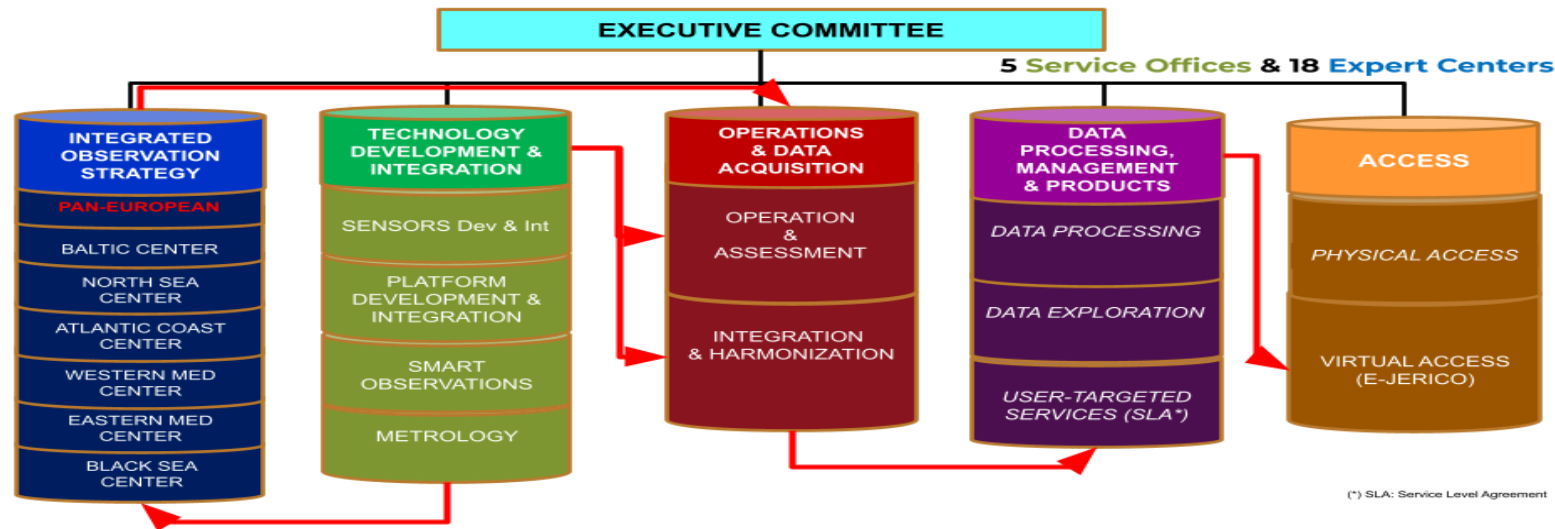


Figure 5.2 Proposed 5 Service Offices for JERICO-RI.



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Figure 5.3 Proposed 5 Service Offices with related Expert Centers for JERICO-RI.

A **Services Estimation Model** for JERICO-RI over the RI life cycle complete with a sensitivity analysis on the amount and type of services to be delivered has been completed as part of the Business Plan development. The model is aligned with the governance structure of the RI and the overall model for service development and implementation based on the Service Offices and Expert Centres in Figures 5.2 and 5.3 above.

The JERICO-RI business model will start with a limited number of services and show progress over the development life cycle of RI. It is anticipated that access services both physical and virtual, which have already been developed over the last decade of activity, would be the most straightforward to make operational first. There is also a strong recommendation from members that the services to internal members of JERICO-RI be prioritised in the services estimation model to ensure strong support from members benefitting from these Services.

A Benefit In-Kind Policy (Appendix 4) has been completed and is provisionally approved by JERICO-RI members to enable resources and support to develop and operationalise the RI Services.

The Technology Readiness Levels (TRL) which JERICO-RI provides services and support for in its services Model are as follows:

- TRL 1-3 (basic research)
- TRL 4-6 (R&D for feasibility studies and prototyping)
- TRL 7-9 (R&D for commercialisation)

In the case of the Business Plan and the definition of services, it is important to refer to the exploitation plan of J-S3 and the subsequent Key Exploitable Resources. These project outcomes can be categorised under four broad headings:

1. Technological Innovations,
2. Access,
3. Best Practices and innovative monitoring,
4. Co-operation agreements.


These project outcomes are the most developed lists of potential services and products developed and/or operationalised by the JERICO-RI community and highlight a clear strategic focus by JERICO-RI on the development of services for stakeholders. A number of potential JERICO-RI Services have been clearly defined in terms of Key Exploitable Resources (KER's) in WP2 of JERICO-S3.

As part of the services estimation model development process, the KERs in Table 5.1 were evaluated, categorised and integrated, where practicable, into a high level RI Services model for JERICO-RI. The JERICO Nations Committee representatives are also evaluating the specific services that will be provided under the various Service Offices and Expert Centers. This process will be completed as part of JERICO-S3 WP9. The model will be utilised and further enhanced during the preparatory and implementation phases of the future JERICO-RI.

Table 5.1 Summary of Key Exploitable Resources being developed under JERICO-S3 that are under consideration in the JERICO-RI services estimation model.

Project Outcome	Key Exploitable Resource	Objective of Exploitation	Who will benefit/Potential Services
Technological innovations	KER 1.1: JERICO Interoperable Instrument Module (cEGIM)	To investigate new commercial opportunities on the basis of new developments (algorithmics) and sensor payload for biogeochemistry and biology	RTSYS company under Ifremer (Host country representative) licence for the upgraded COSTOF2 module
Technological innovations	KER 1.2: JERICO Plankton dynamics multi-sensor package (PSP)	To investigate commercial opportunities. Integration of the new sensors into monitoring strategies and platforms	Coastal observing community, consulting companies, blue growth activity operators
Technological innovations	KER 1.3: Water sample filtering and preserving device (WASP)	Demonstrate a method for eDNA sampling based on a commercially available solution	Coastal marine biologists
Technological innovations	KER 1.4: Autonomous Coastal Observing Benthic Station (ACOBS)	Integration of the new sensors into monitoring strategies and platforms. Best practices in operational and integrated benthic (soft bottom) observation	Coastal observing scientific community (benthic biologists and biogeochemists)
Technological innovations	KER 1.5: JERICO-CORE e-infrastructure	Supporting the current and future JERICO-RI services	UN Decade - CoastPredict CORIS, Support JERICO-RI Services
Access	KER 2.1: VA: JERICO-CORE/VRE	Promote VA and ensure service beyond the end of the project	Users of coastal data and services JERICO-RI - Service
Access	KER 2.2: TA External international evaluation	Promote TA and ensure service beyond the end of the project	Access Service JERICO-RI - Service
Access	KER 2.3: RD&I results/success stories	Success story for engaging with stakeholders	JERICO-RI - Service
Best practices & Innovative monitoring strategies	KER 3.1: JERICO-RI Best practices for coastal observation	To implement best practices within the coastal observatories- Maximizing impact of JERICO-RI in the European landscape, maximizing interactions with stakeholders at regional level. Creating added-value for science, monitoring and sustainable growth at regional and pan-European scales.	Coastal Platform operators, CMEMS, EMODnet, nations, Monitoring Authorities JERICO-RI - Implementation/Service
Best practices & Innovative monitoring strategies	KER 3.2: Best practices for Data Management	Maximising impact of JERICO-RI in the European landscape	Coastal platform community JERICO-RI - Implementation/Service
Cooperation agreements	KER 4.1: MoC with key RIs	Making JERICO-RIs positioning in the RI landscape clear and unquestionable - Initiating new collaborations btw RIs	JERICO-RI - Implementation
Cooperation agreements	KER 4.2: Partnership with Copernicus marine service, ESA and EUMEDSAT	Elaborating fit-for-purpose products - Promoting of this products/service towards different communities, commercialization protection/IPR, start-ups	JERICO-RI- Service
Cooperation agreements	KER 4.3: Roadmap for cooperation with industries	Publishing and promoting a long-term strategy with respect to the Industry - giving confidence to investors	JERICO-RI- Service

Table 5.2 Draft version of JERICO-RI Services Estimation model over the RI life cycle phases.

RI Services		Preparation phase 2023 - 2025			Implementation phase 2025 - 2029			Operation phase 2029 - 2058			Termination phase 2059
		Worst	Baseline	Best case	Worst	Baseline	Best	Worst	Baseline	Best	
	No. of members <i>0,2 FTE per member</i>	10 members			10	11	13	13	15	19	0
Access	Physical Access Services - <i>Number of services</i>	20 services			20	30	40	20	30	40	0
Access	Virtual Access <i>HR needs</i>	1 FTE			1 FTE	2 FTE	3	0.5 FTE	3 FTE	5	0
Access	JERICO-CORE/VRE	0			1	2	3	3	5		0
Access	TA External international evaluation	< 0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0
Access	RD&I results/success stories	< 0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0
DATA PROCESSING, MANAGEMENT & PRODUCTS	Data Processing	< 0.5			Under development in JERICO-S3						
	Data Exploration	< 0.5			Under development in JERICO-S3						
OPERATIONS & DATA ACQUISITION		< 0.5			Under development in JERICO-S3						

TECHNOLOGY DEVELOPMENT & INTEGRATION	JERICO-CORE e-infrastructureJ	Under development in JERICO-S3					
	JERICO Plankton dynamics multi-sensor package (PSP)	Under development in JERICO-S3					
	Water sample filtering and preserving device (WASP)	Under development in JERICO-S3					
	Autonomous Coastal Observing Benthic Station (ACOBS)	Under development in JERICO-S3					
	JERICO Interoperable Instrument Module (cEGIM)	Under development in JERICO-S3					
INTEGRATED OBSERVATION STRATEGY							
	Training Catalogue <i>No of trainings/year</i>	<2 trainings/year	2	<5	>8	>12 trainings/year	0
	Scientific Experts <i>permanent FTEs</i>	1 FTE	1	<5	>7	>10 FTE	0

Applying a services estimation model for a marine research infrastructure like JERICO-RI involves several steps. The model aims to quantify the value and impact of services provided by the infrastructure. It is important to define the costs of the services and the revenue sources/resources that could be used to cover these costs. A template with 11 steps was developed to help structure the development of potential Services to be offered by JERICO-RI. This will ensure consistency in developing Services in JERICO-RI by providing a robust framework for quantifying each potential new services' value, impact and contribution to the objectives of JERICO-RI (see Table 5.3).

Services Estimation Model - Current Status January 2024: Specific JERICO_RI services are currently being defined by JERICO Nations Committee members. As a result, Table 5.2 Services Estimation Model is still being progressed, with a final version due for completion as part of JERICO-S3 Task 9.4 in July 2024.

The Cost Structure of RI Service portfolio will be completed in JERICO-S3 WP9 when more detail about the cost structure of the Service portfolio is available. A timeline for JERICO-RI services over the RI life cycle with sensitivity analysis is under development. More detail is required on Services, user services heading, and further details on individual services with Costs and Benefit In-Kinds.

The distinction between internal RI services and external services is ongoing in terms of prioritisation in the services estimation model. Work is continuing with National Representatives who are evaluating what services their nations can contribute to under a new JERICO-RI. The service estimation model is also helping to identify potential services that members of JERICO-RI would like to avail of, as these new services may not be available in their country. This applies in particular to calibration and metrology services and access to specialised equipment and infrastructures. The range of services offered by JERICO-RI will have to evolve and include society, policy and industry end-users, identify the impact the services have on costs, and how these services should inform and demonstrate how end-users can remedy and reduce their impact.

Table 5.3 Services Estimation Model development steps.

Service Estimation Model Step	Description
1. Define the Scope of the JERICO-RI Services:	Identify the specific services offered by JERICO-RI. These include data collection, analysis, access to research platforms, training, consulting, etc. Ensure that the list is comprehensive and covers all aspects of services provided. Define whether it is an external/internal Service or both.
2. Identify Key Performance Indicators (KPIs):	Determine the metrics that will be used to measure the performance and impact of each service. For example, this could include metrics like the number of users, units of access, data quality, research publications, user satisfaction scores, etc. (KPIs defined in Section 8.3).
3. Gather Data:	Collect historical data related to the services provided by JERICO-RI. This may include usage statistics e.g TA and VA, user feedback/stories/profiles, research outcomes, and any other relevant information.
4. Develop a Valuation Framework:	Create a framework for assigning a value to each service. This could involve considering factors such as the level of effort required to provide the service, the expertise involved, and the impact it has on research outcomes.
5. Assign Monetary Values (if applicable):	For certain services, it may be possible to assign a monetary value based on market rates for similar services. For example, if JERICO-RI provides training workshops, use estimates of the cost of similar training programs in the industry.
6. Apply the Model:	Use the established framework and valuation criteria to estimate the value of each service provided by JERICO-RI. This could involve a combination of quantitative analysis and expert judgement.
7. Consider Non-Monetary Benefits:	Acknowledge that not all benefits can be easily quantified in monetary terms. Consider qualitative factors like increased scientific knowledge, enhanced research capabilities, and positive impacts on policy-making.
8. Aggregate and Analyze Results:	Sum up the estimated values for each service to get an overall estimation of the value provided by JERICO-RI. Analyse the results to identify which services contribute the most to the overall value.
9. Validate with Stakeholders:	Share the estimated values with stakeholders, including researchers, funding organisations, and policymakers. Seek feedback and validation to ensure the model aligns with their perceptions of the value provided.
10. Communicate the Value Proposition:	Use the estimated values to communicate the value proposition of JERICO-RI to potential users, collaborators, and funding organisations. Highlight the tangible benefits and impacts of the services offered.
11. Monitor and Update and Refine	Continuously monitor the performance of services and update the estimation model as necessary to reflect changes in the scope, quality, or demand for services.

5.3 JERICO-RI's Contribution to Key European Environmental Research Policies and Priorities

JERICO-RI, as the coastal component of Europe's vast environmental data and services landscape, can make a key contribution to European Coastal Management and Policy Requirements. Its network of observatories and data management tools enable researchers, policymakers, and stakeholders to make informed decisions and take effective actions to protect Europe's coastal seas.

JERICO-RI provides:

- FAIR Access to high-quality data and data products at local, national and European scales,
- Virtual Access to specific datasets and model products,
- Transnational Access to part of its vast infrastructure.

JERICO-RI has a clear scientific strategy for:

- Assessing and predicting changes under the influence of global and local drivers,
- Assessing the impact of climate change and extreme events,
- Unravelling the impacts of natural and anthropogenic changes.

JERICO-RI is a long-term provider of data to EMODnet and Copernicus Marine; it will also be a significant contributor to:

- Europe's emerging European Digital Twins of the Ocean (EDITO),
- The innovative digital twins for end users developed under H2020 Iliad,
- The Destination Earth (DestinE) flagship initiative,
- EU Mission: Restore our Ocean and Waters.

JERICO-RI will provide coastal components to the European Open Science Cloud (EOSC). JERICO-CORE (the Virtual Research Environment of the RI) is an endorsed project of the CoastPredict programme under the United Nations Decade of the Ocean.

The services provided by JERICO-RI are available for national partners and stakeholders and continue to support coastal management, policy implementation and sustainable development at National, Regional and International levels.

5.4 JERICO-RI's Relationships with other RIs

The JERICO-RI position and its pivotal role in the European Research Landscape has been greatly strengthened through the development of strong linkages and agreements between JERICO-RI and a number of existing RIs in the broader environmental space. Thanks to an effective involvement in the ENVRI community through the Board of European Environmental RIs (BEERI), JERICO-RI has forged connections with other relevant RI's (such as **Danubius**, **EMBRC**, **ICOS**, **EPOS**, **EMSO**, **EuroARGO**, **LifeWatch**).

Joint actions have been planned as part of the Green Deal calls. The JERICO-RI partnership is particularly involved in ENVRI-FAIR and the BlueCloud initiative, which are both related to the European Open Science Cloud (EOSC), to avoid duplication of effort related to data management.

Throughout JERICO-DS, discussions between JERICO-RI and existing ERICS have developed. This has led to a number of Memorandums of Collaboration (MoC) and Memorandums of Understanding (MoU) being signed, or in the process of being signed, to strengthen and define the relations and collaborations with existing ERICs where there are

areas of common interest and mutual benefit. These agreements have helped strengthen JERICO-RI's positioning in the European RI landscape, making its role clear and unquestionable and have facilitated the initiation of new collaborations between RIs.

This strategy, aligned with a sophisticated communications and branding effort, has led to increased awareness of the importance of a JERICO-RI in the European marine research landscape. The ERIC Forum, a collaborative platform for European Research Infrastructure Consortia, has provided a rich source of strategic value for JERICO-RI's Business Plan. By engaging in the Forum's activities, JERICO-RI can adopt best practices in operational efficiency, align with European research policies, and gain access to valuable networking and partnership opportunities. Participation in the Forum enhances JERICO-RI's visibility and advocacy on a European level, allowing for better risk management and sustainability strategies. Additionally, leveraging the Forum's resources for training and capacity building can significantly strengthen JERICO-RI's workforce capabilities, keeping it abreast of the latest trends and developments in research infrastructure management, thus ensuring its long-term viability and relevance in the European research landscape.

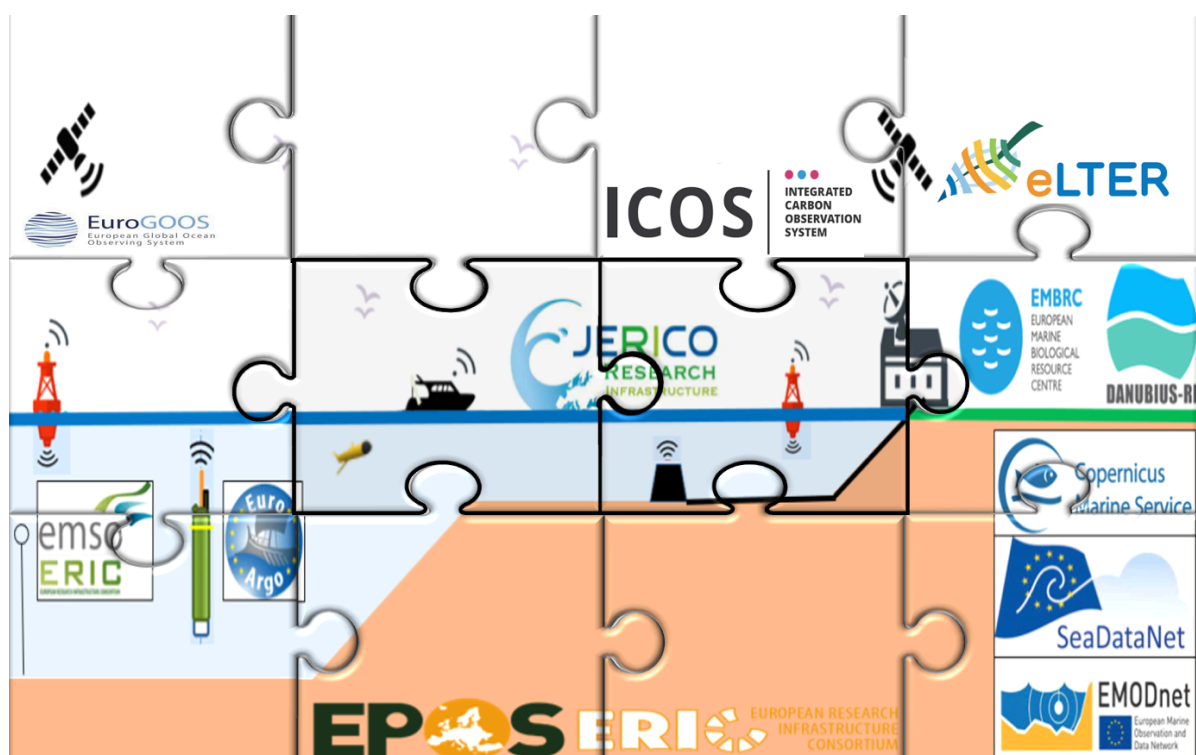


Figure 5.4 Schematic illustrating how JERICO-RI is a key component of the European Marine Research landscape and the Other RIs.

5.5 JERICO-RI User Strategy

Users are essential stakeholders in the JERICO-RI research infrastructure. Their involvement ensures a user-centric approach, drives improvements, fosters collaboration and knowledge exchange, influences policies, and empowers the research community. By actively engaging users, JERICO-RI can leverage their expertise and perspectives to achieve its objectives and effectively address the challenges and opportunities in marine research. JERICO-S3 D9.2 'User engagement strategy plan' and JERICO-DS D4.1 'User/stakeholder strategy' describe in detail the work carried out to determine the key user and stakeholder demands in a future JERICO-RI.

The JERICO-RI User Committee (JUC) was established in 2022 to ensure user input was front and centre in developing the objectives of the JERICO-RI research infrastructure. JERICO-RI is a collaborative effort of partner countries aimed at advancing marine research and fostering cooperation among researchers. The JUC serves as a vital component in facilitating user engagement, feedback, and collaboration within the JERICO-RI framework. This assessment aims to analyse the committees' effectiveness, identify areas for improvement, and ensure its activities align with the goals of JERICO-RI. The JUC is the advisory committee guiding the strategy for the elaboration of Services and Products in the framework of the JERICO-RI.

Purpose and Function of the JERICO-RI User Committee:

The JERICO-RI User Committee plays a crucial role in fostering collaboration, communication, and user involvement within the research infrastructure. Its primary purpose is to represent the interests of users and stakeholders, gather feedback, and contribute to the strategic development of JERICO-RI. The committee serves as a liaison between the user community and the JERICO-RI management, ensuring user needs and requirements are considered in decision-making processes.

Strengths of the JERICO-RI User Committee:

- **User Representation:** The committee comprises members from diverse user groups, including scientists, researchers, policymakers, and industry professionals, ensuring a broad range of perspectives and expertise.
- **User Engagement:** By actively involving users in decision-making processes, the committee promotes transparency, inclusivity, and user empowerment within the JERICO-RI framework.
- **Collaboration and Networking:** The committee provides a platform for users to collaborate, share knowledge, and foster partnerships, enhancing the overall research capabilities and impact of JERICO-RI.

Weaknesses and Areas for Improvement:

- **Representation and Diversity:** Ensuring adequate representation of user groups from all partner countries and disciplines will contribute to a more comprehensive and inclusive decision-making process.
- **Communication and Outreach:** Strengthening communication channels between the committee, users, and the wider research community will enhance engagement and increase the visibility of JERICO-RI initiatives.
- **Feedback Utilisation:** Emphasising the importance of actionable feedback and establishing mechanisms to track the implementation of user recommendations will enhance the effectiveness of the committee's contributions.

Opportunities for Alignment with JERICO-RI Objectives:

- **Research Collaboration:** The JUC can facilitate collaborative research initiatives, promoting interdisciplinary cooperation among users and leveraging the diverse expertise within the partner countries.
- **Knowledge Exchange:** By organising workshops, conferences, and training programs, the committee can facilitate the exchange of knowledge, best practices, and advancements in marine research, contributing to the overall objectives of JERICO-RI.

- **Policy Influence:** The committee can actively engage policymakers and stakeholders to advocate for marine research priorities, thereby shaping policy decisions at regional and international levels.

Conclusion:

The JUC serves as a vital link between users and the JERICO-RI research infrastructure. Strengthening its effectiveness by addressing weaknesses and capitalising on opportunities will enhance user engagement, collaboration, and the overall impact of JERICO-RI. Ensuring diverse user representation, improving communication channels, and maximising the utilisation of user feedback will contribute to the success of JERICO-RI in advancing marine research, fostering cooperation, and achieving its overarching objectives as a European research infrastructure.

The methodology presented for defining JERICO-RI users involves several steps to gather information and classify users based on various criteria. Here's a review of the methodology:

- **Definition of JERICO-RI users' typology:** The first step involves identifying and classifying users based on their sector (economic activity), category (Private, Public, Academia, NGOs, or General Public), subcategory (use of JERICO-RI), and scientific field. This typology helps assess users' needs and expectations in terms of communication and dissemination.
- **Identification of users' current usage, needs, and expectations:** This step focuses on understanding users' current usage of the infrastructure and anticipates their future needs and expectations. It helps in formulating strategic choices for targeting specific user groups with tailored actions. It also considers the development priorities of the infrastructure in terms of Products and Services (P&S).
- **Identification of stakeholders' capacity to influence the RI:** To ensure long-term engagement and sustainability, the analysis assesses the level of involvement of different users and their capacity to influence research infrastructure actions. The level of interest in the RI and the ability to influence are considered as variables for defining user involvement.

The methodology also mentions the use of a '**User Story Survey**' to gather input directly from JERICO-RI users regarding their identity, activities, usage of services, and special requirements. This survey helps gauge the level of interest in JERICO-RI and refine the P&S provided.

The methodology further includes the classification of users based on categories (Private, Public, Academia, NGOs, Military, General Public), subcategories, sectors (aquaculture, fisheries, oil & gas, etc.), and scientific fields of application or research (hydrodynamics, biodiversity, contaminants, etc.).

Overall, the methodology provides a structured approach to understanding and classifying JERICO-RI users based on various criteria. It aims to gather information, assess user needs, and support strategic decision-making for communication, dissemination, and development of products and services.

5.6 JERICO-RI as a Platform for Innovation

An operational JERICO-RI will coordinate long-term coastal multiplatform observations using consistent technologies and provide technology support to secure cost-efficiency and interoperability. In addition, JERICO-RI needs to include novel types of observations as new

coastal challenges emerge and new technologies are developed. The ability to adopt new technologies is reflected in the structure of the JERICO-RI organisation across the board.

A technical and technology outlook for coastal observatories (JERICO-DS D2.1) and a gap analysis for JERICO-RI technologies (JERICO-DS 2.2) highlight several key areas where JERICO-RI can significantly enhance its role as a platform of innovation in coastal observation:

- **Advancement in Observation Technologies:** While physical observations like sea surface temperature and salinity are operational at high TRLs in many countries, biochemical observations (e.g. phytoplankton biomass, oxygen, turbidity) vary in operational maturity. Improving harmonisation and implementing joint Quality Assurance/Quality Control (QA/QC) procedures for these observations can make the data more useful for stakeholders and compatible with other sources like satellite observations.
- **Development of Lower TRL Observations:** Many chemical, biological, and benthic observations are still at lower TRLs, either in pilot phases or under development. Enhancing the development and deployment of these observation methods can provide a more comprehensive understanding of coastal environments.
- **Funding and International Collaboration:** A major challenge identified is the lack of sustainable funding, particularly for advancing technologies from TRL8 to TRL9. This funding gap hinders the operational use of innovative methods. Enhancing funding opportunities and encouraging international collaboration can bridge this gap, allowing for more consistent and widespread application of best practices and harmonisation in observations.
- **Improving Spatial and Temporal Coverage:** Current gaps in spatial coverage (e.g., near-coast vs. open ocean) and temporal frequency of coastal observations, especially for biochemical or biological variables, limit the understanding of coastal dynamics. Expanding these observations can provide a more detailed and dynamic picture of coastal ecosystems.
- **Data Accessibility and Interoperability:** The gap in data accessibility and interoperability means that not all collected data are available for use by relevant stakeholders like Regional Sea Conventions (RSC). Improving these aspects can enhance the utility of the collected data.
- **Strengthening Stakeholder Collaboration:** There is a need for stronger collaboration with stakeholders such as RSCs and the Copernicus Marine Service (CMS). This can improve the usability of coastal observations and align them more closely with stakeholder needs.
- **Addressing Global Challenges:** With increasing use of coastal waters and threats like climate change and biodiversity loss, JERICO-RI can play a crucial role in providing the necessary observations to address key scientific challenges related to coastal waters.

In summary, by addressing these challenges and leveraging opportunities for improvement, JERICO-RI can evolve into a more effective and innovative platform for coastal observation, thereby significantly contributing to a better understanding and management of coastal ecosystems.

5.7 Role of the JERICO Label

The JERICO-RI Label is a set of criteria defined to ensure standardisation, interoperability, and the quality of data for coastal observatories. It has been defined in detail in JERICO-DS D5.5.

The JERICO-RI community will reach a new level of quality and relevance to society by implementing the JERICO Label. The JERICO Label aims to monitor the quality of observation performed by all its individual systems, ensure an improved harmonisation and integration of its components, and provide referenced tools for supporting a cost-efficient expansion of the system of systems. At the present time, the JERICO Label is internal to the JERICO-RI community to provide organisation and rules, both as a network and as a research infrastructure. The Label is not meant to “exclude” anything or anyone in any way. In the short term, its function can be viewed as a “technical” descriptor that can serve as a management tool for the JERICO-RI. However, the wider goal is to try and establish a kind of consensus-based “benchmark” for characterising the capabilities of coastal RIs in European waters that can be freely adopted by any interested party on a purely voluntary basis, provided compliance and with the set requirements are met.

To develop, enhance and sustain the scientific research excellence framework of JERICO-RI, the JERICO-RI has developed the concept of a **JERICO Label** in order to:

- Acknowledge a consensus on guidelines for best practices in the design, the implementation, the maintenance, the data policy and the valorisation of operational coastal observatories,
- Achieve fair recognition of the quality of the managed observatories for the partners and all newcomers that comply with this Label,
- Help stakeholders becoming aware of the European interest in the development of high-quality coastal observatories,
- Foster a wider market for the industry in sensor technology and platforms based on the agreed recommendations.

To define the JERICO Label, the following are taken into account:

- The heterogeneity of the coastal observing systems to address the multiple space and time scales that characterise the variability of the coastal ocean,
- The compliance with other normative efforts (EU projects such as SeaDataNet & MyOcean, EU initiative EMODnet),
- The specificity of the coastal environment,
- The heterogeneity of the processes and interacting scales,
- The advancements on the observing technology and data transmission and availability,
- The advancements on the scientific knowledge of marine ecosystem processes.

The above makes clear that the best definition of a JERICO Label is that of “fit for purpose”, where each observation system must show that it fulfils a set of requirements emanating from the observational purpose. A diversity of economic drivers and scientific objectives has resulted in a range of coastal monitoring operators, which JERICO-RI can bring together in a community and promote.

The perceived mechanism is an **audit procedure**, which describes the equipment, maintenance operations, the calibration, and anti-biofouling procedures as well as the data processing and handling of participating JERICO-RI observatories.

In addition, elements of the Governance Structure, KPIs, Values, Ethics and JERICO's Role in the Ocean Best Practices Systems (OBPS) are also included in the JERICO Label Definitions (JERICO-DS D5.5). A JERICO Label Committee has been established in 2022 to manage the future technical development and evolution of the JERICO Label.

5.8 Market Trends and Outlook

Global megatrends are grand challenges affecting society that provide both a source of innovation and opportunities for the development of JERICO-RI. The JERICO BMC provides a mechanism to determine how the JERICO Business Plan can adapt and evolve to assess markets and technologies and how to interact with these megatrends. Together with our stakeholders and users, JERICO-RI creates information and knowledge to respond to the pressing societal, environmental, and private sector needs and challenges posed by these megatrends.

The JERICO-RI embraces emerging technologies which will revolutionise the way the ocean is observed. Developments in **biotechnology** (molecular and optical sensors, omics-based biology) will soon provide direct and online access to chemical and biological variables, including in situ quantification of harmful algae and contaminants. Using **artificial intelligence (AI)** in conjunction with the **Internet of Things (IoT)** provides operational platforms autonomy and remotely operated smart sensors. Embracing key technologies, high-quality open access data, modelling and satellite observations will support sustainable blue growth, warning and forecasting coastal services and a healthy marine ecosystem.

The EU Blue Economy report for 2022 (European Commission, 2022) continues to analyse the scope and size of the Blue Economy in the European Union. It aims at providing support to policymakers and stakeholders in the quest for a sustainable development of oceans, coastal resources and, most notably, to the development and implementation of policies and initiatives under the European Green Deal in line with the new approach for a sustainable Blue Economy. Through its economic evidence, the report also seeks to serve as a source of inspiration to investors.

5.9 Main Markets Affected and Technology Drivers

The JERICO-RI BMC incorporates analysis on Blue Economy trends in relation to its services estimation model and RI design.

The EU Blue Economy report for 2022 (European Commission, 2022) report also states that:

“Instrumental to the transition towards a sustainable Blue Economy and enhanced international ocean governance is the ability to accurately map, quantify and value marine ecosystem services, as well as to monitor blue natural capital accounts and the social and environmental impacts caused by anthropogenic activities. Effects of human-induced pressures can be found in 93% of European seas, putting at risk the health of almost 40% of the population living within 50 km of the 68,000 km European coastline.”

It is clear the JERICO-RI, as a pan-European coastal marine infrastructure, will play an important role in this transition.

5.10 Technology Transfer pathways

As highlighted in Table 5.1, there are a number of JERICO-S3 project outcomes known as KERs, which are considered the most mature in terms of potential S&Ps to be further developed and/or operationalised by the JERICO-RI community. The establishment of a **Technology Development and Integration Service Office** with 4 associated 'expert

centers' on sensor development, platform development, smart observations and metrology will develop the technology transfer pathways within the JERICO-RI service offering.

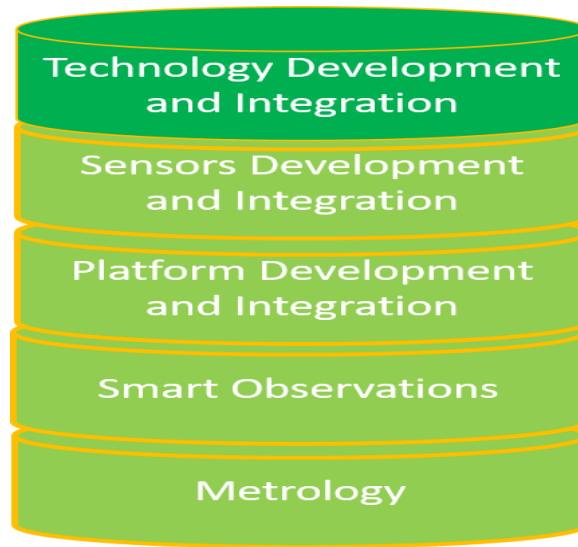


Figure 5.5 JERICO-RI Technology Development and Integration "Service Office" with 4 associated **expert centres** designed to drive the technology transfer process.



Figure 5.6 JERICO-RI Technology Transfer process.

The technology transfer plan for JERICO-RI's marine research infrastructure aims to foster efficient and seamless knowledge exchange within the European research landscape. Aligned with the strategies of other ERICs, this plan prioritises several key elements:

- **Collaborative Partnerships:** Establishing strategic alliances and partnerships with other European RIs to facilitate the sharing of technological advancements, methodologies, and best practices related to marine research. This collaboration allows for a cross-pollination of ideas and resources, promoting innovation and maximising the impact of technological developments.
- **Knowledge Exchange Platforms:** Developing dedicated platforms, workshops, and forums that facilitate the exchange of scientific and technical expertise between JERICO-RI and other European consortia. These platforms serve as arenas for researchers, industry experts, and stakeholders to share insights, discuss challenges, and explore opportunities for collaboration in technology development and implementation.
- **Standardisation and Harmonisation:** Ensuring compatibility and interoperability of technologies and data formats across different European RIs. By adhering to common standards and protocols, JERICO-RI aims to streamline technology transfer processes, enabling smooth integration and utilisation of shared resources.
- **Training and Capacity Building:** Implementing training programs and capacity-building initiatives focused on technology adoption and utilisation. These programs target researchers, technicians, and stakeholders, empowering them with the necessary skills and knowledge to effectively leverage cutting-edge technologies within the marine research domain.
- **Innovation and Commercialisation Support:** Encouraging innovation and facilitating the commercialisation of research outcomes by providing support mechanisms, such as technology transfer offices, intellectual property management strategies, and industry collaborations. These efforts aim to bridge the gap between research findings and practical applications, fostering economic growth and societal impact.

By aligning JERICO-RI's technology transfer plan with the strategies of other ERICs, a cohesive and synergistic approach will be established. This collaborative effort promotes the exchange of expertise, accelerates technological advancements, and enhances the overall impact of marine research across Europe. Contract research and collaborative research are envisaged as the most used technology transfer pathways for JERICO-RI, followed by patents and licensing of the intellectual property generated.

5.11 Data Policy

The JERICO-CORE information security policy, described in detail in **JDS D3.1 (Legrand et al., 2023)**, aims at securing JERICO-CORE data, information, and services against any loss of conformity, integrity, and availability due to incidents, human errors, or malicious attacks. Because the latter cannot be totally avoided, the JERICO-CORE information security policy establishes an Information Security Management System (ISMS). The ISMS ensures that security risks are assessed at all stages of the JERICO-CORE lifecycle, from design to operation and decommissioning. The ISMS systematised the identification of potential risks, threats, and vulnerabilities in the JERICO-CORE distributed architecture and anticipate their adverse consequences. The ISMS emphasises planification activities for security risk treatment and establishes an incident management system in which incidents that have compromised information security are reported and documented. The incident management system also encompasses steps for containing the damage, investigating the incident, and taking appropriate corrective actions to prevent similar incidents in the future. The ISMS frames periodic auditing and security reviews to identify security improvement actions.

Finally, the ISMS includes training and awareness-raising programs for JERICO-CORE actors, users, and stakeholders to educate them on specific security risks.

The intellectual property rights for physical and remote projects funded by JERICO-RI will be agreed upon between the user, the facility operator and JERICO-RI CMO. Data acquired by users during an experiment supported by JERICO-RI pertaining to environmental parameters shall be made publically available to third parties. In most cases, the user must provide the JERICO-RI CMO and a National Oceanographic Data Centre (NODC), preferably within the SeaDataNet network, or one of the JERICO-S3 data centers interfaced with SeaDataNet or CMEMS In situ TAC with the metadata and, where possible, the raw data collected during the experiment.

5.12 Access Introduction

Physical and remote access to JERICO-RI infrastructures has been provided by the transnational access programme over the last 10 years, and has facilitated European coastal ocean projects in research, novel experiments, and innovative marine technology testing. Throughout three projects (JERICO-FP7, JERICO-NEXT, JERICO-S3), JERICO-RI built upon and enhanced a strong demand from the coastal marine research community for efficient physical and remote access to marine research infrastructures, enabling better research outcomes through well-managed access practices. Access to the JERICO-RI coastal observation infrastructures has proven to be a key service provided, where Table 5.4 shows the development of the programme since the inception of JERICO-FP7 and highlights the demand for a continued access programme. A clear trend shows more infrastructures and access days being offered to meet the demand of the user community from the previous JERICO-RI projects (Loughlin et al., 2023).

Table 5.4 The decadal development of JERICO-RI TA programmes.

	JERICO-S3 (2020-2024)	JERICO-NEXT (2015-2019)	JERICO-FP7 (2011-2015)
Infrastructures on Offer	42	35	14
Targeted facilities (% vs offered facilities)	23 (55%)	24 (69%)	13 (93%)
Submitted TA projects	49	40	24
Supported TA projects (% vs submitted projects)	41 (84%)	28 (70%)	19 (79%)
Days of Access Offered	4466	4128	1385
Number of users (Women, %)	131 (39, 30%)	102 (29, 28%)	55 (14, 34%)
Non-EU Users ⁸	8	5	2

Infrastructures offered for access will be dependent upon the facilities that represent JERICO-RI member countries. JERICO-RI coastal observing systems are mapped

spatially in Figure 4.1, of these infrastructures, 42 were offered in JERICO-S3. Infrastructure type is totalled as some nations offer more than one infrastructure in some categories. A complete description of each facility can be found in JERICO-S3 D8.1 (Gaughan, et al., 2021).

Figure 5.7 shows the most used type of infrastructure, both physical and remote access, across all three JERICO-RI projects. Gliders were the most used facility type, with 22% of the projects supported, followed by fixed platforms and cabled observatories (Loughlin, et al., 2023). These top three infrastructure types should be focused on for physical access in JERICO-RI.

Table 5.5: Example of the 42 infrastructures across 13 nations offered during JERICO-S3.

Type of Infrastructure	BE	DE	EE	ES	FI	FR	GB	GR	IE	IT	NO	PT	SE	total on offer
Cabled Observatory														5
Ferrybox														8
Fixed Platform														16
Glider and AUVs														6
Multi-Platform Facility														3
Supporting Facility														3
Special Equipment														1

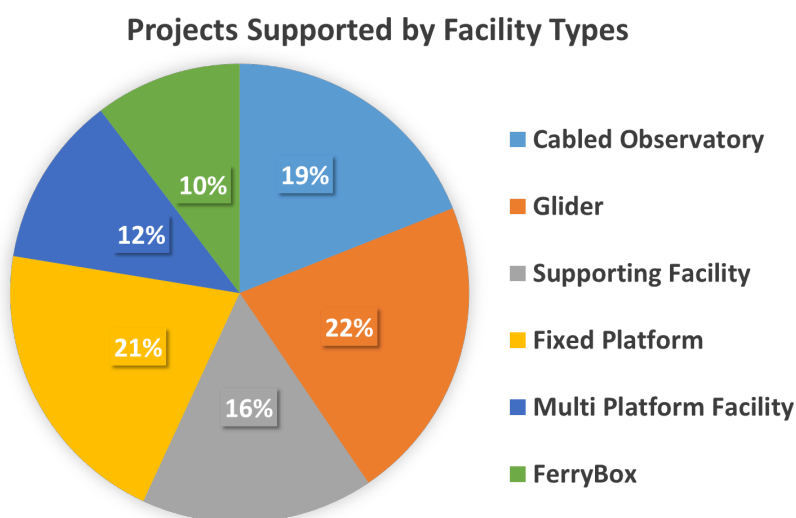


Figure 5.7 The percentage of physical access projects supported by each facility type across all three JERICO-RI TA programmes.

One of the key aspects of JERICO-RI is the access to multi-platform coastal observatories located in the different regions of Europe. The availability for access to these infrastructures allows for a wide selection of projects and users with varying interests (biology, chemistry, physical oceanography, etc.) to conduct experiments under very different oceanographic conditions. Table 5.6 shows examples of TA projects that showcase the different uses of JERICO-RI infrastructure. Users have taken advantage of the infrastructures to use multiple facilities for the highest quality results from experiments (Loughlin et al., 2023).

Table 5.6 Sample of the broad range of Transnational Access research projects enabled by JERICO-RI infrastructures.

Use of infrastructure(s)	Project Name, country of leading organisation	Infrastructure(s), country(ies) of facility
One project and one infrastructure (glider) across many years and JERICO-RI projects to maintain a monitoring line of the water column in the Algerian Basin.	ABACUS, Italy	SOCIB glider, Spain
One SME uses many types of infrastructure in various locations to test a new underwater pH sensor. This company is a repeat JERICO-RI user having projects in both JERICO-NEXT and in JERICO-S3.	ANB sensors, UK	OBSEA coastal observatory (ESP), HCMR multi-platform facility (GRE), & FMI Utö Atmospheric Marine Research Station(FIN)
Many projects took place in one facility, facilitating knowledge sharing between 17 scientists from different countries.	AQUA-Action 1 & AQUA-ACTION 2 - Germany OBS-EXP-Bridge- Italy BalhObEx- Greece	SYKE MRC Lab Algaine FINNMAID - Finland
A research based project testing an instrument across two different environmental conditions using cabled observatories to compare the collected data.	FISHES A and B- UK	OBSEA coastal observatory (ESP), SmartBay Cabled Observatory (IRE)

JERICO-RI also provides Virtual Access (VA), with 22 VA infrastructures offered in JERICO-S3. This service varies in formats such as a website, an API, a repository on github and can contribute to different types of resources like datasets, added-value products, software, documents, etc. (Rita et al., 2022). A review of the access to the JERICO-RI in **JERICO-S3 D9.1** (Fernández, et al., 2021) found that the main type of access is Virtual Access at 15% more than the Physical Access to JERICO-RI facilities. This indicates that the efficiency of the RI depends on its capacity to provide both access types.

5.12.1 Access Policy

A key service for JERICO-RI is access to high-quality pan-EU coastal infrastructures. A standard and clear procedure for managing user access requests within JERICO-RI is envisaged, enabled by the Service Level Agreements (SLAs) and implemented by the JERICO-RI Secretariat in interaction with the Liaison Officers in the National Nodes. The first point of entry for users will be the JERICO-RI website, with a service offer interface presenting the service portfolio and an online access request form.

JERICO-RI offers access to different platform types under the following categories: cabled observatories, ferryboxes, fixed platforms, gliders and AUVs, multi-platform facilities, supporting facilities, and special equipment. Access to infrastructure is provided through three different avenues:

1. **Physical Access** allows the user to physically visit the infrastructure either for free of charge or at a cost,
2. **Remote Access** allows users to access the infrastructure services without having to physically visit the site, and
3. **Virtual Access** refers to the free access of e-infrastructure through the data resources and associated services and can be used by a multitude of users.

Physical and remote access is competitive access and must be applied for with a selection process based criteria for scientific excellence, availability and work plan, and seeding links to industry.

The access policy for physical and remote access was first developed in **JERICO-S3 D13.3** (Gaughan, et al., 2021) and is now integrated into the JERICO-RI Business Plan. Access requests financially supported by public funding managed by JERICO-RI (notably TA funding) will be screened for ethical compliance and practical feasibility by in-house RI staff at the requested sites, and subsequently evaluated by a largely external User Selection Panel (USP) and ranked based on scientific/technological quality and originality, pertinence to JERICO-RI thematic priority areas, environmental impact/ethics, and innovation potential of the submitted proposals. The “user” is the external commissioner of the services from JERICO-RI. Access requests using their own funding for commercial uses will be checked for eligibility based on ethical compliance and feasibility.

Virtual Access policy is outlined in **JERICO-S3 D11.1** (Rita, et al., 2021), where it uses access metrics to assess the impact of VA. Each VA infrastructure has its own form of access, depending on what the service is. A Virtual Access Metrics System (VAMS) was developed to monitor the access metrics of the JERICO-RI VA services (Rita, et al., 2021). The main metrics measured were outreach activities and VA concept of how the VA will fit into JERICO CORE. These metrics should continue to be monitored in order to assess the impact of the VA service. A pilot of JERICO-CORE can be found [here](#) where it compiles JERICO resources into one queryable platform.

JERICO-RI CMO will monitor the quantity of access, type of user (academia, industry, policy, others), geographic distribution, and user satisfaction through a feedback mechanism, implemented as part of quality assurance for continuous improvement of access services.

The access policy, outlined in **JERICO-DS D3.1 (Legrand et al., 2023)**, describes the JERICO CORE service desk as the primary point of contact for users, and the JERICO CORE resource catalogue provides an exhaustive description of the JERICO-RI online and physical resources, products, datasets, documents, tools, Virtual Research Environments (VREs), and other functionalities and services accessible to JERICO-RI users. The Access Policy is guided by the principles and recommendations of the European Charter of Access for Research Infrastructure and aims to promote scientific excellence, international cooperation, and knowledge dissemination. The deliverable describes the users, the resource catalogue and JERICO-RI responsibilities.

5.12.2 Access Modes

Access modes, as described by the European Commission (ESFRI, 2016), to the RIs for physical and remote use are:

- **Excellence driven** is based on the scientific excellence, originality, quality and technical and ethical feasibility of the users' request for access. This mode enables users to access high-quality facilities in all geographic locations, nurturing international, collaborative relationships.

- **Market driven** mode is defined through an agreement between the user and JERICO-RI and may lead to a confidential fee for access based on the user request.
- **Internal driven** access will be access provided to other JERICO-RI members using JERICO-RI facilities. This will be based on availability, feasibility, and will not give priority over the previous two modes.

Virtual access is accessed through a wide mode, guaranteeing the maximum reach to users for free use of data resources and digital services and not limited to a geographical location.

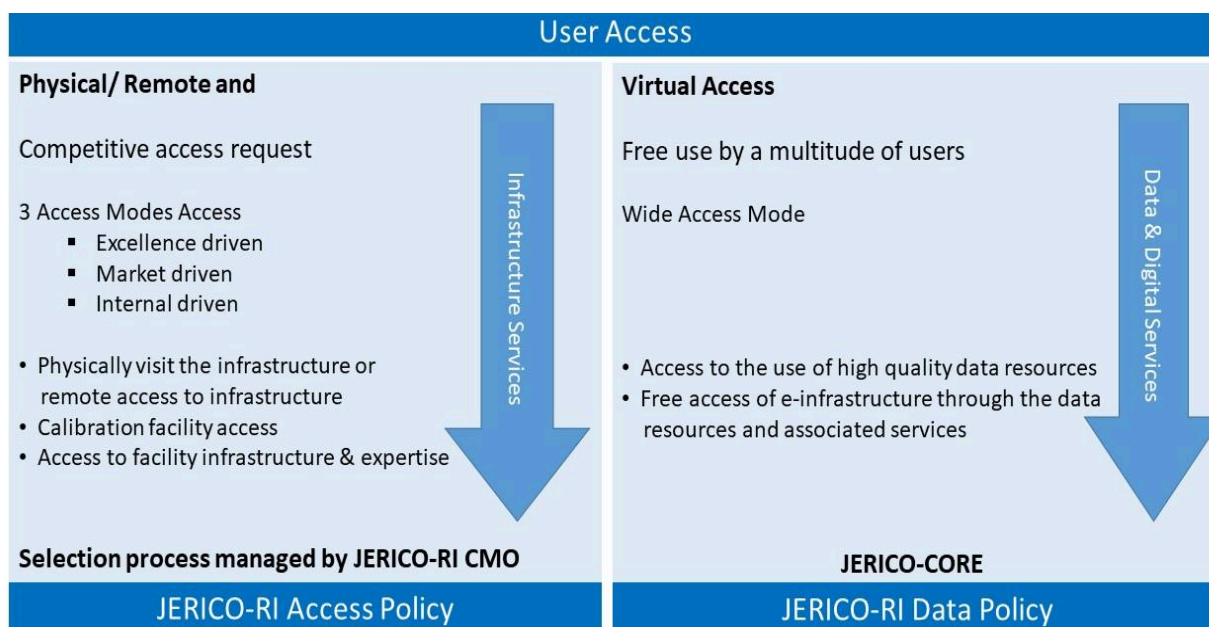


Figure 5.8 Schematic illustrating the JERICO-RI access modes.

5.12.3 Unit of Access Costs

The costs for physical and remote access to research infrastructures is quantified in units of access. While costs will vary greatly on the type of infrastructure platform, units of access will be reported using days (where possible) to standardise the reporting between the various types of infrastructure. If a minimum or maximum number of units of access days are to be provided by a facility, this must be noted on the users' interface for access requests. Unit costs should be calculated by the facility operator based on the guidelines of the Horizon 2020 cost calculation (Horizon Europe Programme, 2022), which are outlined below as an excerpt from the guidelines.

- Unit costs calculated in accordance with their historical data for the categories of eligible costs (listed in the guidelines).
- The reimbursement of eligible costs actually incurred for the categories of eligible costs.
- A combination of the forms of costs referred to in points (a) and (b), if part of the eligible access costs varies significantly and cannot be represented by its average.

Costs for market driven requests must be calculated by the facility operators and agreed upon with the user.

Internal driven costs will use the system described in Appendix 3 using the JERICO-RI Points (Barter) System. The points system will work as an exchange when a member has the qualifying points to trade for services.

JERICO-CORE units of access and costs will be clearly stated in the resource catalogue (Legrand., 2023). For instance, an access unit could be the number of gigabytes downloaded or the number of hours (used on the VRE). Costs and fees associated with units of access for the use of a resource will be listed on the price list and must be transparent.

5.13 Communications and Branding

With the objective of establishing JERICO-RI as a prominent and influential community comprising scientists, policymakers, industries, investors, and the general public, the core aims of the communication plan are as follows:

- Enhance JERICO-RI's visibility within the relevant communities.
- Strengthen JERICO-RI's position as a leading entity in marine research, ecology, policy support, and RD&I endeavours.
- Promote JERICO-RI's service offerings and ultimately attract a larger user base.
- Foster the development of a robust and influential community around JERICO-RI, encompassing stakeholders and users from academia, industry, policy, and the general public.
- Reinforce the organisational efficiency and effectiveness.

The Branding Strategy is in line with the JERICO-RI Business Plan. Drawing from a unified JERICO-RI corporate identity, JERICO-RI employs standardised corporate communication materials, including presentations, email signatures, official correspondence, business cards, etc. This approach ensures clear external recognition of the JERICO-RI brand. Furthermore, National Nodes will adhere to prescribed national branding elements in all instances where they represent JERICO-RI, particularly in presentations and their online presence.

5.14 JERICO-RI Business Model Summary

This JERICO-RI Business Model has incorporated findings from the ERIC Forum Implementation project (2022), which analysed the modus operandi of 27 existing ESFRI RIs to support the planning of their sustainability.

The Business Model operating as an ERIC legal entity will initially include a minimum of 42 facilities/ infrastructures (based on infrastructures made available in JERICO-S3). These infrastructures will make available to JERICO-RI up to a maximum of **20%** of their available access time to service demands from JERICO-RI users (internal and external). With infrastructures having on average annual availability of 44 weeks per year and each infrastructure making available a conservative 5% of their total access time, this results in the initial JERICO-RI working with infrastructures spread across 14 European states and providing a minimum of 431 days of access in the first year of operation - see Appendix 4. The Services Estimation Model (SEM) under development describes a pipeline of JERICO-RI S&Ps managed across 5 Service Offices and 18 Expert Centres, which will drive the development and expansion of RI services. The business model is based on the assumption that the technical and financial viability of the services is based on in-kind contributions from the members - see Section 7.9 on Benefit in Kind contribution and Appendix 4.

The path to sustainability commences with the succession of JERICO-RI project to the ESFRI roadmap, with anticipated acceptance by the end of Q4 in **2025**.

Once accepted on the ESFRI roadmap, the consortium will prepare the required legal framework and business structure together with securing the required political and funding commitments as well as the participation of the National Facilities required to facilitate an

application to become an independent legal entity. It is anticipated that the application to be recognised as an ERIC will be made at the end of **Q4 2028**, with granting of formal recognition anticipated at the beginning of **Q1 2030**. At this point, the JERICO-RI has a legal framework to allow it to begin operating as a not-for-profit entity. The timelines reflected herewith capture similar timescales associated with other ESFRI entities applying to and being awarded ERIC legal framework status. Therefore, these timescales are recognised as realistic.

6. JERICO-RI Structure - Business, Governance and Organisation

6.1 Business and Legal Structure

Due to the nature of operation and legal framework requirements for bringing together pan-European distributed infrastructures with their own legal structures, a range of governing frameworks were investigated. These ranged from registered companies in individual Member States to registered charities in a European member state (AISBL). Following these studies, a standardised ERIC organisational structure was adopted as the most appropriate legal environment for the management and governance of JERICO-RI. The ERIC structure is a pan-European recognised legal structure established specifically to support an amalgamation of scientific infrastructures operating as a collective body. It enables the establishment and operation of distributed research infrastructures on a not-for-profit economic basis within Europe. The ERIC will be operated in accordance with the Statutes and a set of accompanying Implementing Rules.

The following deliverables describe in detail the proposed Business Legal Structure:

- **JERICO-S3 D9.4** Proposed organisation structure, and long term governance,
- **JERICO-DS D5.3** Conceptual Design Report of JERICO-RI, structure of legal entity and way forward.

JERICO-RI is developing an ontology to specifically identify key terms and provide a simple definition of the business and legal structure terminology:

Governance: the system by which an organisation makes and implements decisions to achieve its goals.

Assembly of Members: one representative from each Member State (the national delegate) that may be accompanied by one or more advisors. The national delegate is appointed by the Member State.

Scientific, Technical and Ethical Advisory Committee: a collegial body appointed according to specific rules to provide advice to the Assembly of Members.

Director General: the legally responsible Head of JERICO-RI appointed by the Assembly of Members for a fixed period.

Executive Committee: a collegial body elected from their peers, according to specific rules, for the operation and management of the JERICO-RI.

Office: performs the managerial function of planning, organising, directing and controlling. These managerial functions are related to office management. They are needed to achieve office objectives. An office can be virtual or physical.

Expert Center: a group of experts responsible for discussion and strategy within some specific key scientific or technological domains, needed for activities and the generation and operation of specific centers. An Expert Center can be virtual or physical.

Services: actions and activities carried out for the benefit of targeted users and providing assistance to these users. They can be internal if addressing the internal needs of the JERICO-RI or external when addressing JERICO-RI external users' needs.

6.2 JERICO-RI Legal Entity

The highest level of governance in JERICO-RI will be the **Assembly of Members** who have the ultimate decision-making powers of JERICO-RI. The Assembly of Members will be advised by the Scientific, Technical and Ethical Advisory Committee of independent experts. The Director General will report to the Assembly of Members on the strategic, scientific, legal, financial and operational aspects of JERICO-RI. The Director General will be supported in these activities by the JERICO-RI Central Management Office (CMO), which performs the administrative functions of JERICO-RI (legal advice, financial accounting, HR services, etc). The Executive Committee will be responsible for the operation and management of JERICO-RI and report to the Director General. The Executive Committee will also be supported by the CMO. A complete description of the governance principles and description of the Executive & Operational Levels is available in **JERICO-S3 D9.4**.

6.2.1 Host Country

France is the agreed host country for a future JERICO-RI after successfully leading consecutive JERICO-RI European projects.

6.2.2 Membership

JERICO-RI is made up of 39 partners, including scientists, modellers, technicians, and stakeholders who provide a central hub of coastal expertise within individual Member States and across Europe. It is an extensive coastal observation of almost 700 platforms monitoring Europe's vast coastline, spanning 19 countries covering 13 regions.

6.3 Governance and governing bodies

The proposed governance of JERICO-RI is organised in **three** levels. The **Decision level (1)** includes the Assembly of Members, Director of the RI (CEO). The **Executive level (2)** (or Head Office, HO) includes the Management Office, the heads of financial affairs and administrative affairs, the Steering Committee (including representatives from the JUC), regions representatives, the chair of the Research, Innovation and Excellence unit, the head of the JERICO-RI User Access Unit (JUA), the head of the Data & Operation (D&O) unit. The **Operation level (3)** comprises the Service Offices, Expert Centres, the JUA, and Advisory bodies such as the User Forum and the external Scientific and Technical Advisory Committee (STAC).

JERICO-RI will be governed at the highest level by the Member States that have joined the ERIC. The governance system that each Member State adopts internally is a matter for each individual Member State. However, the following is a proposed governance mechanism for consideration by each Member State and allows for the regional specificities of JERICO-RI:

- Each Member State appoints a national delegate to the Assembly of Members.
- It is proposed that each Member State appoints one "Head of Country" delegate as its country's representative to the JERICO-RI Executive Committee.
- It is proposed that each Member State also appoints at least one delegate to each Office. For the Access Office, it is proposed that each Member State could appoint one delegate from each institution that forms that Member State's JERICO-RI. For the Data, Science, Technology, and Operations Offices, it is proposed that each Member State appoints one delegate from each Region in which that Member State's JERICO-RI operates.
- Each Member State can provide additional personnel to each Office or Expert Center to deliver specific Services as required.

For example, point 3; if France joins JERICO-RI with both Ifremer and CNRS as partners in JERICO-RI, then, for the Access Office, France could appoint one delegate for Ifremer platforms and one delegate for CNRS platforms. For the Data, Science, Technology and Operations Offices, France could appoint two delegates to each office (one from the Atlantic Margin Region and one from the Western Mediterranean Region), or a single representative to represent France's interests in any of the offices; likewise for each Member State that joins JERICO-RI.

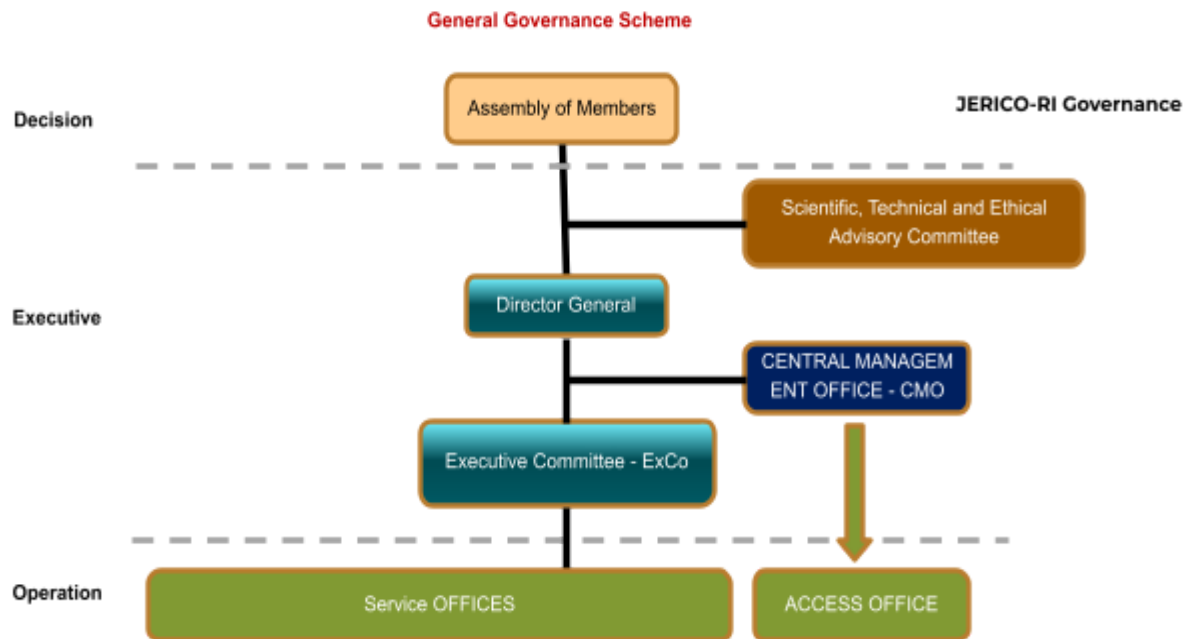


Figure 6.1 Summary of Proposed JERICO-RI Governance Model.

- The highest level of governance in JERICO-RI will be the Assembly of Members who have the ultimate decision-making powers of JERICO-RI.
- The Assembly of Members will be advised by the Scientific, Technical and Ethical Advisory Committee of independent experts.
- The Director General will report to the Assembly of Members on the strategic, scientific, legal, financial and operational aspects of JERICO-RI.
- The Director General will be supported in these activities by the JERICO-RI Central Management Office, which performs the administrative functions of JERICO-RI (legal & contract, financial accounting, HR services, etc)
- The Executive Committee will be responsible for the operation and management of JERICO-RI and report to the Director General.
- The Executive Committee will also be supported by the Central Management Office.

Considering the distributed nature of the proposed RI and the adopted practices in the established ERICs, the **Assembly of Members (AoM)** will be the highest decision-making body and shall be composed of delegates of all the Members duly authorised for such purpose. Each delegate may be accompanied by one or more advisers (the terms will be defined in the internal rules). The AoM discusses and decides all major policy directions, the formation and dissolution of subsidiary bodies, approves the annual accounts and provides instructions and guidance to the CEO. The CEO is the Director General of the RI and s/he will be appointed by the AoM for a certain period of time (~three years) with the option for

re-appointment for one further term. The CEO will be an "ex-officio" member of the AoM without voting rights.

The CEO, as legal representative of the JERICO-RI, will be responsible for supervising the operation of the RI through the Headquarters consisting of the Management Office (MO) and other Executive bodies and his/her office will prepare the agenda and logistics of each of the meetings of the AoM, in close collaboration with the Chair of the AoM.

Indicatively, the CEO, in close collaboration with the MO, will submit for approval and present to the AoM the strategy and Implementation Plan, the annual program and budget, the statements of account of the previous year, MO activity reports for the previous year and future plans including the participation to projects for the coming year(s).

Moreover, the CEO will be responsible for the recruitment plan (in coherence with the budget and the RI hiring procedures), which will be approved by the AoM as part of the annual program. The CEO will inform on a regular basis the Chair of the AoM on any important activities.

The **RI Director** is appointed by the **Assembly of Members**, to whom they report back. The RI Director heads up the executive and manages the day-to-day operation of the ERIC to include:

- Financial management and control,
- The executive will manage the budget to support the deployment of JERICO-RI activities and its administrative support function,
- Employment regulations,
- Equal opportunities,
- Talent attraction, performance management and staff training,
- Corporate responsibility,
- Responsible research and innovation,
- Insurance and liability.

6.4 Operational Structure of JERICO-RI

The research infrastructures participating in the JERICO-RI are based in different countries and operate under a variety of in-country regulatory guidelines. Given the distinct national governing regulations dictating their operations, the **JERICO-RI Central Management Office (CMO)** will establish **Contractor-Subcontractor agreements** with each participating research infrastructure. This adaptable approach enables the CMO to accommodate varying legal ownership and operational management criteria specific to each infrastructure. It also facilitates compliance with national regulations influencing the engagement and operation of each infrastructure within the JERICO-RI. Under the Contractor-Subcontractor agreement, the CMO will assume the role of the 'Contractor,' while the individual infrastructure will act as the 'Subcontractor.' This agreement will delineate the rules governing the operational involvement of the infrastructure within JERICO-RI Coastal Observation ERIC activities.

It will specify:

- The advantages gained by the infrastructure through its participation in the JERICO-RI Coastal Observation ERIC,
- The contractual obligations pertaining to operations,
- The process for fee collection by the Infrastructure,

- The management of user access and service delivery when conducting JERICO-RI Coastal Observation ERIC activities,
- The procedures for payment of all fees, levies, and/or commissions to be remitted to the CMO by the Infrastructure,
- The promotion of the infrastructure by the JERICO-RI Coastal Observation ERIC,
- The support provided to the infrastructure during JERICO-RI activities,
- Future investments and development of the infrastructure.

Initially, the JERICO-RI CMO will be responsible for actively promoting all distributed infrastructures comprising the JERICO-RI Coastal Observation ERIC to the broader international oceanographic research and industry communities, as well as user groups. The JERICO-RI CMO will also engage with potential infrastructure users and advocate the benefits of testing at a JERICO-RI Coastal Observation ERIC infrastructure. Once the Contractor-Subcontractor agreement is established, in addition to the CMO's promotion of testing benefits and user engagement, each infrastructure will also independently promote the benefits of JERICO-RI Coastal Observation ERIC engagement and seek users.

Access will be granted and implemented through the contractual agreement established between the User and the Infrastructure. Consequently, once a User is introduced to a specific infrastructure, it becomes the responsibility of that infrastructure to:

- Finalise the Provision of Service Agreement,
- Oversee the management of the user testing contract,
- Coordinate fee setting and the collection of fees.

The Agreement will also address the fulfilment of any local consenting requirements, if necessary, as well as any stipulations for indemnity insurances to enable the infrastructure to grant access and deliver the required service.

7. Financial and Funding Framework

7.1 Financial Feasibility - Introduction and background

One of the key issues determining the long-term sustainability of JERICO-RI is that of **financing**. Establishing and maintaining a large marine RI is expensive due to the high costs of specialised observational and measurement equipment and the high costs of operating and maintaining such systems in the challenging marine environment.

The financial sustainability of the JERICO-RI has been a key focus of the Infrastructure design process throughout the evolution of the RI. A detailed cost-benefit analysis was carried out in 2018 under the JERICO-NEXT project, and a dedicated sustainability WP in JERICO-DS supplemented with training in RI sustainability management and funding models for key JERICO-RI personnel has meant financial considerations are at the forefront of the RI design.

The objective of the cost analysis is to give full, transparent evidence of the required investment for the set-up and running resources for operation of the RIs, using state-of-the-art financial units that are easily interpreted and communicated to the political and funding authorities. Adoption and use of the cost analysis will strengthen the reliability of the cost information reported in the ESFRI Roadmap, and will provide solid reference values for the monitoring activities of ESFRI on the projects and periodic updates of the landmark status of the operational RIs.

As part of the JERICO-NEXT project in 2019, a cost-benefit analysis was carried out to appraise the balance of costs and benefits associated with the permanent establishment of the JERICO-RI as a sustainable long-term RI, in both the ERIC and AISBL legal forms as compared to the potential discontinuation of the JERICO-RI project (**Gaughan et al. 2019**). The methodology and result used in estimating the benefit-to-cost ratio when analysing the European coastal observing system was cited in the GCOS implementation plan WMO (2022) and a European Marine Board Policy brief on Sustaining in situ Ocean Observations in the Age of the Digital Ocean (2021).

The quantitative component of this economic appraisal has found that both the JERICO ERIC and JERICO AISBL options return a surplus of benefits to society. The present value of the stream of benefits resulting from the JERICO ERIC option returns a surplus of benefits to society with a value of €24.4m over the period 2020-2028, while the JERICO AISBL option returns a value of €18.7m over the same period. The single largest contributing factor to the strong NPV results in both the ERIC and AISBL scenarios is the substantial data cost savings for the JERICO Partners, which stem from the centralised data standardisation and data sharing practices which are facilitated, at a relatively low cost, by the JERICO project

The permanent establishment of the JERICO-RI under the ERIC legal form would result in the most advanced form of centralised research coordination, management and administration among all options under consideration in this analysis. As compared to an AISBL, the ERIC legal form enables the achievement of greater economies of scale and more advanced forms of resource allocation and research coordination.

A crucial step in a Cost Benefit Analysis is the calculation and comparison of the **Net Present Value** (NPVs) for the options considered. The (NPV) is the value of the net monetary flows of a particular investment option expressed in present value terms. A positive NPV is generally viewed as the most reliable indicator in support of an investment proposal. The key determinants of the NPV are the appraisal horizon, the discount rate applied and the accuracy of estimates for costs and benefits. In the NPV method, the

revenues and costs of a project are estimated before being discounted and compared. The preferred option is that with the highest positive NPV. Projects with negative NPV values should be rejected because the present value of the stream of benefits is insufficient to recover the cost of the project. The **Benefit Cost Ratio (BCR)** is also an important indicator for public investment appraisal purposes. The BCR is **the ratio of total benefits to total costs when total benefits and total costs are expressed in discounted present value terms**. In other words, the BCR is discounted net revenues divided by discounted net costs.

Table 7.1 Summary of JERICO-RI Cost benefit Analysis output (JERICO-Next 2019).

Option	Present Value of Costs	Present Value of benefits	Discount Rate	Net Present Value (NPV)	Benefit Cost Ratio (BCR)
Discontinuation	26,276,936	0	4%	-26,276,936	0.00
ERIC	6,886,283	31,294,668		24,408,386	4.54
AISBL	6,582,067	25,354,935		18,772,869	3.85

Both the **ERIC** and **AISBL** scenarios returned strongly positive **Net Present Values** NPVs, meaning that both of these options return a surplus of benefits. The present value of the stream of benefits resulting under the JERICO ERIC option returns a surplus of benefits to society with a value of €24.4m over the period 2020-2028, while the JERICO AISBL option returns a value of €18.7m over the same period (Table 7.1). The higher NPV for the JERICO-RI ERIC option is the result of higher data cost savings in this scenario, higher public procurement cost savings and more commercial access service activity. **The outputs from this Cost Benefit Analysis provided the financial rationale to move forward and develop JERICO-RI as an ERIC.**

7.2 JERICO-RI Cost Estimation Model Methodology

The cost estimates for the JERICO-RI have been prepared following the framework and methodologies outlined in **StrEsfri Study on Guidelines of Cost Estimation of Infrastructures** (2019), which provides a conceptual and methodological tool for cost estimation of RIs. The cost structure for each of the phases of the JERICO-RI includes the **annual cost** of running the JERICO-RI National Nodes and any upgrades required. From the start of the Implementation phase onwards, there will also be an annual cost associated with running the JERICO-RI central management office.

JERICO-RI operations at the Central Management Office will be ensured by the Members' commitment to contribute to the Core Budget during **renewable 5-year periods or budgetary cycles**. This provides the JERICO-RI with medium-term funding continuity to support the operations planned for each budgetary cycle.

A significant **Host Premium**, partly in cash and partly in-kind, is a significant and fixed dimension of the Core Budget of the RI. To date, 3 countries have committed to financially support JERICO-RI. Work on strengthening National Commitments is being led by the JERICO Nations Committee and described in **JERICO-DS D4.2**.

1. **The unit of analysis:** includes **all** the cost components of RI and includes costs incurred by the **Central hub** together with those in the **National nodes**.
2. **The Time Horizon** - Cost estimates related to the entire JERICO-RI lifecycle over the period 2023-2063.
3. **Start Date** - (2020?) The Year when the first resources were deployed for the **design phase**. The start date is fixed when the first financial or in-kind allocation is made for activities of the preparatory phase of the JERICO-RI.
4. **The base year** - (2020?) The point in time when the cost estimation is made i.e. the year of the ESFRI Roadmap application.
5. **Costs are expressed in real terms (Present Value)**. Prices are constant at the base year 2020: future costs are forecasted according to realistic assumptions and are net of inflation while past costs, usually reported in financial statements, must be converted into base year value by applying the inflation index.
6. **Only cash outflows are reported**. The cost accounting must follow a cash flow method. Depreciation, reserves and other accounting items that are usually reported in balance sheets are **not** included. Sources of financing are used to identify cost items but shall not be mixed or added to them.
7. **In-kind contributions** are included by calculating their corresponding market price or actual production costs. The JERICO-RI Host country contribution refers to the **cash and in-kind contributions of the host country institutes (Ifremer and CNRS)** towards the running costs of the JERICO-RI central hub.
8. **Costs are expressed in Euro**. The official exchange rate of the base year (2020) is used to convert foreign currencies in Euro.
9. **Costs for the JERICO-RI distinguish between investment costs (capital costs) and operating costs**.
 - **Capital costs** include: design and preparation; construction and start-up; replacement costs; major upgrades; decommissioning.
 - **Operating costs** include: rent of building or equipment; personnel; ordinary maintenance and repair; utilities and consumables; management and administration.
10. **Total costs** are calculated at present value. Future costs are discounted **using a rate of 4%** while past costs are capitalised **using a rate of 5%**

Box 7.1 10 step process for the cost estimation of an RI which was applied to JERICO-RI to develop its cost estimation model.

Following the ESFRI Guidelines (ESFRI 2019) on cost estimation of RIs, non-operating expenses listed below are **excluded** from the cost estimates:

- Depreciation or reserve,
- Interests,
- Currency exchange losses,
- Provision of future losses or debts,
- VAT, unless it is not recoverable and thus represents an actual cash outflow,
- Bank costs.

7.3 JERICO-RI Cost Estimation Process

The cost estimations for JERICO-RI have been prepared in line with the framework and methodologies outlined in **Str-ESFRI Study on Guidelines of Cost Estimation of Infrastructures for RIs** (ESFRI 2019) aiming for inclusion in the ESFRI Roadmap.

As the RI evolves and partnerships change, it will be important to update the Cost Book regularly to reflect any modifications to in-kind contributions and their impact on the RI's financials. An initial Cost Book was produced for the JERICO ESFRI Application in 2020. This has been updated over the period 2021-2023 as part of the JERICO Design project. The JERICO-RI Cost Book is the result of a collaborative work involving the following key personnel involved in the JERICO-RI design process:

- Members of **JERICO Nations Committee group** (established in 2019) and JERICO Funding Working Group (established in 2021) have provided the cost estimates for JERICO-RI Infrastructures. These contributors are best placed within their Institution and Nation to compile the costing related to the national infrastructures to be included as part of JERICO-RI.
- **Work package leaders and task partners** of the JERICO-S3 and JERICO-DS projects coordinate the process of cost estimation and deliver the collected financial information.
- **Lead persons and experts** working in existing ERIC's providing the actual costs for ERIC operations over a multi-year period.
- Inputs, review and analysis from **economic and financial experts** from the University of Bicocca Milan and from the Socio-Economic Marine Research Unit (SEMRU) in Ireland. Multiple iterations of the cost estimation process were necessary to produce the Cost Book, following the work on the technical documents of the JERICO-RI Facilities, the selection of the CMO host nation (France) and the implementation planning of the various National Facilities. The National contact persons of the **JERICO Nations Committee** were actively involved during the process to validate the cost estimates of each country having organisations involved in running the various National Facilities.

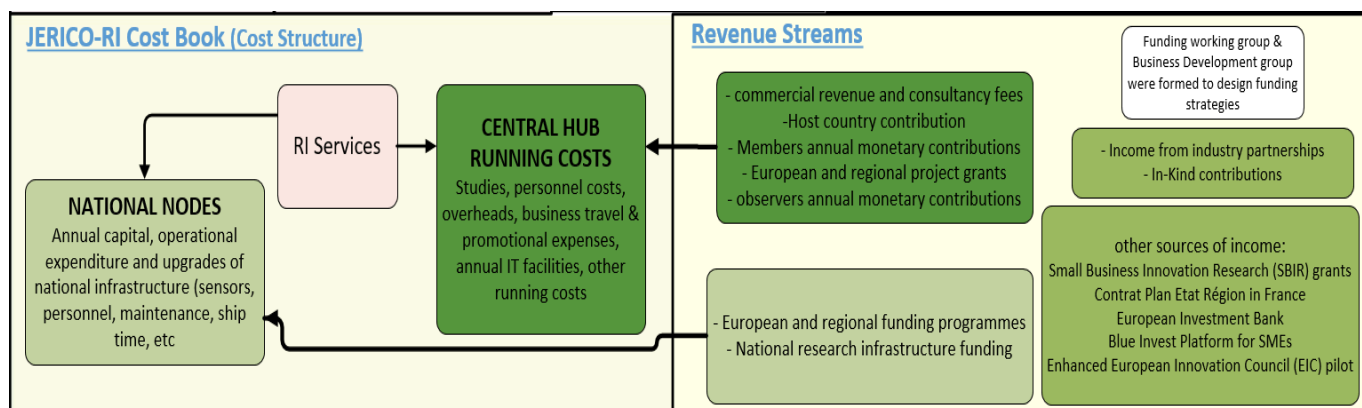


Figure 7.1 Using the Business Model Canvas to design the Cost Model for JERICO-RI.

The cost assumptions in the model were established during a financial & business model training workshop run by the University of Milan-Bicocca in April 2022. It was structured to match the **JERICO-RI governance model** detailed in Chapter 6.

All costs and revenues have been calculated with the application of sensitivity analysis (2-way sensitivity analysis) to help determine the best options for the development of the RI, taking into account various scenarios and eventualities.

The JERICO-RI Cost Book is composed of **two sections**, reporting respectively (1) the cost information on the JERICO-RI **CMO** and (2) the various **National Nodes** that will be included as part of JERICO-RI.

A detailed **Cost Book** that outlines the cost structure and financial planning of the RI has been prepared during the design phase of the project. The cost estimates are provided through dedicated graphs for the **CMO** and the various **National Nodes**. The purpose of the Cost Book is to give a clear identification, definition and realistic planning of the overall infrastructure costs **for the entire JERICO-RI lifetime**.

The **JERICO-RI Cost Book** aims to:

- Support the stakeholders' engagement by providing information on the value of the initial investment needed to realise the RI, its CMO and various National Nodes,
- Assess the necessary information to evaluate the long-term sustainability of JERICO-RI in the financial plan,
- Provide comprehensive information for the ESFRI monitoring and evaluation activities.

As such, the Cost Book is a reference document to be used throughout the evolution of the JERICO-RI. The Cost book details costs and revenues (**Cash and in-kind** over a **5 year financial plan** using different assumptions and scenarios regarding the operational level of JERICO-RI). The Cost Book scheme closely reflects the current proposed organisational and governance structure of JERICO-RI.

The **Cost Book Analysis** contains the following elements:

- A detailed breakdown of the **JERICO-RI National Nodes** capital expenditure (**Capex**) and operational expenditure (**Opex**),
- An undiscounted time horizon for the operation costs over the lifetime of the infrastructure, including the CMO costs,
- Discounted time horizon,
- A summary table (Box 7.2) detailing the costs over the full RI cycle initially for 2020 and now updated for **2023** as the base year.

Time horizon (number of years in the reference period)	35
Start date of the time horizon	2018
Base year (point in time of the analysis)	2023
Last year of time horizon	2053
Scale	Thousand
Currency Cost Estimates in Euro	EUR
Capitalisation rate	5%
Discount rate*	4%
Inflation Rate	2%
Prices are constant at the base year:	2023
Future costs are forecasted according to realistic assumptions and are net of inflation	

Box 7.2 JERICO-RI Costbook Parameters and assumptions

For **distributed research infrastructures (DRI)**, such as JERICO-RI, which consists of a coordinating secretariat and operational nodes located in different countries and often within existing infrastructures, **the relevant cost items encompass those incurred by the CMO as well as those incurred by National Nodes**. These components and associated projects are considered necessary to enable the RI to achieve its mission.

The total costs of the RI comprise the sum of the costs of each component, irrespective of its geographical location. Since all resources required for the facilities' setup and functioning are estimated at the start, future costs are estimated as forecasts/projections, while past costs (e.g. existing and already available assets like equipment, facilities, etc.) are provided considering historical data.

Given that nodes within JERICO-RI may be situated within existing facilities that also conduct research activities unrelated to the distributed RI's mission, it is essential to include **only** cost items that are **directly attributable to JERICO-RI**. This includes shares of time, equipment usage, or personnel costs that are **specifically allocated** to JERICO-RI, ensuring a precise cost estimation.

Total costs are expressed in **present value**. Past/future costs must be translated into present values by means of an appropriate capitalisation/discount rate. Each future cash flow should be discounted by an appropriate financial discount factor and each past cash flow should be capitalised. In principle, the two discount/capitalisation rates may differ as they represent two different opportunity costs (prospective and retrospective).

The suggested value by the European Commission for major infrastructure projects co-funded with European Structural and Investment Funds is **4%** in real terms, see Article 19 (Discounting of cash flows) of Commission Delegated Regulation (EU) No 480/2014).

The cost estimation guidelines (ESFFRI, 2019) highlight the need to consider an appropriate counterfactual scenario, i.e. what would have been the costs in the absence of the project. The computation of the incremental costs is thus performed by subtracting the **costs of the counterfactual scenario** from the **costs of the RI**. In the case of a newly established RI, i.e. with no pre-existing scientific service or infrastructure, the without-the-project scenario is one with no operations and the incremental scenario is relatively easy to calculate since it coincides with the costs of the RI itself.

However, in case of investments aimed at improving or expanding an already existing RI, the counterfactual is represented by the costs of maintaining the service or infrastructure at a level that it is still operable (**Business As Usual - BAU**) or even small adaptation investments that were programmed to take place anyway (do-minimum). Incremental costs are then the difference between the scenario with and that without the project. This implies that cost savings translates into positive cash flows.

The BAU scenario shall be adopted as a rule of thumb. For some distributed infrastructures, the establishment of the RI may include only the setting up of the network. In this case, the BAU scenario would coincide with the project(s) continuing to operate in an uncoordinated way.

7.4 Financial Sustainability of the JERICO-RI Business Model

The key elements determining the financial sustainability of JERICO-RI are:

- Long-term Commitment of RI Members,

- Diversification of RI financial resources,
- Own income generation capabilities,
- Strategic and financial planning,
- Measurement of the impact of the RI.

RI Life Cycle Timelines:

JERICO-RI aims to enter the ESFRI RoadMap in 2025 and through further development in a preparatory phase and implementation phase become an ERIC with 7 to 8 years by 2033 with an operational lifespan of at least 30 years.

JERICO-RI life cycle phases estimated timelines:

- Preparatory Phase 2025-2028
- Implementation Phase 2028-2032
- Operational Phase 2033-2053
- Termination Phase 2053

Current Status:

Since 2020, JERICO-RI is in its **Design Phase** with this design activity funded by 2 EU Grants which will both expire by June 2024. Keeping the consortium functional will require additional resources which are to be provided in-kind by lead project partners through the involvement of National Committee members, as well as additional resources via in-kind contributions by France, which will sustain activity through the next ESFRI roadmap application.

Short to Medium Term outlook:

Once on the ESFRI roadmap, it is envisaged that work on the preparatory phase will be supported by an additional EU Infradev Grant with additional support from the JERICO-RI partners.

The initial financial plan reports the indicative plan of the expenditures and revenues related to JERICO-RI CMO and JERICO-RI National Nodes for the years 2030–2033 (implementation phase). An estimation of revenues and expenditure for a year of the full operational phase is also reported as indicative future plan over a 5-year operational period.

During the implementation phase, the costs associated with the CMO will follow the “low” scenario (see Figure 7.5). The INFRADEV support will cover operational costs, costs associated with the ERIC formation and upgrades to infrastructures. France, as the host country, has committed a full-time resource to maintain the coordination efforts supplemented by benefit-in-kind support from key JERICO-RI members.

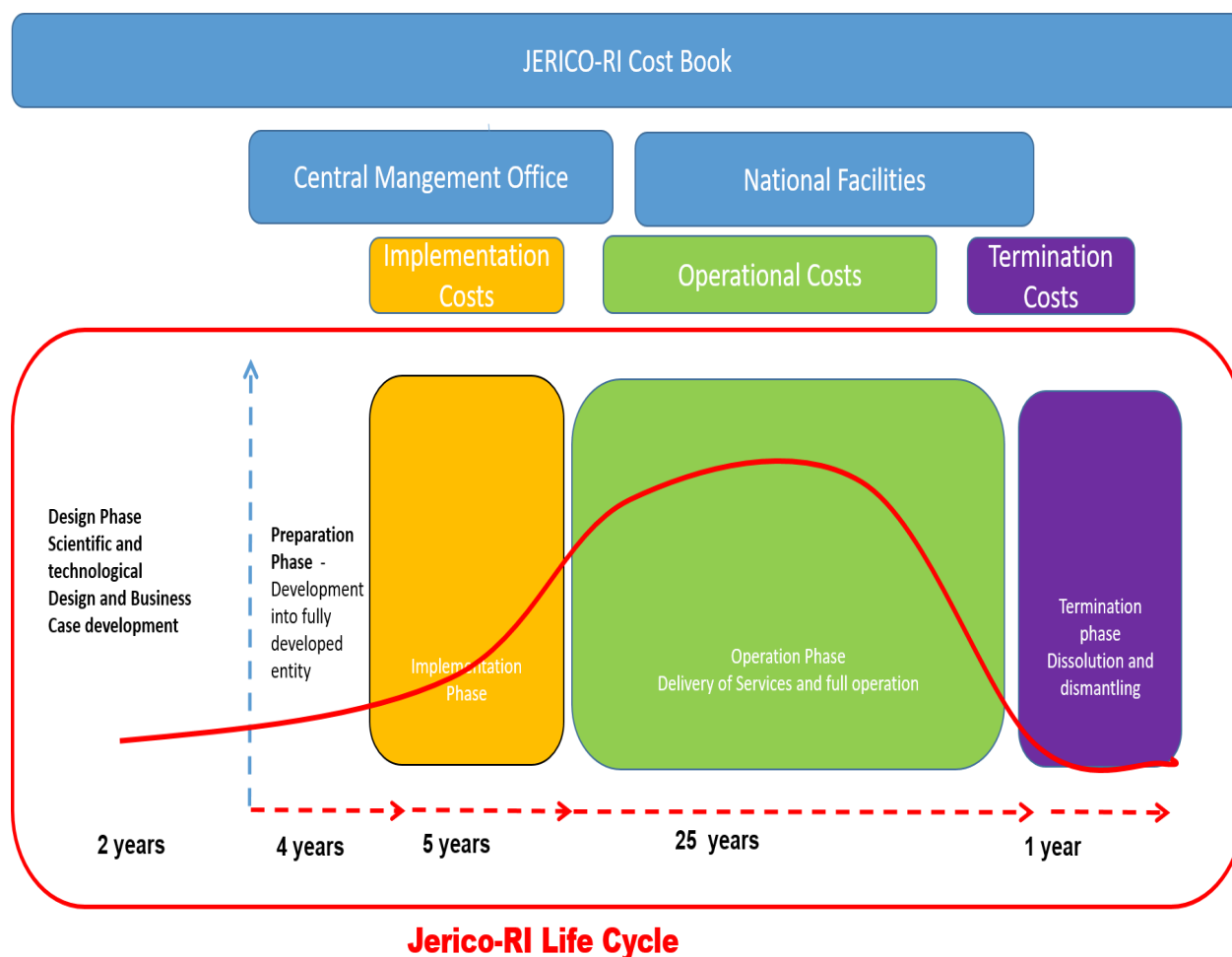


Figure 7.2 Schema illustrating the change in costs through the different life cycles of the RI over the JERICO-RI Life Cycle phases.

In Figure 7.2 of the Cost Book structure, the red line demonstrates the changes in costs through the different life cycles of the RI with support from the EU Commission for the design and preparation phase and the increase in costs as the RI increases activity during the **implementation phase**, reaching a maximum during the **operational phase** of 25 years, reducing towards the **termination** phase.

Table 7.2 Description of the key components of the JERICO-RI Finance Model.

Financial Model Category	Description
A. Member and Host country contributions	Refers to the cash and in-kind contributions of the JERICO-RI members and the host country institutes (Ifremer and CNRS) towards the running costs of the JERICO CMO.
B. Income and revenues (estimates)	For all types of RI funding streams. 5-year horizon (start-up phase of 2 years, and then full regime).
C. Cost structure (estimates)	Personnel, travel and meetings, office rental, IT infrastructure, equipment and instruments, training and licences.
D. Five years financial forecasts	5-year revenues and costs for JERICO-RI CMO and National Nodes.

E. Financial sustainability	National commitments and secured funding from JERICO-RI partners.
F. Capital Investment	Future projections for capital investment of the JERICO-RI Regional nodes.

7.4.1 Annual costs of running the JERICO-RI National Nodes and Main Upgrades

JERICO-RI is a **Distributed Research Infrastructure** with facilities located all over Europe. These facilities are operated as National nodes. The annual running costs of the National Nodes of the JERICO-RI consist of capital expenditure (**CAPEX**) on equipment, sensors and other coastal observing platforms, and operational expenditure (**OPEX**) on the recurring costs associated with running the nodes, including personnel, maintenance, vessel use, data management, building costs and other expenses. Estimates of the annual CAPEX and OPEX of the JERICO-RI nodes have been provided by National Infrastructure contact points from the JERICO-RI member states and are presented in Figures 7.3- 7.6 below. The Figures relate to all of the infrastructures that will be included in a future JERICO-RI.

The annual CAPEX was estimated by calculating the average yearly capital expenditure over five years (**2015 to 2019**). This was done using the information provided by the national infrastructure contact points for each National Node. The figures amount to **€4.3 million per year** on capital expenditure and **€22.66 million per year** on operational expenditure. The total annual cost of running the JERICO-RI National Nodes is estimated to be **€26,957,000**.

The Running Costs for the National Nodes in a distributed JERICO-RI are described as follows:

The Capital Investment and Operating costs are presented aggregated per CMO and National Nodes. The categories for **OPEX** are categorised under the following **Cost Units** and described (1 to 5) with **CAPEX** summarised (6). The following 5 cost units have been identified by the JERICO-RI facility operators as common headings to consider expenditure in coastal observation infrastructures.

1. **RI Maintenance:** This refers to all costs related to the maintenance of the national facility research infrastructures. This includes the purchase of consumables, materials and spare parts specifically used for access to the infrastructure. Examples: general engineering consumables (chains, ropes, shackles, connectors, minor cabling), chandlery, scientific consumables, calibration services, survey services, minor repairs, moulding, fabrication, batteries, etc.
2. **Personnel:** This refers to all staff in terms of Full Time Equivalent (FTE), dedicated to facility management and administration, scientific and technical activities, employed according to national legislation, trade union's agreements, etc. Examples: full costs of salary, travel and accommodation, training, health and safety equipment, etc.
3. **Ships/Vessels:** This refers to ship time used to provide access to infrastructure. Examples: for deployment, recovery, maintenance cruises, workboat charter, small boat hire, vessel running costs, fuel, etc.
4. **Data Related Costs:** This refers to all costs associated with data management. Examples: web hosting, servers, data communications, tele-communications, IT consumables, software licences, etc.
5. **Building Running Costs:** this refers to the building running costs and other miscellaneous costs associated with providing access to infrastructure as a service. Examples: rent/lease/hire, insurance, heating, lighting, electricity, waste disposal, cleaning, building maintenance, painting, decorating, etc.

6. **Total Capital Investment:** This refers to the investment of €5,000 or more in new equipment, sensors and facilities required to provide access to infrastructure. Examples: Computer hardware, light machinery, cars/vans/trucks/boats/forklifts, new instruments/sensors, new platforms, new buildings or major renovations, any assets for use >5yrs.

Table 7.3 Annual OPEX and CAPEX Expenditure in € (Euro) - breakdown by Cost Unit (Personnel, Vessel, Data, etc.) and by country of the JERICO-RI National Node Infrastructures.

Member State	General RI Maintenance	Personnel	Ships/Vessels	Data related	Building Running Costs	Total OPEX	Total Capital Investment (2023)
Belgium	99,000	180,000	65,000	30,000		374,000	120,000
Croatia	120	360	160,000	20,000	85,000	745,000	140,000
Denmark	0	0	0	0	0	0	0
Estonia	47,000	42,000	27,000	21,000	34,000	171,000	47,000
Finland	215,000	1,260,000	100,000	40,000	403,750	2,018,750	450,000
France	703,000	6,190,000			5,000	6,898,000	700,000
Germany	105,500	417,000	100,000	51,000	27,500	701,000	
Greece	70,000	380,000	110,000	80,000	140,000	780,000	50,000
Ireland	278,842	196,208	158,245	90,508		723,803	135,003
Italy	494,936	499,442	306,343	48,957	148,181	1,497,859	1,939,828
Netherlands						0	
Norway	40,000	450,000	0	50,000	135,000	675,000	100,000
Portugal		352,000	500,000	54,000	170,000	1,384,700	1,800,000
Spain	515,000	1,442,000	154,500	103,000	535,600	2,750,100	1,545,000
Sweden	150,000	300,000		15,000		465,000	250,000
Total	2,718,398	11,709,010	1,681,088	603,465	1,684,031	19,184,212	7,276,831

Table 7.3 represents the running costs of JERICO-RI infrastructures across the different National Nodes. Some countries are in the process of determining and updating these figures. As of December 2023, this table is still in progress, with several countries still considering the infrastructures to be included in JERICO-RI. Capital investment shows broad fluctuations across the countries due to the sometimes irregular and opportunistic nature of securing Capital investments in different countries. It is important to note that the cost estimates for JERICO National Nodes **only included costs for activities that are directly linked to JERICO-RI.**

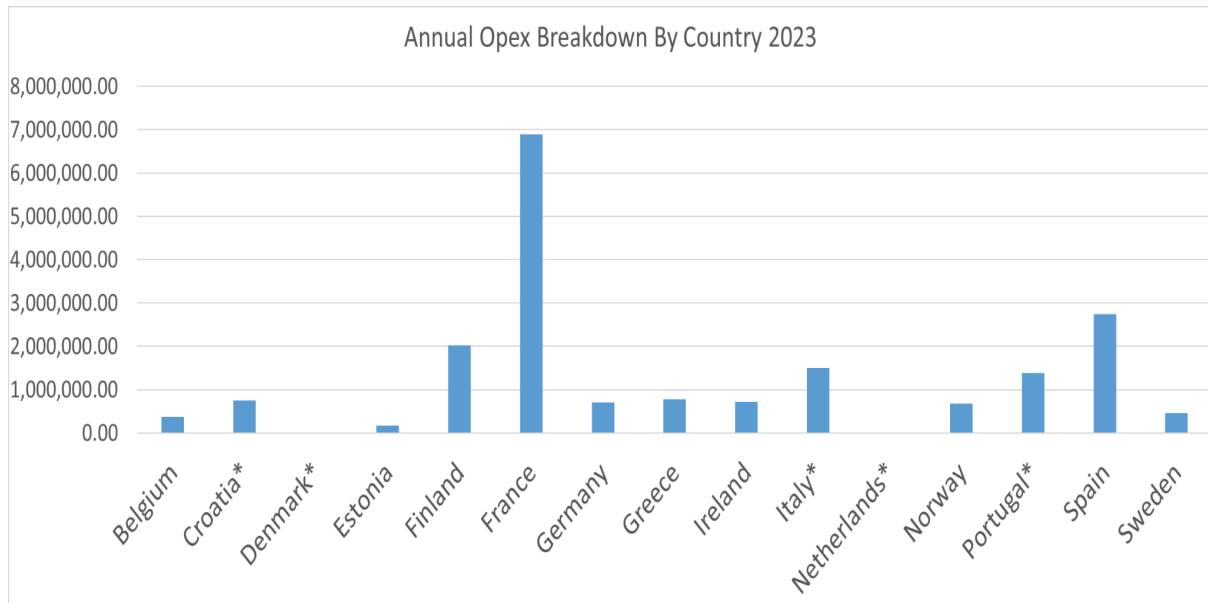


Figure 7.3 Annual OPEX Breakdown by future JERICO-RI Country for 2023.

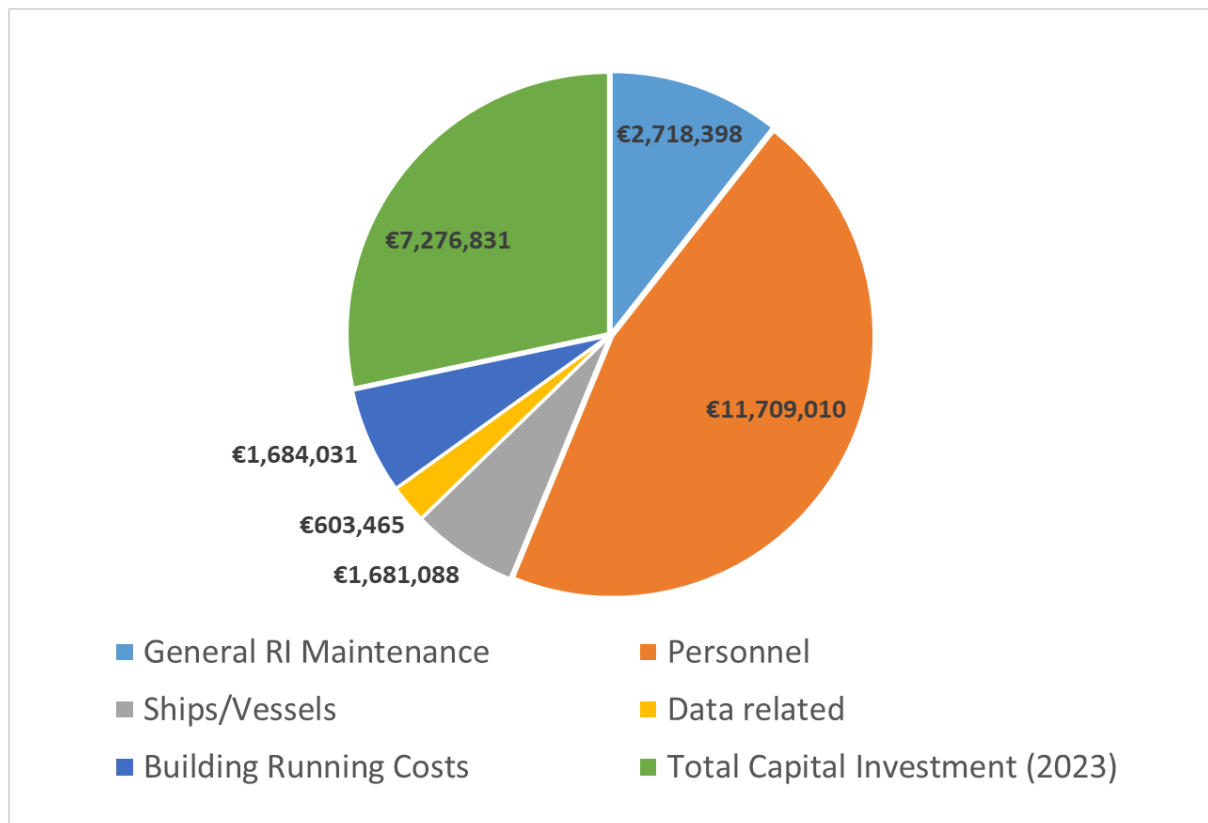


Figure 7.4 Breakdown of Annual OPEX by **Cost Unit** and Total Capital Investment across all JERICO-RI National Nodes for 2023.

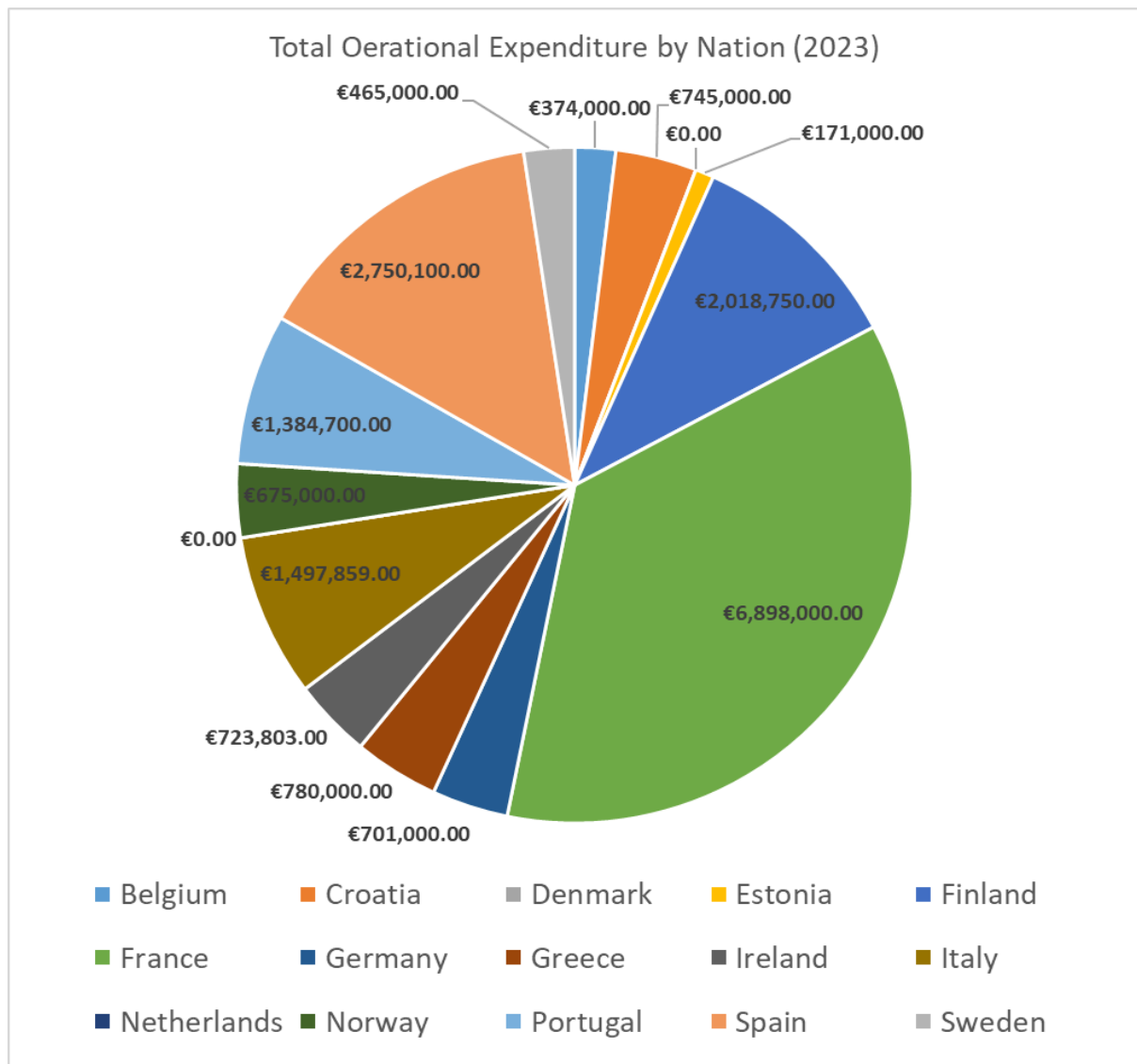


Figure 7.5 PTotal OPEX per annum for 2023 breakdown by country.
*Total Opex per annum by Nation €19,184,212.

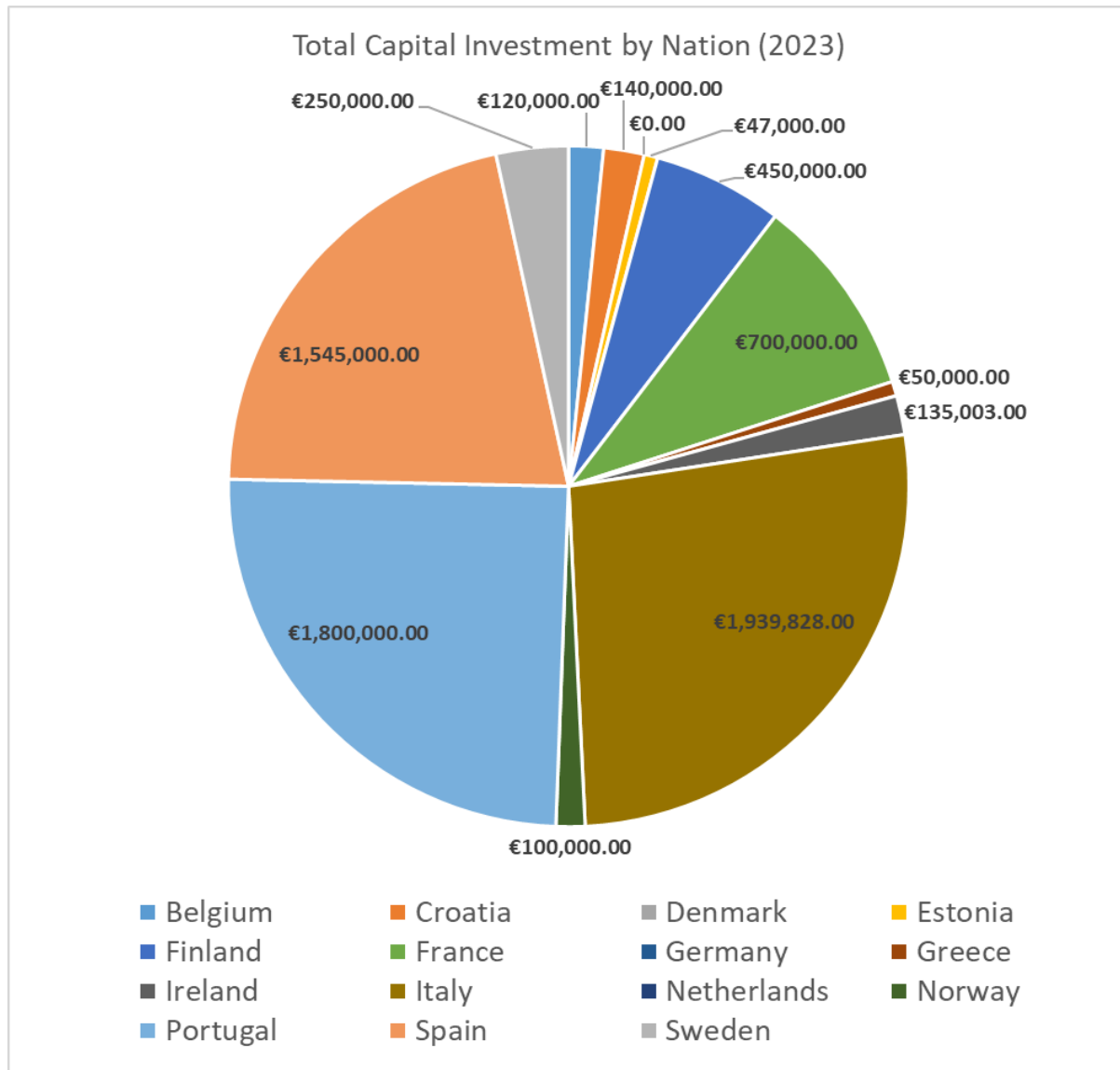


Figure 7.6 Total Capital Investment in € per JERICO-RI member Country in 2023.

Analysis of Opex and Capex estimates:

Across the JERICO-RI National Nodes, the total OPEX per annum was **€19,184,212**. The Capital expenditure amounted to **€7.267** million per annum. **Personnel** costs represent the highest percentage of the overall operational costs. The majority of these costs are related to research personnel, with facilities managers and engineers representing the bulk of the cost. Depending on the size of the facility, the number employed can vary significantly. **General maintenance** is the next highest cost, reflecting the challenging nature of operations in the marine environment to the operational costs, followed by **Building Running Costs** and **Ships/Vessel Costs**.

7.4.2 Annual Revenue for Running and Upgrading the JERICO-RI National Nodes

The revenues for running the JERICO National Nodes and main upgrades are provided by the individual nations. This helps keep the national facilities operational by covering the Unit

Costs. The **JERICO-RI Services Model** relies on these National Nodes being operational to deliver its **value-added services** above the basic functioning of the nodes.

Note: *cost estimates only include costs for activities that are directly linked to JERICO-RI as per ESFRI guidelines (ESFRI 2019).*

7.4.3 Annual Cost of Running the JERICO-RI CMO

The costs of running the JERICO-RI Central Management Office will not come into effect until the **implementation phase of JERICO-RI** (estimated to commence in 2030). Running costs for the JERICO-RI CMO have been estimated based on the current organisational functions and are also based on existing marine environmental RIs. As such, there is a high level of confidence in each of the cost headings.

It is planned that the running costs of the JERICO-RI CMO will be funded from the host country, **France**, RI Member and Observer contributions and also in-kind contributions from the Members in terms of personnel, services and equipment.

These costs are expected to be incurred during the implementation and operational phases of the JERICO-RI and remain relatively constant for the implementation phase, with an increase in costs when ramping up to the operational phase with a subsequent increase in services and personnel envisaged.

There are **three broad running costs headings** for the JERICO-RI CMO:

- **Personnel Costs** (Salary Costs for CMO personnel),
- **Administrative Costs** (Day-to-day running costs of RI),
- **RI Services Costs** (See Services Estimation Model for Definition and structure of Service Offices).

Each heading has a number of subcategories related to the day-to-day operations of the RI and the delivery of its Services.

A **5-year projection** has been prepared to display the running costs to the end of the implementation phase completion. Table 7.4 below shows a summary of the running costs for one year. A sensitivity analysis has also been calculated to show how the running costs could vary - **The Low, Medium and High options relate to the different operational scenarios** (or modes of operation) of the RI. This has been prepared to reflect different potential levels of operation of the RI depending on internal and external factors which may impact the running costs and revenues available. This sensitivity analysis reflects how the running costs can be varied to account for any changes in the anticipated incoming revenues.

Analysis: The personnel costs are based on a minimum of 4 Core personnel working in the ERIC - a Director, Finance manager, Programme manager and Services Coordinator.

Table 7.4 Summary of the Central Management Office running costs and cost headings for 1 year.

		Year 1		
		Low	Medium	High
Personnel Costs	Provided In Kind FTE %			
Director		100,000	100,000	100,000
Services Coordinator		80,000	80,000	80,000
Project Manager		80,000	80,000	80,000
Finance		80,000	80,000	80,000
IT Engineer	1	0	0	80,000
Science Officer	1	0	0	80,000
Data Officer	1	0	0	80,000
Administrative Costs				
Office Space	1	20,000	20,000	20,000
Utilities	1	10,000	10,000	10,000
Insurance	1	15,000	15,000	15,000
Consumables	1	15,000	15,000	15,000
Professional Fees	1	30,000	30,000	30,000
Marketing/Outreach	1	10,000	10,000	10,000
Meetings	1	20,000	20,000	20,000
Contingency	1	20,000	20,000	20,000
Overheads	1	72,000	72,000	108,000
RI Services				
Integrated Observation Strategy	1	10,000	40,000	80,000
Technology Development and Integration	1	10,000	40,000	100,000
Operations and Data Acquisition	1	50,000	60,000	80,000
Data Processing , Management and Products	1	50,000	80,000	100,000
Access	1	100,000	150,000	200,000
Total		772,000	922,000	1,388,000

Table 7.5. Estimated 5-year annual running costs for the JERICO-RI Central Management Office under low, medium, and high operation scenarios.

		Year 1			Year 2			Year 3			Year 4			Year 5		
		Low	Medium	High	Low	Medium	High	Low	Medium	High	Low	Medium	High	Low	Medium	High
Personnel Costs																
Director	Provided In Kind FTE %	100,000	100,000	100,000	102,000	102,000	102,000	104,040	104,040	104,040	106,121	106,121	106,121	108,243	108,243	108,243
Services Coordinator		80,000	80,000	80,000	81,600	81,600	81,600	83,232	83,232	83,232	84,897	84,897	84,897	86,595	86,595	86,595
Project Manager		80,000	80,000	80,000	81,600	81,600	81,600	83,232	83,232	83,232	84,897	84,897	84,897	86,595	86,595	86,595
Finance		80,000	80,000	80,000	81,600	81,600	81,600	83,232	83,232	83,232	84,897	84,897	84,897	86,595	86,595	86,595
IT Engineer	1	0	0	80,000	0	0	81,600	0	0	83,232	0	0	84,897	0	0	86,595
Science Officer	1	0	0	80,000	0	0	81,600	0	0	83,232	0	0	84,897	0	0	86,595
Data Officer	1	0	0	80,000	0	0	81,600	0	0	83,232	0	0	84,897	0	0	86,595
Administrative Costs																
Office Space	1	20,000	20,000	20,000	20,400	20,400	20,400	20,808	20,808	20,808	21,224	21,224	21,224	21,649	21,649	21,649
Utilities	1	10,000	10,000	10,000	10,200	10,200	10,200	10,404	10,404	10,404	10,612	10,612	10,612	10,824	10,824	10,824
Insurance	1	15,000	15,000	15,000	15,300	15,300	15,300	15,606	15,606	15,606	15,918	15,918	15,918	16,236	16,236	16,236
Consumables	1	15,000	15,000	15,000	15,300	15,300	15,300	15,606	15,606	15,606	15,918	15,918	15,918	16,236	16,236	16,236
Professional Fees	1	30,000	30,000	30,000	30,600	30,600	30,600	31,212	31,212	31,212	31,836	31,836	31,836	32,473	32,473	32,473
Marketing/Outreach	1	10,000	10,000	10,000	10,200	10,200	10,200	10,404	10,404	10,404	10,612	10,612	10,612	10,824	10,824	10,824
Meetings	1	20,000	20,000	20,000	20,400	20,400	20,400	20,808	20,808	20,808	21,224	21,224	21,224	21,649	21,649	21,649
Contingency	1	20,000	20,000	20,000	20,400	20,400	20,400	20,808	20,808	20,808	21,224	21,224	21,224	21,649	21,649	21,649
Overheads	1	72,000	72,000	108,000	73,440	73,440	110,160	74,909	74,909	112,363	76,407	76,407	114,610	77,935	77,935	116,903
RI Services																
Integrated Observation Strategy	1	10,000	40,000	80,000	10,200	40,800	81,600	10,404	41,616	83,232	10,612	42,448	84,897	10,824	43,297	86,595
Technology Development and Integration	1	10,000	40,000	100,000	10,200	40,800	102,000	10,404	41,616	104,040	10,612	42,448	106,121	10,824	43,297	108,243
Operations and Data Acquisition	1	50,000	60,000	80,000	51,000	61,200	81,600	52,020	62,424	83,232	53,060	63,672	84,897	54,122	64,946	86,595
Data Processing , Management and Products	1	50,000	80,000	100,000	51,000	81,600	102,000	52,020	83,232	104,040	53,060	84,897	106,121	54,122	86,595	108,243
Access	1	100,000	150,000	200,000	102,000	153,000	204,000	104,040	156,060	208,080	106,121	159,181	212,242	108,243	162,365	216,486
Total		772,000	922,000	1,388,000	787,440	940,440	1,415,760	803,189	959,249	1,444,075	819,253	978,434	1,472,957	835,638	998,002	1,502,416

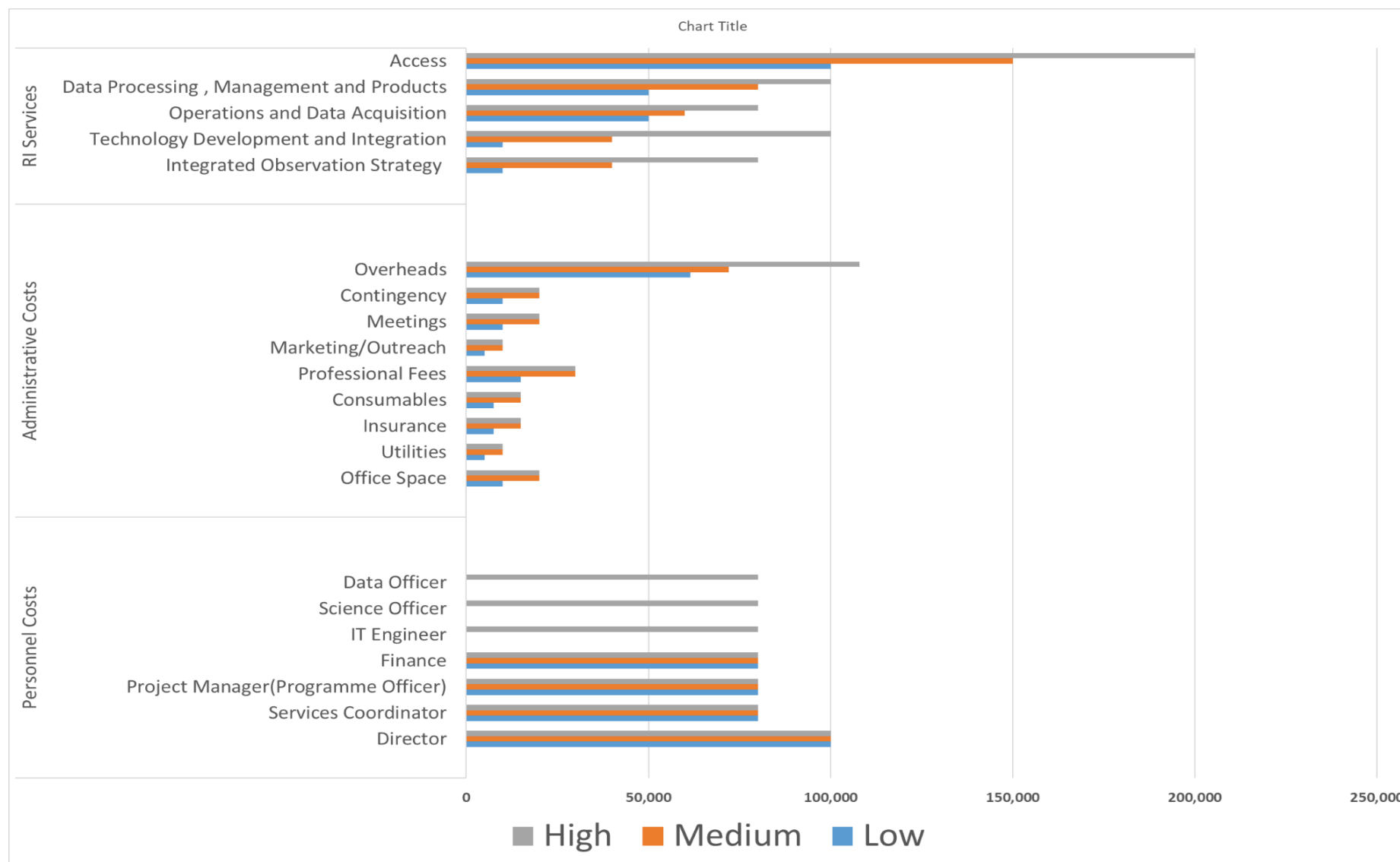


Figure 7.6 Cost breakdown by Cost Units of Running Costs of CMO under Low/Medium/High operational status.

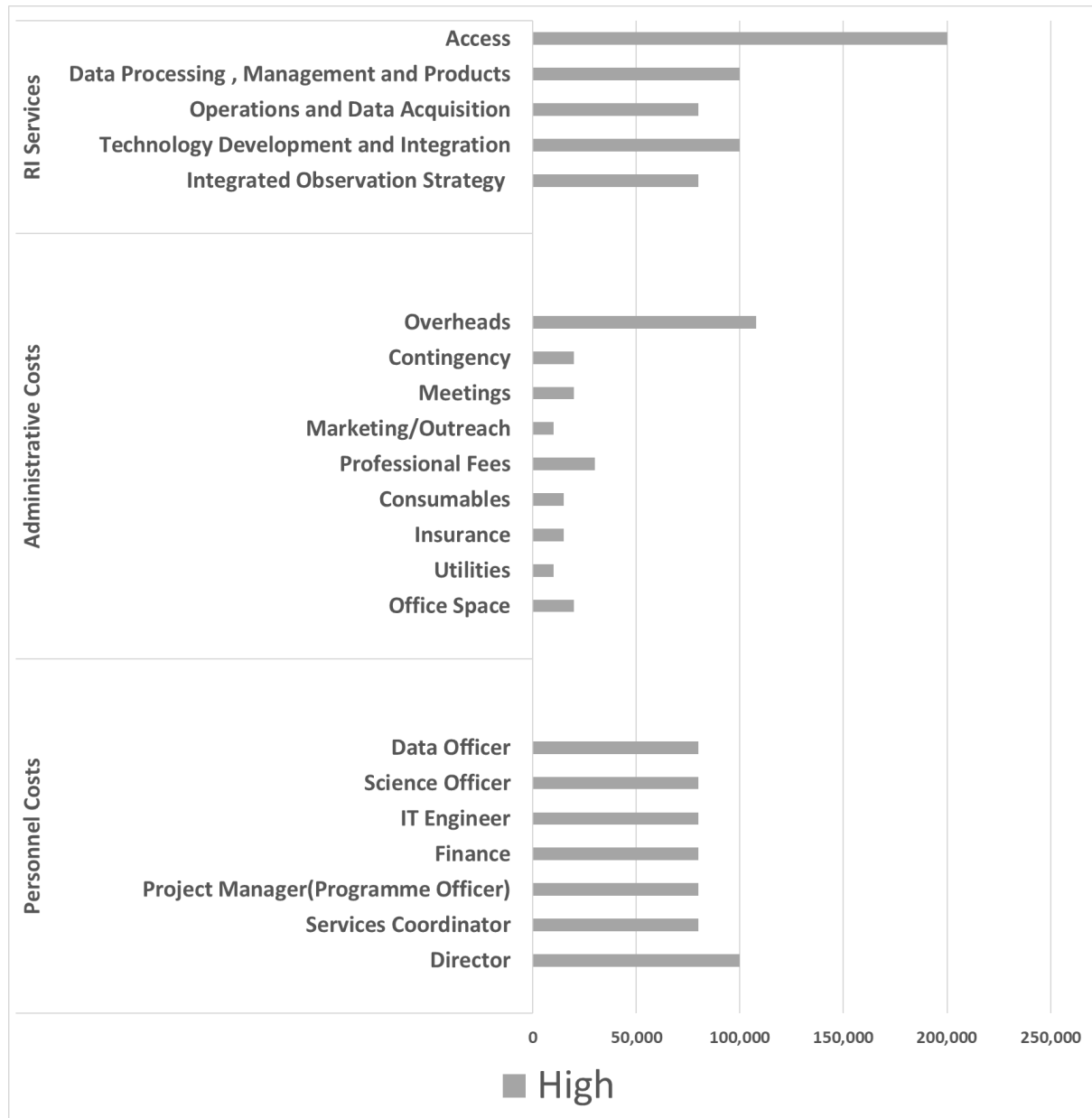


Figure 7.7 Annual Running Unit Costs for CMO at a High operational level.

Table 7.6 Summary of running costs on an annual basis for the Central Management Office over a 5-year period - a sensitivity analysis is applied for a Low, Medium and High operational level for JERICO-RI.

	Year 1			Year 2			Year 3			Year 4			Year 5		
Sensitivity	Low	Medium	High	Low	Medium	High	Low	Medium	High	Low	Medium	High	Low	Medium	High
Total	772,000	922,000	1,388,000	787,440	940,440	1,415,760	803,189	959,249	1,444,075	819,253	978,434	1,472,957	835,638	998,002	1,502,416

7.5 JERICO-RI Funding Model and Revenue Streams

The revenue streams and contributions to sustain the JERICO-RI that have been identified include:

- Annual host country monetary and in-kind premium contributions,
- Full Member and Observer member monetary and in-kind contributions,
- National research infrastructure funding from individual nations,
- European and regional funding programmes,
- Income from industry partnerships and collaboration,
- Sponsorships,
- Infrastructure access fees for Users,
- Grants and other resources within limits and under terms approved by the Assembly of Members,
- Private Sector Investments/Public-private partnerships/Crowdfunding.

A **National Financial Commitment Strategy** has been identified in **JERICO-DS D4.2** based on the establishment of the JERICO Nations Committee where a national representative is tasked with coordination of efforts to secure strong financial commitments from the participating counties. The national representatives will use this Business Plan to demonstrate the added value to justify additional investment in the JERICO-RI by their Nation, thus ensuring a long-term commitment is secured.

Annual **Host Country Contribution** refers to the annual cash and in-kind contributions of the host country institutes (Ifremer and CNRS) towards the running costs of the JERICO central hub.

Members' Annual Monetary Contributions refers to the annual membership contributions towards the running of the JERICO central hub. There are a number of ways to calculate this fee, including an **agreed flat fee per member** (e.g., for EMSO ERIC, it is €35,000 and for EuroArgo ERIC, it is €30,000). The fee proposed in the scenario for the table above is €30,000 per annum, with an assumption of 10 founding members (including the host country) upon establishment.

Other options that could be applied to calculate the contributions include part flat fee, part GDP-based and part GDP per capita based (EMBRIC) and on the number and type of infrastructure included in the RI (ICOS).

Observers' Annual Monetary Contributions refers to the observers' fees towards the running of the JERICO central hub. In general, these are a specified fraction of the Member's fees (e.g., EMSO ERIC observers contribute €10,000, EuroArgo ERIC observer nations contribute €10,000). The Observer contribution proposed here is €5,000, with an assumption that there will be 4 Observers in the operational phase.

European and regional project grants refers to funding from the agencies and programmes identified that will be used to supplement the running costs of the JERICO-RI CMO. A conservative estimate of €100,000 per year is provided based on participation in a minimum of 2 such projects.

As noted above, the annual monetary host country, member and observer contributions will form the core budget of JERICO-RI and will be used to fund the running costs of the JERICO-RI CMO. The goal is to establish a fair and balanced financial framework that allows Member countries to collectively support the ERIC's mission and activities while ensuring equitable participation.

In order to determine the monetary contributions or membership fees for JERICO-RI, a review of funding models for a number of existing marine and environmental ERICs was conducted. Based on this, JERICO-RI is considering **four main options** to calculate membership contributions:

- **Flat fee** for Members and Observers based on an agreed amount: €30,000 per Member and €5,000 per Observer,
- **Percentage flat fee**, percentage based on Member State's Gross Domestic Product (GDP) (e.g., 50% flat fee, 50% based on GDP),
- **Percentage flat fee**, percentage based Member State's GDP, percentage based on GDP per capita. (e.g., 50% flat fee, 25% based on GDP, 25% based on GDP per capita),
- **Membership contributions related to the number and type of infrastructures included in JERICO-RI.** It is envisaged that the running costs of the JERICO-RI CMO will remain constant for the implementation phase.

As the membership fees fund the running costs, this means that any new Member joining the JERICO-RI would result in the lowering of fees for each member. JERICO-RI CMO will seek commitments on these contributions for the implementation phase and then follow a review for subsequent 5-year budgetary cycles.

The funding model for JERICO-RI will be finalised during the preparatory phase, but the **flat fee** option is being used for the finances in the Business Plan.

Table 7.7 below shows the potential revenues available to fund the costs of running the JERICO-RI CMO.

RI Revenue Assumptions at start of operational phase:

- 8 Full members:** €30,000 per annum flat fee
- 3 Observer Members:** €10,000 per annum flat fee
- Host Country Contribution:** €356,000 per annum

Table 7.7 Estimated Annual revenues over 5-years to fund JERICO-RI CMO (net present value has been calculated using a discount rate of 4%, CSIL, 2019).

Revenue Source Item	Revenue					
	Year 1	Year 2	Year 3	Year 4	Year 5	
Host Country Contribution	€356,000	€366,680	€377,680	€389,011	€400,681	
Members' Annual Monetary Contributions	€270,000	€278,100	€286,443	€295,036	€303,887	
Observers' Annual Monetary Contributions	€30,000	€30,900	€31,827	€32,782	€33,765	
European and regional project grants	€200,000	€206,000	€212,180	€218,545	€225,102	
Commercial revenue and consultancy fees	€110,000	€113,300	€116,699	€120,200	€123,806	
Total Revenue	€966,000	€994,980	€1,024,829	€1,055,574	€1,087,242	€5,128,625

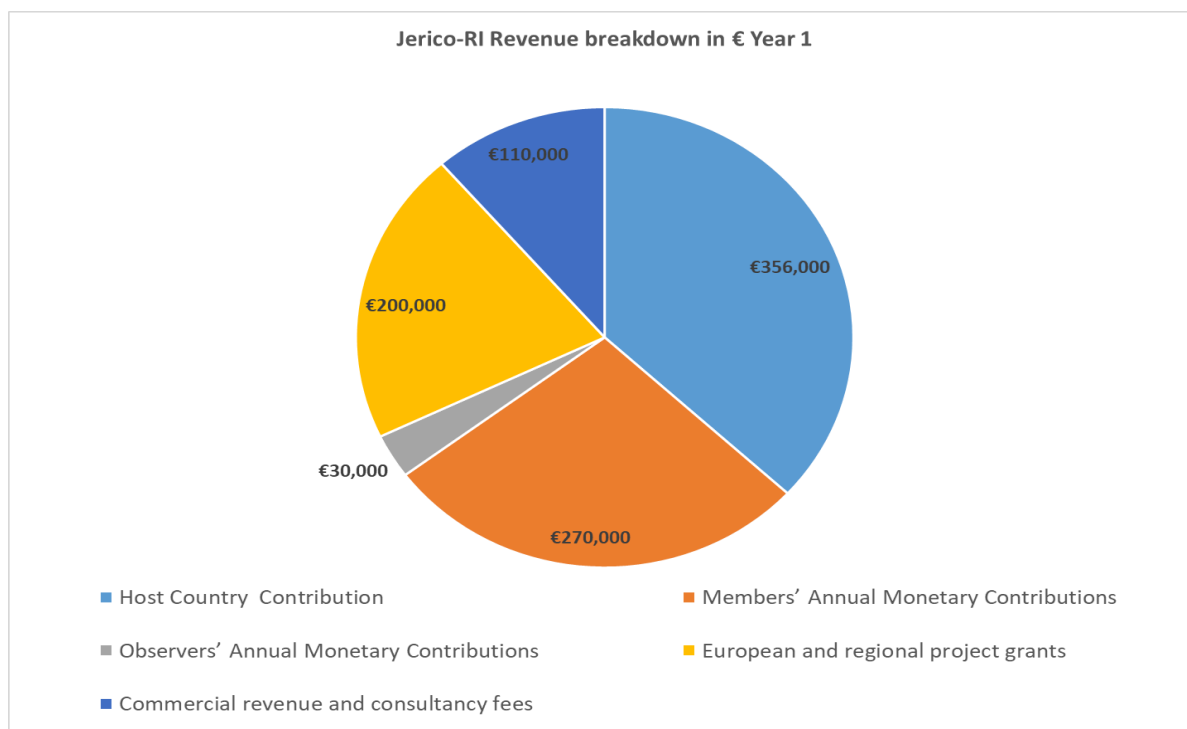


Figure 7.8 Estimated Annual revenue streams for JERICO-RI.

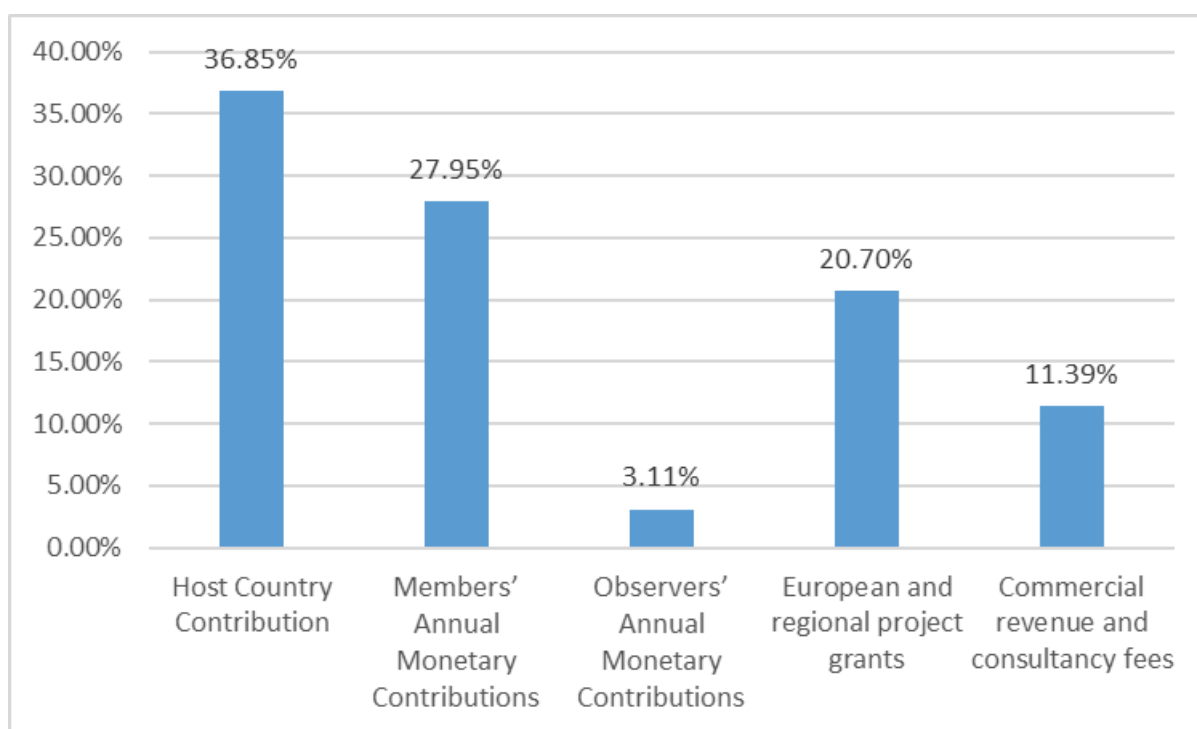


Table 7.9 Estimated JERICO-RI Revenue Sources (breakdown by %).

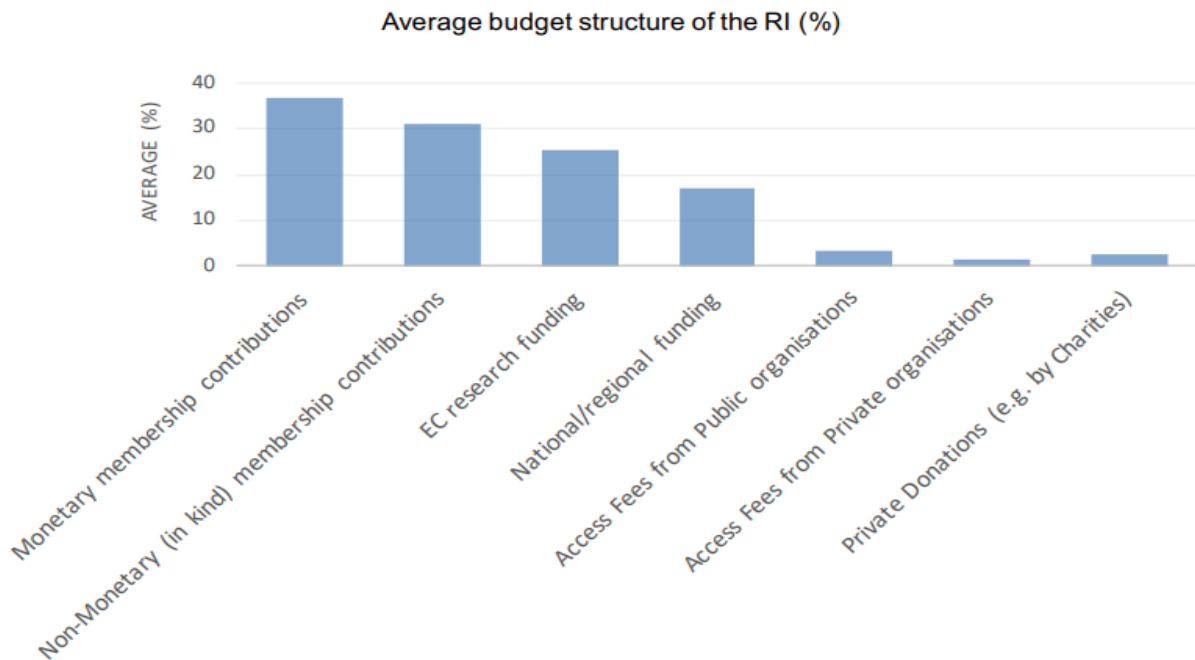


Figure 7.10 Annual average budget structure across 27 surveyed ERICs in the ERIC Forum survey (ERIC Forum, 2022 *Implementation Project Report and proposal for a model sustainability plan for ERICS*).

7.6 JERICO-RI Costs versus Revenues Analysis

The Cost versus Revenues diagram in Figure 7.11 provides a summary of the tabs in the Cost Book and aggregates the results to produce a financial analysis for JERICO-RI. It presents the summary of the RI's estimated Annual running costs and **revenues**.

Analysis: On cost structure, the data indicates that slightly more than 40% on average of the budget is spent on human resources (HR); in-kind HR for the **28.5%** (personnel employed at any RI Member's institutions, providing services to the RI in lieu of monetary contributions). On average, 22% are indirect costs (all expenses incurred for materials, services and maintenance necessary for the operation of the RI), and 15% are other direct costs (for example, depreciation costs or leasing fee of equipment; purchase of consumable materials; supply of services - catering, translations and interpreting, rent meeting rooms, cost of external auditor, support services; missions of structured and unstructured personnel, specific costs such as TA and clinical studies).

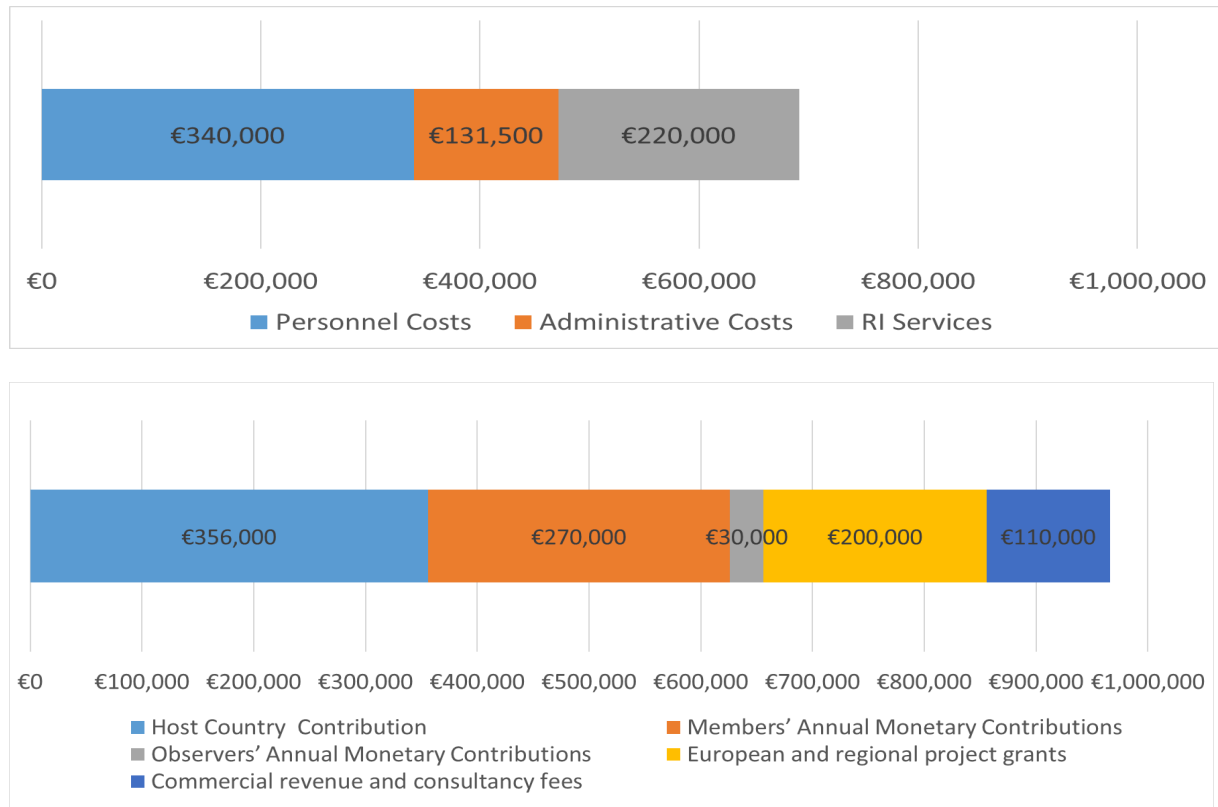


Figure 7.11 JERICO-RI Annual Running Costs versus Annual Revenues.

7.7 National Research Infrastructure Funding

National research funding organisations will fund the annual cost of running the JERICO-RI National Nodes and any upgrades required. These costs are outlined in Figure 7.11 above. Operating infrastructures in the marine environment is a challenging and costly endeavour. The JERICO-RI CMO will actively support Member States in applications for funding for upgrades to existing facilities. A review of national research funding organisations for the JERICO-RI Member States has been conducted (see Appendix 1). These funding agencies will be monitored regularly to identify calls relevant to JERICO-RI Members. Links between JERICO-RI and national funders will be established and further developed through the EOOS Resources Forum.

7.8 European and Regional Funding Programmes

The use of regional investment funds may be considered to fill in important observation gaps along the European coasts. The use of European Regional Structural Funds, where applicable, will be actively pursued and promoted. A number of European and regional funding programmes that are relevant for the achievement of JERICO-RI strategic objectives have been identified (Annex 1). Horizon Europe (2021 -2027) provides funding for research, development and innovation to secure Europe's global aims and to maximise the scientific, economic and societal impact of this funding. The Invest EU Programme builds on the success of the Investment Plan for Europe (Juncker Plan). It integrates the European Fund for Strategic Investment (EFSI), Employment and Social Innovation (EaSI), InnovFin and other funding instruments into one comprehensive programme. With InnovFin – EU Finance for Innovators, the EIB Group (the European Investment Bank and the European Investment Fund) can provide financing starting at €25,000 for investments in Research and Innovation (R&I) to companies and other entities of all sizes and ages.

European Structural and Investment Funds (ESIF) include the European Regional Development Fund, European Social Fund, Cohesion Fund, European Agricultural Fund for Rural Development and European Maritime and Fisheries Fund. They are jointly managed by the European Commission (EC) and Member States and account for over 50% of EU funding. The InvestEU Fund is expected to mobilise at least €650bn in additional investment for the period 2021-2027. The Joint Programming Initiative (JPI) for Oceans is an intergovernmental platform that aims to increase the impact of national investments in marine maritime research and innovation. JPI Climate aims to align national programmes by jointly coordinating their climate research and funding new transnational research activities.

7.9 Benefit In-Kind Contributions

Benefit In-Kind (BIK) contributions from Members are vital to JERICO-RI in delivering its proposed services portfolio. A BIK policy has been drafted on behalf of the consortium detailing the requirements and expectations from various Members of the in-kind contributions required - the policy draft is included in Appendix 4. The policy should be endorsed by all the JERICO-RI members. The services estimation model has identified the BIK contribution to operate JERICO-RI services that are required in addition to the in-cash contributions that are more focused on the operation of the JERICO-RI CMO.

The percentage of in-kind compared to in-cash that are to be used to cover operational costs is to be finalised. In an ERIC forum report (2022) on ERIC sustainability, a survey reported that, on average, 30% of the revenues for an ERIC were provided as BIK.

To account for in-kind contributions in the JERICO-RI Cost Book, the following steps have been considered:

- **Identify and quantify in-kind contributions:** Clearly identify the types and amounts of in-kind contributions that the RI will receive from various partners or stakeholders. Quantify the value of these contributions based on market rates or established valuation methods.
- **Separate financial and in-kind contributions:** Distinguish between financial contributions and in-kind contributions in the Cost Book. Ensure that each type of contribution is recorded and accounted for separately.
- **Assign a fair value:** Assign a fair and reasonable value to each in-kind contribution based on its market value or the cost it would take to obtain it commercially.
- **Include in budget and expenses:** Incorporate the value of in-kind contributions as part of the overall budget and expenses in the Cost Book. These contributions may offset certain expenses that would otherwise be incurred by the RI.
- **Document agreements:** JERICO-RI will formalise agreements with partners providing in-kind contributions to outline the terms, duration, and expectations of the contributions. This documentation will help clarify responsibilities and avoid misunderstandings. JERICO-RI has drafted a BIK policy - see Appendix 4 to address the details of BIK contributions.
- **Regularly update the Cost Book:** As the RI evolves and partnerships change, the Cost Book should be updated regularly to reflect any modifications in BIK contributions and their impact on the RI's financials.

An appropriate identification (and evaluation), as well as the representation (in the Annual accounts) of the BIK contributions, allows the understanding of the real overall values of the resources involved in an ERIC. It also allows both the RI management and the policy-makers at the Member's Government or EU level to understand the specific and overall impact of the ERICs activities.

A methodology aimed to define the the BIK contributions within the activities of JERICO-RI takes into account: A) the mission of the ERIC; B) the structure of the ERIC as a distributed research infrastructure; C) the different activities performed by the JERICO-RI through the facilities made available from the Member States.

It is based on a methodology developed in the **Accelerate Project** – Planning for Sustainability of Research Infrastructures (2021) and includes the following 4 steps:

1. Resource Definition

- Establish the potential resources available for JERICO-RI across the National Nodes,
- Formulate Framework Agreements between JERICO-RI and National Nodes designated by respective national governments. These agreements will formalise the definition of the facilities coordinated.

2. Resource Identification and Allocation

- Annually plan activities and allocate resources to JERICO-RI.
- Draft Specific Agreements with each National Node detailing in-kind contributions covering:
 - Detailed technical description of planned activities,
 - Project plans, including timelines, deliverables, and milestones,
 - Total estimated values of contributions,
 - Roles, responsibilities, and delivery mechanisms,
 - Ownership transfer rules, if applicable,
 - Delivery responsibility for in-kind contributions.
- Adhere to ERIC Regulation Article 13 for balanced budgeting and accounting.

3. Cost Measurement and Reporting Rules

- Implement guidelines for reporting benefit in-kind (BIK) contributions:
 - Costs should be directly related to achieving JERICO-RI's goals,
 - Back costs with appropriate documentation (e.g., timesheets, certifications),
 - Align costs with agreed administrative, scientific, and technical activities,
 - Ideally, include costs in JERICO-RI's budget,
 - Ensure compliance with national laws (tax, labour, social security),
 - Adhere to principles of sound financial management,
- For inclusion in annual accounts, costs must be audited following common auditing principles.
- Assign internal or external auditors for each research entity/ national facility to report and verify BIKs.

4. Implementation Tools

- Develop a unified methodology with tools for data collection and accounting:
 - Standardised tables for BIK data collection based on specific agreements,
 - Guidelines for accurately filling out tables,
 - Instructions for representing scientific activities,
 - Timelines for BIK data submission in line with budget/financial statement approvals,
 - Forms for detailing activities undertaken or planned,

- Indicators for assessing the impact of activities.
- Provide administrative support from JERICO-RI's CMO to national facilities.
- Recommend forming an internal committee involving financial officers from JERICO-RI and national facilities to facilitate the process.

This methodology is aligned closely with the proposed services estimation model presented in section 5.2. It is anticipated that the BIK contributions from the JERICO-RI partners will enable and support the delivery of a majority of the services being offered by the RI, particularly services related to physical and virtual access.

7.10 Income From Industry Partnerships

Access to JERICO-RI infrastructures as well as training and expert advice from within the ERIC, will be offered as a service to Industry partners as a measure to raise revenue to secure the sustainability of the JERICO-RI.

Over the 10-year history of JERICO-RI Transnational Access, there has been significant industry involvement with industry-related projects accounting for 22% of all access projects (Loughlin et al., 2023). This clearly demonstrates the demand from the industry for access to the multi-platform research platforms, calibration facilities and scientific expertise that JERICO-RI can provide as a service.

A **Business Development Group** was set up as part of JERICO-S3 to identify potential opportunities to interact with the industry.

7.11 ERIC Funding Models and Initiatives

The ERIC Forum is a community of 21 leading European Research Infrastructures that aims to strengthen coordination and networking, reinforce the informal ERIC network or its successor framework, support the organisation of specific meetings, targeted thematic workshops focusing on shared challenges such as the development of internal procurement rules, harmonised reporting, VAT exemption practices, insurances and pensions policies and training of governance bodies representatives, as well as support ERICs in preparation, based on best practices, support common communication and outreach activities and strengthen the external representation of ERICs as a stakeholder in consultations and other policy actions that could affect them. The ERIC Forum Implementation Project is a Horizon2020 project which brings together the ERIC community to strengthen its coordination and enhance its collaborations.

Recommendations from the ERIC forum on funding strategies for RIs were published in a policy brief in ERIC FORUM (2020). Appropriate mechanisms and a sufficient volume of funding for operations and for projects requesting services from ERICs are of the utmost importance for delivering a high and sustainable impact. The following ERIC Forum recommendations are being incorporated into the Funding Plan and Governance Strategies for JERICO-RI

- ERICs should be fully eligible and be recognised by national funding agencies, and cross-border funding from national funding agencies should be promoted,
- ERICs and funding bodies at all levels can join efforts to improve ERICs visibility and attractiveness. Funding bodies should actively refer applicants to ERIC, encouraging and providing incentives for their use,
- Transnational Access mechanisms must be safeguarded and expanded to support ERIC consolidation, respond to specific challenges, develop research communities and provide a flexible budget for sustainable access for competitive projects,

- Simplification of the application and financial processes for distributed RIs in Horizon funding can help to overcome bureaucratic hurdles and boost the visibility of ERICs,
- Dialogue and collaboration among national, regional and European funding bodies must be strengthened to ensure the alignment of strategies and the synergic use of resources.

JERICO-RI proposes to leverage the advantages of the legal status of the ERICs within the individual Member States, for example:

*Article 7.2 confirms the full legal capacity of an ERIC and its **right to conclude contracts under the law of each of its Member States**: “An ERIC shall have in each Member State the most extensive legal capacity accorded to legal entities under the law of that Member State. It may, in particular, acquire, own and dispose of movable, immovable and intellectual property, conclude contracts and be a party to legal proceedings.” In other words, the Article implies that while an ERIC has its statutory seat in just one country, the legal entity of an ERIC should be recognised in all of its Member States. Importantly, this recognition should also cover **public research and innovation funding bodies**.*

Another approach to facilitate regional access for SMEs and thereby encourage the use of JERICO-RI, is to create an **access fund** for the use of the RI. This enables SMEs and Start-Ups that may have limited financial capabilities, i.e. those that are likely to benefit most from access to equipment and expertise they do not possess and cannot afford, to benefit from the RI (this is currently the case for the Basque Country Region in Spain for EMBRC-ERIC).

A dialogue between ERICs and regional representatives is essential. The participation and involvement of regional representatives in RI governance should be developed, as it helps to ensure better coordination between local and RI strategies.

Regions and RIs should engage as early as possible in the establishment of the RIs to ensure they meet local needs and expectations. A mapping between the attributes and assets of the RIs and the needs of the regions should be carried out and an open two-way dialogue should be maintained throughout the consolidation of the ERIC and into its operational life.

7.12 Other sources of income

A **Funding working Group for JERICO-RI** was established in 2020 as part of the JERICO DS WP4 activities with a goal of identifying and targeting funding opportunities across the member countries. A JERICO-RI funding register has been established to identify funding programmes and calls that JERICO-RI should apply for.

The ERIC Forum Policy Brief on Funding Models for Access to ERIC Multinational/Transnational Service (2020) highlights the following funding instruments available to JERICO-RI to explore opportunities for additional sources of income:

- National funding schemes,
- ERA-NETs European Research Area Network and EJP (European Joint Programme) mechanisms,
- ERDF funds for cross-border projects and RI development,
- The ERC funding scheme,
- Horizon 2020 and Public Private Partnerships (with outlooks on Horizon Europe),
- Transnational Access Mechanisms,
- Short term mobility and fellowships.

Other sources of income that will be pursued by JERICO-RI include Small Business Innovation Research (SBIR) grants, the Contrat Plan Etat Région in France, the European Investment Bank and the Blue Invest Platform for SMEs. The Enhanced European Innovation Council (EIC) pilot - (<https://ec.europa.eu/research/eic/index.cfm>) supports top-class innovators, entrepreneurs, small companies and scientists with ideas and the ambition to scale up internationally. It brings together the parts of Horizon 2020 that provide funding, advice and networking opportunities for those at the cutting edge of innovation.

In addition to grants, other types of financing are offered at the European level through institutions such as the European Investment Bank and European Investment Fund. These include debt financing, equity products, and project bonds.

At the national level, governments typically allocate funds within their budgets for innovation, research, and higher education. These funds can support specific research programs, including PhD and project research, as well as the operation and implementation of R&D institutions and research infrastructures. Internationalisation and research cooperation are also areas that can be covered by these funds.

The management of Research and Innovation (R&I) funds at the national level is often distributed among innovation agencies. These agencies may also be responsible for managing European Structural and Investment Funds. Additionally, private foundations that invest in innovation and scientific research may provide additional funding opportunities.

Each Member State has unique processes and funding opportunities, and political and geopolitical factors also come into play. Therefore, it is essential to have a broad understanding of these dynamics within the scope of JERICO-RI. The distributed infrastructure will need to coexist within different National Nodes and a European context.

By understanding the available funding streams at each National Node and at the European level, the JERICO-RI network can identify financing options for its operations and services. This knowledge helps in planning the financial framework that will ensure the long-term sustainability of the infrastructure. Moreover, leveraging the expertise within the JERICO-RI network, infrastructure services can provide guidance to funding agencies for establishing more objective and targeted screening processes. Advice and support can also be offered to end-users, helping them access funding schemes at various development stages and effectively utilise them to advance their technologies towards commercialisation.

7.13 Sensitivity Analysis and Confidence Levels

To increase the clarity and truthfulness as well as the accuracy of the confidence levels identified, we use three scenarios of operation for the JERICO-RI:

- the baseline (expected level of activity),
- the best-case (e.g., increase in the expected level of activity),
- the worst-case (e.g., decrease in the expected level of activity).

The different scenarios of operation (low, medium, high) allow for a certain control of the operational expenses of the RI. The low scenario minimises the overheads, and focuses on BIK from Members to enable secondments of personnel of participating infrastructures to resource the required human resources.

The Sensitivity Analysis of key input costs is presented in the 'Sensitivity' tab of the Cost Book. The sensitivity analysis can be univariate or bivariate and looks at changes to the

operational balance resulting from changes to the inputs. The user can change the input range in order to analyse different options. The operational balance affected by this analysis is based on the JERICO-RI configuration defined in the setup table, considering the operational costs and revenues. It is not the long-term operational balance.

The sensitivity/variation of the RI operational balance is based on:

- Number of participating members,
- Number of service Offices,
- Base Fee,
- Host Premium,
- Utilisation rate,
- Commission rate,
- Levy values,
- Number of infrastructures available for access and number of units of access.

7.14 Summary

The **financial model** and **Cost Book model** enable an analysis of different scenarios of operation of the JERICO-RI and can be used to examine the different phases of the RI implementation. These methodologies identify the main areas of risk for the long-term sustainability of the RI. During the preparatory and implementation phases, when no legal entity is established and no revenues are being generated, the operational costs will need to be covered by other sources of funding.

France, as the host nation, has committed to providing management and funding during the preparation of the application to ESFRI and it is anticipated that an EU support programme, like INFRADEV-2 program, which provided support for the Preparatory Phase of new ESFRI projects, would be available to JERICO-RI once on the ESFRI roadmap.

During the operational phase of the RI, the number of participating members will affect the revenues. However, the number of members will be known, and the management of the CMO and the service offices can be adapted in order to align the costs to the incoming revenue.

The number of units of access to JERICO-RI infrastructure and other services will also affect the revenue; however, like the number of members, this will be set in the contracts between participants and the RI, and the costs can be adjusted. One source of risk during the operational phase will be the utilisation rate of the facilities offering access. However, the previous JERICO FP7, JERICO-NEXT and JERICO-S3 projects have shown that there is a demand for access to facilities, and the added-value provided by JERICO-RI facilities will minimise the risk of not meeting the minimum utilisation rate needed for the sustainability of the RI. JERICO-RI's proven ability to attract researchers, businesses, industries and public bodies to access its service offerings will help ensure its sustainability and success.

In terms of Financial KPI's criteria that have been identified as important in determining the sustainable ongoing operation of JERICO-RI facilities include:

- Per year operating cost of research platforms,
- Percentage of regular funding (e.g., from permanent national programmes or an institute's annual budget) in the per year operating cost of platform,
- Percentage of intermittent funding (e.g., from projects) in the per year operating cost of platform,

- Per year maintenance cost of platform,
- Percentage of regular funding (e.g., from permanent national programmes or an institute's annual budget) in the per year maintenance cost of platform,
- Percentage of intermittent funding (e.g., from projects) in the per year maintenance cost of platform,
- Average cost per datum.

8. Added Value of JERICO-RI

As a dedicated coastal marine research infrastructure, JERICO-RI offers significant value to its members, users, and funders. For members, the infrastructure provides a collaborative platform, fostering partnerships across diverse scientific disciplines and institutions. It offers access to cutting-edge technologies and facilities, enabling researchers to conduct comprehensive and interdisciplinary studies that address complex coastal challenges. Moreover, being a part of JERICO-RI enhances the visibility and recognition of Member organisations within the scientific community, potentially attracting top talent and fostering innovation.

Users benefit from JERICO-RI's diverse suite of observation systems and standardised data collection methodologies. The infrastructure ensures high-quality, harmonised data, which users can access and utilise for their research and operational needs. For coastal stakeholders, this means better-informed decision-making regarding environmental management, marine safety, and policy development, ultimately contributing to societal well-being and sustainable coastal development.

From a funding perspective, JERICO-RI provides a robust Business Plan that delineates the cost-effectiveness and long-term sustainability of the infrastructure. This is attractive to funding bodies, as it demonstrates a strategic approach to resource allocation and an efficient utilisation of funds. Moreover, the RI's ability to continually innovate and incorporate state-of-the-art technologies ensures that funders' investments remain at the forefront of scientific advancement.

Overall, a dedicated research infrastructure like JERICO-RI stands as a catalyst for scientific collaboration, data standardisation, informed decision-making, and efficient resource utilisation, thereby benefiting its members, users, and funders alike.

8.1 Financial Benefits of JERICO-RI to Potential Members

JERICO-RI operating as an ERIC framework provides a legal capacity recognised in all EU countries, flexibility to adapt to specific requirements of each infrastructure and exemptions from VAT and excise duty. The full potential of VAT Exemption on goods and services that are purchased by the ERIC is still being interpreted (ERIC Forum, 2020).

Quantifiable benefits that are directly attributable to the Members of a future JERICO-RI include the following:

- Reduced transnational costs and redundant expenditure on equipment and facilities,
- Discounted pricing through a system of centralised procurement,
- User community benefits resulting from the JERICO-RI Transnational Access Programme,
- Additional revenues from Participation in EU-funded projects that involve JERICO-RI,
- Additional RI commercial access service revenues and VAT rebates on equipment purchases (A report by the ERIC Forum details the potential uses of the VAT exception in ERIC Operations, ERIC Forum, 2020).

8.2 Advantages and Benefits of Joining JERICO-RI

Joining a European Research Infrastructure Consortium (ERIC) offers several tangible benefits from an institutional, national and international perspective:

- **Access to Advanced Facilities and Expertise:** JERICO-RI offers cutting-edge research facilities and specialised technologies, enabling high-quality experiments

and studies that may not be available at the national level, ensuring researchers have access to top-tier resources.

- **Enhanced Research Collaboration and Leverage of National Expertise:** Membership fosters collaboration between national and international researchers, promoting the exchange of knowledge and ideas, leveraging national expertise to enhance the overall capabilities and reputation of JERICO-RI, attracting increased research opportunities and funding.
- **Increased Visibility and Recognition:** Being part of JERICO-RI elevates the profile of Member institutions and researchers within the European scientific community, resulting in greater visibility, higher citation rates, and international recognition.
- **Access to Funding and Streamlined Administrative Processes:** JERICO-RI secures funding from various European programs, supporting national research projects, while its established administrative frameworks simplify processes such as project proposals, budgeting, and reporting, reducing administrative burdens.
- **Facilitation of Cross-Disciplinary Research and Access to Policy Processes:** JERICO-RI spans multiple scientific disciplines, fostering interdisciplinary collaborations for innovative breakthroughs. Membership provides a platform for Member stakeholders to engage with European policymakers, shaping the research agenda and policy landscape at the European level.
- **Access to Training and Infrastructure Improvement:** JERICO-RI offers training and educational programs for researchers, students, and technicians, nurturing human capital within the national research community. It invests in maintaining and upgrading research infrastructure, providing state-of-the-art facilities without the financial burden of ownership or maintenance.
- **Enhanced Competitiveness and VAT Exemptions:** Participation enhances competitiveness in securing funding from European programs like Horizon Europe, demonstrating commitment to European collaboration and standards. Additionally, VAT exemptions on certain goods and services lead to significant cost savings.
- **Pooling of Resources and Cost-Sharing Opportunities:** Member countries pool financial resources, minimising financial burdens and maximising funding impact, while cost-sharing arrangements allow varying financial capacities to participate in joint initiatives.
- **Access to Grants, Reduced Overheads, and In-Kind Contributions:** JERICO-RI offers grants and scholarships, supports reduced administrative overheads, and provides opportunities for in-kind contributions, allowing cost-effective collaboration.
- **Access to Specialised Services and Potential Revenue Generation:** Access specialised services within JERICO-RI and potential revenue sharing from commercial activities associated with its research infrastructure, providing an additional income source for member countries.

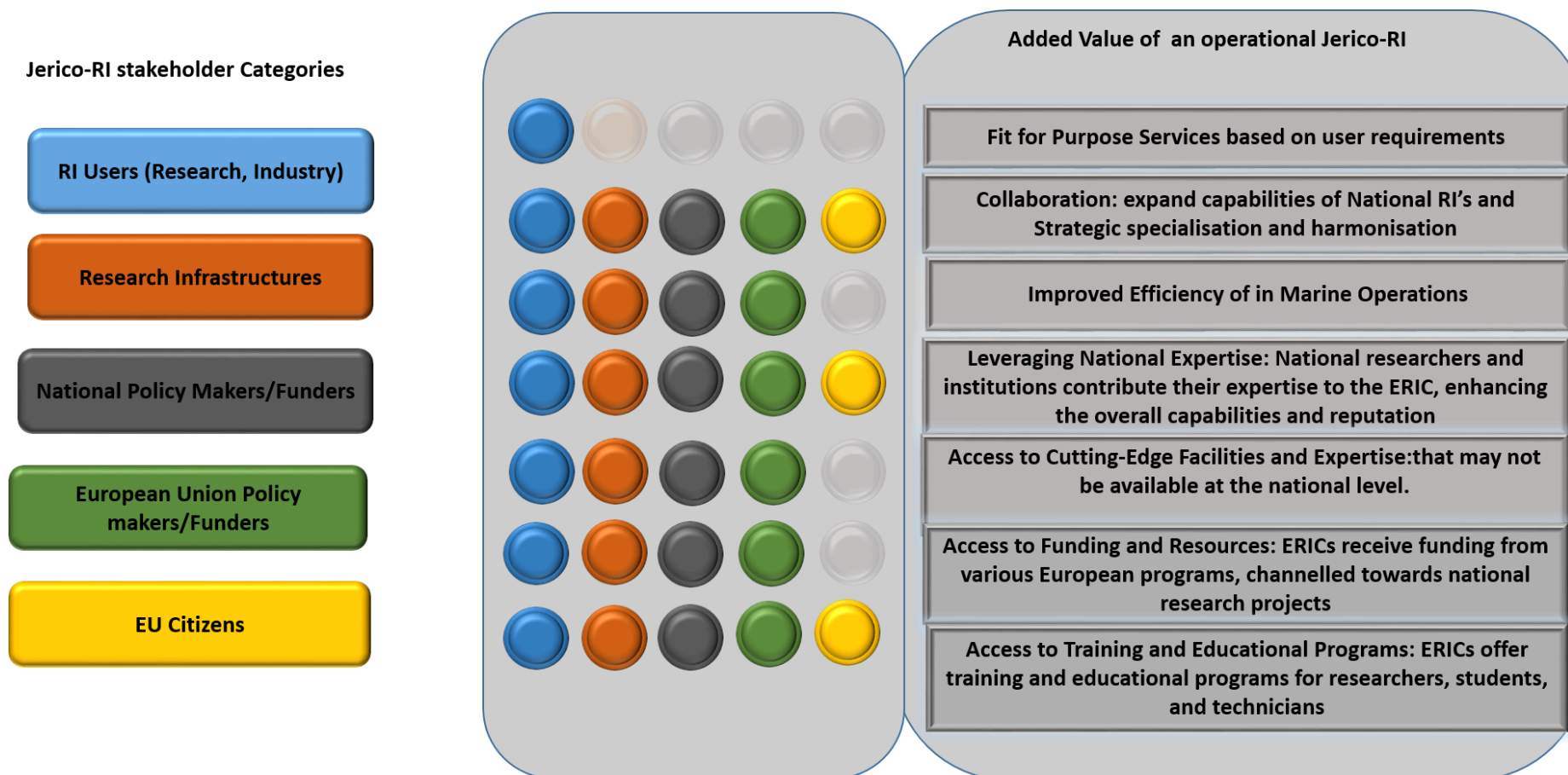


Figure 8.1 Illustrating the added value matrix where JERICO-RI's stakeholder categories benefit from a range of benefits and advantages through participation in the RI. The JERICO-RI Business Plan will deliver this extra value to stakeholders through its business, governmental and organisational design.

8.3 Key performance indicators

Monitoring the progress and development of JERICO-RI across its development phase is an important consideration in the sustainability plan. In JERICO-DS, Key Performance Indicators (KPIs) have been developed relating to the Science, Technology, Data, Sustainability, Governance and Communications work packages. These have been synthesised in **JERICO-DS D5.5**.

Defining the KPIs is an important element of the Business Plan as they provide mechanisms to:

- Have an internal management tool that helps the RI to achieve tangible results, and enables the monitoring of progress against set objectives, mission, and vision.
- Document improvements and developments, and monitor performance in various areas of interest, including e.g. scientific outcomes and outputs, technical performance, operations, adequacy of services, access, trainings, user uptake etc.
- Have an instrument for communicating the successes of the RI to various audiences and stakeholder groups by presenting measurable results.
- Improve the long-term impact and value of the RI, demonstrate its effectiveness, efficiency and accountability, and address the requests of governing bodies.
- Mitigate risks by detecting problems early on, and provide informed feedback on key strategic documents and policies of the RI.
- Evaluate the work of the RI Central Management Office and measure the level of engagement with each National Node.

Box 8.1 Mechanisms used to define the JERICO-RI Key Performance Indicators.

In JERICO-DS, 7 KPIs were selected as priority indicators from a synthesised list of KPIs to demonstrate how effective JERICO-RI is in meeting objectives for performance. The task linked closely with all JERICO-DS work packages to identify, evaluate and synthesise the KPIs from the ESFRI Sustainability Working Group (Kolar, 2019) and OECD (2019) recommendations that the JERICO-RI design will incorporate into its different life cycle phases, enabling effective performance monitoring as the RI develops. The 7 priority KPIs are shown in Table 8.1.

Table 8.1 Summary of synthesised JERICO-RI Key Performance Indicators.

RI Objective	KPI description	Sub-indicators
Enabling scientific excellence	KPI1: JERICO-RI in publications and citations	Number of published JERICO-RI related articles. Number of citations.

Enabling scientific excellence	KPI2: Units of Access Provided by JERICO-RI facilities	Units of access provided for physical and remote access. Units of access provided for VA. Number of applications and grants for TA. Number of requests for VA. Number of internal JERICO infrastructure users. Number of external scientific JERICO infrastructure users.
Enabling scientific excellence	KPI3: Number of applications and grants/projects granted	Number of applications accepted. -Number of projects accepted.
Enhancing transnational collaboration in Europe; Enabling scientific excellence	KPI4: Number of collaborations with other RIs	Number of projects other RIs are contributing to with JERICO-RI. Number of MoUs signed with other RIs.
Facilitating economic activity; Enabling scientific excellence	KPI5: Number of collaborations with industry	Number of industrial users for all services provided by JERICO-RI.
Enhancing transnational collaboration in Europe; Optimising management	KPI6: Number of JERICO-RI Member States	Number of Member States signed with JERICO-RI.
Optimising management	KPI7: Revenues	Sources of revenues including financial and in-kind contributions.

The use of KPIs by JERICO-RI across its life cycle phases emerges as a strategic framework following the establishment of a Working Group (WG) by the ESFRI. This WG was tasked with formulating a comprehensive set of KPIs applicable to RIs, aligning from input to outcome indicators. The developed KPIs underwent rigorous testing, ensuring they met **RACER** (Relevant, Accepted, Credible, Easy to monitor, and Robust) criteria.

To facilitate KPI implementation, the establishment of a Monitoring Implementation Group is proposed, aiming to refine KPIs, share best practices, and monitor their adoption across JERICO-RI stakeholders. It is proposed that the KPIs used by JERICO-RI are further determined in a dialogue between the RI and ESFRI (Strategic Working Groups, Implementation Group, the Monitoring Implementation Group), involving other relevant parties, e.g. funders of the RIs or ministries. JERICO-RI will collect data and calculate the KPIs periodically in a manner that can be presented to the evaluators during the periodic evaluation by ESFRI.

8.4 Socio Economic Impacts

Some of the key socio-economic benefits associated with the permanent establishment of JERICO-RI are actually of far greater import than the benefits that were considered in the quantitative component of the economic appraisal. While many of the qualitative benefits

that are wholly or partly attributable to JERICO-RI cannot currently be measured or counted, there is little reason to doubt that the JERICO-RI has a positive socio-economic impact in such cases.

Improving the efficiency and effectiveness of scientific research: Coastal observatory services support the environmental protection work of public authorities and national, local and regional governments. The data provided by coastal observatories allows bureaucratic authorities to formulate, implement and assess policies for environmental protection with increased effectiveness and with greater confidence that the underlying information is quality-assured and scientifically validated.

Commercial and industrial applications: By improving the management and exploitation of coastal environments for commercial and societal purposes, coastal observation systems meet the needs of end-users by generating information related to societal economic needs and resource requirements. By enhancing the effectiveness of coastal environment marine observatories, the JERICO-RI contributes towards the achievement of more sustainable marine resource exploitation.

Social and producer surpluses: The commercial benefits of coastal marine observation systems stem from the economic value of the data generated by such systems and the effects that such information has on the behaviour of commercially active individuals and organisations.

Supporting environmental protection: Coastal observatory services support the environmental protection work of public authorities and national, local and regional governments. The data provided by coastal observatories allows bureaucratic authorities to formulate, implement and assess policies for environmental protection with increased effectiveness and with greater confidence that the underlying information is quality-assured and scientifically validated.

Understanding and adapting to global climate change: Coastal observation systems can mitigate the socio-economic risks of climate change by improving forecasting of conditions in coastal environments and by assisting in the design of climate-proof coastal infrastructures that prevent coastal flooding and associated property damage. By providing data for climate research and ocean modelling, coastal oceanography can improve climate prediction and monitoring, improve management of environmental change and improve prediction of extreme weather events. Such data can improve guidance for public policymaking on environmental management and climate change adaptation, mitigating the social and environmental costs of climate change.

Responding to public environmental and other public safety hazards: Coastal observatories also improve health and safety in coastal areas by improving the responsiveness and effectiveness of search and rescue services. Particular coastal observatory RIs can monitor conditions in coastal environments in real-time, providing rescuers with information on the location and condition of distressed individuals as well as data on sea currents, sea surface conditions and wind conditions.






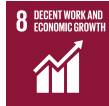
Providing secure financial support to the research network: JERICO-RI will provide secure multi-annual funding for scientific research endeavours. National budgetary financing in Europe is invariably revised and allocated on an annual basis, making national funding streams prone to cuts when the fiscal positions of national governments come under strain. Sustained and consolidated long-term funding commitments, whether from participating Member State governments or in the form of EU funding, help to ensure the sustained operation of observatories and multi-annual research projects that may suffer cuts in their funding streams in the event of an economic crisis or a change in government.

Box 8.2 Non-quantifiable socio-economic benefits associated with the permanent establishment of JERICO-RI.

In particular, the work of Europe's coastal observatories in **understanding and adapting to climate change** should be highlighted. The future costs of current climate change inaction in Europe and elsewhere is not immediately apparent or readily quantifiable but can be

understood with reference to climate forecasting models contained within contemporary scientific research. On the basis of current projections, global climate change will have a detrimental socio-economic impact on Europe's coastal communities, and climate change mitigation and adaptation action are urgently required. By providing data for climate research and ocean modelling, coastal oceanography can significantly improve guidance for public policy-making on environmental management and climate change adaptation, mitigating the social and environmental costs of climate change. By integrating Europe's coastal observatories on a regional scale, JERICO-RI has the potential to make critical contributions to research and understanding of global climate change now and in the future.

JERICO-RI has looked closely at developing its Business Plan and practices in line with the **UN Sustainable Development Goals (SDG's)** that are the most relevant for a coastal marine RI. Services that benefit society and the environment are at the core of our mission. Integrating the UN SDGs into our business strategy improves the assessments of our impacts on sustainability and inspires us to develop and support new services and sustainable practices.

 <p>No Poverty</p> <p>JERICO-RI can contribute to sustainable fisheries management, ensuring the livelihoods of coastal communities dependent on fisheries; alleviating poverty.</p>	 <p>Quality Education</p> <p>JERICO-RI's infrastructure creates opportunities for educational programs and research collaborations, contributing to quality education in marine and environmental sciences.</p>	 <p>Affordable and Clean Energy</p> <p>Research from JERICO-RI contributes to the understanding of renewable energy potential in coastal areas, supporting the development of affordable and clean energy solutions.</p>
 <p>Zero Hunger</p> <p>JERICO-RI can support sustainable aquaculture and fisheries, contributing to food security and addressing hunger in coastal communities.</p>	 <p>Gender Equality</p> <p>JERICO-RI promotes gender-inclusive research and educational opportunities, contributing to gender equality in the field of coastal observations and marine science.</p>	 <p>Decent Work and Economic Growth</p> <p>JERICO-RI's activities create employment opportunities in marine research, data analysis, and technology development, contributing to decent work and economic growth.</p>




 <p>Good Health and Well-being</p> <p>JERICO-RI can provide data on water quality, aiding in the prevention of waterborne diseases. Access to clean water positively impacts the health and well-being of coastal populations.</p>	 <p>Clean Water and Sanitation</p> <p>Coastal observations help monitor water quality, ensuring clean water for communities and supporting sustainable sanitation practices in coastal areas.</p>	 <p>Industry, Innovation, and Infrastructure</p> <p>By standardising methodologies and technologies, JERICO-RI contributes to innovation in coastal observations, supporting sustainable infrastructure development and industry practices.</p>
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Figure 8.2 Socio-Economic Impacts of JERICO-RI through SDGs 1 to 9.


 <p>Reduced Inequality</p> <p>JERICO-RI's inclusive approach and collaboration with diverse stakeholders reduce inequalities by providing valuable data and opportunities for coastal communities, researchers, and industries.</p>	 <p>Climate Action</p> <p>JERICO-RI's observations contribute to monitoring and addressing the impacts of climate change on coastal ecosystems, supporting climate action initiatives.</p>	 <p>Life on Land</p> <p>By monitoring and preserving coastal biodiversity, JERICO-RI supports life on land by ensuring the health of ecosystems connected to coastal regions.</p>
 <p>Sustainable Cities and Communities</p> <p>Coastal observations support sustainable urban planning and community development by providing data for managing coastal resources, mitigating risks, and ensuring the resilience of coastal communities.</p>	 <p>Life Below Water</p> <p>JERICO-RI directly contributes to the conservation and sustainable use of marine resources, promoting life below water and biodiversity in coastal areas.</p>	 <p>Peace, Justice, and Strong Institutions</p> <p>JERICO-RI's commitment to evidence-based decision-making supports strong institutions and contributes to peace and justice in the management of coastal resources.</p>
 <p>Responsible Consumption and Production</p> <p>JERICO-RI contributes to responsible consumption and production by providing data on marine ecosystems, supporting sustainable fisheries, and reducing the environmental impact of coastal activities.</p>		 <p>Partnerships for the Goals</p> <p>JERICO-RI fosters collaborations and partnerships between European research institutions, governments, and local communities, supporting collective efforts to achieve the SDGs.</p>

Figure 8.3 Socio-Economic Impacts of JERICO-RI through SDGs 10 to 17.

9. Financial Risk Assessment and Mitigation Strategy

9.1 Background to Risk Assessment

Risk management in JERICO-RI is a critical component of the Business Plan, as risks represent a primary source of uncertainty and potential threats to the operation, outcomes, and success of JERICO-RI. As part of its risk management strategy, JERICO-RI has established a set of Risk Management Guidelines, serving as general guiding principles for operation and management. These principles, detailed further in the JERICO-RI Risk Management Plan, are as follows: Risk assessment involves identifying hazards and their potential effects and also developing control measures to offset any negative impact on the JERICO-RI.

The methodology used to carry out the risk assessment involves three main steps:

1. Risk event identification,
2. Risk analysis,
3. Risk evaluation.

Risk event identification is the process of recognising and recording potential risk factors and events that may affect JERICO-RI and the achievement of its objectives. The risk identification process includes identifying causes and sources of the main risks, such as events, situations or circumstances that could have a negative impact on JERICO-RI. The categories of risk faced by JERICO-RI include Financial, Organisational and Technical risks.

The aim of a **Risk Analysis** is to measure the impact of a potential event, situation or circumstance as well as developing an estimation of the probability of these hazards actually occurring. Risk analysis involves determining the probability of the event occurring and the magnitude of its impacts. A quantitative risk analysis involves estimating practical values for probability (likelihood) and impact being ranked on a numerical scale ranging from one to five (a higher rating to create a single numerical value for the overall risk magnitude).

The **Risk Probability** refers to the likelihood or frequency of a risk occurring. Probability rank is ranging from highly unlikely to very likely that an event will occur with three intermediate levels (Highly unlikely, Unlikely, Possible, Probable, Likely, Very likely).

The **Risk Impact** refers to the consequences of the event occurring and is rated on a scale from one to five, assuming a risk event occurs. A single impact may affect a range of different objectives and stakeholders. The impact rank is Insignificant, Minor, Moderate, Serious, Severe.

The **Risk Magnitude** is calculated by multiplying probability rating by impact rating as shown in a risk matrix. The **Risk Matrix** or map helps to define risk tolerance and identifies risks that need more attention.

A **Risk Evaluation** examines the extent to which identified risks could affect the ability of JERICO-RI to achieve its objectives. Risk evaluation involves defining control measures and identifying associated monitoring procedures.

A **Risk Response Strategy** is a systematic process in which risks are either accepted or rejected. If a risk is deemed to be above an acceptable level (in this case, a high or moderate risk), then mitigating actions should be taken to reduce the risk. Mitigation refers to actions taken, to either decrease impacts of the risk or decrease the probability of the risk occurring. Once risk mitigation has been carried out, risk magnitude is then recalculated based on any residual risk.

9.2 Methodology for Financial Risk Management in JERICO-RI

Throughout its maturation phases, JERICO-RI will encounter both internal and external risks at different levels. These risks can have varying impacts on the success of the project. They encompass financial, operational, external, and reputational factors. To evaluate the potential impact of each identified risk, we utilised a risk matrix, ranking risks based on their likelihood and potential consequences (see Table 9.1). By prioritising risks that are more likely to occur and could significantly affect the project, this section will proactively address the financial risks and enhance the project's overall resilience. As part of the risk event identification process, the ESFRI Forum report and proposal for a model sustainability plan for ERICS (2022) was studied to identify common issues and risks that existing RI's at various stages of development had encountered.

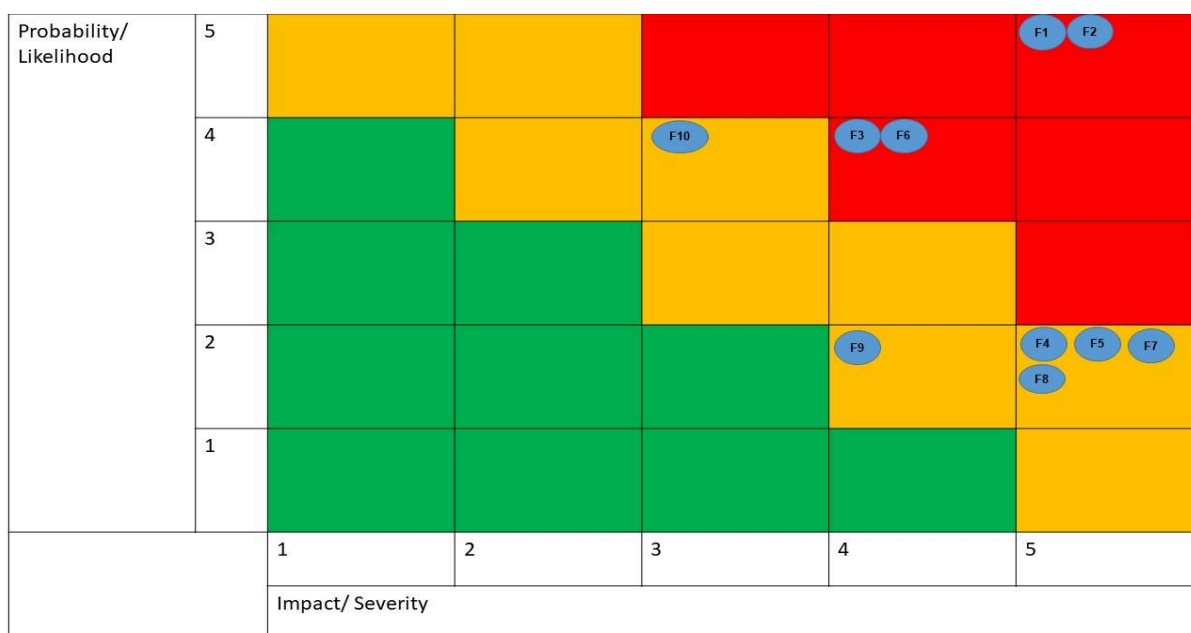
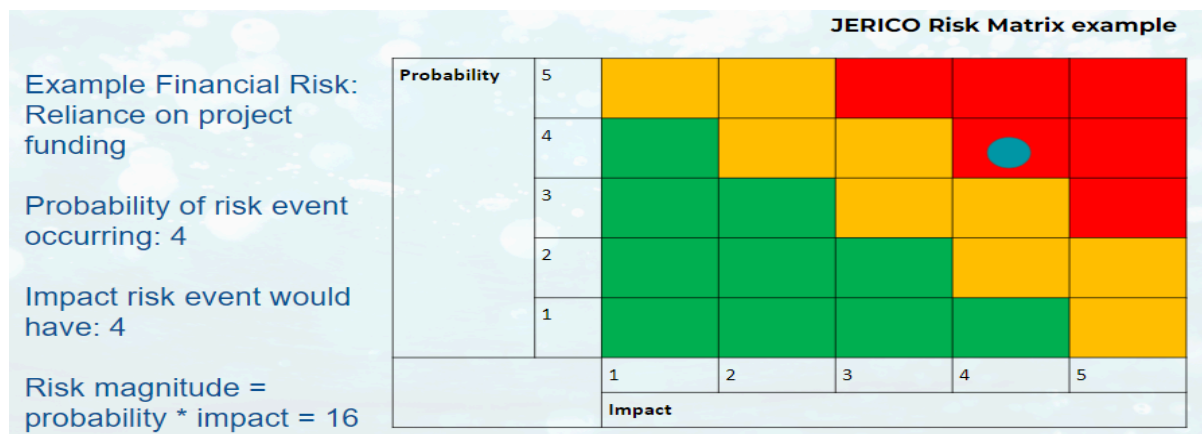


Figure 9.1 JERICO-RI Financial Risk Matrix illustrating how financial risks are identified and evaluated on probability and impact.

For the risk treatment, JERICO-RI maintains a **Risk Register**, which is the basis for the Risk Management. The Risk Register identifies the potential risks for JERICO-RI, and is updated regularly. The Risk Register keeps track of identified risks, current assessment of their likelihood and impact and the defined responsibilities. Currently, the owner managing these financial risks is the JERICO Nations Committee, it is envisaged that as the project moves into its preparation phase that this will be managed by the Executive Committee supported by the Central Management Office.

Table 9.1 JERICO-RI Financial Risk Register, listing the calculated impacts and proposed mitigations.

Risk ID.	Risk Identified	Owner	Probability	Impact	Magnitude	Proposed Mitigation
F1	Over reliance on project funding - identified in the ESFRI Roadmap application review in 2021	JERICO Nations Committee/	5	5	25	Secure National funding Commitments. There is a time dependency on this risk that can be addressed by additional awareness of mechanisms for securing financial commitments. It may not be possible to get any higher commitment at an early phase. Maximise the Benefit in Kind Contributions of members to deliver services.
F2	Lack of Funding commitments from Member States - Financial commitments as a RI is provided only by the lead country. - "Financial commitments as a research infrastructure is provided by the lead country only, while other commitments are institutional commitments (in kind), or operational costs of national participating facilities."	JERICO Nations Committee/	5	5	25	The JERICO Nations committee and coordination have been targeting GOOS National Focal Points and key political influencers at the national level, building support within Nations to support JERICO-RI. France, in particular, has been involved in high-level discussions through its ambassadors in the different nations to raise JERICO-RI as a priority. JERICO-DS D 4.2 describes in detail the efforts to strengthen National Commitments via the JERICO Nations Committee
F3	EC funding makes up majority of financial support to date for JERICO-RI	JERICO Nations Committee/	4	4	16	Expected that additional EU support once accepted on to the ESFRI roadmap. Linked to F2 with strong National Contributions to be secured through lobbying for national support - already secured for France, Italy and Croatia, with others to follow.
F4	RI Running Costs Exceed Income	JERICO Nations Committee/	2	5	10	Detailed funding model with sensitivity analysis completed. JERICO to explore other funding Options and mechanisms to reduce costs/Barter exchange/Strong BIK contributions.
F5	Poorly defined Services resulting in low usage of RI impacting Cost Model	JERICO Nations Committee	2	5	10	JERICO-RI Services Estimation model developed to plan and cost RI services portfolio over the RI life cycle - regular reviews.
F6	Impact of increased Inflation on Funding Model	JERICO Nations Committee	4	4	16	Monitor JERICO funding model and Cost Book developed using ESFRI recommended methodologies to monitor impacts of inflation on the JERICO Cost Book providing

						early identification of inflation impacts on the RI funding Model.
F7	Loss of partners or national support	JERICO Nations Committee	2	5	10	Effective Governance Structure to address Members' and national stakeholders' needs to ensure continued support. Continue to work with non-member nations to develop support for securing membership in the RI.
F8	No decision on Membership fee model to be used	JERICO Nations Committee	2	5	10	Funding Model assumption in Business Plan of a flat rate base fee of €30,000 per nation with €5,000 for observers and a host contribution of €356,000. Changes to the membership fee model could be made during the preparatory phase.
F9	CMO running costs undefined	JERICO Nations Committee	2	4	8	Funding model developed with a sensitivity analysis applied to CMO running costs based on 3 operational levels to address fluctuations in CMO running costs.
F10	JERICO-Core Development Costs undefined	JERICO Nations Committee/ Socib	4	3	12	JERICO DS D3.5 details the strategic plan for JERICO-CORE and has identified in its risk management plan mitigations to address risks related to the costs of development through the RI lifecycle.

10. Implementation of the Business Plan

The Business Plan for JERICO-RI serves as a strategic guide delineating the establishment and operation of a Marine Coastal Observation European RI. This plan details the infrastructure's objectives, strategies, governance, financial framework, and operational activities. The plan delineates JERICO-RI's long-term vision, emphasising its added value in the European environmental research domain and alignment with key research policies. It elucidates unique features such as its research facilities, service offerings, regional sites, and pilot supersites. The user strategy, market trends, access modes for researchers, and communication strategies are also outlined, aiming to effectively engage users and stakeholders.

Additionally, the plan covers governance, financial management, human resources, and funding frameworks, presenting a 5-year financial outlook and implementation activities. It proposes innovative design solutions aligned with national strategies and the overarching EU vision for JERICO-RI. The collaborative effort reflects the funding model, ensuring economic viability and alignment with financial strategies.

Overall, this Business Plan charts a comprehensive path, ensuring the infrastructure's successful establishment, operation, and sustainability. It outlines strategies, resources, and partnerships pivotal to addressing scientific challenges, supporting innovative research, and contributing to European environmental research policies in marine coastal regions.

The implementation of the JERICO-RI Business Plan encompasses executing the strategies, actions, and initiatives outlined within the plan to achieve specific goals. This process involves various elements that are crucial for successful execution:

Execution of Planned Activities: involves translating planned activities into action items. Assigning responsibilities, setting timelines, and executing tasks, ranging from operational processes to financial management, research and development, and marketing campaigns, are key components.

Resource Allocation: Efficient allocation of resources, including budgeting, staffing, and procurement of necessary tools or technology, is vital. Optimising available resources (including BIK contributions) supports the achievement of the plan's objectives.

Monitoring and Evaluation: Continuous monitoring against established benchmarks and milestones is crucial. Regular evaluations help in assessing progress, identifying deviations, and making necessary adjustments for improvement.

Adaptation and Flexibility: The business landscape is dynamic, requiring flexibility to respond to market changes, technological advancements, and unforeseen challenges that might impact the plan's execution.

Communication and Stakeholder Engagement: Clear communication about the Business Plan's goals, progress, and outcomes is essential. Engaging stakeholders - employees, investors, customers, and partners - ensures alignment, support, and valuable feedback for successful execution.

Risk Management: Identifying potential risks and having contingency plans to mitigate them is crucial. Anticipating challenges and having strategies in place to manage and mitigate adverse impacts is an integral part of implementation.

Review and Adjustment: Periodic reviews help in assessing the plan's effectiveness and impact. It involves revisiting strategies, reassessing goals, or making changes to align with the evolving landscape.

Box 10.1 Key elements of the Business Plan Implementation.

In essence, the successful execution of the JERICO-RI Business Plan requires a comprehensive approach. Strategic execution, resource management, continual monitoring, flexibility, stakeholder engagement, risk mitigation, and continual refinement are key to achieving the desired outcomes and sustaining the infrastructure's success.

11. Conclusions and Summary

The sustainability of an RI is impacted by many factors (legal, governance, technical, scientific, financial) and by multiple stakeholders (users, national RIs, governing boards, policymakers, funders), all of them influencing the capacity of an RI to remain sustainable in time. This is particularly challenging in the case of distributed RIs like JERICO-RI, where the number and diversity of contributors require a high level of coordination and synchronisation of policies and resources.

This deliverable is a comprehensive account of the evolution of the JERICO-RI infrastructure's value proposition throughout the project's life cycle. It traces the development of the proposition from the initial perspectives to its refined state based on feedback gathered through ongoing interactions with various user groups and stakeholders.

Together with a refined Mission, Vision, and Value Statement, this deliverable lays a robust foundation for the future ERIC. It presents a compelling business case for the establishment of an independent legal entity that unites a disparate, multi-platform network of pan-European coastal infrastructure nodes, overcoming the limitations and higher operating costs of operating in a disconnected way across European countries. This transformation will result in the creation of an integrated RI dedicated to delivering cutting-edge coastal observations and associated science research services in the marine coastal domain fully integrated within the future landscape of EOOS - a pan-European ocean observation system (EOOS, 2023).

Operating within an ERIC legal framework, the JERICO-RI has a strong potential for long-term economic sustainability within a 5-year period from its commencement. This viability will be attained by initially providing infrastructure access and services to its broad multi-sectoral user community, followed by expansion into a more sophisticated data services and the industry sector. The key to achieving earlier financial sustainability lies in adopting a streamlined CMO operational model that minimises overhead costs.

A strong contribution from the host country in terms of BIK will help to ensure operational efficiency and secure competitive premises rental rates, thus minimising overheads. The successful development and operation of JERICO-RI will hinge on delivering cutting-edge research, facilitating infrastructure access, and offering services to meet the needs of the JERICO-RI user community through the provision of national support via membership fees and a significant in-kind contribution from the individual Members.

JERICO-RI is characterised by multidisciplinary teams, which implies the availability of different resources and interlinkages among different capacities, with the ability to approach research questions from different perspectives. This can represent a great benefit for the entire organisation and for the overall output capacity of the ESFRI RI ecosystem.

The JERICO-RI Business Plan is underpinned by key results and impacts from the JERICO-DS design study which has demonstrated the JERICO-RIs capabilities and competencies in the following areas:

- Scientific roadmap and user community identified,
- Technology roadmap defined,
- Commercial-user community identified,
- Services linked with scientific-user needs,
- Services linked with commercial-user needs,
- Demonstrated ability to attract businesses, industries, public services,
- Access policy defined,

- Inter-institutional and multilateral agreement with partners,
- Feasibility study successfully completed,
- Physical and virtual access established as a key service

JERICO-RI is focused on advancing four key areas to accomplish the ultimate objective of transitioning from financial viability to long-term sustainability as follows:

1. **Financial Focus:** Strengthening financial sustainability by consolidating JERICO-RI memberships, engaging new countries in JERICO-RI, and aligning JERICO-RI data and service provision with national strategies and funding to ensure stability.
2. **Technical and Innovative Strategies:** Ensuring sustainable data and service provision within the JERICO-RI services framework, contributing to the sustainable operation of the JERICO-CORE e-infrastructure, and promoting innovation for the effective implementation and utilisation of the e-infrastructure.
3. **Scientific Excellence:** Collaborating with similar global initiatives on marine data interoperability, fostering international cooperation to encourage multidisciplinary utilisation of marine science data, engaging users to raise awareness about multidisciplinary data and services available through JERICO-RI, and conducting user training initiatives to highlight the services available in JERICO-RI to address key scientific challenges.
4. **Economic and Societal Impact:** Establishing a sustainable and ethically sound approach to delivering services and scientific information to society, implementing a strategy for assessing socio-economic impacts, and fostering sustainable collaboration with the private sector.

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12. Annex

Appendix 1 - List of National funding agencies by JERICO Member

JERICO Member	Organisation	Type of organisation
Belgium	Brussels Economy and Employment	Research funder/performer
	(National) Scientific Research Fund (F.R.S.-FNRS)	Research funder
	Research Foundation - Flanders (FWO)	Research funder
	General Operational Directorate for Economy, Employment and Research	Research funder
	Brussels Institute for Research and Innovation (INNOVIRIS)	Research funder

Croatia	Belgian Federal Science Policy Office (BELSPO)	Research funder
	The Agency for Mobility and EU Programmes	Intermediary agency
	Croatian Academy of Sciences and Arts	Research funder/performer
	Croatian Science Foundation	Research funder
Estonia	Information Technology Foundation for Education	Research funder
	Estonian Development Fund	Research funder
	Estonian Academy of Sciences	Research funder
	Foundation Innove	Research funder
	Enterprise Estonia	Research funder
	Archimedes Foundation	Research funder
	Estonian Research Council	Research funder
Finland	Academy of Finland	Research funder
	The Finnish Innovation Fund (Sitra)	Research funder
	Business Finland	Research funder
	Ministry of Environment	Research policymaker/funder
	Ministry of Transport and Telecommunications	Research policymaker/funder
France	National Research Agency (ANR)	Research funder
	General Secretariat for Investment	Research funder
	General Directorate for Enterprises	Research support
	Ministry of Higher Education Research and Innovation	Research policymaker/funder
	Ministry of the Economy, Industry and Digital Sector	Research policymaker/funder
	Ministry of ecological transition	Research policymaker/funder

	Local authorities and stakeholders	Policymaker/funders
Greece	General Secretariat for Research and Technology	Research policymaker/funder
	Ministry of Economy, Development and Tourism	Research policymaker/funder
	General Secretariat for Public Investment /Partnership for Growth Framework	Research funder/policymaker
	General Secretariat of Industry	Research funder/policymaker
	General Secretariat for Strategic and Private Investment	Research funder/policymaker
	Special Secretariat for Public-Private Partnerships	Research funder/policymaker
Ireland	Science Foundation Ireland	Research funder
	Irish Research Council	Research funder
	Enterprise Ireland	Research funder
	IDA Ireland	Research funder
	Sustainable Energy Authority Ireland (SEAI)	Research funder
Italy	National Research Council	Research funder/performer
	OGS	Research funder/performer
	Ministry of the Environment for the Protection of Land and Sea	Research policy coordinator/funder
	Ministry of the Infrastructure and Transportation	Research policy coordinator/funder
	Ministry of Economic Development	Research policy coordinator/funder

	Ministry of University and Research	Research policy coordinator/funder
	National University Council	Research advisor
Netherlands	Netherlands Enterprise Agency (RvO)	Research policymaker/funder
	Ministry of the Infrastructure and Water	Research policy coordinator/funder
	Technology Foundation (STW)	Research funder
	Netherlands Organisation for Scientific Research (NWO)	Research funder
Norway	Ministry of Trade, Industry and Fisheries	Research funder
	Ministry of Education and Research	Research funder
	Research Council of Norway	Research funder
	Innovation Norway	Research funder
Portugal	Science and Technology Foundation	Research funder
	National Innovation Agency	Intermediary organisation

	Planning, Evaluation, Strategy and International Relations Office	Research policymaker
	National Strategic Reference Framework (NSRF)	Research framework programme
	Ministry of Defence	Research funder
Spain	Centre for the Development of Industrial Technology	Research funder
	Spanish Ministry for Science and Innovation	Research funder/policy coordinator
	Spanish Ministry of Economic Affairs	Research policy coordinator
Sweden	Knut and Alice Wallenberg Foundation	Research funder
	Swedish Foundation for International Cooperation in Research and Higher education (STINT)	Research funder
	Swedish Foundation for Strategic Environmental Research (Mistra)	Research funder
	The Swedish Foundation for Humanities and Social Sciences	Research funder
	Swedish Environmental Protection Agency	Research funder
	Swedish Research Council for Health, Working Life and Welfare (Forte)	Research funder
	Swedish International Development Cooperation Agency (Sida)	Research funder
	The Swedish Research Council	Research funder
	Knowledge Foundation (KKS)	Research funder
	Swedish National Space Board (SNSB)	Research funder
	Swedish Foundation for Strategic Research (SSF)	Research funder
	The Swedish Research Council Formas	Research funder
	Swedish Energy Agency	Research funder
	VINNOVA (Swedish Innovation Agency)	Research funder

Appendix 2 Overview of European regional funding programmes

Funding Programme	Brief Description	Relevance to JERICO-RI
Horizon Europe (2021 – 2027)	Horizon Europe will follow on from H2020 with the aim to maximise the scientific, economic and societal impact of EU investment in research and innovation. The proposed budget is €100bn for the period 2021 - 2027.	The activities of JERICO-RI are linked to the three pillars of Horizon Europe in terms of excellent science, addressing global challenges on climate, natural resources and the environment and providing a platform for innovation. Mission Ocean deals with the importance of healthy oceans, seas, coastal, and inland waters, which is strongly related to the JERICO-RI mission.
InvestEU Programme (2021 – 2027)	This programme builds on the success of the Investment Plan for Europe (Juncker Plan). It integrates the European Fund for Strategic Investment (EFSI), Employment and Social Innovation (EaSI), InnovFin and other funding instruments into one comprehensive programme. The InvestEU Fund is expected to mobilise at least €650bn in additional investment for the period 2021- 2027.	InvestEU supports four different policy areas relevant to JERICO-RI: <ul style="list-style-type: none"> · Sustainable infrastructure: financing projects in water, waste and other environmental infrastructure. · Research, innovation and digitisation: financing projects in research and innovation, commercialisation of research outputs. · Small businesses: facilitating access to finance to small companies to test and demonstrate new technologies on JERICO-RI test sites and regional facilities. · Social investment and skills: financing projects for the education and training of JERICO-RI personnel, including skills and knowledge transfer.
Cooperation in Science and Technology (COST) Action	Provides funding for researchers to establish interdisciplinary research networks in Europe and beyond. Operates an open call system – proposals can be submitted at any time of year and are collected twice per year. The next collection date is planned for 29 th April 2020.	Provides funding which would be used to: <ul style="list-style-type: none"> · Finance JERICO-RI joint development meetings, establish permanent relations with new users through a bi-annual JERICO conference, exhibitions at industry events, etc., enlarge membership of JERICO-RI. · Enhance collaboration with related RIs (EuroArgo ERIC, EMSO ERIC, EuroFleets, ICOS, LIFEWATCH), develop training services for the JERICO

		community (users and members) conduct outreach and communication activities.
Joint Programming Initiative Oceans	JPI Oceans is an intergovernmental platform that aims to increase the impact of national investments in marine and maritime research and innovation. JPI Oceans adds to the value of national research and innovation investments by aligning national priorities and implementing joint actions. Projects are jointly funded by JPI Member States.	Several of JPI Oceans' strategic priority areas for marine and maritime research align with JERICO-RI strategic objectives and activities. These include: <ul style="list-style-type: none"> · Technology and sensor development · Interdisciplinary research for good environmental status · Observing, modelling and predicting ocean state and processes · Climate change impact on physical and biological ocean processes
European Green Deal	The European Green Deal provides a roadmap for making the EU economy sustainable. This will include a number of actions to: <ul style="list-style-type: none"> · Boost the efficient use of resources by moving to a clean, circular economy · Restore biodiversity and cut pollution 	Policy areas relevant to the objectives of JERICO- RI include clean energy, sustainable industry, biodiversity and eliminating pollution. Notably, JERICO-RI's objectives are in line with addressing the specific challenges of achieving <i>A transparent & accessible ocean: Towards a Digital Twin of the Ocean.</i>
European Structural and Investment Funds (ESIF)	The five ESIFs account for over 50% of EU funding. They are jointly managed by the EC and Member States. The fund is delivered through: <ul style="list-style-type: none"> · European Regional Development Fund · European Social Fund · Cohesion fund (2021-2027) · European Agricultural Fund for Rural Development · European Maritime and Fisheries Fund 	The purpose of these funds is to support job creation, business competitiveness, economic growth, sustainable development, and improve citizens' quality of life.

Appendix 3 - Internal Services - JERICO Points (Barter) System

It has been identified by JERICO Partners that **Internal services** to Members of the consortium is a key factor in delivering value to the Member countries and partners in the consortium. The multi-platform nature of the JERICO-RI Infrastructure means that there is a large variety of observation platforms, support facilities and calibration facilities that could be utilised by internal JERICO partners to better carry out their research activity. The JERICO TA programme did enable some of this physical access to individual researchers both within and outside the JERICO Members but it has been identified as an important future internal service that can be provided.

Obviously, resourcing and sustainability are the key issues to enable this and as a result, research has been carried out into a mechanism that could be coordinated centrally to manage a “JERICO-RI points system” to enable JERICO Members to operate an internal barter-like exchange mechanism for physical access, Access to expertise and access to calibration and maintenance facilities. This approach is also linked to the BIK Policy - see Appendix 4 .

Barter system Concept in JERICO-RI:

In this setup, researchers, scientists, and innovators from various fields come together to share resources, knowledge, and facilities. Instead of monetary transactions, Members contribute their expertise, skills, or specific equipment or materials in exchange for access to the lab's resources.

For instance, a biologist might offer to assist a chemist with a specific experiment in exchange for access to specialised lab equipment. Similarly, an engineer could provide technical support for a robotics project in return for access to 3D printing facilities.

This barter system fosters a collaborative and resourceful environment, allowing Members to leverage their individual strengths for mutual benefit. It encourages a sense of community in the JERICO-RI and facilitates interdisciplinary research and innovation.

Barter- Services Exchange Strategy

Managing a barter system in a centrally organised research infrastructure like a JERICO-RI Community Facility and Expertise Space involves establishing clear guidelines, facilitating communication, and tracking contributions. Here are steps to effectively manage the barter system:

Membership Registration and Profiles:

- Each Member should create a profile indicating their expertise, skills, and the resources they can contribute.
- Include a record of their previous contributions and exchanges.

Resource Inventory:

- Maintain an up-to-date inventory of available resources, including equipment, materials, and expertise.
- Categorise resources based on type, availability, and expertise required.

Exchange Platform:

- Develop a digital platform (e.g., website, app) for Members to post their offers and requests.

- Include features for Members to communicate, negotiate, and finalise exchange agreements.

Clear Guidelines and Policies:

- Establish rules for fair exchanges, such as a system for valuing contributions (e.g., a points system based on time, expertise, or resource value).
- Specify any restrictions on usage, safety protocols, and ethical considerations.

Communication Channels:

- Provide forums, chat rooms, or discussion boards for Members to communicate about potential exchanges.
- Encourage transparency and open communication.

Moderation and Oversight:

- Assign an administrator in the Central Management Office to oversee the exchange platform, ensure adherence to guidelines, and resolve conflicts if they arise.
- Implement a reporting system for inappropriate behaviour or disputes.

Feedback and Ratings:

- Allow Members to rate and provide feedback on their exchange experiences.
- This helps build trust and accountability within the community.

Documentation and Tracking:

- Maintain a record of all exchanges, including details like date, parties involved, resources exchanged, and any special agreements.
- This serves as a reference for future exchanges and helps in tracking Member contributions.

Regular Updates and Announcements:

- Keep Members informed about new resources, upcoming events, or any changes in guidelines or policies.

Evaluation and Improvement:

- Periodically assess the effectiveness of the barter system and gather feedback from Members.
- Use this input to make adjustments and improvements as needed.

Training and Support:

- Provide resources and training to help Members make effective use of the barter system.
- Offer support for technical issues or disputes.

Legal Considerations:

- Ensure that the barter system complies with any legal or regulatory requirements related to memberships, resource sharing, and exchanges.

By implementing these steps, a centrally managed JERICO-RI barter system can efficiently facilitate resource exchange among Members while maintaining fairness, transparency, and accountability.

Sample Table for JERICO Points Internal TROC/Barter/Exchange Model

Contribution Type	Unit Value Criteria	JERICO Facility e.g EIROOS Account 2024
Time Spent (hours)	1 hour of work = 10 JERICO Points	400
Expertise Level (Per consultation)	Beginner = 20 JERICO Points	60
	Intermediate = 50 JERICO Points	100
	Expert = 100 JERICO Points	200
Specialised Skills/Knowledge	Specialised Skill e.g. Metrology expert = 30 JERICO Points	
(per day)	Specialised Skill B e.g Glider Pilot = 80 JERICO Points	400
Value of Materials/Equipment	Equipment Type X (e.g Glider) = 80 JERICO Points	400
	Sensor Type Y e.g. PCo2 = 10 JERICO Points	40
	Instrument Calibration Type e.g. CTD=10 JERICO Points	400
Total		2000

Integration of this barter system concept requires additional research and will be integrated into the BIK Policy once completed during the preparatory phase.

Appendix 4- JERICO-RI Benefit In-Kind Policy

The ESFRI Guidelines on Cost Estimation of Research Infrastructures (2019) define benefit in-kind contributions as non-cash contributions provided by a legal entity (e.g., in terms of personnel or machine time, supply of equipment, services, buildings, etc.). They represent a non-cash benefit (and risk) transfer of goods and services and/or personnel based on statute and/or agreements involving (directly or indirectly) the Members and planned in yearly programs approved by the General Assembly (Central European Research Infrastructure Consortium (CERIC) workshop on BIKs in the life cycle of an ERIC, Dec 2019).

Two main cases of **benefit in-kind contributions** can be distinguished:

- Contributions to the construction and operation of an RI by procuring and transferring goods and services.
- Contributions to the implementation and operation of an RI by making available existing facilities, which may be improved “in-situ” within the contributing Member during the ERIC operation.

In addition to monetary contributions, JERICO-RI Members may also provide BIK contributions for the functional operation of JERICO-RI. BIK contributions may be in the form of personnel time for the delivery of services and provision of access to facilities, equipment and other infrastructure for the delivery of services. In practice, BIK contributions are likely to be a combination of both of these forms.

In accordance with the proposed Articles of Statutes of the JERICO-RI, hereinafter referred to as the Organisation, the Council of the Organisation has adopted the following internal provisions on benefit in-kind contributions.

Benefit in-kind contributions are a non-cash contributions in the form:

- **In-kind contributed Goods**
 - • durable goods (e.g. equipment/software)
 - • non-durable goods (e.g., consumables/materials)
- **In-kind contributed Personnel**
 - • Personnel seconded/not seconded from the Representing Entity to the ERIC
- **In-kind contributed Services**
 - External services provided by the Representing Entity to the ERIC (e.g., external consultancy)
 - Internal services provided by the Representing Entity to the ERIC (e.g., right to use a facility)

In relation to the delivery of JERICO-RI services, **there are two categories of BIK contribution (1) Personnel time and (2) provision of access to facilities, equipment and other infrastructure** for each category - it is foreseen that there will be three main types of in-kind contributions see Table below.

Type of BIK Contribution	Mandatory in kind-contributions:	Voluntary in-kind contributions:	Requested in-kind contributions:
Personnel time	Participation in governance activities, management board/nations committee activities and related meetings is mandatory for all JERICO-RI Members. These contributions (personnel, travel costs and other resources related to participation in governance activities) will be in addition to annual monetary contributions.	Participation in JERICO-RI Thematic Expert Centres and other working groups to carry out centralised actions, project proposal writing and similar exercises will be on a voluntary basis, as per a request by the JERICO-RI Management Office. These contributions (personnel, travel costs and other resources related to participation in JERICO-RI working and service groups) will be in addition to annual monetary contributions.	These are for ad-hoc activities and relate to personnel, expertise and/or other resources requested by the JERICO-RI Management Office to one or various Members to satisfy JERICO-RI requirements, which would otherwise be sourced externally (e.g. specific data management expertise).
Provision of access to facilities, equipment and other infrastructure	Envisaged that there will be a minimal level of access to infrastructure per year (up to a certain value to be determined as part of the annual review process outlined below).	Contributions will involve access to infrastructure required in order to carry out centralised actions relating to involvement in the thematic centres (e.g. provision of physical access to infrastructure as part of a Transnational Access programme, provision of virtual access through JERICO-CORE).	Ad-hoc activities related to hardware and/or software use and/or other resources requested by the JERICO-RI management office to one or various members to satisfy JERICO-RI requirements,

Approval and Review Process

The JERICO-RI in-kind contribution policy shall be reviewed every year by a dedicated BIK Contribution Committee, where the contribution of each Member will be determined. Once the BIK contribution proposal is approved, the Member shall be accredited the BIK contribution value as part of its total contribution to JERICO-RI.

The policy will require approval by the JERICO Nations Committee (in the future, this will be the role of the Assembly of Members or equivalent senior management group). BIK contributions must be included in the Cost Book estimation analysis by calculating their corresponding market price or actual production costs. Personnel that is provided as in-kind contributions should be included in the cost estimation at the equivalent labour cost covered

by the partner institution and including salaries, fringe benefits, and social security contributions of personnel engaged. Differences in the salaries between JERICO-RI nations and a potential weighting system for the cost estimation of personnel will be discussed and approved by the Nations Committee/Assembly of Members. The JERICO-RI Cost Book value defines the total value of the BIK contribution.

Calculation of Access Availability across the JERICO-RI facilities:

- Average available access to Facility 44 weeks per annum
- Access days per week = 5 Day
- Total Access Days 220
- 5 % availability for JERICO-RI related Access = 11 days per annum
- 11 days x 42 Facilities = 431 days Access per annum available for JERICO-RI related Activity