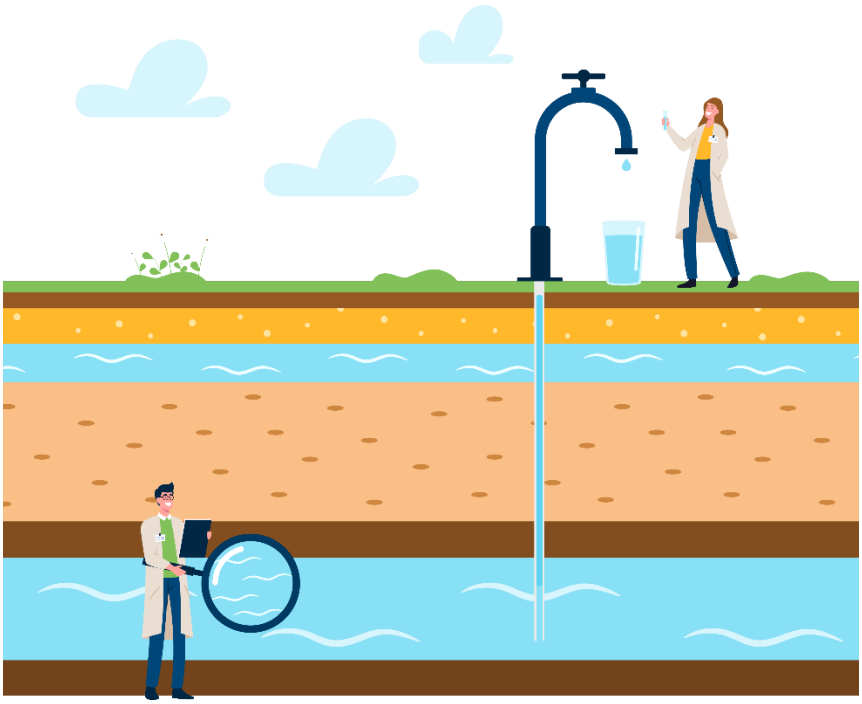
MAR2PROTECT

D6.1 Initial Stakeholder Analysis of the Demo Sites and the EU stakeholder landscape & engagement strategy



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GRANT AGREEMENT NUMBER: 101082048

PROJECT ACRONYM: MAR2PROTECT

PROJECT TITLE: "Preventing Groundwater Contamination Related to Global and Climate Change through a Holistic Approach Based on Managed Aquifer Recharge"

PROJECT Duration: 1st December 2022 - 30th November 2026 (48 months)

WEBSITE: https://mar2protect.eu/

ABBREVIATION / ACRONYM:

Abbreviation / Acronym	
AdTA	Águas do Tejo Atlântico
APA	Agência Portuguesa do Ambiente
ARPA	Agenzia Regionale per la Protezione dell'Ambiente
CC	Climate change
CoP	Community of Practice
ERSAR	Entidade Reguladora dos Serviços e Resíduos
EU	European Union
GC	Global change
GDP	Gross Domestic Product
GDPR	General Data Protection Regulations
GW	Groundwater
H2020	Horizon 2020
INRGREF	Ministry of Agricultura, Water Resources and Fisheries, Tunisia
ISSBAT	Higher Institute of Applied Biological Sciences of Tunis
M2P	MAR2PROTECT
MAR	Managed Aquifer Recharge
NGO	Non-governmental organisation
PAHs	Polycyclic Aromatic Hydrocarbons
WFD	Water Framework Directive
WWF	World Wildlife Foundation
WWTP	Wastewater Treatment Plant

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Revision History

Version	Date	Author	Document history/approvals
01	06/01/2023	Uta Wehn, Ane Bilbao, Luke Somerwill	Initial context analyses created
02	24/02/2023	Dario Frascari, Sergio Salinas, Ana Pereiro, Atef Jaouani, Gideon Wolfaardt, Sara Espinosa	Review of context analyses and completion of questionnaires
03	08/05/2023	Uta Wehn, Luke Somerwill	Addition of Executive Summary, Methodology, Stakeholder Engagement, Stakeholder Analysis, CoP and Ethics sections, and Annexes
04	16/05/2023	Ana Pereiro, Tamara Rodríguez, Srdana Kolakovic, Dario Frascari	Review
05	30/05/2023	Uta Wehn, Luke Somerwill	Comments and feedback addressed

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EXECUTIVE SUMMARY

Stakeholder engagement is a key component of MAR2PROTECT, particularly, the activities of the LivingLabs and the International Community of Practice (CoP). This deliverable outlines the initial stakeholder analysis that was conducted to ascertain the relevant stakeholders for each Demo Site, understand the current contexts, and recognise the appropriate stakeholders for the MAR2PROTECT project. The report provides a detailed insight into the various stakeholder that will be engaged throughout MAR2PROTECT and outlines guidance in order for this engagement to take place. This includes the detailed stakeholder engagement strategy within the LivingLab compendia, the CoP guidance, and the ethics procedures.

The stakeholder analysis technique employed in this document was modified from the methodology utilised in the H2020 Ground Truth 2.0 project (Pfeiffer et al., 2016). This methodology underscores that the identification and mapping of stakeholders is not an end in itself, but rather a means to facilitate decision-making and project activities. By gaining a better understanding of the various contextual factors that could influence a project, appropriate management and communication approaches can be selected and prioritized for specific target audiences. The stakeholder analysis was carried out at two levels: i) Demo Sites and ii) the EU stakeholder landscape. The outcomes of these analyses are utilized to shape strategies for engaging stakeholders at the Demo Site, particularly in the LivingLabs; in the International Community of Practice (CoP), and eventually for scaling up and promoting the adoption of distinct MAR2PROTECT outcomes.

An initial desk-based context analysis for each Demo Site was conducted using the Pestel Analysis approach (assessing the Political, Economic, Sociological, Technological, Legal and Environmental contexts of each Site). This information was then validated and built upon by the respective LivingLab teams, who also developed a detailed list of relevant stakeholders. An analysis of these stakeholders was then conducted, by understanding their role in MAR: a Decider, a Supplier, a Customer/User, or an Executor. Further information was also gathered on their influence, interest and support profile.

For the LivingLabs at each Demo Site, a stakeholder engagement strategy was developed and outlined for each LivingLab in the form of a compendium which provides guidance throughout the process of setting up and implementing the LivingLabs. This procedure ensures effective and ethical stakeholder engagement.

Guidance for the stakeholder engagement activities of the CoP was developed, drawing on the guidance developed for the WeObserve Communities of Practice (Wehn et al., 2019). This information provides guidance for all steps of the CoP management (from the scoping of the CoP to the invitation of members, its launch, and general management practices). It also highlights potential members of the CoP, and how these stakeholders can be engaged most effectively.

This deliverable also outlines the various procedures that have been put in place to ensure ethical and GDPR-compliant stakeholder engagement within MAR2PROTECT. These procedures cover all aspects of data collection and management, as well as participation selection practices. Supporting documents and relevant templates can be found in Annexes 3-6.

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1. INTRODUCTION

1.1. PROJECT BACKGROUND

MAR2PROTECT will provide a holistic approach to prevent groundwater contamination from the impacts of climate change and global change, through different innovative technologies and societal activities.

The core of the project is centred around a tool supported by Artificial Intelligence (M-AI-R DSS) that will receive real-time information from sensors placed in risk locations where the technologies will be implemented, among other vitally important information (innovative technologies, preferences of social agents, risk assessment).

M-AI-R DSS will allow a new generation of Managed Aquifer Recharge approaches to improve groundwater quality and quantity. The core of the innovative Managed Aquifer Recharge is that this Decision Support System will incorporate technological and societal engagement information using an Artificial Intelligence-based evaluation to improve groundwater quality and quantity.

To ensure a high replication potential, M-AI-R Decision Support System will collect information from 7 demo sites in 4 European countries (Portugal, Italy, Spain, Netherlands) and 2 in non-European countries (Tunisia, South Africa) which were carefully chosen by their degree of maturity from previous successful projects and a wide range of settings in terms of climatic conditions, water sources, type of pollution, Managed Aquifer Recharge scheme and political/societal context.

A dedicated task (T6.1) within Work Package 6 *Creating and measuring impact: multi-stakeholder engagement, replication and upscaling* comprises the implementation of the multi-stakeholder approach. This task will engage stakeholders in the Demo Sites as well as key stakeholders at the regional/EU level and civil society, through actions to enhance the prevention of GW contamination, using validated engagement methods.

1.2. PURPOSE OF THIS DOCUMENT

As part of task T6.1, a stakeholder analysis is undertaken to identify relevant stakeholders for each Demo Site and to understand the current contexts; and to identify relevant stakeholders for the international Community of Practice (T6.3).

The stakeholder analysis methodology used in this document was adapted from the approach used for the stakeholder analysis conducted in the H2020 Ground Truth 2.0 project (Pfeiffer et al., 2016). This methodology emphasises the fact that the cataloguing and mapping of stakeholders is not a goal in itself, but rather a tool that can support decision-making and project activities. By better understanding, the various contextual forces that might affect a project, the most relevant, appropriate and effective management and communication approaches for specific target audiences can be selected and prioritised. In MAR2PROTECT, the stakeholder analysis is undertaken at two levels: i) Demo Sites and ii) the EU stakeholder landscape. The findings of these stakeholder analyses are used to inform the strategies for engaging stakeholders at the Demo Site, especially in the LivingLabs; in the International CoP and, subsequently, for upscaling and market uptake of distinct MAR2PROTECT results.

This document presents the initial stakeholder analyses of the MAR2PROTECT Demo Sites and the broader EU stakeholder landscape, and tailored engagement strategies for the LivingLabs stakeholders as well as the International CoP. Updates to these analyses will be presented at a later stage in the project.

1.3. STRUCTURE OF THIS DOCUMENT

In section 2, the results of the stakeholder and context analysis for each MAR2PROTECT Demo Site are presented, detailing the political, environmental, social/cultural, technical and economic

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contexts, before the key stakeholders to engage in the LivingLabs are summarised. In section 3, the strategy for engaging key stakeholders in the LivingLabs at each Demo Site is detailed. Section 4 presents the macro-level stakeholder analysis for MAR2PROTECT at the EU level. This provides key inputs for the stakeholder engagement strategy of the MAR2PROTECT International Community of Practice presented in section 5 in the form of structured guidance for setting up and implementing the CoP. The ethics issues cutting across the MAR2PROTECT stakeholder engagement activities are summarised in section 6 and supported by specific procedures in Annexes 3-6.

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2. STAKEHOLDER & CONTEXT ANALYSES OF THE MAR2PROTECT DEMO SITES

2.1. APPROACH AND METHODOLOGY

The stakeholder analysis methodology adapted to MAR2PROTECT (Pfeiffer et al., 2016) was conducted in two stages. Firstly, data were collected for each of the seven MAR2PROECT Demo Sites via desk research of project documents, as well as secondary sources including empirical data provided by OECD, World Bank and other academic papers (see Annex 2). During this stage, for each of the Demo Sites, a context analysis was conducted using the Pestel Analysis approach (assessing the Political, Economic, Sociological, Technological, Legal and Environmental contexts of each Site). A stakeholder inventory was also compiled, with identified stakeholders relevant for each Demo Site according to the quadruple helix (public sector, private sector, civil society and academia).

In the second stage, the data collected during the desk research was verified and enhanced by the MAR2PROTECT Demo Site leaders to create a more comprehensive stakeholder inventory for each Demo Site. The information collected during the analysis will be used to guide the stakeholder engagement strategy for the LivingLabs in each Demo Site. This stakeholder analysis represents an initial effort and will be updated at a later stage in the project.

The MAR2PROTECT LivingLab Stakeholder Analysis Framework (see Figure 1), categorises all stakeholder groups relevant to the MAR2PROTECT LivingLabs. This framework is based on the role of stakeholders in the project and was developed as part of the Ground Truth 2.0 project (Pfeiffer et al., 2016). The design of the framework is modular and enables LivingLab teams to easily identify stakeholder groups relevant to their work, thereby facilitating engagement with a variety of subsets of stakeholders when required. Additionally, stakeholders with multiple roles are listed in multiple categories within the framework, which draws attention to potential role conflicts or engagement for multiple reasons.

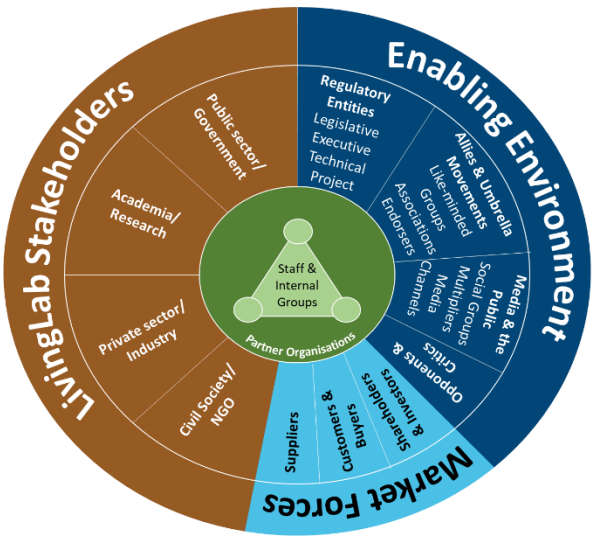

Figure 1 Main stakeholder categories for LivingLabs, adapted from Pfeiffer et al. (2016).

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2.2. DEMO SITE 1 – KATWIJK, THE NETHERLANDS

The Dutch Demo Site (located in the region of South Holland, in the municipality of Katwijk, at the border of Lake Valkenburg) consists of a pilot installation for treating surface water before infiltration in aquifers or for drinking water production. The Site aims to use managed aquifer recharge to preserve and protect a local aquifer while treating surface water to account for increasing water demand resulting from population and economic growth. Treatment of the lake will also be needed to prevent groundwater contamination resulting from managed aquifer recharge.

The main goal of this Demo Site is to provide water to meet increasing demand while protecting natural resources.

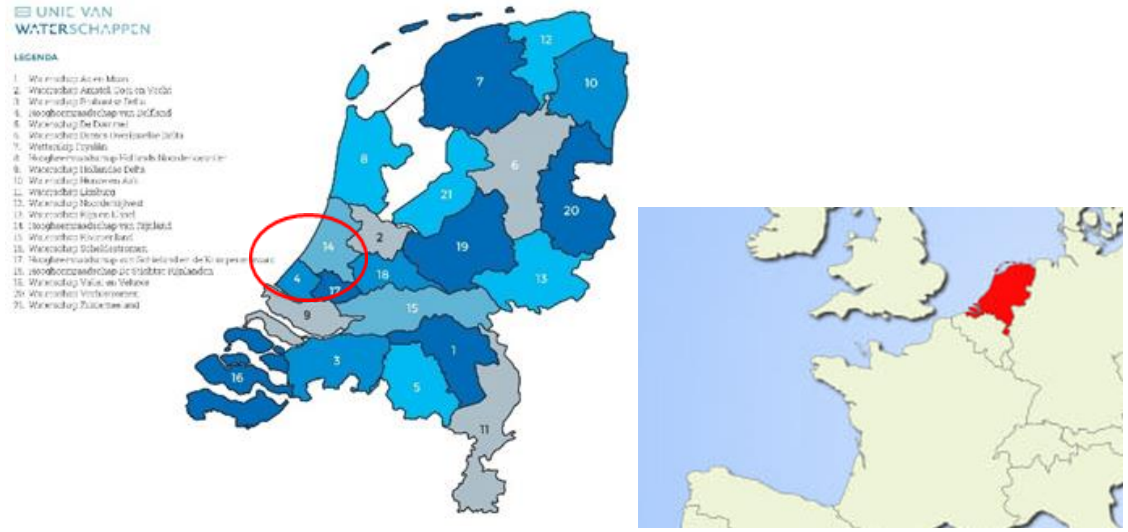

Figure 2 Target area of the Dutch Demo Site (Unie van Waterschappen, 2023; Freeworldmaps).

Political context

In the Dutch Demo Case, the site belongs to, and is therefore under the jurisdiction of, Dunea. Dunea has the mandate to manage the nature area and control/operate the water infiltration of water in dunal aquifers. The Demo Site involves testing technologies for the treatment of surface water. The technical research department of Dunea will decide on the technologies to be tested. The pilot installation owned by Dunea is part of their research programme on new water sources (coping with increasing water demand and decreasing water quality).

Concerning the broader political context in the Netherlands, the political structure includes four political hierarchies, namely the EU, national, provincial and municipal levels. The Water Board areas are cross-jurisdictional units that overlap the provincial boundaries. While the institutional structure may seem complicated, the boundaries of water boards are actually more visible in the physical landscape, as they are typically marked by dikes or water discharge areas.

Currently, the different levels of government are responsible for different aspects of water management. Rijkswaterstaat is responsible for the overall planning, the water boards are responsible for regional operation and management, flood defences, and wastewater treatment, municipalities are responsible for spatial planning and drainage systems, and the provinces are responsible for the integration of spatial planning and related policies.

In practice, the Water Boards have gained more power and autonomy, with the supervisory role of provinces being reduced. For example, decisions related to water levels and construction and improvement of water management structures no longer require prior provincial approval.

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Additionally, the water boards have more autonomy over financial decisions, including the ability to raise their own taxes and the absence of the need for provincial approval of management plans and cost-related by-laws. Where provincial approval is still required, decision-makers tend to defer to the technical expertise of the water boards.

The Netherlands was an early adopter of regulatory reform policies within the OECD and emphasizes stakeholder engagement processes. The Better Regulation agenda has been focused on reducing burdens for businesses and citizens, with water management, treatment, and pollution falling within this agenda.

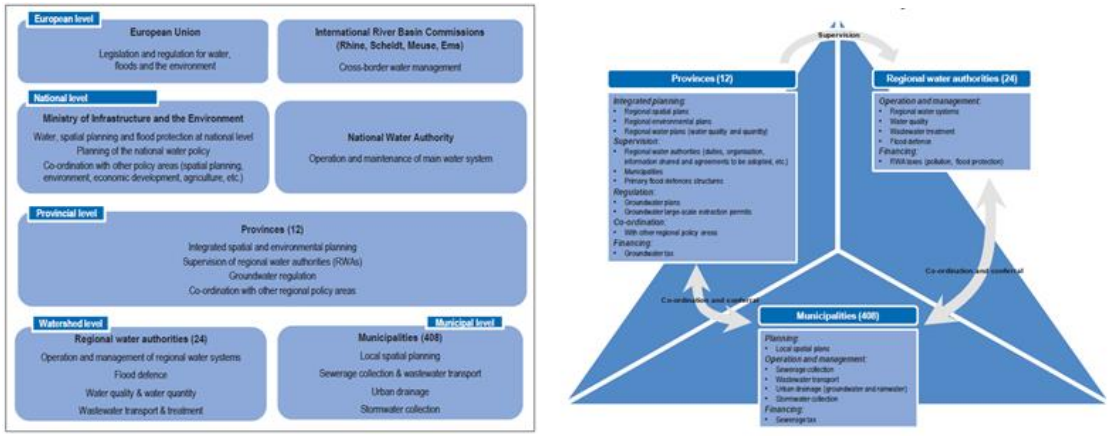

Figure 3 Institutional layers of water management and mutual dependency in the Netherlands (OECD, 2014).

A variety of national laws and regulations are relevant to this case. These include: the Soil Protection Infiltration Decree and the Drinking Water Decree. At the European level, the Directive on the quality of water intended for human consumption is also relevant.

Environmental context

Katwijk is located in the southwest of the Netherlands, on the North Sea coast. It has a mild climate, with relatively warm summers and cool winters. Specifically, the Demo Site will focus on Lake Valkenburg, which is fed by the River Rhine. The focus of the Demo Site is on the treatment of lake water and a dunal aquifer affected by light salinity intrusion. In terms of landscape, the Demo Site is located in Berkheide, a special dune area and part of the Hollandse Duinen National Park, which itself is largely situated in the municipality of Katwijk (on the North Sea in the west of the Netherlands).

The Netherlands is facing several environmental challenges, many of which are predicted to worsen with the changing climate. Intensive farming and traffic issues have a significant impact on air quality, as well as the degradation of soil in agricultural areas. Intensive farming has also impacted water quality in many areas, with many of the Dutch rivers and lakes containing too much nitrogen and phosphates.

Social/Cultural Context

South Holland (where the Demo Site area is located) is the most populated (and mostly densely populated) province in the Netherlands. Katwijk is a relatively small municipality within South Holland but has a growing population (0.93% in 2022). The population in South Holland are primarily the Dutch population. While Dutch is the first language of most residents, English language skills are generally good.

Katwijk is a coastal municipality and is the second-largest coastal resort in the Netherlands. The municipality is relatively urban, (with five main urban centres: Katwijk aan Zee, Rijnsburg, Katwijk

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North, Katwijk aan den Rijn and Valkenburg) with a small rural population. The city of Leiden is also located close to the Demo Site.

The province of South Holland generally tries to innovate and be proactive when dealing with (environmental) challenges. In particular, Dunea is known as a water utility that shares knowledge with other Dutch water utilities.

In terms of environmental attitudes in the Netherlands more broadly, there is high societal concern about water pollution, however, relatively low concern about drought. According to the survey "Attitudes of European citizens towards the Environment" (European Commission, 2020):

- 50% of the population personally believe that protecting the environment is very important, and 75% think that climate change is a very serious problem in the Netherlands.
- 37% of Dutch respondents considered that pollution of rivers, lakes and groundwater is an important environmental issue.
- 28 % of respondents agreed that environmental issues have a direct effect on their daily life and health.
- Sources of environmental information are: 68% TV, 57% social networks and the internet, and 49% newspapers.

Technical Context

The Netherlands is among the top performers in connectivity in Europe and it is one of the EU countries which, overall, performs better in terms of the digital public. In terms of fixed broadband take-up, it is 90%, above the EU average (77%).

Specifically, for relevant water management, unmanaged aquifer recharge began in the Netherlands at the beginning of the 20th century, with centralized disposal of sewage water, the disposal of groundwater from deep construction pits, and the irrigation of some polder areas. The introduction of MAR projects and related technology began in the middle of the century.

Economic Context

In economic terms, Katwijk aan Zee is the main urban hub of the municipality. However, the municipality is close to other larger urban economic hubs (including The Hague, Leiden and Amsterdam). Rural economic activities are also prominent in surrounding municipalities, most notably in Lisse, which focuses on flower growing. Recently, there has been a significant increase in water demand in the region, originating from industry and changing demographics.

In general, Dutch incomes lie above the OECD average, and the Dutch enjoy comparatively low labour market insecurity. Regional disparities in income and other key economic statistics are relatively low, and the country as a whole has a below-average level of inequality when compared to the rest of the OECD. Life satisfaction in the Netherlands is also substantially higher than the OECD average level.

The Netherlands scores highly in nearly all areas of the OECD Better Life Index. In particular, the Netherlands is above average for jobs, work-life balance, education, environmental quality, social networks, civic engagement, safety and life satisfaction when compared to other OECD countries.

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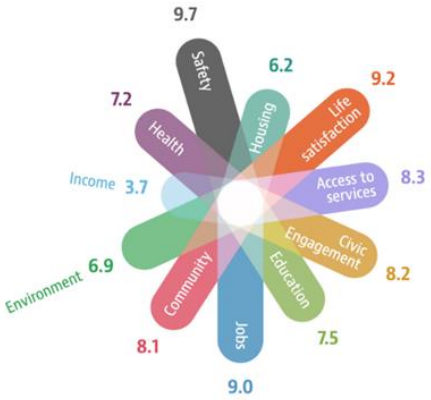

Figure 4 Regional Well-Being Indicators in South Holland. Source: https://www.oecdregionalwellbeing.org/.

Stakeholder Inventory

To ensure adherence to privacy and data protection regulations, the names of organisations have been removed from this deliverable; the number of identified organisations per sector has been included instead. Organisation and stakeholder names have been included in full in the (confidential) LivingLab compendia.

Table 1 Stakeholder inventory, Katwijk.

Sector	# of stakeholders identified to engage
Private sector/Industry	1
Public sector/ Government	4
Civil society/NGO	3
Academia/Research	1

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2.3. DEMO SITE 2 – OUED SOUHIL - NABEUL, TUNISIA

Context mapping

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The Demo Site will focus on Oued Souhil, a river terminating in the Mediterranean Sea at the town of Nabeul. The aquifers, located in the Cap Bon Peninsula in Tunisia, are strongly overexploited due to increasing water demand for domestic use and irrigation. In the area, the groundwater level is rapidly declining and water quality is deteriorating due to seawater intrusion and diffuse pollution from agriculture (pesticides, fertilizers). In response, the local basin authority started the Managed Aquifer Recharge fed with treated wastewater, using infiltration basins. However, treated wastewater is polluted by high salinity and micropollutants. There is thus a strong need to implement an effective tertiary treatment to minimize the introduction of these pollutants in the aquifer.

Figure 5 Target area of the Tunisia Demo Site (Freeworldmaps).

Political context

Below the national level government, Tunisia is divided into governorates, which are divided, in turn, into 264 delegations. The current constitution of the country is relatively new and was adopted in 2014, following the Arab Spring. The Demo Site is located in the Nabeul Governorate.

At present, the majority of the water management legislation is developed and coordinated by the Ministry of Agriculture and Water Resources. In 2019, Tunisia started the development of the Vision and Strategy for the Water Sector by 2050 (EAU 2050).

The Demo Site is under the supervision of INRGREF (the agricultural research institute), which is dependent on the Ministry of Agriculture, Water Resources and Fisheries. INRGREF, as the manager of the Site, has open cooperation with ISSBAT. The endorsement has to be obtained from INRGREF prior to any dissemination of sensitive data.

Environmental context

Tunisia is located in northern Africa on the Mediterranean Sea. The coastline, and the rest of northern Tunisia are the most densely populated areas of the country, while central and southern parts of the country are largely (semi-)arid, or desert. The climate is mostly temperate with generally mild winters and hot summers.

Tunisia suffers from various environmental issues, including water scarcity, pollution of water (due to urbanization and poor sanitation), and erosion. Without interventions, these issues are predicted to worsen due to climate change in the near future. The OECD notes that tighter regulation of environmental exploitation and pollution is required to allow for the continued growth of tourism in the country.

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The water resources surrounding the Demo Site in Oued Souhil have come under increasing pressure from the increasing population, as well as over-exploitation from industry and agriculture. Overexploitation of groundwater has led to a decline in groundwater levels and increasing salinity from seawater intrusion. Contamination from pesticides and fertilizers is also possible, due to the surrounding agricultural land.

Social/Cultural Context

Tunisia has a population of nearly 12 million inhabitants, 95% of which have a Berber or Arabic background. The Tunisian population is very homogeneous and is characterized by the uniformity of culture, language (Arabic) and religion. Culturally, Tunisia is significantly influenced by other Mediterranean countries, as well as the history of French colonization in the country. The Demo Site is located in Nabeul, a small, coastal town located in the northeast of Tunisia with a population of around 60,000. In general, coastal areas (such as Nabeul) are considered to be more developed than the interior regions.

Regarding the importance of environmental issues to society in Tunisia, there are currently high levels of societal concern about water pollution, salinity intrusion and drought.

Technical Context

Tunisia has achieved the highest access rates to water supply and sanitation services in the Middle East and North Africa. As of 2011, access to safe drinking water became close to universal, approaching 100% in urban areas and 90% in rural areas.

Regarding the use of MAR, such strategies were observed in Tunisia for the first time in 1956, in the Soukra area. Then, in 1986, an experimental artificial recharge station for the Nabeul-Hammamet (Oued Souhil) aquifer was developed. Since then, a wide range of approaches – including the creation of freshwater injection wells and sewage-water infiltration basins - over the last 30 years.

Civil society in the Cap Bon region has been engaged to preserve the environment and raise public awareness of ecologically and culturally responsible practices. The leveraging of various channels was required to achieve this: several local associations (Tunisian Association of Environmental Law, Eco-Tourism Environment Association); the organization of sensitization workshops; and dissemination through social networks (in particular Facebook, Twitter, LinkedIn and websites such as jamaity.com).

Economic Context

Tunisia has a steadily growing GDP per capita, which is close to the average of other neighbouring countries in the Middle East and North Africa. This steady growth is based on the country's mixed economy, which has historically focused on the export of oil, phosphates, agri-food products, and car parts. Currently, tourism is starting to account for a larger share of the Tunisian economy, particularly along the northern coastline of the country.

The Governorate of Nabeul is considered an important agricultural centre (making up 15% of national agricultural production). The industrial sector is also relatively well developed (and contributes 13.3% of the national industrial fabric). The area also constitutes an important export hub (10% of national exports) and is the primary tourist centre of the country (22% of the total national capacity). The region is also known for its artisanal specialities such as pottery and ceramics.

Stakeholder inventory

To ensure adherence to privacy and data protection regulations, the names of organisations have been removed from this deliverable; the number of identified organisations per sector has been

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included instead. Organisation and stakeholder names have been included in full in the (confidential) LivingLab compendia.

Table 2 Stakeholder inventory - Oued Souhil, Nabeul.

Sector	# of stakeholders identified to engage
Private sector/Industry	3
Public sector/ Government	8
Civil society/NGO	6
Academia/Research	5

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2.4. DEMO SITE 3 – FRIELAS, PORTUGAL

Context mapping

Frielas, the Portugal Demo Case, is located in the municipality of Loures, within the Lisbon Region on the western coast of Portugal (see Figure 6). Notably, Frielas is one of the largest wastewater treatment plants (WWTP) in Portugal and will become increasingly important in the coming years with the changing climate. The Frielas WWTP belongs to AdTA, with activities linked to the West edge, Tagus alluvium, and Tagus-Sado basin (left bank) aquifers, each of which is affected by the salt intrusion. This WWTP discharges treated effluent into the Tagus basin and treats 70 000 m^3/day. Due to a lack of technologies to remove emerging contaminants, several pollutants were detected in the effluent. The discharge of these emerging pollutants, expected to increase with population and industrialization rise, has a serious impact on MAR implementation and acceptance. The Demo Site aims to address these issues.

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Figure 6 Target area of the Frielas Demo Site (Freeworldmaps).

Political context

Policy issues relevant to the Frielas WWTP are generally considered and decided at the national level (EU legislation is always transposed to the national level). The relevant regulators are: APA (Agência Portuguesa do Ambiente), ERSAR (Entidade Reguladora dos Serviços e Resíduos) and & Águas de Portugal, SGPS (the holding of AdTA (Águas do Tejo Atlântico) so must guide the strategies that are in line with the Environmental Ministry).

More broadly, Portugal has three levels of governance (in addition to the EU level): central, regional (the Autonomous Regions) and local level (municipalities and parishes). At the regional level, the responsibilities of the Autonomous Regions include water, mineral and thermal resources, and locally produced energy; and at the local level, the parishes have responsibilities for water supply, rural and urban infrastructure, environmental and well-being, and urban and rural planning among others. Multi-municipal systems, jointly owned by Águas de Portugal (a national holding company) and the municipalities in their areas, are responsible for the abstraction, treatment and main regional distribution systems of drinking water, and the regional sewerage and wastewater treatment.

Environmental context

The Loures municipality (in which Frielas is located) is split between a rural zone in the north and an urban zone in the rest of the area. Situated on the west coast of the country, Frielas experiences an Atlantic climate. The most relevant environmental features of the area are the Loures River, Trancão River, and Tejo estuary natural reserve.

Portugal is one of the most vulnerable European countries to the impacts of climate change. With increasing extreme weather events (including heatwaves and heavy rainfall), the areas of the country will become more vulnerable to drought, wildfires, water scarcity and flooding.

Social/Cultural Context

Frielas is located in the fifth most populated municipality in Portugal, with a population of over 200,000, and is situated close to Lisbon. The population of the city largely identify as Portuguese and closely identifies with the city of Lisbon. Around 20% of the population does not have a Portuguese background.

Regarding environmental concerns within Portugal generally, there are medium levels of concern about water pollution, but high levels of concern about drought. In terms of environmental attitudes relevant to the Demo Case (European Commission, 2020):

- 49% of the population personally believe that protecting the environment is very important, and 69% think that climate change is a very serious problem in Portugal.
- 53% of Portuguese respondents considered that pollution of rivers, lakes and groundwater is an important environmental issue.

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- 39% of respondents agreed that environmental issues have a direct effect on their daily life and health.
- Sources of environmental information are: 88% TV, 33% social networks and the internet, and 28% newspapers.

Technical Context

Water management in Portugal is becoming a key topic of focus for the national government, with the revision of the National Water Plan, further implementation of the National Program for the Efficient Use of Water, a new strategy for the water-supply and wastewater treatment sectors and the review of the River Basin Management Plans conducted in the recent past.

A central issue in Portuguese environmental policies is the vulnerability of the country's coastal zones. Policies regarding this subject have begun focusing on integrated coastal zone management, linking maritime policies with climate-change adaptation policies.

Regarding the Demo Site specifically, the Frielas wastewater treatment plant is one of the largest in Portugal. It carries out a water treatment process for the waters of the Rio Trancão and Rio de Loures.

Popular, relevant social engagement tools in the region include municipal websites and pages of LinkedIn, Instagram, Facebook, Twitter, and YouTube.

Economic Context

In the region of Lisbon, the most notable employers are: Petrogal, EDP, Pingo Doce, Galp, MEO and Repsol. Additionally, the Port of Lisbon is strategically located near Portugal's main consumption centre, making it a top choice for businesses looking to reach the Lisbon and Vale do Tejo region. It boasts three specialized terminals with modern infrastructure and accessibility and has a global capacity of approximately one million TEU. Container traffic is a key component of the port's operations, with regular cabotage services to major ports in North Europe and Spain, as well as numerous direct services provided by major container ship lines. The port is home to three specialized clusters focused on offshore robotics and engineering, digital ports, and green shipping.

More broadly, Portugal has a GDP per capita of $36,700, slightly below the OECD and EU average, as well as an average level of income inequality compared to the rest of the OECD countries. Its economy is mainly driven by services and tourism, while the traditional sectors of agriculture and fisheries now only contribute a small portion to Portugal’s economy.

Portugal also performs relatively well in the OECD Better Life Index. In particular, Portugal performs well in metrics related to housing safety and environmental quality. However, it is ranked as below average compared to other OECD countries in income, social connections, civic engagement and life satisfaction.

According to the OECD regional well-being survey, the Metropolitan Area of Lisbon (the district in which Frielas is located) is ranked highly in terms of income, health, access to services, education, civic engagement and life satisfaction when compared to the rest of Portugal. However, it is one of the lowest-ranked districts for housing and environmental quality.

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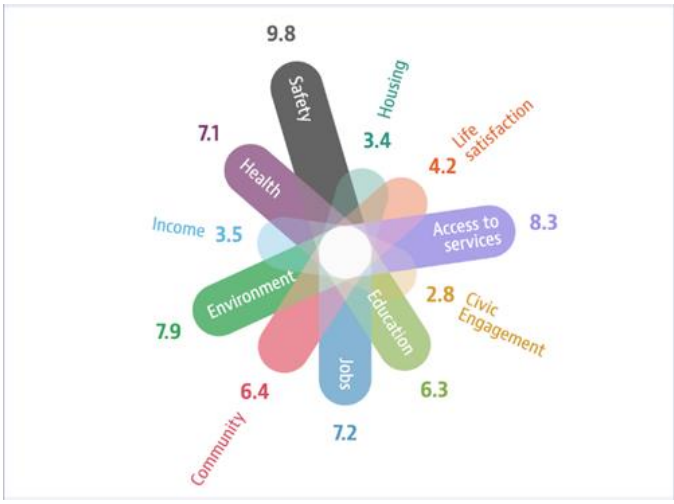

Figure 7 Regional Wellbeing Indicators in North Portugal. Source: https://www.oecdregionalwellbeing.org/.

Stakeholder inventory

To ensure adherence to privacy and data protection regulations, the names of organisations have been removed from this deliverable; the number of identified organisations per sector has been included instead. Organisation and stakeholder names have been included in full in the (confidential) LivingLab compendia.

Table 3 Stakeholder inventory, Frielas.

Sector	# of stakeholders identified to engage
Private sector/Industry	14
Public sector/Government	7
Civil society/NGO	8
Academia/Research	6

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2.5. DEMO SITE 4 – EMILIA-ROMAGNA, ITALY

Context mapping

The Italian Demo Case – located in the northeast area of the country in the Emilia-Romagna region - aims to manage the recharge of a coastal aquifer, using treated municipal wastewater. The Ravenna coastal aquifer is affected by overexploitation, relevant saline intrusion, and diffuse pollution from agriculture. Climate change and increasing water abstraction due to increasing population and agricultural production are expected to increase these problems. The Demo Case has identified the potential of MAR (along with treated wastewater from coastal wastewater treatment plants) as a promising solution to ensure long-term sustainable management of the aquifer. Two wastewater treatment plants are located within 70 km from the aquifer boundaries (Ravenna and Bologna WWTPs), potentially usable for aquifer recharge with treated wastewater.

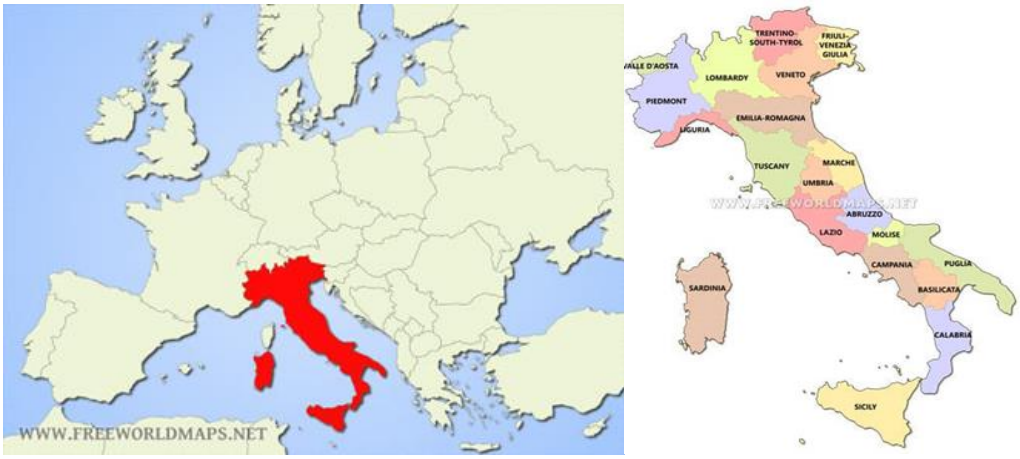

Figure 8 Target area of the Italian Demo Site (Freeworldmaps).

Political context

Italy is organised into regions, provinces, municipalities and metropolitan cities. The Emilia-Romagna Region has ordinary status with legislative and administrative competencies, defined by their statutes. On February 28th 2018, the central government signed an individual preliminary agreement with the Emilia-Romagna region on the recognition of "differentiated autonomy". Such "differentiated autonomy" status is established by special legislation based on the agreement between the central government and the region and approved by the absolute majority in the Chamber and the Senate. The "differentiated autonomy" status shall last 10 years and Emilia-Romagna shall have autonomy in the following areas: environment protection, healthcare prevention, education, employment protection, and international relationships with the European Union.

The Demo Site spans three natural reserves of high interest: the Regional Park of the Po Delta and Comacchio Valley, and the Cervia Salt Marshes. The decision-making process related to the Ravenna phreatic aquifer is primarily coordinated by the Emilia-Romagna Region government. Through its agency ARPA (Regional Environmental Protection Agency) the Region monitors all groundwater bodies, including the phreatic aquifers. For any project which alters the status quo, a service conference is called. The service conference is a round table including all administrations involved at all levels (Provinces, Municipalities, and so forth), and all stakeholders, including citizen groups. An important public body involved in the decision-making process is the Basin Authority "Distretto Padano" (Po District), a public body which draws up strategic plans to safeguard the environment.

In Italy, policy debates at town and regional levels are in most cases restricted, but in some specific circumstances, they are open to the public. There are specific channels that can be used by civil

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society groups to raise issues that will then be debated by town and regional governments. Citizens' rights to information and participation are implemented mainly by national and EU legislation.

Environmental context

The Demo Site is located in a Mediterranean climate, with high subsidence and industrial areas. The landscape of the region is dominated by the plains of the Po Valley, mountainous areas in the North, and sandy beaches on the coast. The phreatic aquifer around the town of Ravenna is particularly complex as it interacts directly with several minor surface water bodies and with the sea. The aquifer at large belongs to the largest river basin in Italy, that of the Po River. Of particular interest are the "piallasse", several local lagoons which constitute a specific ecosystem. At large, all the coastal region constitutes a fragile environment that is threatened by saltwater intrusion that puts at risk plants unsuited to salty environments.

Temperature rise (particularly in summer months), drought, decreases in rainfall, and increases in severe weather phenomena have been noted as critical environmental issues in the coming years for the region. In coastal areas, sea level rise and the loss of wetlands & dunes have been causes for concern.

Social/Cultural Context

The Emilia-Romagna region, as the name indicates, is divided into two zones: Emilia, located in the west, and Romagna, located in the east. Some citizens identify themselves as belonging to the Emilia or Romagna description of the regions, but most people identify themselves just as Italian. The population is quite homogeneous, even if there is a relevant presence of immigrants coming mainly from North Africa, the Middle East and Southern Asia. The demo site, including the selected WWTPs, is located across both Emilia and Romagna.

The population density of Emilia-Romagna (200 inhabitants per km^2 in 2019) is close to the national average and is evenly distributed. There is an axis of medium-sized cities along the Via Emilia, where two-thirds of the population and the majority of the industrial production are concentrated. While each town in the region has a specific identity, Bologna - the region's capital - represents a reference point, thanks to its size, its strong industrial network and the presence of Bologna University, the 2nd largest university in Italy and the oldest in the western world.

In Italy more generally, a medium level of societal concern about water pollution has been measured, while high levels of concern about drought have been noted. Furthermore (European Commission, 2020):

- 43% population personally believe that protecting the environment is very important, and 86% think that climate change is a very serious problem in Italy.
- 30% of respondents considered that pollution of rivers, lakes and groundwater is an important environmental issue.
- 38% of respondents agreed that environmental issues have a direct effect on their daily life and health.
- Sources of environmental information are: 73% TV, 34% social networks and the internet, and 32% newspapers.

Technical Context

Emilia Romagna is a territory with a high number of social innovation experiences representing specific learning processes. Furthermore, the region has a high level of technical expertise and ranks among the highest in Europe in terms of manufacturing, SME innovation, employment in medium and high-tech manufacturing and knowledge-intensive services, patenting, export, FDI attraction, and new business creation.

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Managed aquifer recharge in Italy has only started to become commonplace relatively recently, with several projects starting in the early 2010s. More specific to the area of this Demo Site, one MAR pilot project took place on the Marecchia River in Emilia Romagna, using a recharge basin to alleviate water scarcity in the Rimini area during periods of drought.

The Demo Site area features uniform and well-developed network access. The most widely used social media are WhatsApp, Instagram and Facebook. Various local online communities are also used.

Economic Context

Emilia-Romagna is one of the wealthiest and most developed regions in Europe, with relatively high employment rates. It has the third-highest gross domestic product (GDP) per capita in Italy (after Lombardy and Trentino-Alto Adige) and the percentage of the population with a tertiary education degree is 23.3%. Manufacturing still plays a leading role in the overall regional economy, with some of the most important industrial districts in Italy. In the area of the Ravenna coastal aquifer, there is a major industrial centre, the Ravenna petrochemical cluster. It is one of the largest industrial clusters in Italy, connected to the Ravenna port.

According to the OECD regional well-being survey, the Emilia-Romana region in terms of access to service, civic engagement, jobs, community, income, housing and life satisfaction is high compared to the rest of Italy, but it is one of the lowest-ranked regions for the environment (see Figure 9).

When looking at Italy more generally with the OECD Better Life Index, the country performs well in measures of health, work-life balance and civic engagement, when compared with other OECD countries. However, it scores below average on income, employment, education, environmental quality, social connections and life satisfaction.

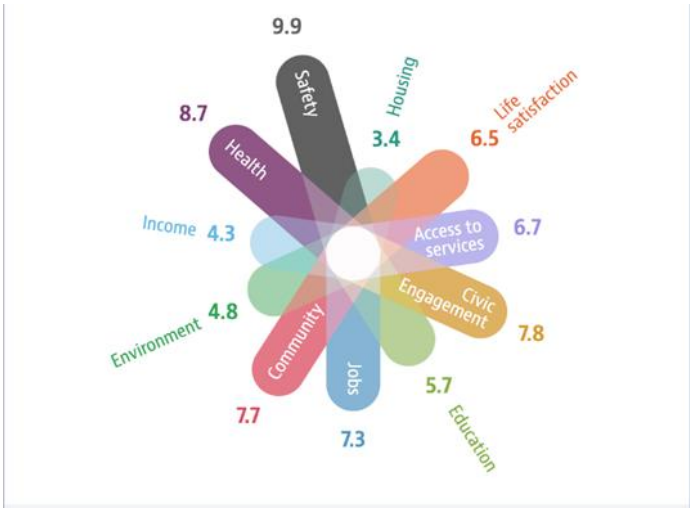

Figure 9 Regional Well-Being Indicators in Emilia-Romagna. Source: https://www.oecdregionalwellbeing.org/.

Stakeholder inventory

To ensure adherence to privacy and data protection regulations, the names of organisations have been removed from this deliverable; the number of identified organisations per sector has been included instead. Organisation and stakeholder names have been included in full in the (confidential) LivingLab compendia.

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Table 4 Stakeholder inventory, Emilia-Romagna.

Sector	# of stakeholders identified to engage
Private sector/Industry	14
Public sector/ Government	5
Civil society/NGOs	2
Academia/Research	1

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2.6. DEMO SITE 5 – CAPE FLATS, SOUTH AFRICA

Context mapping

The South African Demo Site (located in Cape Flats) will join an existing managed aquifer recharge project to increase the local aquifer recharge rate and to reduce salinity intrusion. To prevent deterioration of the Cape Flats Aquifer water quality, Managed Aquifer Recharge needs to be associated with preventive measures aimed at decreasing diffuse pollution from various sources – arguably pollution by greywater from informal settlements and industry, as well as agriculture.

The Cape Flats Aquifer is the major source of municipal water for Cape Town city and irrigation, but is increasingly contaminated by salinity intrusion, and diffuse pollution from various sources, which also include micropollutants from underperforming WWTPs. The current groundwater extraction rate is near 100% of natural recharge and there is the potential for increased seawater intrusion. Due to climate change, population growth (with influx from other regions inside SA as well as neighbouring countries) illegal dumping and the rapid increase in food production, the Cape Flats Aquifer is expected to reach over-extraction in the near future.

Figure 10 Target area of the South African Demo Site (Freeworldmaps).

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Political context

South Africa has a three-tier administration system, with the national, provincial and local levels of government all having a degree of legislative and executive authority. The three levels are defined in the Constitution as distinctive, interdependent and interrelated. Various advisory bodies made up of traditional leaders are also involved in the administrative process.

In South Africa, water provision and relevant infrastructure is under the domain of the national government. The National Water Act of 1998 ensures that South Africa's water resources are protected, used, developed, conserved, managed and controlled in a sustainable and equitable manner, for the benefit of all people.

Decision-making processes relevant to groundwater management are generally coordinated by the National and Provincial Depts. of Water Affairs, as well as the City of Cape Town. The Demo Site will work closely with the City of Cape Town, using open public channels, and utilising established, trusted relationships when communicating with the City.

Environmental context

Cape Flats is a large, low-lying, flat area, in the southeast of Cape Town. The area is facing high levels of rapid urbanisation (formal/planned development as well as informal/unplanned), leading to an increasing scarcity of resources, (including water, energy, and the ability to treat waste products) and pollution of the city's air, water and open spaces. Cape Town (and South Africa in general) has a high level of vulnerability to climate change, leading to concerns of water availability, and increasing levels of pollution (particularly from agriculture).

Social/Cultural Context

South Africa is a diverse country, with a variety of cultures, languages and religions. The population (of around 60 million) is largely concentrated in coastal areas and the northeast of the country. Despite increasing urbanization, a substantial number of rural inhabitants are present in South Africa, who are disproportionately living in conditions of poverty. Cultural traditions amongst the rural population are particularly strong, although many such traditions are reduced in urban areas. Within Cape Town (and the area of Cape Flats specifically), there are various ethnic or tribal groups present in the population, with a diverse range of different languages spoken, in addition to many religious, social and cultural sub-groups.

The public perception of environmental issues in South Africa is generally not well known. Recent research has suggested that environmental issues are not prioritized and were rated as the 17th most important issue facing South Africa by the country's population. However, high societal concern about water pollution and drought has been measured.

Cape Town is often viewed as the trendsetter for the rest of South Africa, particularly regarding good governance. Considering this, the selection of the Demo Site within Cape Town is strategic and can impact the uptake of following groundwater management and MAR activities.

Technical Context

South Africa (and Cape Town in particular) has faced high levels of water stress in the recent past, leading to a significant focus on issues of water scarcity. A variety of risk assessments in Cape Town have been conducted on the topic, in addition to the creation of a Water Resilience Plan. The latest Cape Town Water Strategy, which aims to increase resilience to drought, has highlighted the importance of the exploitation of diverse water resources, diversified infrastructure, making optimal use of stormwater and urban waterways for the purposes of flood control, and water reuse and recreation. It also specifically highlighted the importance of managed aquifer recharge in the region.

Stellenbosch University has an extensive network of relevant groups and organizations, within the University and outside (e.g., WWF) with whom they frequently collaborate. Within the University

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there are diverse views and approaches related to engagement. Approaches to engagement will be informed by the communities that will be involved in the project.

Economic Context

South Africa has a mixed economy, with a particular focus on mining, tourism and agriculture. Despite having the third highest GDP per capita of any country in Africa, it has one of the highest levels of inequality in the world.

Regarding the area of Cape Flats, the economy is largely dominated by the financial and business services sector within Cape Town, along with concentrated industrial clusters, and ports. While the region of the Western Cape has a GDP per capita higher than that of South Africa as a whole, Cape Flats still experiences high levels of poverty.

Stakeholder inventory

To ensure adherence to privacy and data protection regulations, the names of organisations have been removed from this deliverable; the number of identified organisations per sector has been included instead. Organisation and stakeholder names have been included in full in the (confidential) LivingLab compendia.

Table 5 Stakeholder inventory, Cape Flats.

Sector	# of stakeholders identified to engage
Private sector/Industry	3
Public sector/Government	3
Civil society/NGO	3
Academia/Research	The SU team has a large network of academic as well as highly-trained industrial partners

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2.7. DEMO SITE 6 – MARBELLA, SPAIN

Context mapping

The Spanish Demo Site located in the municipality of Marbella, in southern Spain, belongs to the province of Málaga in the autonomous community of Andalusia. Marbella is situated on the Mediterranean Sea (see Figure 11).

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The Demo Site will focus on the El Señorío Aquifer, located in Marbella. The El Señorío Aquifer is located in a Mediterranean coastal area. This area is highly populated and could triple its population in summer due to tourism activity. This area has suffered water stress for decades and Hidralia (private water utility in the area) already has an asset to carry out a MAR operation, running since 2000. The aquifer can potentially be affected by salinity intrusion, during drought events. To curb salt intrusion and increase the natural recharge rate, Hidralia implemented a groundwater management system that combines monitoring of the salt intrusion to the aquifer with an operational plan based on the protection of the aquifer, coordinated with a MAR scheme, drawing water from an upstream carbonate aquifer of high quality.

Figure 11 Target area of the Spanish Demo Site (Freeworldmaps).

Political context

The entirety of the El Señorío Aquifer is located in the same basin district and municipal (administrative) limits. It is governed by four distinct levels of government: EU (directives); National government (directives transposition to Spanish regulatory framework and own national regulatory framework); Autonomous government (regional legislative framework); and Municipal. In general, policies relevant to the aquifer are created by the EU, National and Autonomic levels. Decision-making for groundwater management in the area is generally coordinated by Consejería de Agricultura (Junta de Andalucía).

Citizens have a right to information on, and participation in, the development of relevant policies. On the Ministry of the Environment website, there is a public participation section where future action plans (drafts) are published, and a deadline is established for sending comments.

More broadly, Spain is a regionalised state and comprises three levels of governance: central, regional and local (comprising provinces and municipalities). The autonomous communities, the provinces and the municipalities run their respective affairs autonomously. Most of the autonomous communities enjoy the same degree of political autonomy, although there are some differences between the exercise of their powers on specific cultural and linguistic powers, civil legislation and some specific provisions on police and public security, immigration, etc. Autonomous communities of Andalusia assume competencies in water resources management.

Environmental context

Marbella is a city of just under 150,000 inhabitants, located on the Mediterranean coast of Spain. The city is surrounded by the Sierra Blanca and foothills to the north, and the Mediterranean Sea to the south. The city has a Mediterranean climate, with humid winters and dry, warm summers.

The main water source in the area originates from a sprouting spring (Camoján), upstream of the MAR system, belonging to a chalk aquifer. The MAR operation is conducted through deep injection wells in a Pliocene Aquifer.

Spain is one of the most vulnerable countries in the EU to climate change. It is predicted that the changing climate will bring higher temperatures, average sea level rises and a reduction in water

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availability to the south of Spain in particular, affecting cities such as Marbella. Other environmental threats that are foreseen to worsen with climate change include wildfires and erosion.

Social/Cultural Context

Marbella is one of the most important tourist cities of the Costa del Sol and is largely dominated by tourism year-round. The city is also a cultural centre, with a range of museums and music events throughout the year.

Residents in the area primarily identify as Andalusian, although there are regular influxes of northern European populations in summer. The main and official language is Spanish, but due to the floating population, English, German and Russian can be present.

In Spain more generally, there is high societal concern about water pollution and drought. Nationally, significant progress has been made towards the implementation of the Water Framework Directive. In terms of attitudes, the 2020 Eurobarometer Poll "Attitudes of European citizens towards the environment" (European Commission, 2020), found that:

- 62% of the population personally believe that protecting the environment is very important, and 90% think that climate change is a very serious problem.
- 42% of respondents considered that pollution of rivers, lakes and groundwater is an important environmental issue.
- 55% of respondents agreed that environmental issues have a direct effect on their daily life and health.
- Sources of environmental information are: 74% TV, 48% social networks and the internet, and 22% newspapers.

Technical Context

Water management strategies such as managed aquifer recharge have a long history in Spain, meaning that there is a considerable level of technical expertise and infrastructure in the country. In 2018, there were over 32 different managed aquifer recharge projects taking place across Spain (although these were mostly focused on central and north-eastern areas of the country). The type of strategies being deployed also varies considerably, with at least eight different types of managed aquifer recharge present in Spain.

Economic Context

In Marbella, the economy is largely fuelled by tourism. The largest employers in the area include hotels and golf courses. The effect of tourism has led the city to have one of the highest household disposable incomes per capita amongst the municipalities in Andalusia.

More generally, Spain has a GDP per capita of $40,724, below the OECD average, with slightly above-average levels of inequality compared to the rest of the OECD countries. Its economy is mainly driven by the automotive industry, medical technology, chemicals, shipbuilding, tourism, and textiles.

In the OECD Better Life Index, Spain performs above average in measures of work-life balance, health, social connections and safety when compared to other OECD countries. However, the country is below average in jobs, education, and life satisfaction.

Regarding the Demo Site specifically, Marbella is one of the most populous municipalities in the province of Málaga and is amongst the municipalities ranking highest in household disposable income per capita in Andalusia. According to the OECD regional well-being survey, Andalusia in terms of income, jobs, environment, health and education is one of the lowest-ranked areas of Spain.

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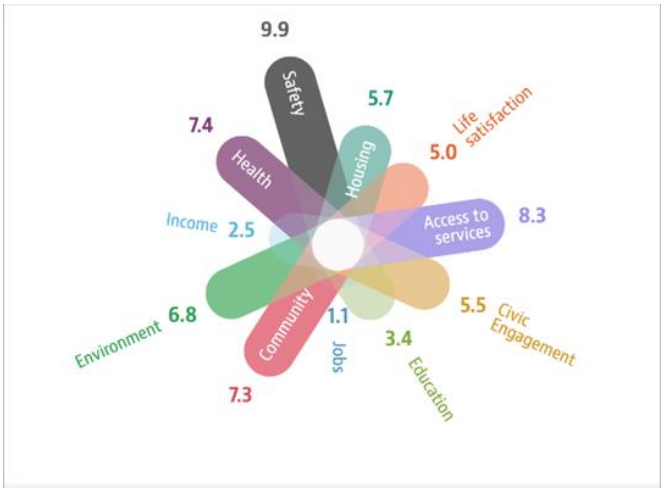

Figure 12 Regional Well-Being Indicators in Andalusia. Source: https://www.oecdregionalwellbeing.org/.

Stakeholder inventory

To ensure adherence to privacy and data protection regulations, the names of organisations have been removed from this deliverable; the number of identified organisations per sector has been included instead. Organisation and stakeholder names have been included in full in the (confidential) LivingLab compendia.

Table 6 Stakeholder inventory, Marbella.

Sector	# of stakeholders identified to engage
Private sector/Industry	3
Public sector/ Government	8
Civil society/NGO	2
Academia/Research	3

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2.8. DEMO SITE 7 – LIMA RIVER ESTUARY, PORTUGAL

Context mapping

The Lima River estuary Demo Site is located in the northwest of Portugal. The estuary - an end member of the international Lima watershed - receives diffuse pollution from agriculture, untreated municipal wastewater, and industrial wastewater. Nutrients, metals, pharmaceuticals, PAHs, and

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other chemicals have been detected in estuary sediments and surface waters, which can generate a risk if transported to the aquifer. During tides, salt intrusion extends up to 20 km upstream in the river, which can limit the possibility to use river water for irrigation or drinking water. Furthermore, extreme weather events can also cause relevant erosion in the basin. The objective of the Demo Site is to show that vegetated areas (salt marshes) can protect the estuarine environment and aquifer from these various threats.

Figure 13 Target area of the Lima River Demo Site (Freeworldmaps).

Political context

In addition to the EU level, Portugal has three levels of governance: central, regional (the Autonomous Regions) and local level (municipalities and parishes). At the regional level, the responsibilities of the Autonomous Regions include water, mineral and thermal resources and locally produced energy; and at the local level, the parishes have responsibilities for water supply, rural and urban infrastructure, environmental and well-being, and urban and rural planning among others. Multi-municipal systems, jointly owned by Águas de Portugal (a national holding company) and the municipalities in their areas, are responsible for the abstraction, treatment and main regional distribution systems of drinking water, and the regional sewerage and wastewater treatment.

Formal decisions are initially proposed by administrative entities, then followed by a period for public consultation to gather feedback and approval from citizens (only national citizens can participate). The consultation takes place via public channels (such as consultalex.gov) and is made as accessible as possible.

As a transboundary basin (between Spain and Portugal), water management in the Lima River should be coordinated for the whole of the River Basin District. These management processes are largely outlined by the Convention on Cooperation for Portuguese-Spanish River Basin Protection and Sustainable Use, in force since 2000 and were revised in 2008 under the WFD principles.

Environmental context

The Lima River runs west covering 108 kilometres from Galicia in Spain to northern Portugal, where it enters the Atlantic Ocean at Viana do Castelo city. The Lima Estuary (which is a protected area, under the NATURA2000 network) in particular contains diverse types of landscape, including coastal areas, saltmarshes, intertidal sandy areas and brackish subtidal areas. These areas are home to a wide variety of migratory and alien species, including birds, fishes, macroalgae, molluscs and more.

Portugal is one of the most vulnerable European countries to the impacts of climate change. With increasing extreme weather events (including heatwaves and heavy rainfall), the areas of the country will become more vulnerable to drought, wildfires, water scarcity and flooding. The Lima River is at

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particular risk from drought, with transboundary water and drought planning and management processes between Spain and Portugal required. Furthermore, as the watershed contains urban, industrial and agricultural areas, the aquifer can be impacted by several pollutants originated from wastewater, agricultural fertilisers and other activities.

Social/Cultural Context

The Norte Region of Portugal (through which the Lima River runs) is largely dominated by the city of Porto, and other cities such as Viana do Castelo. Besides urban areas, it also contains agricultural areas and several national and natural parks. The cultural history of the boundary area (Viana do Castelo district) is largely tied to that of Galicia in Spain; the two areas have been promoting their official candidacy for the recognition of the common intangible cultural heritage by UNESCO.

The population of the area is largely homogeneous, and primarily identified as Portuguese and 'Minhotas' (i.e., from the Minho area in the north of Portugal). Moreover, the population from this region (Viana citizens and from Minho in general) show a strong cultural affinity with Galicia, in northern Spain. Specific examples of this are frequent references to TV programmes from Galicia TV, weather forecast, and also in relation to the sea, and aquatic resources management specifically.

Regarding environmental concerns within Portugal generally, there are medium levels of concern about water pollution, but high levels of concern about drought. In terms of environmental attitudes relevant to the Demo Case (European Commission, 2020):

- 49% of the population personally believe that protecting the environment is very important, and 69% think that climate change is a very serious problem in Portugal.
- 53% of Portuguese respondents considered that pollution of rivers, lakes and groundwater is an important environmental issue.
- 39% of respondents agreed that environmental issues have a direct effect on their daily life and health.
- Sources of environmental information are: 88% TV, 33% social networks and the internet, and 28% newspapers.

Technical Context

Water management in Portugal is a key topic of focus for the national government, with the revision of the National Water Plan, further implementation of the National Program for the Efficient Use of Water, a new strategy for the water supply and wastewater treatment sectors and the review of the River Basin Management Plans conducted in the recent past.

One important environmental issue in Portuguese environmental policies is the vulnerability of the country's coastal zones. Policies regarding this subject have begun focusing on integrated coastal zone management under the EU Maritime Spatial Planning Directive, linking maritime policies with climate-change adaptation policies.

Economic Context

In northern Portugal, there are several major employers, some industrial clusters, and the commercial Port of Viana do Castelo (run by the company APDL). In the port jurisdiction, an industrial unit is installed to carry out the shipbuilding and repair activity, with a total area of 245,000 m^2. The shipyards are operated by the company West Sea - Estaleiros Navais, Lda. The port also holds a manufacturing cluster for the wind energy industry (company Enercon). The biggest employers in Viana do Castelo include hospitals, temporary employment agencies, and manufacturing (of parts and accessories for motor vehicles).

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Portugal more generally has a GDP per capita of $36,700, slightly below the OECD and EU average, as well as an average level of income inequality compared to the rest of the OECD countries. Its economy is mainly driven by services and tourism, while the traditional sectors of agriculture and fisheries now only contribute a small portion to Portugal's economy.

Portugal also performs relatively well in the OECD Better Life Index. In particular, Portugal performs well in measures related to housing safety and environmental quality. However, it is ranked as below average compared to other OECD countries in income, social connections, civic engagement and life satisfaction.

According to the OECD regional well-being survey, the Norte Region of Portugal ranks highly in terms of civic engagement, health and safety is high compared to the rest of Portugal, but it is one of the lowest-ranked regions for income and life satisfaction.

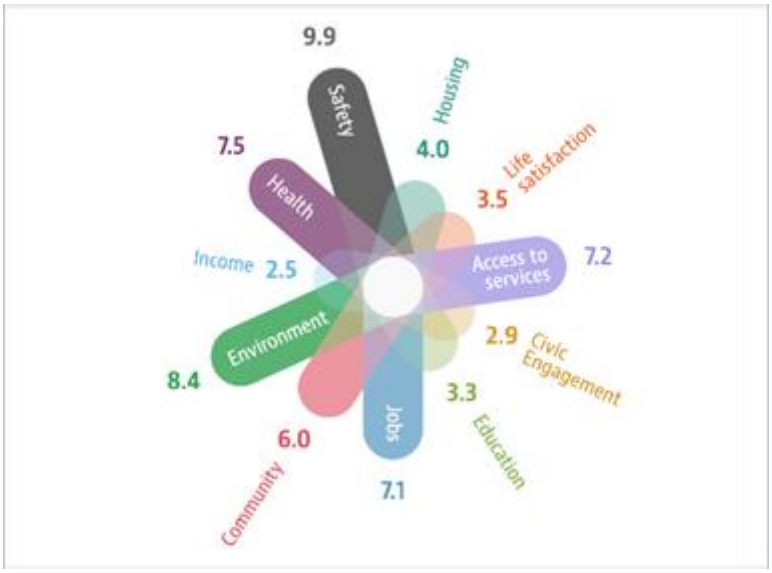

Figure 14 Regional Well-Being Indicators in the Metropolitan area of Lisbon. Source: https://www.oecdregionalwellbeing.org/.

Stakeholder inventory

To ensure adherence to privacy and data protection regulations, the names of organisations have been removed from this deliverable; the number of identified organisations per sector has been included instead. Organisation and stakeholder names have been included in full in the (confidential) LivingLab compendia.

Table 7 Stakeholder inventory, Lima River.

Sector	# of stakeholders identified to engage
Private sector/Industry	3
Public sector/Government	4
Civil society/NGO	4

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Academia/Research	2

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- https://www.oecdbetterlifeindex.org/countries/portugal/
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3. STAKEHOLDER ENGAGEMENT STRATEGIES FOR THE LIVINGLABS AT THE MAR2PROTECT DEMO SITES

3.1. THE MAR2PROTECT LIVINGLABS

MAR2PROTECT (M2P) provides a holistic approach to prevent groundwater contamination from the impacts of climate change and global change, through the combination of innovative and complementary technologies with a strong stakeholder engagement in 7 carefully chosen demo sites, considering different climatic, political and social contexts and different water sources for managed aquifer recharge (MAR). M2P extends the use of societal engagement actions for MAR and sets up and implements a range of locally tailored engagement approaches for MAR co-designed with stakeholders in LivingLabs.

Setting up and implementing LivingLabs in the seven M2P demo sites requires a sound approach. The Ground Truth 2.0 co-design methodology (Wehn and Pfeiffer, 2020) and adapted by the H2020 project MICS represents best practice in the guiding multi-stakeholder interactions in LivingLabs contexts and is particularly suitable for the context of MAR due to the methodology's focus on generating societal engagement activities that are purpose-driven to address jointly agreed societal challenges, based on a sound understanding of the social context. The guidance generated for MAR2PROTECT draws on key deliverables, namely the overall co-design methodology (Wehn and Pfeiffer, 2020), guidance for stakeholder and context analysis (Pfeiffer et al., 2018), stakeholder engagement (Anema et al., 2018) and guidance for co-design of citizen science activities in the MICS case-study sites (Wehn, 2022).

3.2. Guiding principles for the MAR2PROTECT LivingLabs

The MAR2PROTECT LivingLabs are based on the following guiding principles.

i. LivingLab principles

The overarching guiding principles of the Living Lab methodology[1] are that this form of stakeholder engagement:

- *Creates **value** for users by understanding their needs and motivations.*
- *Gives future users **influence** on the decisions.*
- *Aims for **sustainability** in economic, environmental and social terms.*
- *Involves multiple perspectives and collaborates widely for **openness.***
- *Carries out activities in the **real-life context.***

ii. Relevant stakeholders

In order to fully capture the potential of LivingLabs as innovation experiments in real-life and applied settings, a diverse range of stakeholders from the quadruple helix (public sector, private sector, academia & civil society) should be involved in the co-design process as early as possible, namely:

- *citizens, communities and civil society organisations.*
- *scientists, and academics.*
- *public sector actors - legislative (policymakers).*
- *public sector actors - executive (local authorities; implementing agencies).*
- *industry/private sector.*

No single stakeholder (pre)defines the challenge that the LivingLabs will address. Nevertheless, the specific roles of the stakeholders involved in the co-design process may differ according to cultural contexts and the co-design dynamics can be adjusted accordingly.

[1] Ståhlbröst, A. and M. Holst (n.d.) The Living Lab Methodology Handbook, University of Technology and Centre for Distance-spanning Technology, Sweden [https://www.ltu.se/cms_fs/1.101555!/file/LivingLabsMethodologyBook_web.pdf].

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iii. Open-source tools and existing engagement activities and tools

The societal engagement activities of the LivingLabs in the M2P demo sites will use open-source tools (e.g., Epicollect5 [https://five.epicollect.net/], Open Data Kit [https://opendatakit.org/]) and existing activities (e.g. Citizen Science initiatives) and tools, provide that these serve the requirements identified and agreed upon in the co-design process in the M2P LivingLabs.

3.3. THE MAR2PROTECT LIVINGLAB METHODOLOGY

The MAR2PROTECT LivingLabs are created by means of following a structured methodology for setting up and implementing LivingLabs at each Demo Site, taking local contexts, culture, stakeholder relations, etc. into account. The MAR2PROTECT LivingLabs methodology consists of the following stages (see Figure 15):

1. Rapid screening (context & stakeholder analysis).
2. Tailor methods to context & invite LivingLab stakeholders.
3. Launch M2P LivingLab.
4. Co-design societal engagement activities.
5. Launch societal engagement activities.
6. Evaluate & reflect.

Several of these stages consist of carefully designed social interaction moments with relevant stakeholders to set up the LivingLab and to co-design the societal engagement activities to engage wider communities. Iterations of distinct stages and stakeholder interactions may be necessary on a case-by-case basis to ensure stage-specific objectives are met.

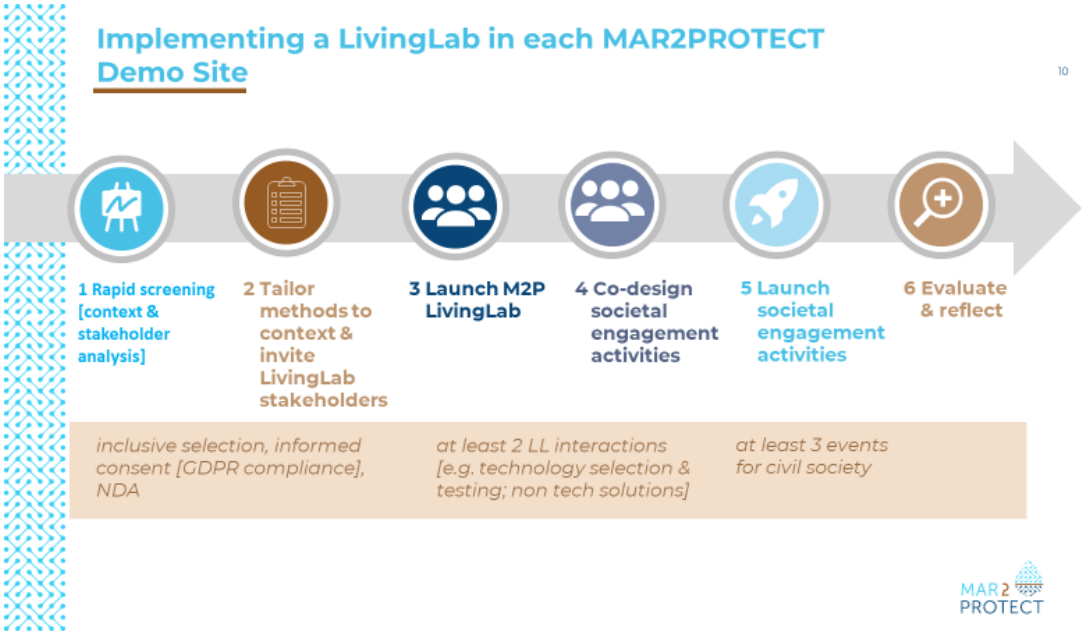

Figure 15 Overview of the MAR2PROTECT LivingLabs methodology. Source: Wehn (2023).

The tailored stakeholder engagement strategy for each LivingLab is created by using a generic compendium (one per LivingLab), guiding each organising team through the stages of the MAR2PROTECT LL methodology. The MAR2PROTECT compendium for the LivingLabs is a collection of instructions, worksheets and guidelines, as well as a safe (confidential) workspace for the MAR2PROTECT LivingLab coordination teams. Per stage, the compendium outlines the objectives; measures of completion; and a checklist of actions with tools and guidance for the implementation.

The strategy outlined in the compendium first sets the foundation for a successful LivingLab by ensuring that the project team, stakeholders, and management tools are in place to support the project's goals. It involves the appointment of team members for the LivingLab, developing an

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understanding of the context in which the LivingLab will exist, and the establishment of a sound stakeholder management system.

The context for the LivingLab activities in the demo site area is then analysed and summarised. Background and contextual information are gathered for the formation of the LivingLab through a desk-based Pestel analysis, as well as with a structured questionnaire, completed by LivingLab team members (see Annex 1).

Following this, to ensure effective stakeholder management, a stakeholder management tool is set up and procedures are put in place. 15-20 relevant organisations are first identified and grouped by sector: Private sector/Industry; Public sector/Government; Civil society/NGO; and Academia/Research. The stakeholder management tool (see Table 9) is then completed with more detailed stakeholder information, relevant to their engagement in the LivingLab.

Table 8 Stakeholder Management Tool.

Stakeholder type	Organisation (if applicable	Location	Contact person (stakeholder)	Contact person's role	Contact owner (MAR2PROTECT team member)	Invitation status (sent, accepted; n.a.)	Why invite to the LivingLab? (e.g. participation; endorsement)	What enables /hinders participation in LivingLab activities?

Additional activities include the formulation of the LivingLab's ambition(s) and goal(s), and the agreement to the project's procedures for stakeholder data management, indicating that the LivingLab project will operate in an ethical and transparent manner.

Following this, potential participants are invited to join the LivingLab while enabling environment authorities to be informed, and an understanding of cultural and local specificities for LivingLab meetings is developed. The main objective is to establish the LivingLab community and create an environment that is conducive to successful LivingLab meetings by understanding local and cultural specificities.

To achieve this objective, customized invitation messages are sent to each prospective LivingLab member, outlining the purpose of the LivingLab and the expectations of participants. These invitations are structured with four key questions: Why we are doing this; Why the stakeholder's input is useful; What the stakeholder is getting out of it; and How the stakeholder can be involved. Using these guiding questions, tailored invitations are created for each sector of stakeholders.

Enabling environment authorities are also informed about the planned LivingLab, ensuring that the project is compliant with local regulations and requirements. When reaching out to these authorities, messages are tailored to their responsibilities and roles.

To ensure that LivingLab meetings are culturally and locally appropriate, the LivingLab team also works to understand the specificities of the area and the community. Information is captured in a template in the compendium (see Table 10). This understanding is then used to establish the conditions necessary for successful LivingLab meetings and ensures that the facilitation of the interactions within the workshop is appropriate and fits the context in which they take place.

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Table 9 Conditions for holding workshops/interactive meetings with the LivingLab participants in the demo sites.

Key aspects	Demo site conditions
Cultural specificities (e.g. language; the extent to which general LivingLab principles can be applied here)	
Ways of interacting in the meeting setting	
Opportunities for bringing these stakeholders together in the LivingLab	
Challenges for bringing these stakeholders together in the LivingLab	

By inviting potential LivingLab participants and informing enabling environment authorities, the LivingLab project is able to establish a community of stakeholders and ensure that the project is compliant with local regulations. By understanding cultural and local specificities for LivingLab meetings, the project can create an environment that is conducive to productive discussions and effective collaboration.

The MAR2PROTECT process to work with the LivingLabs compendium is as follows:

1. T6.1 Task leader IHE Delft prepares instructions on the MAR2PROTECT LL methodology for the demo sites, which are the same for all demo sites and collated in the generic compendium template.
2. MAR2PROTECT demo site leads use their respective compendium to record and report all results of their LivingLabs set-up and implementation activities, filling in the document over time. This ensures all information is easily accessible for all tasks in MAR2PROTECT, without the need for much coordination.
3. The progressive completion of the compendium [i.e. completion of fields in the main text and the respective compendium annexes, as requested] feeds into and is undertaken during the regular demo site team teleconferences and discussions. Short tables are included in the main sections, whereas long and expanding tables are included in compendium annexes.

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4. REGIONAL/EU STAKEHOLDER ANALYSIS FOR MAR2PROTECT

4.1. METHODOLOGY AND APPROACH

In the analysis, identified stakeholders were added to a matrix (see Figure 16), highlighting their involvement in MAR activities and their role. Stakeholders were allocated one of four roles:

- **Decider** – those making decisions about MAR (e.g. international organisations, national policymakers, local governments etc).
- **Customer/User** – those using the results or experiencing the effects of MAR (e.g. farmers, NGOs, foundations, environmental organisations, citizens, civil society organisations etc).
- **Supplier** – those supplying people, means and/or knowledge to MAR (e.g. SMEs, industry, academia, student communities, mass media, etc).
- **Executors** – those executing MAR (water utilities, drinking water suppliers etc).

This analysis was conducted as part of an ongoing exercise by the MAR2PROTECT LivingLab teams. In order to collate the results across LivingLabs, a shared Miro board was used to gather inputs. Specific organisations identified during the proposal were used to prefill the matrix, however, adding newly identified organisations will be a rolling exercise for the MAR2PROTECT consortium.

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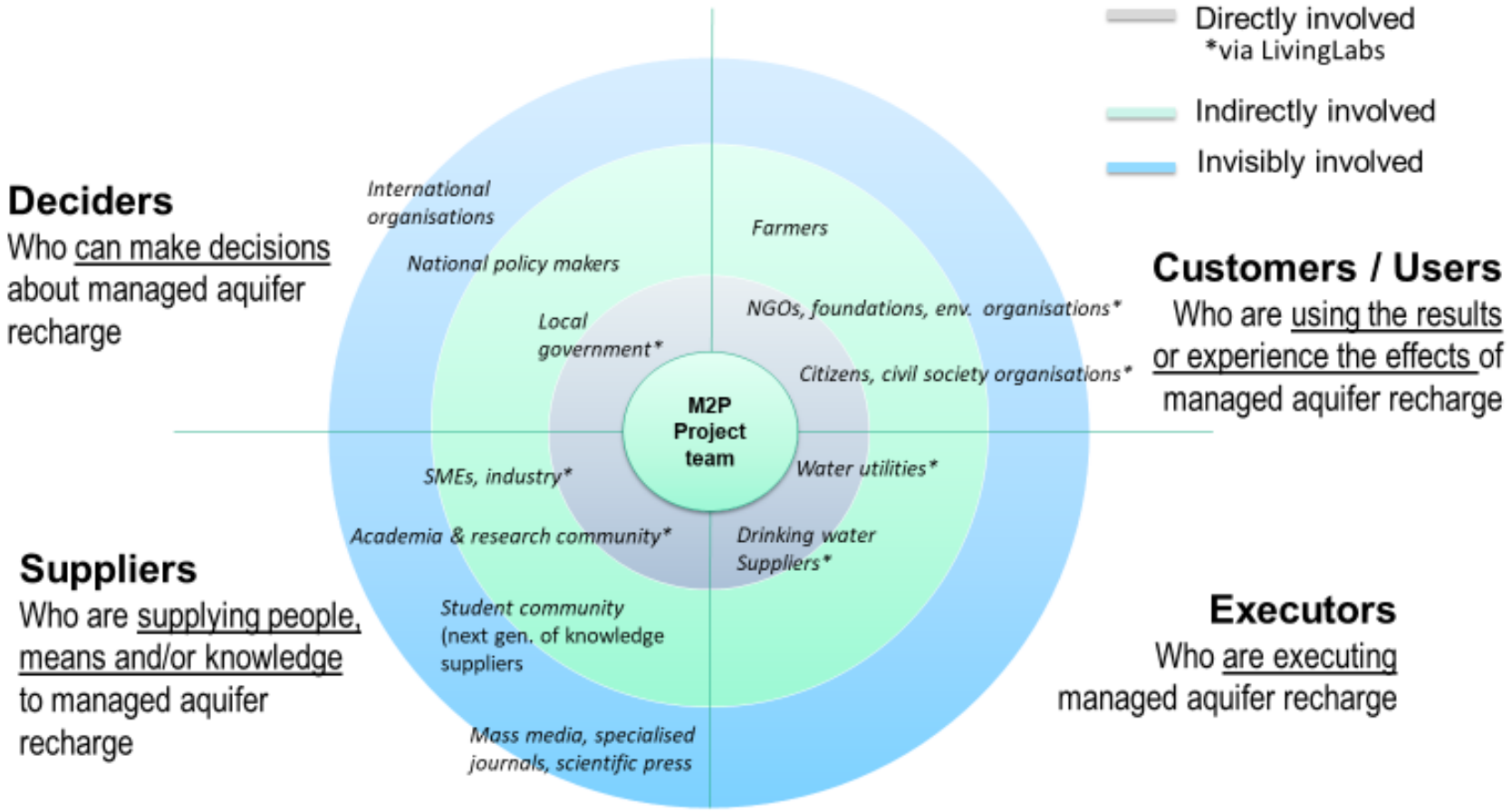

Figure 16 MAR2PROTECT Stakeholder analysis matrix.

4.2. STAKEHOLDER LANDSCAPE

Stakeholder Landscapes consider various stakeholder groups (identified within a stakeholder analysis) and assess their attitudes, levels of influence and positions. The Stakeholder Landscape for MAR2PROTECT has been divided into 10 different target groups highlighted relevant to the project within the regional/EU context (see Table 11). These target groups will be targeted by project actions, and different strategies to reach each group will be identified by WP7 (Communication, Dissemination, IP & Exploitation and Networking with other EU initiatives).

Table 10. MAR2PROTECT target groups.

TG1 ARC	Academia and Research Community
TG2 IND	Industrials (SMEs and Large Companies)
TG3 WUT	Water Utilities, Drinking Water/Water Suppliers
TG4 PROJ	National, European and International Projects related to MAR2PROTECT
TG5 CIV	Citizens/Civil Society
TG6 GOV	Government, International Organisations, CC&GG & Policy Makers
TG7 NGO	Foundations/NGO/Environmental Organisation
TG8 PRESS	Mass Media, Specialised Journalists, Scientific Press
TG9 STU	Student Community
TG10 FARM	Farmers

A preliminary identification of specific stakeholders from each target group took place during the development of the MAR2PROTECT proposal. Following the stakeholder analysis outlined in this document, a more complete understanding of the stakeholders within each target group can be seen.

TG1 ARC - Academia and Research Community

The academia and research community play a crucial role in MAR projects. They contribute to the development of scientific knowledge, design and implementation of monitoring and assessment systems, and evaluation of the impact of MAR projects on groundwater resources. They can provide expertise on the technical, economic, and environmental aspects of MAR and help identify best practices for implementation. Moreover, they can collaborate with different stakeholders to disseminate research findings and provide training and capacity-building programs.

Examples: NOVA University of Lisbon; Deltares, University of Bologna.

TG2 IND - Industrials (SMEs and Large Companies)

The industries that can benefit from MAR include agriculture, food and beverage, and manufacturing industries. These stakeholders can provide funding, and technical expertise, and help implement MAR projects. They can also benefit from the availability of additional water resources and help mitigate the impact of their activities on groundwater resources.

Examples: GlaxoSmithKline, Suez, Veolia.

TG3 WUT- Water Utilities, Drinking Water/Water Suppliers

Water utilities and drinking water/water suppliers are essential stakeholders in MAR projects. They are responsible for ensuring a reliable and safe water supply to the population. MAR can help them increase the availability of water resources and improve the quality of water, leading to cost savings and improved customer satisfaction. These stakeholders can collaborate with local governments, NGOs, and the private sector to plan, implement, and maintain MAR projects.

Examples: HERA, Associação portuguesa de distribuição de drenagem de Águas, Dunea.

TG4 PROJ - National, European, and International Projects related to MAR2PROTECT

National, European, and International Projects related to MAR2PROTECT can provide funding, and technical expertise, and help disseminate information on MAR projects. These stakeholders can also help harmonize policies and regulations related to MAR and facilitate knowledge-sharing and capacity-building programs.

Examples: NINFA, SAFECREW, ToDrinQ, UPwater, H20forAll and IntoDBP (https://mar2protect.eu/linked-projects/), Zeropollution4water: NINFA, SAFECREW, ToDrinQ, UPwater, H20forAll, IntoDBP, ICT4WaterCluster

TG5 CIV- Citizens/Civil Society

Citizens and civil society groups are essential stakeholders in MAR projects. They can provide feedback, raise awareness, and help ensure the sustainable use of groundwater resources. These stakeholders can also participate in public consultations, provide inputs on MAR projects, and monitor their implementation. Moreover, they can collaborate with NGOs, foundations, and international organizations to advocate for sustainable water management practices.

Examples: Citizen Science initiatives (e.g. Plataforma INVASORAS.PT)

TG6 GOV- Government, International Organizations, CC&GG & Policy Makers

Government agencies, international organizations, and policymakers are crucial stakeholders in MAR projects. They can create enabling policy environments, regulations, and standards that promote MAR projects. They can also provide funding, and technical expertise, and help coordinate the implementation of MAR projects at the national and regional levels. These stakeholders can work with different stakeholders to ensure that MAR projects align with national and regional development priorities.

Examples: Rijkswaterstaat, Rijnland Water Authority, Agência Portuguesa do Ambiente, Emilia-Romagna Region.

TG7 NGO - Foundations/NGO/Environmental Organization

Foundations, NGOs, and environmental organizations can provide funding, and technical expertise, and help raise awareness of the environmental and social benefits of MAR projects. They can also advocate for sustainable water management practices and engage with different stakeholders to promote the sustainable use of groundwater resources.

Examples: Lisboa E-NOVA, +Atlantic, Circular Economy Portugal, Meijendel nature reserve association.

TG8 PRESS - Mass Media, Specialized Journalists, Scientific Press

The mass media, specialized journalists, and scientific press can play a critical role in raising awareness of the benefits and challenges of MAR projects. They can report on the implementation of MAR projects, share success stories, and help promote knowledge-sharing and capacity-building programs. They can also help hold stakeholders accountable for their actions related to MAR projects.

Example: De Volkskrant, El Pais, Water Resources Management, Journal of Water Resources Planning and Management.

TG9 STU - Student Community

The student community is an important stakeholder in MAR projects. They can contribute to research, capacity-building, and awareness-raising efforts and represent future water professionals and decision-makers.

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MAR projects offer an excellent opportunity for the student community to gain practical knowledge and experience in water management, hydrogeology, environmental engineering, and other related fields. Students can participate in MAR projects as interns, research assistants, or project partners, which can provide them with hands-on experience and a better understanding of the challenges and opportunities in water management.

Examples: Youth for the Rhine, Water Youth Network

TG10 FARM – Farmers

Farmers are an essential stakeholder group in managed aquifer recharge (MAR) projects as they are significant water users and can benefit from the availability of additional water resources. Farmers are among the most significant users of water resources in the EU, and their access to water is essential for their livelihoods. MAR projects can provide additional water resources for irrigation, livestock watering, and other agricultural activities. Farmers can benefit from MAR projects by increasing their crop yields, improving their livestock's health, and reducing the risk of water shortages during droughts.

Examples: Confagricoltura Emilia Romagna

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5. STAKEHOLDER ENGAGEMENT IN THE MAR2PROTECT INTERNATIONAL COMMUNITY OF PRACTICE

5.1. APPROACH AND METHODOLOGY

This section draws and builds on the guidance provided for the WeObserve Communities of Practice (Wehn et al. 2019), and applies it to the MAR2PROTECT context. It details what Communities of Practice (CoPs) are, why a MAR2PROTECT International CoP is needed, and how the MAR2PROTECT CoP could function. It also provides detailed advice on stakeholder engagement in the CoP (ranging from logistics and meeting planning to data management and GDPR compliance).

The WeObserve CoPs were developed to consolidate practice-based knowledge of Citizen Observatories on four different topics: Engagement & Co-design; Impact & Governance; Interoperability; the SDGs. In the development of the guidelines for the MAR2PROTECT International CoP, a range of the literature and documentation developed during the lifetime of the WeObserve CoPs was consulted. This includes Inception Reports (Wehn & Velzeboer, 2018), Terms of Reference (Wehn & Velzeboer, 2020), Mid-Term and Final Reports (Wehn et al., 2019; Wehn et al., 2021); and resulting papers (Hager et al., 2021).

5.2. WHAT ARE COMMUNITIES OF PRACTICE AND WHY DO WE NEED THE MAR2PROTECT INTERNATIONAL COP?

Communities of Practice can be defined as "groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly" (Wenger-Trayner & Wenger-Trayner, 2015). The structural elements of a CoP are domain, community and practice (Wenger et al., 2002):

- The knowledge domain is the specific set of issues or topics. It is the raison d'être that brings the community members together and drives their joint learning.
- Community refers to the people who care about the domain.
- Practice refers to the specific knowledge the community develops, shares and maintains; the shared practice of the community members that they are developing in order to be effective in their domain (e.g., frameworks, ideas, tools, styles, stories).

These definitions highlight that a CoP is more than codified knowledge (e.g., a website, database or best practices), namely a group of people who interact, learn together, build relationships, and in the process develop a sense of belonging and mutual commitment' (Wenger et al., 2002, p.34).

Within MAR2PROTECT, the CoP will include experts in the fields of MAR, GW protection and CC from non-European countries or other continents that can help to improve the results and impact of M2P, ensuring transfer to different climatic & social contexts totally independent from those studied in the European case studies. Structured sharing of experiences between the experts and the project partners will capture insights on how to adapt specific MAR2PROTECT technological solutions and societal engagement approaches to other contexts and exchange experiences, solutions, and policy approaches in the field of CC/GC impact on groundwater.

5.3. WHAT TOPICS (DOMAINS) WILL THE INTERNATIONAL COP FOCUS ON?

In MAR2PROTECT, the International CoP is intended as a key mechanism to exchange challenges, technological solutions, society engagement experiences and policies in the field of groundwater (GW) protection from a climate change (CC) and global change (GC) perspective. During the lifetime of the CoP, new topics and domains may be also identified by members.

5.4. WHO CAN PARTICIPATE IN THE MAR2PROTECT INTERNATIONAL COP?

The International CoP is intended as a key mechanism to consolidate knowledge on MAR inside as well as beyond the MAR2PROTECT consortium. As such, the members of the CoP will be made up of experts from different non-EU countries in the field of MAR and groundwater, and international representatives from high-impact institutions. CoP members will be welcomed from all continents. Particular stakeholder groups that will be targeted include:

- Water professionals.
- Public authorities (local, regional, national, EU).
- Civil society organisations.
- Research & academia.

To ensure engagement from intended sectors, and to support the promotion of the CoP internationally, a preliminary list of eight MAR-expert CoP members with geographically diverse backgrounds have been invited to the CoP. In order to comply with GDPR, the names of these members have been omitted from this deliverable, however, their fields of expertise include: (waste)water treatment; advanced water management; contaminant monitoring and modelling; groundwater remediation; and| groundwater and climate change policy.

With the participation criteria for CoP members in mind, additional members will be recruited by invitation only (not via open calls) on a continuous basis, in close alignment and agreement with the initial set of CoP members listed above and using the results of the broader MAR2PROTECT stakeholder analysis presented in section 4.

Some additional stakeholders (such as project partners and members of the MAR2PROTECT LivingLabs) may be invited to specific CoP activities or meetings if they are of particular relevance to the topic. However, these individuals will not be considered de facto members of the CoP.

5.5. WHAT WILL THE INTERNATIONAL COP DO?

The CoP meetings will be set up using an established approach for CoPs and will be carefully structured to:

i) promote co-creation and exchange of experiences, challenges, solutions, and policy approaches in the field of CC impact on GW, from different continents and therefore different climatic, political and socioeconomic contexts;
ii) train stakeholders on the adaptation of the technological & non-technological solutions to their local context, together with the assessment of the suitability in relation to their social, economic, and legal characteristics;
iii) enhance replication for those solutions/opportunities ready for implementation.

5.6. WHY SHOULD STAKEHOLDERS PARTICIPATE IN THE INTERNATIONAL COMMUNITY OF PRACTICE?

By participating in the International CoP, stakeholders can:

- Share ideas, knowledge or experiences and work with others (networking).
- Leverage their ideas or knowledge.
- Work towards concrete solutions in citizen science and optimise relevant resources.
- Help broaden their own and their organisation's knowledge and horizons (capacity development).
- Link up with relevant initiatives at a global, national, regional or local level with the overall goal of mainstreaming MAR into policy and environmental management.

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5.7. WHAT IS DIFFERENT ABOUT THE MAR2PROTECT INTERNATIONAL COP?

Many stakeholders are involved in Working Groups, Communities of Practice, Action Groups etc., most of which involve volunteer activities on top of existing professional obligations and commitments. Not surprisingly, many are experiencing a certain fatigue to be involved in 'yet another' CoP.

The MAR2PROTECT International CoP will overcome the known weaknesses and obstacles for "working groups/Communities of Practice" by providing the following:

✓ Structure for managing the CoP activities:

- by specifying clear deadlines and required outputs (incl. reporting templates).
- by ensuring the complementarity of roles, expertise and type of input accepted by each participant so as not to duplicate efforts.

✓ Support for leading the CoP by making a set of tools available:

- to ensure that meetings and actions happen in a timely manner.
- to accelerate knowledge consolidation by enabling the demonstration of ideas and adapted solutions.

✓ Funding:

- to enable and enhance member participation by reducing the cost of participation.

✓ Dissemination and outreach:

- by assisting with the sharing of experiences and knowledge.
- by providing a hosting platform and visibility for the CoP at one of the many MAR2PROTECT events.

✓ IP protection and reputation:

- by requiring adherence to a common set of rules that protect the IPR of the members and the privacy of their discussions.
- by introducing a consensus process for internally deciding what content will be made public and when.

5.8. RESPONSIBILITIES OF THE MAR2PROTECT INTERNATIONAL COMMUNITY OF PRACTICE

5.8.1. SETTING UP THE MAR2PROTECT INTERNATIONAL COP

A Call for Participation in the CoP will be announced via project and partner communication channels (including the project website and social media). Relevant channels and events for the communication of the Call will be identified from the stakeholder analysis task within MAR2PROTECT. Contact information for potential CoP members will be gathered using an online form.

In addition to the Call for Participation, specific stakeholders (identified during the stakeholder analysis process) will be invited to participate in the CoP meetings. Tailored invitations will be sent to these stakeholders, depending on their interest and potential role and involvement in the CoP meetings.

When joining the CoP participants will be asked to sign an informed consent form (see Annex 4) in order to follow the General Data Protection Regulation (GDPR). This form will indicate the following items:

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- CoP participants can stop their participation in the CoP at any time and can ask for the removal of all the personal data it has stored related to them.
- CoP participants give explicit consent to be contacted by MAR2PROTECT and give permission for the storage of their personal contact details.
- CoP participants indicate they are aware that MAR2PROTECT is collecting data for project purposes, and information provided by the participants can be used for related outputs (information provided will be acknowledged, as desired).

In addition to obtaining informed consent, the ethical procedures outlined in Annexes 3 – 6 will be followed at all relevant stages of CoP management.

At this stage, CoP participants will also be required to sign a non-disclosure agreement. This is to ensure that confidential information discussed and stored by the CoP remains private.

5.8.2. LAUNCHING THE MAR2PROTECT INTERNATIONAL COP

Following the Call for Participation, the CoP will then be launched via an official Launch Workshop. During this workshop, participants will:

- be guided through a process of co-designing specific, thematic foci and problem statements.
- agree on specific objectives and activities to achieve the identified objectives.
- identify relevant target audiences for the CoP.
- identify CoP principles of conduct.

The CoP will be chaired by MAR2PROTECT partners, supported by staff from their respective organisations. The CoP will meet at least 2 times per year (8 times in total over the project lifetime), by means of virtual workshops. Stakeholder knowledge captured in the CoP will inform the selection of technologies for upscaling, identification of training and capacity development needs and modalities, and concrete policy recommendations.

To capture the outcomes of meetings, and to ensure CoP impact, specific knowledge-sharing and communication procedures will be followed. Internal CoP communication will be conducted via an email list (subscribing to the email list will be mandatory), while the progress of discussions and minutes of meetings will be recorded and organised in the MAR2PROTECT SharePoint. A private space on the MAR2PROTECT website will be created to CoP-related share all procedures, communication campaigns and reports. The implementation of these procedures will be the responsibility of the CoP chairs.

The CoP will continue to exist only as long as it delivers value for their members in terms of achieving jointly set objectives. The CoP will need to adhere to its own defined timeline and CoP members should decide whether they wish to continue joint activities beyond the lifetime of the MAR2PROTECT project (2022-2026).

Apart from specific responsibilities that will be outlined in the next chapter, there are several general criteria that the CoP and its members should adhere to:

- The CoP should be composed of relevant stakeholders.
- The CoP should strive for gender balance in the composition/interactions of the group.
- The CoP should comply with the MAR2PROTECT ethics and gender aspects. The relevant documents (see the following section) will be given to the CoP before the start of any activities.
- The CoP should operate in a transparent manner, whilst remaining open to new participants.

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Table 11 Principles for Cultivating Communities of Practice, based on Wenger et al. (2002).

Principles	Explanation
Design for evolution	- build on pre-existing personal networks - new members bring new interests and pull the focus of CoP in new directions - design: not to impose structure but help the community develop - combine design elements to catalyse community development
Open a dialogue between inside and outside perspectives	- deep understanding of community issues (challenges, latent potential in emerging ideas and techniques) - obtain outside perspectives to see possibilities to develop and steward knowledge - dialogue: information from outside the community with community ambition
Invite different levels of participation	- coordinator and core group (take on community projects, identify topics for the CoP to address, move CoP along its learning agenda) - active participants (attends meetings regularly, participate occasionally in community forums, 15-20% of the CoP) - peripheral participants (large proportion; rarely participate) - outsiders (not members but interested in the CoP, incl. customers, suppliers, and 'intellectual neighbours')
Develop both public and private community spaces	- public places of the community (meetings, website, informal networking) - private space (F2F, online; coordinator fills the space between meetings; informal, back-channel discussion, one-on-one networking
Focus on value	- the source of value changes over the CoP lifetime - early: focus on current problems, needs of community members - later: developing a systematic body of knowledge - encourage community members to be explicit about the value
Combine familiarity and excitement	- familiar events, website use, ongoing activities - conferences, fairs, workshops: bring the community together in special ways, spontaneous contact
Create a rhythm for the community	- timing/frequency of regular events - the combination of the whole community and small-group gatherings - mix of idea-sharing forums and tool-building projects

5.8.3. SETTING UP SMART OBJECTIVES FOR THE MAR2PROTECT INTERNATIONAL COP

Before starting its activities, the CoP will define its objectives in a way that is Specific, Measurable, Achievable, Relevant and Timely (SMART), whilst taking into consideration best practices from relevant past and/or ongoing initiatives. Also, the objectives should be defined following a participatory process in which all CoP members can take part.

These objectives will be captured in an inception report that will have the following structure:

- Scope of Problem statement: Description of the scope of the CoP or the issues the CoP will address.
- Business case: What is the need for the group and what are the benefits of the work done in the group.
- Target audience: Who benefits from the work done.
- Foundation members: List of initial members of the CoP.
- Activities planned: List of activities, deliverables and timelines.
- Communication agenda.

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- Ways of working: Periodicity, media and time of the meetings initially foreseen.
- Policies and procedures: How to opt-in, how to vote for publicly releasing results, how to include or deprecate activities.

The document will be approved by the foundation members of the CoP and made public as a reference for other people who may express interest in the future. Future members should adhere to the document to join.

5.8.4. WAYS OF WORKING

The CoP will meet regularly by teleconference (Zoom, Teams, GoToMeeting or similar) and will take advantage of existing opportunities to meet in person for longer discussions. These meetings will be driven and facilitated by MAR2PROTECT but will be composed by a much broader audience in an open and transparent manner.

An email list for the CoP has been created and subscribing to the email list will be mandatory to be part of the group. In addition, the progress of the discussions and minutes of meetings will be recorded and organized in a wiki, GitHub or similar platform that will be provided and managed by MAR2PROTECT ensuring harmonization and preservation. Following CoP-internal discussions, a task force will draft a solution proposal in the form of best practice, a profile or a standard. The resulting documents may be presented to a broader audience, comments will be incorporated and the final solutions will be agreed.

5.8.5. COMMUNICATION AND KNOWLEDGE-SHARING STRATEGY

One of the most vital aspects of a CoP is its communication, both within the group and with external stakeholders, i.e., communication beyond the group's members. The International CoP will need to detail communication activities, how it plans to communicate among the CoP members and also how it plans to reach its target audience.

5.8.6. OBLIGATORY COMMUNICATION FOR THE EXTERNAL COMMUNICATION OF COP ACTIVITIES

Any communication from the CoP should use the MAR2PROTECT template for presentations, accessible on the MAR2PROTECT platform.

The CoP should include a statement to show that it is part of the MAR2PROTECT project which has received funding from the European Commission.

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6. ETHICS ISSUES

Based on best practices, and following consultation with experts in the field, a range of practices and procedures have been developed to navigate the various ethical issues and concerns that are expected to arise over the course of various stakeholder engagement activities taking place during the MAR2PROTECT project lifetime (primarily in WP6 and WP7). These procedures are included as annexes in this deliverable (Annex 3-6).

In Annex 3, all ***procedures relating to collecting, managing and protecting personal data*** within MAR2PROTECT are outlined. Primarily, the guidelines outlined in this annex ensure compliance with the General Data Protection Regulation (GDPR), which defines personal data and special categories of personal data and outlines principles and conditions for processing such data. The Annex presents the GDPR-compliant procedures for obtaining informed consent when gathering personal information and is accompanied by a template **Informed Consent Form** (in Annex 4). This form can be adapted to a range of MAR2PROTECT activities during which personal information may be collected.

In addition, Annex 3 also outlines best practices for ***data storage, protection, retention and destruction***. It also outlines procedures for any ***transfer of personal data*** between the European Economic Area (EEA) and non-EEA countries or international organizations. The procedures apply to individuals involved in the project consortium, including those outside of it, and involve obtaining informed consent from them for the processing of their personal data.

Another ethical consideration concerns inclusivity and the ***selection of participants during stakeholder engagement activities*** (see Annex 5). Within MAR2PROTECT, criteria for participation will be simple and limited to ensure the widest possible participation. Furthermore, the project participation criteria include free will and informed consent, interest in MAR, experience with relevant technologies, and availability of relevant MAR-related information, ensuring that stakeholder engagement is as open as possible. The project aims to avoid discrimination of potential participants by providing user training and equipment, as needed, to help these stakeholders overcome technical barriers.

All MAR2PROTECT partners will confirm their acknowledgement of and compliance with these ethics procedures by signing the 'Confirmation of practising the MAR2PROTECT Ethics Principles' (see Annex 6). The signed forms will be collected by the Project Coordinator.

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ANNEX 1 Guiding questions for Context Mapping

Guiding questions for generating inputs for the Context Mapping (adapted from Pfeiffer et al., 2016):

"You have 'placed your Case Study on a map': It will take place in [...]. How was the location for the Demo Site chosen? For example, does it match a political or administrative entity? Or a geographical or natural area?"	
Political/Administrative Boundaries	
"Does your case involve cross-jurisdictional institutions (e.g. basin organizations, nature reserves,...)? "	
"Your Case Study will be affected by a range of laws and regulations. How many levels of government does your country have (e.g. local, district, provincial, national, EU)? Which level(s) of government set or implement policies on: • the issue? • Citizens' rights to information and participation?	
Political process mapping: "Who "owns" or coordinates the decision-making processes related to groundwater management at your Demo Site? Who has the legal authority to decide, who can be ordered to contribute, who has a formal right to participate, who is usually asked to advise?"	
"Who controls what can be discussed in formal decision-making processes [related to the issue of your Case Study]? Are there public channels to raise issues or comments, or is access to policy debates restricted? Do you need to observe formal rules or understand technical /political language to contribute?	
Environmental Boundaries	
"Environmental issues often 'know no boundaries' – i.e., both problems and solutions involve actors 'somewhere else'. Does your case involve phenomena (other than aquifers) with 'natural borders'? Think e.g., about rivers (catchments), region-external sources of pollution, distinct ecosystems or habitats, or migratory species?"	
Social Boundaries	
"People are social creatures. We identify as members of groups and communities. If you asked people in your region to describe themselves, would they identify as [by nationality, the region, the city]? Is the population homogenous, or are there major ethnic or tribal groups, different languages, or religious, social or cultural sub-groups?"	
"Which places are role models for your region? E.g., do policymakers frequently copy programs from or compare themselves to other cities/regions? Which cities/regions are watched as cultural centres and trendsetters?"	
Economic Boundaries	

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"Economic power is a major driver of all policy. How is economic power distributed in your Case Study area? Are there major employers or concentrated industrial clusters, ports or special economic zones inside or outside the project area?"	
Technical Boundaries for civil society engagement	
"The MAR2PROTECT activities will need to be compatible with the way people engage civil society in your case region. Can you think of any specific, positive or negative aspects of the technical tools in your Case Study (e.g. unequal network access)? Are there any particular local preferences for social media networks you know of? Are there any popular local online communities?"	

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ANNEX 2 – Sources per country

Sources and countries	Katwijk, Netherlands	Korba, Tunisia	Frielas, Portugal	Emilia-Romagna, Italy	Cape Flats, South Africa	Marbella, Spain	Lima river estuary, Portugal
OECD country page	https://www.oecd.org/netherlands/	not found	https://www.oecd.org/portugal/	https://www.oecd.org/italy/	https://www.oecd.org/southafrica/	https://www.oecd.org/spain/	https://www.oecd.org/portugal/
OECD Better Life and Regional Wellbeing Indices	https://www.oecdbetterlifeindex.org/countries/netherlands/	not found	https://www.oecdbetterlifeindex.org/countries/portugal/	https://www.oecdbetterlifeindex.org/countries/italy/	https://www.oecdbetterlifeindex.org/countries/south-africa/	https://www.oecdbetterlifeindex.org/countries/spain/	https://www.oecdbetterlifeindex.org/countries/portugal/
	https://www.oecdregionalwellbeing.org/NL33.html		https://www.oecdregionalwellbeing.org/PT17.html	https://www.oecdregionalwellbeing.org/ITH5.html	not found	https://www.oecdregionalwellbeing.org/ES61.html	https://www.oecdregionalwellbeing.org/PT11.html
World Bank 'Doing Business' Analysis	https://databank.worldbank.org/source/doing-business#						
International Telecommunications Union	https://www.itu.int/itu-d/sites/statistics/						
European Statistical Services	https://ec.europa.eu/eurostat						

"Country" Services	Statistical	https://www.cbs.nl/en-gb		https://www.ine.pt/xportal/xmain?xpgid=ine_main&xpid=INE	https://www.istat.it/en/	https://www.statssa.gov.za/	https://www.ine.es/en/	https://www.ine.pt/xportal/xmain?xpgid=ine_main&xpid=INE

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ANNEX 3 – Ethics – Personal Data Processing

The purpose of this annex is to set out the MAR2PROTECT procedures for justifying the processing of personal data, including special categories of personal data, the transfer of personal data from the EEA to a non-EEA country or international organization as well as from a non-EEA country to the EEA. In addition, for the research involving tracking, the document presents how the Living Lab participants will be informed of the existence of the tracking.

Procedures for obtaining informed consent regarding the processing of personal data

During the implementation of the MAR2PROTECT activities, especially those related to the LivingLabs and societal engagement, the MAR2PROTECT partners will inevitably collect and manage information related to natural persons (individuals) inside and outside the project consortium.

Specifically, the MAR2PROTECT procedures for personal data protection apply to data about:

- All individuals who are staff or contractors of the MAR2PROTECT partner organisations related to the MAR2PROTECT activities.
- All individuals involved in the MAR2PROTECT activities (i.e., including individuals outside the project consortium).

Here, we present the MAR2PROTECT procedures for obtaining informed consent in conformity with the GDPR and other relevant regulations (from the individuals mentioned above) regarding the treatment of their personal data.

Applicable official agreements and definitions

MAR2PROTECT will comply with the agreements for personal data protection applicable in the European Union as follows:

- The General Data Protection Regulation (GDPR) (EU) 2016/679 is the principal data protection legislation in the EU. It was approved by the European Parliament on 14 April 2016, took effect on May 25, 2018, and replaced Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data.

According to the GDPR (Regulation (EU) 2016/679):

- 'personal data' means any information relating to an identifiable natural person who can be identified, directly or indirectly by reference to an identifier such as a name, an identification number, location data, an online identifier or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity.
- 'Special categories of personal data' means data revealing racial or ethnic origin, political opinions, religious or philosophical beliefs, or trade union membership, genetic data, biometric data for the purpose of uniquely identifying a natural person, data concerning health or data concerning a natural person's sex life or sexual orientation".
- 'consent' of the data subject means any freely given, specific, informed and unambiguous indication of the data subject's wishes by which he or she, by a statement or by clear affirmative action, signifies agreement to the processing of personal data relating to him or her.
- "Transfer of personal data to a third country or an international organization". Based on the recent guidelines, chapter V will be applicable only to the personal data transfer that meets the following three cumulative criteria:
    1) A controller or a processor ("exporter") is subject to the GDPR for the given processing.
    2) The exporter discloses by transmission or otherwise makes personal data, subject to this processing, available to another controller, joint controller or processor ("importer").

3) The importer is in a third country, irrespective of whether or not this importer is subject to the GDPR for the given processing in accordance with Article 3 or is an international organisation.

- 'processing' means any set of operations which is performed on sets of personal data, such as collection, recording, organisation, structuring, storage, adaptation or alteration, retrieval, consultation, use, disclosure by transmission, dissemination or otherwise making available, alignment or combination, restriction, erasure or destruction.
- 'profiling' means any form of automated processing to analyse or predict aspects concerning that natural person's performance at work, economic situation, health, personal preferences, interests, reliability, behaviour, location or movements.
- 'international organisation' means an organisation and its subordinate bodies governed by public international law, or any other body which is set up by, or based on, an agreement between two or more countries.

According to the GDPR, personal data must be processed in accordance with certain principles and conditions that aim to limit the negative impact on the persons concerned and ensure fairness, transparency and accountability of the data processing, data quality and confidentiality. According to GDPR Article 6 (a) and Article 9 (2a), the data subject needs to give explicit consent to the processing of their personal data for one or more specified purposes.

Personal data processing

During the implementation of the MAR2PROTECT Living Labs, MAR2PROTECT partners will process (collect, storage, use, transfer and disclosure) personal information data related to individuals inside as well as outside the project consortium such as stakeholders involved in Living Labs and the Community of Practice. Specifically, the MAR2PROTECT procedures for personal data protection apply to data about:

- All individuals who are staff or contractors of the MAR2PROTECT partner organisations related to the MAR2PROTECT activities.
- All individuals involved in the MAR2PROTECT activities (i.e., including individuals outside the project consortium), including those collecting information with sensors.

Informed Consent Forms

Personal data and information collected and processed by MAR2PROTECT will only be shared within the research institutions that are part of the Consortium. Participants will be provided with **Informed Consent Forms** (see Annex 4) to inform them about the collection, storage, use, transfer, and disclosure of their data and obtain their permission for this. The form will be produced in relevant local languages so that it can be utilized in all contexts relevant to the project. Before conducting activities in a new context, all languages spoken in the area (including those spoken by minority groups) will be considered when drafting the forms.

Depending on the national legislation, additional information may be included in the template of the MAR2PROTECT Informed Consent Form. Participants can also disagree with the collection of personal data by deciding NOT to click or tick a single box on the informed consent sheet, with the consequence of not being able to participate in the respective MAR2PROTECT activity. Consent can also be withdrawn at any time (by identifying themselves and informing the consortium via the MAR2PROTECT email address), meaning that users can have all gathered personal data destroyed. However, according to GDPR art. 7(3), withdrawal of consent shall not affect the lawfulness of processing based on consent before its withdrawal.

In the case of recruiting minors, their legal guardians will sign the consent form in order for the minors to participate in MAR2PROTECT activities. However, where appropriate, the assent of the child will be requested. When engaging with minority groups, we will pay special attention to ensure that they understand the content of both forms and the project activities.

Consent Procedures

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Before processing personal data, valid consent is needed. When administering the Informed Consent Forms, participants will be informed about the fact that personal data is being collected, for what purpose it is being collected, where, for how long (namely, max. 6 months after the MAR2PROTECT project finishes) and how it will be stored, protected and eventually destroyed. We will therefore provide simply communicated descriptions of the measures for data collection/ data storage/ data processing/ protection of personal data and rights about treatment and management of personal data collected before and after the enforcement of the GDPR.

Participants in the MAR2PROTECT activities will be provided with an Informed Consent Form (digital or in print, see Annex 4) that:

- is in a language and terms fully understandable to them.
- describes the aims, methods and implications of the research, the nature of the participation and any benefits, risks or discomfort that might be involved.
- states that participation in MAR2PROTECT activities is voluntary and that anyone has the right (1) to refuse to participate; (2) to withdraw their participation, samples or data at any time (except for data already processed and included in reports at the moment of her or his withdrawal); and (3) request to destroy personal data anytime.
- states that, for face-to-face interviews and focus group discussions, personal data will be kept in a protected file, (either oral or written agreement, depending on the cultural setting and appropriateness).
- informs them about the possibility to exercise their rights of access, rectification, erasure, withdrawal and opposition.

We will also try to keep the administrative procedures to an acceptable level for the MAR2PROTECT partners and stakeholders in order not to discourage participation in the project activities.

Individuals will have to take action to provide their consent by actively checking a box (in the online version or on a paper version of the informed consent form; see Annex 4).

Individuals who wish to withdraw consent can do so by indicating this to the MAR2PROTECT partners at face-to-face events, or by following the instructions on the information sheet, namely identifying themselves and informing the consortium via the MAR2PROTECT email address. When consent is withdrawn orally, this will be noted down and registered in the presence of the individual withdrawing his/her consent to ensure that this is recorded and can be acted upon accordingly. The information related to the consent withdrawal will be withdrawn from all MAR2PROTECT partners' information repositories.

Responsibilities

MAR2PROTECT partners have the responsibility for ensuring personal data is collected, stored, and handled appropriately within the scope of the MAR2PROTECT project and in conformity with the GDPR as well as national legislation. Each MAR2PROTECT partner that handles personal data must ensure that such data is handled and processed in line with the MAR2PROTECT procedures outlined in this document.

Key responsibilities lie with the following persons/MAR2PROTECT partners:

The Project Coordinator maintains the MAR2PROTECT contact email box. Individuals who wish to withdraw their consent regarding their personal data can do so by sending a request to this email address. The Project Coordinator will channel such requests to the relevant MAR2PROTECT partners, as appropriate.

Each MAR2PROTECT partner's legal signatory is ultimately responsible for ensuring that its organisation meets its legal obligations with respect to the protection of personal data, as follows;

- Dealing with requests from individuals to see the data MAR2PROTECT holds about them,

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- Ensuring all systems, services and equipment used for storing data meet acceptable security standards,
- Performing regular checks and scans to ensure security hardware and software are functioning properly,
- Evaluating any third-party services, the company is considering using to store or process data. For instance, cloud computing services.

General guidelines

In MAR2PROTECT, the following general guidelines for the protection of personal data will be followed:

- The only people able to **access** data covered by the MAR2PROTECT procedures will be those who need it **for their MAR2PROTECT-related activities**.
- **Mass mailings** to individuals outside the MAR2PROTECT consortium will be sent by including such email addresses in: bcc in order not to disclose the email addresses and recipients will have the option to opt out of further mailing.
- Personal data will not be shared informally. When access to confidential information is required, employees can request it from their line managers.
- The MAR2PROTECT partners will provide **training** to all their respective team members to help them understand their responsibilities when handling personal data. Clear and concise disciplinary action must be communicated to the employees.
- Employees will keep all personal data secure, by taking sensible **precautions** and following the guidelines below (section 2.6).
- In particular, strong **passwords** will be used and they should never be shared.
- Personal data will not be disclosed to unauthorised people, either within their own organisation or externally.
- Personal data will be regularly reviewed. If no longer required, it will be deleted and disposed of.
- Employees should request help from their line manager or the data protection officer if they are unsure about any aspect of data protection.

Data storage and protection

These rules describe how and where data will be safely stored.

When personal data is stored on paper, it shall be kept in a secure place where unauthorised people cannot see it or access it. These guidelines also apply to personal data that is usually stored electronically but has been printed out for some reason:

- When not required, the paper or files shall be kept in a locked drawer or filing cabinet.
- Employees shall make sure paper and printouts are not left where unauthorised people could see them, like on a printer.
- Data printouts shall be shredded and disposed of securely when no longer required.

When data is stored electronically, it must be protected from unauthorised access, accidental deletion and malicious hacking attempts:

- Personal data shall be protected by strong passwords (e.g., for accessing the electronic device) that are changed regularly and never shared between employees.
- If personal data is stored on removable media (like a CD, DVD, external hard drive or USB sticks), these shall be kept locked away securely when not being used.
- Personal data shall only be stored on designated drives and servers and shall only be uploaded to an approved cloud computing service.
- Servers containing personal data shall be sited in a secure location, such that only authorised personnel can access them.
- Data shall be backed up frequently. Those backups shall be tested in line with the organisation's standard backup procedures.

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- All servers and computers containing data shall be protected by approved security software and a firewall.

Data retention and destruction

The MAR2PROTECT partners will destroy personal data held when the data is no longer required for the purpose for which it was collected, and when there is no interest to archive it for research and/or statistical purposes. This procedure applies regardless of the format of the data (digital or print).

When there is an interest to archive personal data for research and/or statistical purposes beyond the initially planned data retention period, the personal data will be pseudonymised to the extent that data users will not be able to identify the individuals concerned.

Data transferred from EEA to a non-EEA country

It is not foreseen that personal data will be transferred from the EEA to a non-EEA country by MAR2PROTECT. However, in the unlikely case that personal data do need to be transferred from the EEA to a non-EEA country or international organization, it will be ensured that such transfers are in accordance with Chapter V of the General Data Protection Regulation 2016/679. In order to do so, in that event, MAR2PROTECT will consult a privacy expert on data transferred from EEA to a non-EEA country.

Data transferred from a non-EEA country to EEA

For personal data that are transferred from a non-EEA country (i.e. incl. from Tunisia and South Africa) to the EEA, MAR2PROTECT partners will:

- ensure that processing, notification, consent and accountability provisions meet GDPR standards.
- identify any further data protection requirements in applicable laws in the country in which data are to be collected and explain how MAR2PROTECT will comply with them.
- if applicable, ensure that MAR2PROTECT research participants understand and consent to the export of the personal data they provide to an EU Member State or a non-EEA country.
- use pseudonymisation techniques to minimise the risk to data subjects.
- implement appropriate organisational and technical measures to ensure that personal data are transferred securely.

Implementation of personal data protection procedures

The MAR2PROTECT project partners will enforce the ethics procedures mentioned above in this annex and ensure compliance with all the required regulations to implement in the project's lifetime. Specifically, all MAR2PROTECT project partners will confirm adherence in their practice by signing the form 'Confirmation of practicing the MAR2PROTECT Ethics Principles'.

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ANNEX 4 – Ethics – Informed Consent Form

Note: items marked in yellow need to be completed by the MAR2PROTECT partner using the informed consent form in their MAR2PROTECT activities.

[MAR2PROTECT logo]
[Date, place]

MAR2PROTECT is a project funded under Horizon Europe by the European Commission. MAR2PROTECT will provide a holistic approach to prevent groundwater contamination from the impacts of climate change and global change, through different innovative technologies. The main idea consists in a tool supported by Artificial Intelligence that will receive real-time information from sensors placed in risk locations where the technologies will be implemented, among other vitally important information.

The project coordinator is Associação para an Inovação e Desenvolvimento da Faculdade de Ciências e Tecnologia da Universidade Nova de Lisboa (NOVA) and the partners are Università di Bologna (UNIBO), FEUGA, IHE Delft Institute for Water Education (IHE Delft), CIIMAR, Cetaqua Andalucía, Instituto de Telecomunicações, ISSBAT, the University of Technology Kaunas, and SU University of Stellenbosch.

For more information about the project please visit [add the website].

[**Explain the objective of the <u>specific</u> MAR2PROTECT research incl.** *the aims, methods and implications of the research, the nature of the participation and any benefits, risks or discomfort that might be involved. Please describe these reasons in a way that the person is able to take an informed decision and to prevent the person from being surprised by the use of their personal data].*

Data and information you provide:

By participating in this [**LivingLab workshop/social engagement activity**], you will contribute to a better society by delivering input for the development of citizen observatories and citizen science. Most participants will find the **[workshop/discussion/societal engagement activity]** interesting and thought-provoking. If, however, you feel uncomfortable in any way during the interview session, you can decline to answer any question or end the [**activity/workshop**].

By participating in this [**workshop/discussion/societal engagement activity**], we collect, use and store certain personal and sensitive information about you (such as your email address and contact details, educational background, areas of expertise, religious and ethnic origin, sociocultural origin, gender, literacy levels, social status, age or health data (disabilities)). Please be reassured that **[MAR2PROTECT organisation's name]** guarantees that all personal data obtained from you through this [**workshop/discussion/societal engagement activity**] will be treated in compliance with **General Data Protection Regulation (GDPR, EU 2016/679).**

The information provided by you in this [**workshop/discussion/societal engagement activity**] is voluntary and will be used for research purposes only. It will not be used in a manner which would allow identification of your individual responses. It may be used for a variety of MAR2PROTECT project-related purposes only, which focus on developing and implementing citizen observatories. You can rest assured that we will not use your personal information for commercial purposes. We take steps to ensure that your personal data is stored safely until June 2027. Research data will be archived in the MAR2PROTECT data archive held by [**partner organisation's name**] in order to make them available to other researchers in line with current data-sharing practices.

Risks:
While we do not anticipate that this [**workshop/discussion/societal engagement activity]** will involve significant risks, when you are working without MAR2PROTECT supervision, you must be the person to determine whether your activities are reasonable and appropriate. It is your responsibility to make decisions regarding your safety. MAR2PROTECT is not responsible in cases of any injuries incurred during these activities.

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Informed consent:
If you agree to the collection of personal data by the MAR2PROTECT project, **please indicate this below by ticking the relevant box**.
If you do not agree to the collection of personal data by the MAR2PROTECT project, unfortunately, you cannot participate in the MAR2PROTECT [**workshop/discussion/societal engagement activity**].

The MAR2PROTECT consortium asks for your consent for the following:

- ☐ I agree that my personal data will be used for the purpose of this research described above.
- ☐ I agree to my photograph being taken in the context of the MAR2PROTECT project and images where I appear to be used on the MAR2PROTECT website and other social media channels such as Twitter, and LinkedIn.
- ☐ I agree to my being filmed in the context of the MAR2PROTECT project and images where I appear to be used on the MAR2PROTECT website and other social media channels such as Twitter, and LinkedIn.

You have the right to withdraw your consent at any time by emailing info@mar2protect.eu.

Thank you very much for agreeing to participate in this research.

Yours truly,

[MAR2PROTECT partner organisation's name]
[Data manager name]
[Street name]
[City]
[Country]
Or via email: info@mar2protect.eu.
More information about the MAR2PROTECT project is available at https://mar2protect.eu/.

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ANNEX 5 - Ethics – Participant selection procedures

It is important to clarify that the stakeholders to be contacted for the MAR2PROTECT activities are thought of as informants and sources and co-creators of knowledge and innovation. In this respect, the object of interest is not individuals, but rather different water and other natural resource challenges. For this reason, the data gathered, e.g., during the MAR2PROTECT LivingLab workshops (T6.1) and societal engagement activities (T6.2), will be about their perception of environmental challenges, and not about human beings, or their bodily or psychological characteristics. If any personal data are collected, these will be treated in line with EU law (including GDPR).

In principle, we rely heavily on the long-term relationships that the MAR2PROTECT partners have established with members of their networks and stakeholders during the last decades. Moreover, the activities will use a combination of the following procedures, as appropriate:

- **Targeted recruitment of stakeholders** informed for example by the stakeholder analysis and the stakeholder engagement strategy, via face-to-face activities (e.g., dedicated events such as conferences, workshops, and consultation meetings) and the networks of the MAR2PROTECT partners.
- **Snowballing –** where recruited stakeholders suggest future relevant subjects from among their acquaintances/ from their network.
- **Broadcast recruitment** via the MAR2PROTECT website, social media, at events and via the partners' communication channels to invite participation in the LivingLab activities.
- **Self-selection**, i.e., those stakeholders interested in the LivingLab activities who contact MAR2PROTECT partners or establish contact with MAR2PROTECT via the website/social media.

Criteria for participation:

The criteria for participation are as simple and limited as possible in order to ensure the widest possible participation of stakeholders in the MAR2PROTECT activities. We will aim to engage participants from as wide a range of stakeholders as possible, regardless of their age, gender, or profession, using the following criteria:

- **Free will and informed consent** (in accordance with the GDPR) of all co-creators (or of their legal guardians in the case of minors) obtained prior to their involvement in the MAR2PROTECT project activities.
- Inevitable **implicit criteria** such as the interest in MAR, and experience with relevant technologies such as smartphone apps, if applicable.
- **Existing online activity** (e.g., on Twitter) which can result in implicit sensing. For such participation, the shared information in those platforms has already been consented to by the users within the respective frameworks.
- **Implicit criteria** such as the availability of relevant MAR-related information.

Ethical implications of these recruitment methodologies:

In principle, the combination of procedures and the open nature of the participation criteria ensures that discrimination of potential participants is avoided as much as possible. Nevertheless, less technology-savvy citizens may find themselves excluded from participation in activities due to their lack of basic IT skills. However, other technological alternatives will be explored in order to ensure adequate civil society engagement in the demonstration cases where the digital divide and lack of access to advanced technologies (internet, smartphones, etc.) could negatively affect the operations of the citizen observatories.

The combination of procedures and the nature of the participation criteria aligned with the objectives of the research activities ensure that discrimination of potential participants is avoided as much as possible.

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Action to mitigate discriminatory practices:

In order not to exclude those potential participants that are less technology-savvy, MAR2PROTECT engagement activities will entail user training (see recruitment details above; incl. instruction videos on YouTube) to help them with the technical aspects of using existing societal engagement tools (e.g., Citizen Science data collection apps, etc.). In addition, where equipment is required, this will be provided at a minimal fee/co-funded to ensure no financial obstacles exist.

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ANNEX 6 - Ethics - Confirmation of practising the MAR2PROTECT Ethics Principles

As a partner in the MAR2PROTECT consortium and as a contributor to the MAR2PROTECT activities, with the signature below, *[MAR2PROTECT partner name]* affirms that:

- We have read and understand the contents of the MAR2PROTECT ethics requirements detailed in D6.1 Annexes 3 – 6, hereinafter the "ethics requirements".
- We agree to conduct our MAR2PROTECT activities in accordance with the contents of the MAR2PROTECT ethics requirements.

Without limiting the scope of the MAR2PROTECT ethics requirements, we specifically agree to practice the following:

- Participation of persons in the MAR2PROTECT project activities is entirely voluntary. We obtain the informed consent of informants in advance.
- Participants in the MAR2PROTECT activities will be informed about the fact that personal data are being collected and that they will be protected, stored and eventually destroyed.
- For each of the MAR2PROTECT activities that entail research involving informants, relevant selection criteria, identification and recruitment procedures and informed consent procedures as defined in D6.1 Annex 4 will be followed.
- Each MAR2PROTECT partner who handles personal data ensures that such data is handled and processed in line with the MAR2PROTECT procedures outlined in D6.1 Annex 3 and with applicable GDPR legislation.

Name of MAR2PROTECT contact person within the partner organisation	Date	Signature

Please return the signed form in PDF format to the MAR2PROECT coordinator, Ana Pereiro (anab@fct.unl.pt).

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