



TRANSCEND

Deliverable 6.1: DETAILED AND REVISED PDEC AND IPR STRATEGY

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Title	DETAILED AND REVISED PLAN FOR THE EXPLOITATION AND DISSEMINATION OF RESULTS (PEDR), COMMUNICATION STRATEGY AND PLAN (CSP) AND INTELLECTUAL PROPERTY RIGHTS (IPR) STRATEGY
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Executive summary

This deliverable organizes the execution of the project's PDEC and the IPR agreement. It provides thorough guidance for the design and implementation of dissemination and exploitation activities during the project's lifetime, as well as for the design and implementation of pathways to outcomes and impacts in the medium to longer term; and establishes governance bodies to monitor and where necessary revise the PDEC. It presents the scope and instruments adopted for online and in person communication, the approach adopted for scientific publishing and policy communication, and the methods for stakeholder engagement through training, workshops, and serious games. Finally, it overviews the transfer and dissemination of the background knowledge and actively encourages, while fully respecting the agreed IPR rules, the wider reuse and exploitation of the original foreground generated throughout the project execution.

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1. Principles and organization

The Plan for the Dissemination and Exploitation including Communication activities (PDEC) is critical to meet TRANSCEND intended outputs during the project's lifetime, as well as to design effective pathways to meet outcomes and impacts in the medium (5-6 years) to longer term (7-10 years). USAL has assumed the strategic lead of the PDEC and worked alongside all partners, including WP6 EXPLOIT lead (ARPAE) and co-lead (CMCC), to put in place the means for effective and efficient coordination and information sharing across partners. The detailed PDEC presented in these pages builds on the guidance developed in Section 2 (Impact) of the Description of Work (DoW), which was designed by communication experts leveraging on the feedback received from stakeholders in labs over a series of meetings between Dec 2021 and Feb 2022.

The aim of the TRANSCEND PDEC is to target unresolved policy challenges, stimulate political engagement, forge new partnerships, and pave the way for a closer involvement of public and private stakeholders in the co-creation of robust transformational adaptation policies (TAP) towards equitable and sustainable economic and welfare growth. The innovation potential which we will develop will be put into service and exploited by the public authorities, users' associations and industry participating in the co-creation, with feedback from civil society organizations and general public, resulting in better informed responses for coping with water scarcity under climate change.

The PDEC specifies measures, timing and language lined up with the target audience, and builds upon a collective analysis, SMART (specific, measurable, assigned, realistic and timely) strategy, and professional design and standards (e.g., policy imprinting, media analysis). The design of the PDEC has been overseen by the Project Coordinator with participation of all partners. Stakeholders are also set to play a relevant role in dissemination, exploitation and communication measures through knowledge networks, whose communication channels we will thoroughly exploit.

The PDEC works at two levels:

- 1) Dissemination, communication, and exploitation during the project's lifetime through outreach and in-reach (i.e., harnessing and leveraging knowledge from stakeholders in labs and exploiting the results produced in other projects) measures that contribute towards the achievement of project *outputs/Key Performance Indicators (KPIs)*.
- 2) Design, implementation, and monitoring of feasible and credible pathways to address *outcomes* in the medium term (5-6 years) and *impacts* in the longer term (7-10 years).

The supervision of the PDEC will be supported by two key guidance documents produced as annexes to this report:

- 1) Annex I, which works at the first level of the PDEC (dissemination, communication, and exploitation during the project's lifetime to achieve outputs/KPIs) and details the exploitation and dissemination measures that will be implemented in TRANSCEND, including their name, description, key quantifiable target(s), verification indicator(s), month of deployment, language, communication channels used, and lead partner and their role.
- 2) Annex II, which works at the second level of the PDEC (pathways to outcomes and impacts in the medium and longer term) and details the pathways, outcomes and impacts that will be deployed

and achieved in TRANSCEND, including their description, associated outputs/KPIs, interconnections, and lead partner and role.

Four bodies will govern and monitor the PDEC (Figure 1) at these two relevant levels (outputs/KPIs and outcomes/impacts), and take corrective action where needed:

- 1) The **PDEC Lead, ARPAE**, will continuously overview all dissemination, exploitation, and communication measures. To this end, the PDEC Lead will 1) send reminders via email to partners in charge of each measure at least 2 months ahead of the deadline set in the Roadmap in this report, informing on the specific purpose of the activity and the quantitative targets to be achieved, and requiring an implementation plan that details how the measure will be conducted; 2) receive (1 month ahead of deadline) and revise and send back (3 weeks ahead of deadline) to the partners in charge of the measure the implementation plan; 3) collect all relevant evidence from each dissemination measure and **publish all materials** in the Virtual Forum and other relevant repositories, within 1 month after the measure takes place; 4) monitor performance during the following months for those activities that require continued monitoring (e.g., n. of views of a video); 5) process feedback on the performance of dissemination, exploitation and communication measures produced by the Impact Champion Team and Pathways Team; and 6) **assess performance**, and where targets are not achieved or risks of underperformance manifest, design and apply contingency planning, and inform the Management Board (MB).
- 2) The **Impact Champion Team** will continuously monitor stakeholder engagement through Impact Champions (e.g., on gender balance, see Section 1.2.5 of the DoW); gather feedback from stakeholders; and ensure that the project team considers and responds adequately to stakeholder recommendations by designing guidance to the PDEC Lead ARPAE. The Impact Champion Team will meet online 3 months before and 1 month after each workshop to chart progress. The Impact Champion Team meetings will be chaired by SEI (WP2 Lead) and involve at least one representative from WP1 Lead (CMCC), WP6 Lead (ARPAE), and the project coordinator (USAL), as well as other partners whose contribution is deemed relevant by the chair. Besides informing the design of dissemination, exploitation, and communication measures, a major task of the Impact Champion Team will be to identify gaps and barriers hampering stakeholder engagement in knowledge networks, and fine-tune methods in T1.1-5 (see T1.6 in the DoW).
- 3) The **Pathways Team** will not design or monitor dissemination, exploitation, and communication measures; but rather deploy and monitor pathways that build upon TRANSCEND outputs/KPIs to achieve the project outcomes and impacts in the medium (5-6 years) and longer term (7-10 years). The Pathways Team will also produce regular feedback to ensure that dissemination, exploitation, and communication measures conducted during the projects' lifetime are aligned with the pathways to outcomes and impacts. The Pathways Team will meet every 6 months starting from the second year of the project. The Pathways Team meetings will be chaired by FTC and involve at least one representative from WP1 Lead (CMCC), WP6 Lead (ARPAE), and the project coordinator (USAL), as well as other partners whose contribution is deemed relevant by the chair.
- 4) The **MB**, whose structure is detailed in the Consortium Agreement, will supervise implementation of the PDEC. The MB will revise and where necessary further underpin or amend the contingency plans designed by the PDEC Lead ARPAE. Where serious risks of underperformance that require

significant changes to the project/budget arise, the issue will be elevated to the Steering Committee, alongside suggested guidance on how to deal with it. The MB is integrated by the Project General Coordinator, Project Manager, and WP leads, and will meet online every 12 months to monitor and review the progress and results, conduct quality control (internal review), proactively identify critical risks & challenges, and revise the contingency risk measures designed by ARPAE.

The PDEC is structured across 2 pillars that address the two levels at which it works: 1) dissemination, communication, and exploitation during the project's lifetime to achieve project outputs/KPIs; and 2) implementation, and monitoring of feasible and credible pathways to address outcomes in the medium term (5-6 years) and impacts in the longer term (7-10 years). These two pillars are described in detail in the following subsections.

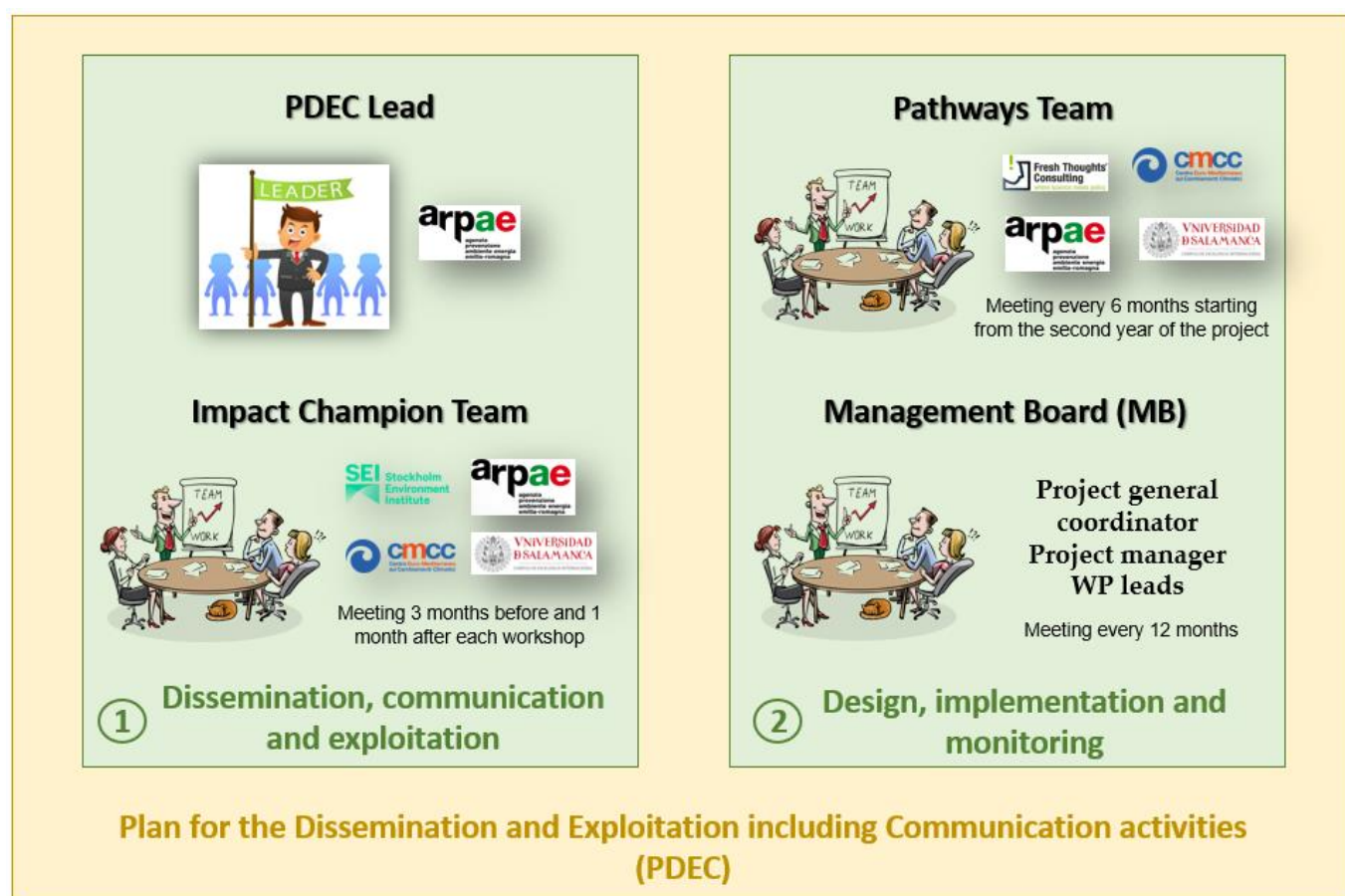


Figure 1 - PDEC governance bodies

2. Dissemination and exploitation measures, and communication strategy and channels during the project's lifetime

The range of exploitation and dissemination measures that will be implemented in TRANSCEND, including their name, description, key quantifiable target(s), verification indicator(s), month of deployment, language, communication channels used, and lead partner and their role, are available in Annex I of this report. Other measures that are implemented during the project will be incorporated to

Annex I by the PDEC Lead ARPAE. Annex I is thus intended to be a living document that is continuously updated and adjusted to achieve project objectives. Annex I is a key output of this deliverable and will provide detailed guidance to the partners in charge of implementing measures, as well as for the PDEC Lead ARPAE to supervise them more effectively and efficiently.

The exploitation and dissemination measures detailed in Annex I are summarized in Table 1 below by target audience, namely: (i) regulators and decision-makers at various levels of government (river basin authorities, environmental agencies, EU and regional to national governments); (ii) utilities, industry (e.g., insurance) and users' associations (e.g., agricultural water users associations); (iii) civil society organizations (e.g., NGOs) and general public; and (iv) academia and research organizations (including young researchers and professionals).

Table 1: Dissemination, exploitation and communication measures by target groups

Regulators: river basin authority, environmental agency, or equivalent body managing water resources	Regulators: EU and regional to national governments
• 28 Local workshops, 2 international workshops • Virtual Forum (website, mobile app) • 70+ Technical and foresight meetings • 34 Training events (in workshops & webstivals) • 28 Newsletter, 7 brochure and leaflets (multilingual) • Twitter, Facebook and other social media • 3 Video presentations (scribble) • 12+ Webinars • 30 Policy briefs ahead of workshops • All project deliverables • 40+ Scientific papers • 45+ Outreach events, 4 webstivals • 3 Open data sets • Portals – FAO Aquastat, WaPOR, EEA, Climate Adapt • Online catalogue of TRANSCEND-enabled services	• 28 Local workshops, 2 international workshops • Virtual Forum (website, mobile app) • 70+ Technical and foresight meetings • 34 Training events (in workshops & webstivals) • 28 Newsletter, 7 brochure and leaflets (multilingual) • Twitter, Facebook and other social media • 3 Video presentations (scribble) • 12+ Press releases in (local) newspapers • 3 Open data sets • 30 Policy briefs ahead of workshops • All project deliverables • 45+ Outreach events, 4 webstivals • Online catalogue of TRANSCEND-enabled services
Academia and research organizations	Utilities, industry and users' associations
• 28 Local workshops, 2 international workshops • Virtual Forum (website, mobile app) • 2 summer/winter schools • 28 Newsletter • All project deliverables • 30 Policy briefs ahead of workshops • 12+ Webinars • 40+ Scientific papers • 45+ Outreach events, 4 webstivals • 3 Open data sets	• 28 Local workshops, 2 international workshops • Virtual Forum (website, mobile app) • 34 Training events (in workshops & webstivals) • 28 Newsletter • 3+ Targeted brochures, e.g. COPA-COGECA • Twitter, Facebook and other social media • 3 Video presentations (scribble) • 30 Policy briefs ahead of workshops

• Portals – FAO Aquastat, WaPOR, EEA, Climate Adapt • 15+ Staff exchanges	• 45+ Outreach events, 4 webstivals • 3 Open data sets • Portals – Water Risk Filter, EEA, Climate Adapt • Online catalogue of TRANSCEND services
Civil society organizations	General public
• 28 Local workshops, 2 international workshops • Virtual Forum (website, mobile app) • 3 Video presentations (scribble) • 28 Newsletter • Twitter, Facebook and other social media • 30 Policy briefs ahead of workshops • 45+ outreach events, 4 webstivals • Science-society events (e.g. Researchers' Night) • Portals – Water Risk Filter, EEA, Climate Adapt	• 14 Local citizen panel meetings, 1 int'l meeting • Virtual Forum (website, mobile app) • 28 Newsletter, blog, brochure • 3 Video presentations (scribble) • Twitter, Facebook and other social media • 14+ Press releases in (local) newspapers • Portals – Water Risk Filter, EEA, Climate Adapt • 14+ Citizen science events (researchers' night) • 4 webstivals

Further to the knowledge networks that embrace representatives of all these groups in labs, we will use a wide-reaching communication strategy and channels that address target groups beyond labs. All measures will be centralized in the online Virtual Forum to ensure fluent, inclusive, and continuous knowledge sharing and co-creation across partners and stakeholders—also in the eventuality of mobility restrictions.

Deliverable 6.1 – Detailed and Revised PDEC and IPR Strategy

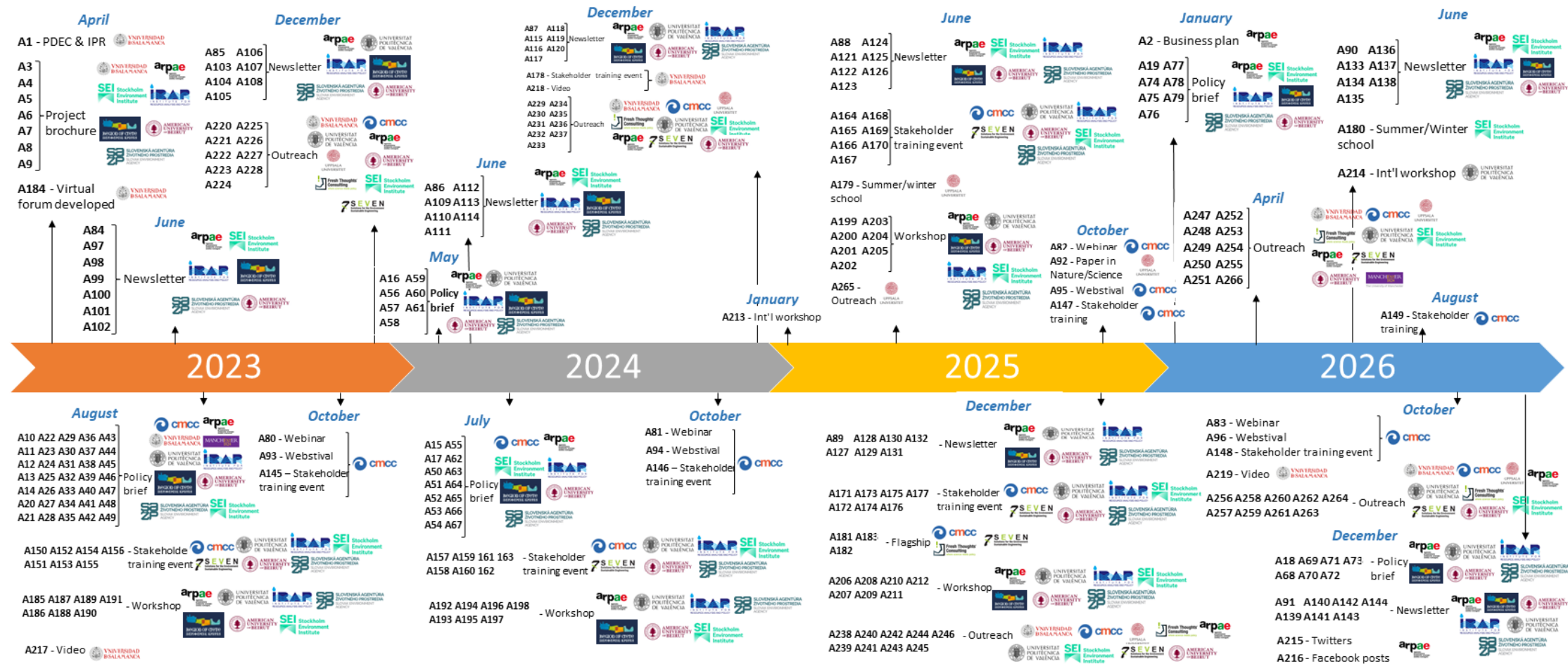


Figure 2 – Roadmap of the exploitation measures and dissemination (All activities in Figure 2 are listed and described in detail in Annex I to this deliverable).

2.1. Exploitation and dissemination measures

The key exploitation and dissemination measures are described in detail below, and include:

- **Business plan.** The business plan, which will be fully developed in D6.5, will design a credible path to deliver the ecosystem of innovation (the *service*) to the market. Co-creation in WP2 will be highly instrumental towards revealing the value gained from the ecosystem of innovation; and to shape expectation and market acceptance and extract business value of the service.
- **Scientific publishing, project brochure, leaflets, policy briefs, newsletter.** The initial dissemination package will include a leaflet and brochure on the business imperative to consider TAP in the operations of stakeholders, including decision-making. The executive summaries of major deliverables will be translated into policy briefs addressing specific audiences in labs and will be designed following the EC Guidance. Biannual newsletters will be elaborated targeting key stakeholders. All these products will be multilingual to ensure wide dissemination.

Partners are closely connected to *scientific publishing*, and several team members are current members of editorial boards of renowned scientific journals in multiple disciplines, including Water Resources Research, Environmental Modeling and Software, Climatic Change or Earth's Future, to name but a few. As a part of our communication and dissemination activities, we will produce scientific articles and special issues in the above and other JCR Q1 journals showcasing project results, including the publication of 10+ papers *per year*. We will submit and publish one paper showing the results of the TRANSCEND Project to Nature and/or Science. The articles in high impact journals will be accompanied by short webinars. All papers will be published **gold open access** leveraging on resources made available by our organizations, and working papers published in online repositories (see Section 1.2.6 of the DoW).

➤ **Training activities.** TRANSCEND will train the critical *transformation agents* needed to catalyze societal transformation and TAP to water scarcity and climate change, including 1) stakeholders and 2) young scientists.

- **Stakeholder training:** We will organize training events back-to-back workshops and webinars to build the capacity of decision-makers and stakeholders in labs and beyond to integrate the value of TAP and the ecosystem of innovation into river basin planning. We will collaborate with UN's WASAG, SWIM H2020 and DG NEAR WES training networks, as well as other major training initiatives, to train regulators as well as entrepreneurs, climate innovators and users. Partners also coordinate a number of postgraduate courses on water resources management taught in English and local languages (e.g., the MBA on [Management of Agri-food businesses](#) at USAL), where the cutting-edge knowledge and methods developed in TRANSCEND will be further disseminated, and stakeholders engaged. As partners of Climate-KIC, we will participate in Pioneers into Practice, consisting of bespoke transitions thinking and systems innovation mentoring delivered through a structured workshop programme and online training. Training activities will also engage stakeholders outside labs, to foster replication and upscaling.
- **Academic training:** The training of transformation agents in academia will be articulated through in-house academic programmes and facilities and summer/winter schools. Most partners coordinate postgraduate programmes on the management of water scarcity and climate change (e.g., MPhil/PhD programmes on Earth Science at [UoM](#) and [UU](#)). Partners (e.g., [CMCC](#)) regularly organize Summer and Winter Schools for young scientists and practitioners, and we will build on this relevant expertise to organize throughout the lifetime of the project **two Summer/Winter Schools**.

➤ **Legacy.** Our legacy strategy aims to ensure a lasting footprint of the project, including the sustained and periodic update of the ecosystem of innovation in living labs. We will also establish “inspiration” labs across the world that explore robust TAP adoption using TRANSCEND’s methods, including in transboundary basins where we aim to set a standardized approach. The key assets needed to successful legacy and replication include:

- We will develop a critical pool of *transformation agents* to sustain, and where needed expand (e.g. new models, additional monitoring data), the ecosystem of innovation after the project ends. We will train 70+ stakeholders in labs, as well as 20+ stakeholders from outside labs; and 70+ PhD students.
- Leveraging on the business plan (D6.5), we will seek and secure additional investments to ensure the sustained and periodic update of the ecosystem of innovation. We expect to secure by the last year of the project, *at minimum*, 50 000 EUR/year/lab over a period of 3+ years in 4+ living labs & 4+ inspiration labs to finance the maintenance and update of the ecosystem of innovation, including direct financial contributions and monetized in-kind contributions (e.g. a worker/group of workers dedicated to the update of the modeling suite, monitoring toolbox and ecosystem of innovation).
- We will closely work with communities and regions beyond labs, including those supported by the EU Mission on climate adaptation and societal transformation. We will keep them updated on project outputs and engage with them in key project activities, including outreach events, webinars and international workshops, where we will showcase the performance of TAP and the ecosystem of innovation and seek their feedback to address gaps that may prevent replication. This will lead to the identification and initiation of 8+ inspiration labs.

We consider that achieving 15+ labs (including 5 large-scale demonstrators in regions enrolled in the Mission on climate adaptation), 160+ transformation agents and 8+ labs with a minimum investment sustained for 3+ years will provide the minimum basis to achieve, with high confidence and in the medium term (5-6y), a *critical mass* of end-users and resources that ignites far-reaching and rapid transformation towards a water scarcity- and climate-proof society within and *beyond* living labs in the longer term (7-10y). We will constantly monitor the performance of training, replication and fundraising activities through an *ad-hoc* Impact Champion (see PDEC governance bodies above and task T1.6 in DoW).

➤ **Policy leverage and Upscaling.** Partners are closely connected to major EU and international water- and climate-related platforms (IPCC, EGD expert groups and networks, HE Missions, UNDRR Sendai Framework for Disaster Risk Reduction, IWRA Task Forces, U.N. FAO), as well as all major national and regional networks in labs. This includes active engagement in major policy initiatives such as the support to water quantity management that FTC develop in 2022-2024 for the European Commission DG ENV, as well as informing basin management plans such as the second planning cycle in Greece, currently ongoing and supported by SEVEN, where we will aim to set TRANSCEND ecosystem of innovation as the standard for river basin planning.

We will leverage this comprehensive expertise and networking capacity to maximize the out- and in-reach of the project. We will review and synthesize existing knowledge, and work closely and attentively with stakeholders, expert groups and policy platforms and networks from regional to global levels, to identify legal, policy and regulatory barriers and reform options to upscaling implementation of TAP across the EU and beyond (see T5.1-5.3 in DoW). We will actively contribute to the design of river basin management plans in labs (EU’s third planning cycle), while seeking opportunities to contribute to supra-national and national strategies for water resources management, climate adaptation, disaster risk reduction,

sustainable development, and ecosystem protection in the EU and beyond. We will author/co-author chapters in the DRMKC report 'State of Science in DRM', leveraging on the coordinating role of members of the Consortium, and actively inform the development of the United Nations World Water Development Report and the UN Global Assessment Report (GAR) on Disaster Risk Reduction, while actively seeking to contribute to other flagship reports produced during TRANSCEND's lifetime. We will liaise with principal innovation platforms, including Climate KIC, to amplify the impact of our activities and boost transformational adaptation to water scarcity and climate change.

2.2. Communication strategy and channels

We will target key stakeholders through our thoroughly designed **communication strategy and channels**. Properly designed communication will support both the dissemination and exploitation of our research results and contribute to achieving the intended outcomes & impacts of the project. TRANSCEND communication channels have been designed to aptly respond to the challenge posed by mobility restrictions due to the COVID-19 pandemic, and include:

➤ **Online communication and the Virtual Forum.** The need for a sound online communication approach has been amplified by the recent COVID-19 pandemic, which significantly restricted mobility to different degrees, including in regions and countries where TRANSCEND labs, partners and stakeholders are located. This calls for the revision and adaptation of communication approaches to the new context. Beyond the conventional approach that uses online communication as an "information clearing-house" or "info-point", we will use online communication also as a tool to actively engage, discuss, build consensus, take decisions and coordinate actions in labs. Online communication will be centralized and managed through the **Virtual Forum**, the communication hub of TRANSCEND, which encompasses all channels of communication in the project, including live online access to workshops and events.

The Forum will be articulated through a **website** that is accessible also from cell phones, thus having a performance comparable to that of an app. The Forum will feature professional design and communication standards that ensure ease-of-access and ease-of-use. The Forum will be designed in a way that is appealing to a diversity of users, guiding the different audiences to products of their interest, including: live online access to project workshops, meetings and training, short news, repository of project results (digital library), access to social media, and a blog that stages interviews, opinion articles and policy briefs. The Forum will employ state-of-the-art web services including interface to Twitter, Facebook, YouTube and other social media; and connect to partners' profiles (Twitter, Facebook) and YouTube channels. We will use videos and other interactive tools for dissemination, where we will employ scribing techniques that are based on mind-mapping and graphical skills of a scribing artist to synthesize complex issues in a way that is accessible to users of different backgrounds and expertise.

The Virtual Forum will aptly complement and underpin, and where necessary substitute, in person communication during the project. **In person communication** will be adopted, where possible, for local and international workshops, training events, and outreach events. In person meetings have a number of advantages over online meetings: they make possible the use of body language, make misunderstandings less likely, increase discipline and concentration, facilitate social exchange, create stronger bonds among participants, catalyze networking, and create a healthy team culture; all of which can be only partly

achieved through online interaction. **Online communication** will be the default for webstivals, webinars and foresight and technical and foresight meetings with limited content and participants, so as to economize time and other resources. Online communication will be also adopted where in person interaction in workshops, training and outreach events is not possible for some or all participants, including due to COVID-19 mobility restrictions. Major stakeholder engagement activities in workshops and training events will include a virtual interface and allow for both in person and remote simultaneous participation, while ensuring fluent communication. All workshops and events will be widely advertised, broadcasted live, recorded, and uploaded to the digital library. This will inform all participants in knowledge networks on the progress and activities in the labs, while making the process *transparent*, thus contributing to build trust among members. We will deploy **sensible virtual engagement techniques and tools** to fully unleash the potential of online communication and ensure continued and active interaction and knowledge-sharing. Leveraging on the Forum channels and platforms, we will apply deep listening and media monitoring tools to better target our communication products; listen actively to online conversations, the media landscape and (key) stakeholders, so to understand underlying currents; audit stakeholder engagement and digital lobbying to map engagement dynamics; and revise online engagement towards strengthening stakeholder engagement/endorsement of TRANSCEND methods and results (advocacy). These functions cannot or can only be partly achieved through in person communication. The upshot is a comprehensive communication strategy that combines the strengths of online and in person communication, and aptly addresses obstacles to in person communication, towards a successful science-policy engagement and co-creation process.

➤ **Talanoa Dialogue.** Online and in person communication will be managed to ensure a continuous dialogue among stakeholders towards collective assessment, consensus building and the eventual adoption of robust TAP to water scarcity under climate change in the living labs. We will identify, invite and engage relevant public and private stakeholders in the living labs leveraging on the Talanoa Dialogue approach.

UNFCCC's Talanoa Dialogue is one of the events attracting the greatest attention in the climate community, bringing together each year high representatives from national, regional, and local governments, industry, civil society organizations, and media cover from all over the world. The Talanoa Dialogue has become a highly effective and impactful platform to present and assess outstanding transformational actions, which in turn can become hints or solutions to the challenges faced by various entities elsewhere.

UNFCCC's Talanoa Dialogue (UNFCCC, 2018) involves the sharing of ideas, skills, and experience through storytelling, so to build trust and knowledge among participants through empathy, understanding and constructive and respectful debate. Blaming others and making critical observations are inconsistent with building mutual trust and respect, and therefore inconsistent with the Talanoa concept. In the Talanoa Dialogue, stakeholders aim to respond three questions: *Where are we now? Where do we want to go? And How do we get there?* (UNFCCC, 2018). In TRANSCEND, these questions will be answered leveraging on a sound co-creation strategy (WP2) that builds on thoroughly designed knowledge networks (WP1). Co-creation means that all relevant stakeholders, including scientists, are an integral part of research, deliberations, and implementation, so to ensure consensus is built and observed at every stage, from the design of credible and realistic scenarios to the effective implementation of robust transformational adaptation strategies. Co-creation in TRANSCEND will be structured in five stages

articulated across the four tasks of WP2, namely, 1) co-design of scenarios and TAP; 2) co-development of modeling efforts, while exploring co-development of monitoring tools (e.g., identifying what the monitoring priorities and gaps of local stakeholders are and which of these can be technically addressed and solved); 3) co-evaluation of TAP; 4) co-identification of robust TAP; 5) and co-implementation of the selected TAP. Table 2 maps how these co-creation stages will contribute to answer the three questions in the Talanoa Dialogue.

Table 2: Addressing Talanoa Dialogue questions through co-creation

Where are we now?	Where do we want to go?	How do we get there?
1a) Co-design credible scenarios	1b) Co-design credible targets for TAP	2) Co-design of relevant TAP 4) Co-evaluation of TAP, combining mechanistic modeling outputs with heuristics and inductive reasoning so to identify strengths and vulnerabilities 5) Co-identification of the robust TAP with the highest potential 6) Co-implementation of the selected TAP
3) Co-development of the modeling framework (including the use of stakeholders' own hydrologic models)		

➤ **Workshops.** TRANSCEND adopts an iterative stock-taking co-creation process where stakeholders and scientists gather in 4 annual local workshops in the context of each living lab, and in 2 international workshops involving all labs (held at partners' premises in Venice—month 25—and Valencia—month 42); complemented with continuous engagement in technical and foresight meetings, training and other events. The objectives, month and participants of workshops are described in Table . 3. Workshops 2, 3, 4 and 5 will field *scenathons* to integrate complex scientific modeling and related outputs into knowledge sharing and better understand how stakeholders make decisions, to enhance transparency and trust, build consensus, and deploy TAP. Workshop 6 will conduct a collective assessment of outputs and implementation plans and catalyze the further development of legacy and upscaling actions, including definition of inspiration labs. We will produce policy briefs ahead of workshops to continuously inform stakeholders on project progress and deliver key information.

Table 3: Objectives, participants and date (in months from the start of the project, M) of the workshops (the project manager has been contacted to postpone the dates of the 1st round of workshops, which coincide with the month of August, to September).

N o	Workshop title	Objectives & participants	M
1	1 st local workshop	Scene setting, momentum building; research gaps, challenges and uncertainties; exploratory co-design and co-development. Participants: local stakeholders	8
2	2 nd local workshop	<i>Scenathon</i> ; co-evaluation; revision of TAP, scenarios and modeling suite (<i>iterative stock-taking process</i>). Participants: local stakeholders	19
3	1 st Int'l workshop	<i>Scenathon</i> ; cross-fertilization; collective identification of gaps and challenges, and TAP with high potential. Participants: int'l network board, other key stakeholders.	25
4	3 rd local workshop	<i>Scenathon</i> ; exploratory co-identification; revision of TAP and scenarios, new iteration(s). Participants: local stakeholders	30
5	4 th local workshop	Presentation of detailed modeling results in <i>scenathon</i> , co-identification; plan for co-implementation of selected TAP in labs. Participants: local stakeholders	36
6	2 nd Int'l workshop	Collective assessment of outputs and co-implementation plans; barriers & reform options for upscaling and legacy; define inspiration labs. Participants: int'l network board, other key stakeholders	42

➤ **Serious games and scenathons.** Workshops 2, 3, 4 and 5 will rely on scenathons, a type of serious game, for the dissemination and exploitation of the scientific results obtained in TRANSCEND across stakeholders. Serious gaming includes a wide range of methods, practices and theories such as simulations, virtual reality, experimental learning, case studies, or modelling. The common denominator of all these methods, practices and theories is the existence of a simulator underneath that predicts response in state variables to the scenarios designed. The scenarios include alternative future climate, development, institutional, and other elements that are inputs to the simulator, and are manipulated by players. Serious games have been applied across a wide range of wicked environmental-natural resources problems (Solinska-Nowak et al., 2018). These efforts have had three primary goals: (1) provide knowledge and familiarity with the dimensions of the socioecological system (SES); (2) make players aware of the challenges of managing the SES now and under future scenarios; and (3) encourage players to develop solutions in response to the scenarios. The success of the application of serious games seems to be almost always measured in terms of the degree and nature of learning achieved as results of participating in the games. There is little research where experiments are conducted to understand aspects of decision-making, or on whether participation in the serious games results in “real” change in the participants and their decisions. The nature of the gaming environment, where the stakes are low (“it is

just a game after all...”), makes for “safe spaces” for innovation. On the other hand, the more realistic the game, in terms of both biophysical and socioeconomic representations of the SES, the more the stakes could be raised for finding implementable solutions (not just a game) but could stifle innovation.

Scenathons or “scenario marathons” are “social learning experiments that help facilitate negotiations among differentially empowered and unequally resourced stakeholder groups” (UNDRR, 2021). They are similar to serious games, but focus on the negotiation process, which make them particularly suitable for the organization of serious games in the context of co-creation within the TRANSCEND project. Scenathons aim to simulate negotiations among different parties using model-informed plausible futures. One example of a scenathon applied to land use and water resources management and agriculture comes from the [Food, Agriculture, Biodiversity, Land-Use, and Energy \(FABLE\)](#) Consortium, which used the scenathon to understand “how countries can transition towards sustainable land-use and food systems [...] by allowing country teams to align national pathways iteratively and collaboratively with global FABLE targets and to balance trade flows” (UNDRR, 2021).

Illustrative example of the use of a multi-player role-play serious game to inform the construction of the Lastras de Cuéllar Reservoir in the Cega Catchment, Spain. A hydroeconomic ensemble model was used to generate simulation results for a series of climate, hydrological, economic, and dam construction scenarios that were agreed upon with stakeholders, and handed over to parties to the decision over three consecutive meetings (2 virtual, 1 in-person) attended by representatives from the Douro River Basin Authority, the Spanish Ministry for the Ecological Transition, and academics. The objective of the meetings was to inform parties to the decision on the simulation outcomes and to complement modeling efforts and mechanistic performance metrics (i.e., automated constrained optimization) with heuristics leveraging on the vision and perspectives of parties to the decision. This allowed parties to the decision to assume roles in shaping the expectation and acceptance of scenarios and helped extract value of the modeling outputs. Each of the three meetings included a multi-player role-play interaction in which participants assumed the role of policy makers and engaged in a “multilogue” that allowed parties to the decision to “parallelly negotiate, persuade, ally, brainstorm or exchange information to take a collective, coherent strategy for the common good” (Duke, 1974).

In the first part of each meeting, participants to the game were presented current scenarios and key variables in scenario design, which had been agreed with them in the previous meeting (case of the second and third meetings) or in previous bilateral meetings (first meeting) leveraging on the scenario simulator tool (Section 5). Subsequently, participants were presented the implied consequences (i.e. simulation outcomes) of their chosen scenarios using a stylized fact sheet. Based on these inputs, participants to the meeting engaged in discussions to decide on the preferred strategy. The multi-player role-play interaction adopted the form of a *Disaster Imagination Game* (Solinska-Nowak et al., 2018), where participants assumed the role of policy makers and had to identify vulnerabilities to selected strategies leveraging on simulation results. Based on this assessment, participants discussed on what strategy could ameliorate those vulnerabilities (i.e., robust strategy).

A key advantage of adopting multi-player role-play interactions is that stakeholders can derive heuristics of value for the solution of the problem from *ad-hoc* interpretations of their experience that are applied to speculate upon the consequences of dam construction (inductive reasoning); and *exchange* these interpretations through lively direct interactions. Thus, temporarily free from everyday limitations, role players “become more open and creative, often entering into meaningful discussions and coming up with

innovative solutions to the in-game problems” (Solinska-Nowak et al., 2018). Accordingly, participants to the game were subsequently asked to revise their initial selection of key variables and inputs to scenario design and to develop new scenarios (Yanagawa et al., 2016). For example, during the first meeting, stakeholders realized that simulation results were particularly sensitive to uncertainty in future climate and hydrology, and decided to include a set of discretionary climate change scenarios where the return period of the drought was reduced to 1-2 years. These additional discretionary scenarios complemented climate change scenarios obtained from the models, which suggested a return period of 3-4 years.

➤ **Outreach events.** We will hold seminars and panel discussions at major industry/users, associations/regulators and citizen events, as well as at OECD, World Bank, EEA, JRC and EC events. We will organize side-events to present results at major scientific and outreach events, including Climate-KIC Innovation festivals, EIP conferences and the World Water Congress, among others. We will also organize annual webstivals through the Virtual Forum to showcase activities across labs and share experiences. Table 4 identifies key international outreach events that we will attend, where we will convene targeted sessions and/or side events, aiming at amplifying the impact of our outreach and *upscaling* activities—including identification and definition of inspiration labs.

Table 4: Preliminary list of international scientific and outreach events we will attend/organize

Activity/Event	Target Audience	Objectives
European Innovation Partnership (EIP) Water Conference	Regulators, utilities, water users, industry, civil society, general public	-Spread and publicize outcomes
EIT Climate KIC Innovation festivals		-Learn about front-line innovation -Forge coalitions and partnerships
IWRA World Water Congress	Regulators, utilities, industry, academic community, civil society organizations	-Disseminate TAP, ecosystem of innovation, labs results
World Water Week		-Establish collaboration
EU Climate Change Adaptation Conference		-Identify and define <i>inspiration labs</i>
UN’s WASAG Network meetings		
IAHS Conferences		
Researchers’ night	Broader society, citizen panels	-Present TAP & project outcomes -Engage citizen panels across labs

3. Design, implementation, and monitoring of pathways to address outcomes and impacts in the medium and longer term

The pathways, outcomes and impacts that will be deployed and achieved in TRANSCEND, including their description, associated outputs/KPIs, interconnections, and lead partner and role, are available in Annex II of this report. Annex II is intended to be a living document that is continuously updated and adjusted to achieve project legacy. Annex II is a key output of this deliverable, and will provide detailed guidance to the partners in charge of designing pathways to outcomes and impacts, as well as for the PDEC Lead ARPAE to supervise them more effectively and efficiently.

3.1. Pathways towards expected outcomes and wider impacts

Our exploitation and dissemination measures, amplified through our communication strategy and channels, will achieve and amplify outputs/KPIs and transform them in outcomes and create impact. Table 5 and 6 map our contribution to the expected outcomes (O) and expected impacts (I), respectively, indicating targets and interest groups, and distinguishing between scientific (blue), economic/technological (orange) and societal (green) outcomes/impacts (and combinations thereof). The distinction between scientific, economic/technological and societal outcomes/impacts was done based on the shared understanding of EC definitions developed between stakeholders in labs and Consortium partners over a series of meetings between Dec 2021 and Feb 2022. During meetings, outcomes and impacts were presented to stakeholders in labs and they assigned them one or more categories, and then started identifying potential TAP to address them. Figure 3 represents the pathways we will follow from our project immediate results in 4 years' time (measured through Key Performance Indicators—KPIs) to outcomes in the medium term (5-6 years) and impacts in the longer term (7-10 years).

Table 5: Expected outcomes of the Call CL6-2022-CLIMATE-01 and how we will address them in 5-6 years

Outcome (O)	Our contribution, including targets and [interest groups]
O-1. Achieve transparent water sharing and adjust water allocation across environmental and human uses towards long-term water replenishment capacity and availability.	-Identify and adopt robust TAP in 15+ labs (7 labs and 8+ inspiration labs), including 5 large-scale demonstrators in regions enrolled in the Mission on climate adaptation, to deliver equitable and sustainable economic & welfare growth under deep uncertainty. [Interest groups: Regulators]
O-2. Adopt inclusive, forward-looking and climate risk-informed water allocation planning and management processes, foster adoption of digital technologies in water management.	-Test and validate in 15+ labs a groundbreaking ecosystem of innovation to assess and address risk and uncertainty in water allocation and management processes. -Monitor TAP performance using digital technologies in 15+ labs . -Adopt TAP including climate & irrigation services in 10+ labs [Regulators; utilities, industry & users; civil society organizations]
O-3. Guide decision makers in transboundary rivers to share transboundary waters equitably, reaping the benefits of appropriate water allocation regimes.	-Adopt and validate the ecosystem of innovation in 8+ transboundary labs . -Develop an internationally accepted and standardized mechanism for allocation of water in transboundary river basins.

Outcome (O)	Our contribution, including targets and <i>[interest groups]</i>
	<i>[Regulators]</i>
O-4. Identify water efficiency deficiencies and achieve improvement by at least 50% by 2030, in regions under water stress, now or in the future, and for water bodies at risk of failing to meet good ecological/quantitative status. & O-5. Reduce the water footprint of water-using sectors, especially agriculture, energy and industry.	-Adopt an impact assessment and water accounting monitoring toolbox in 15+ labs to objectively monitor water efficiency. -Disseminate and promote toolbox adoption in regions enrolled in EU Mission on Climate Adaptation (focus on large-scale demonstrators). -Increase efficiency (value added to withdrawals ratio, as per SDG 6.4.1) by 50%+ and reduce WEI+ by >5% by 2030 in 15+ labs. <i>[Regulators; utilities, industry & users]</i>
O-6. Promote financing mechanisms to smoothen the transition to more appropriate water pricing policies in water supply and sanitation and in the different economic sectors, such as agriculture, energy and industry [...].	-Develop multi-sector and multi-stakeholder partnerships that create and operationalize novel financing mechanisms to support TAP adoption in 12+ labs. <i>[Regulators; utilities, industry & users]</i>
O-7. Help structure appropriate policy dialogue to support allocation reform and increase stakeholders engagement.	-Develop 15+ local knowledge networks (one per lab) and consolidate and expand the international knowledge network. -Engage 500+ stakeholders. -Adopt empathic and participatory Talanoa dialogues in 15+ labs. -Train 150+ stakeholders & 150+ young scientists on project methods. <i>[Regulators; utilities, industry & users; civil society organizations; wider public]</i>
O-8a. Support the implementation of the European Green Deal (EGD)...	-Mainstream uncertainty assessment and robust decision making in all EGD strategies. -Work with <i>all</i> regions and communities in the Mission on climate adaptation, with a focus on large-scale demonstrators. <i>[Regulators; utilities, industry & users; civil society organizations; wider public]</i>
O-8b. ...and the SDGs, notably the SDG 6 “Ensure availability and sustainable management of water and sanitation for all”.	-Increase water efficiency by 50% in 15+ labs (SDG6.4.1). -Reduce WEI+ by >5% in labs (SDG6.4.2). -Increase IWRM by 10+ points in labs (SDG6.5.1). -Establish 8+ transboundary arrangements (SDG6.5.2). -Enhance growth and welfare in 8+ labs in developing countries (contribution to SDG6.1) -Support and strengthen participation of 15+ local communities in knowledge networks (SDG6.B) <i>[Target groups: regulators; utilities, industry & users; civil society organizations; wider public]</i>

Table 6: Expected impacts of destination “Land, ocean & water” and how we will address them in 7-10 years

Impact (I)	Our contribution, including targets and [interest groups]
I-1. Better understanding and enhancing the mitigation potential of ecosystems and sectors based on the sustainable management of natural resources.	-Reach out 10 000+ stakeholders to deliver better understanding of climate-induced changes to ecological and socioeconomic systems, and the mitigation potential of TAP across ecosystems and sectors, under deep uncertainty. -Promote the adoption of our groundbreaking ecosystem of innovation in 200+ basins. [Target groups: regulators; utilities, industry & users; civil society organizations]
I-2. Advanced understanding and science to support adaptation and resilience of natural and managed ecosystems, water and soil systems and economic sectors in the context of the changing climate.	-Training of 1000+ stakeholders to achieve advanced understanding of policy design and implementation under deep uncertainty. -Engagement of 500+ scientists with relevant expertise to support and update the ecosystem of innovation. -Foster adoption of robust TAP in 200+ basins (100+ by 2030), including resilience instruments that enable rapid and sound recovery of natural and human systems following shocks, working in collaboration with the EU Mission for Climate Adaptation. [Regulators; utilities, industry & users; civil society organizations; academics]
I-3. Efficient monitoring, assessment and projections related to climate change impacts, mitigation and adaptation potential in order to bring out solutions for tackling emerging threats and support decision-making in climate change mitigation and adaptation policies at European and global level.	-Promote the adoption of the impact assessment and water accounting monitoring toolbox in 250+ basins, using in-situ and remote sensing data. -Stimulate the adoption of the modeling suite in 250+ basins to produce ensemble projections of climate-induced changes; identify emerging threats and potential tipping points; and inform TAP design and implementation that contribute to water and other key policies (including climate change adaptation and mitigation). [Regulators; utilities, industry & users; civil society organizations; academics]
I-4. Fostered climate change mitigation in the primary sector, including by the reduction of GHG emissions, maintenance of natural carbon sinks and enhancement of sequestration and storage of carbon in ecosystems.	-Foster the adoption of TAP that unleash potential of LULUC for carbon sequestration, including via economic instruments (e.g., PES), in 100+ basins. -Promote the adoption of TAP that store water and carbon through natural water retention measures such as forested infiltration areas and wetlands in 75+ basins. [Regulators; utilities, industry & users; civil society organizations]
I-5. Improved adaptive capacity of water and soil systems and sectors including by unlocking the potential of nature-based solutions.	-Enhance adaptive capacity and resilience of water and soil systems and sectors through TAP that include nature-based solutions (e.g., forested infiltration areas that store water during periods of excess and reduce erosion) and resilience instruments (e.g., agricultural drought insurance that reduces aquifer overdraft during droughts and enables rapid and sound recovery afterwards) in 100+ basins. [Regulators; utilities, industry & users; civil society organizations]

Impact (I)	Our contribution, including targets and [interest groups]
<i>I-6. Better managed scarce resources, in particular soils and water, thus mitigating climate related risks, in particular desertification and erosion, thanks to informed decision-makers and stakeholders and integration of adaptation measures in relevant EU policies.</i>	-Foster uncertainty assessment in EC's Strategic Foresight reports and all EGD strategies, to achieve robust management of scarce resources. -Foster adoption of a groundbreaking ecosystem of innovation to inform systemic transformations to climate change in the 150+ European regions and communities and 75+ large-scale demonstrators supported by the Mission on climate adaptation and societal transformation. <i>[Target groups: regulators]</i>

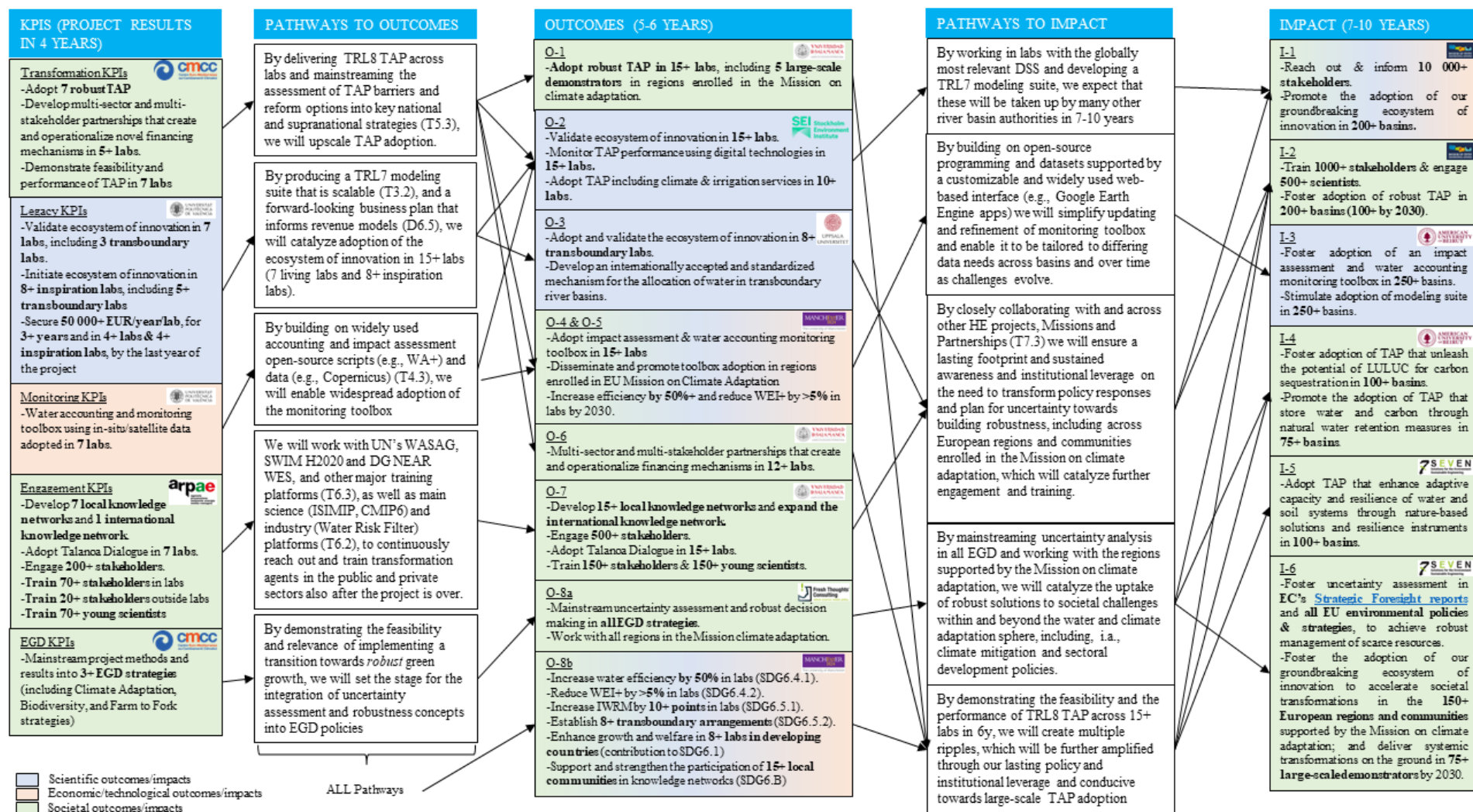


Figure 3: Project's pathways towards impact

3.2. Requirements and barriers

Awareness of the benefits of transformational policies and uncertainty assessment and robust decision making has increased significantly across decision-makers, but the effective utilization of this knowledge for action on the ground is still low, and advancing slowly (OJ, 2020c, 2019). TRANSCEND is placed at the heart of current activities in Europe and internationally on building integrated socio-ecological science, ensemble forecasting, and co-creation of breakthrough ideas about how economic instruments, allocation systems, nature-based solutions, digital technologies, non-conventional water resources and resilience instruments can play a major role towards societal transformation and green growth. This is even more urgent in the light of the momentum for radical change during the UN 'Decade for Action' and the EGD. The key requirements incorporated into our work plan, and how we will address potential barriers are explained below:

- Achieving the transformational impacts that TRANSCEND envisions will demand a large-scale coordination effort across a wide array of EC projects, Missions and Partnerships, so as to explore and exploit synergies and avoid redundancies. The EC Research & innovation agenda on water management includes relevant projects for an estimated volume of around EUR 300 million as **CLARA**, **EPI-WATER**, **GoNEXUS**, **TALANOA-WATER**, **NAIAD**, **HYDROUSA**, **HydroSocialExtremes**, **INTCATCH**, **SCELI-FIRM** and **ACQUAOUNT**. These projects have produced an enormous body of knowledge and the consortium members of this proposal have contributed to many of them (highlighted in bold, see also Section 1.2.3). We have designated tasks and earmarked resources (T7.3) to harness and synthesize this knowledge and exploit synergies with these projects, as well as other projects envisaged in the HE Cluster 6 Work Program 2021-2022 and the European Partnership Water Security for the Planet (see [Water4All 2022](#)), and other relevant projects such as those funded in 2021-CLIMATE-01-01.
- So far, existing transformational policies are limited and confined to pilot studies with limited replicability and scalability. While there is a clear potential for a substantial scaling up of TAP in water and climate adaptation planning, this can only be achieved after the key barriers have been resolved. This includes a clear demonstration of the feasibility and contribution of TAP for water conservation and inclusive green growth, and their ability to cope with deep uncertainty and adapt to change; but also a thorough assessment of institutional barriers and reform options, including in transboundary basins where there is often no established international agreement. We will work to overcome technical, institutional and policy barriers by building on inputs from our models and in-reach from knowledge networks, including first-hand experiences of our key experts, who have shaped the academic, policy and industry discourse on policy transformations under uncertainty through the development of methodologies for uncertainty analysis (e.g. [CMIP6](#)) and the pioneering adoption of these methods for decision-making. We will develop with major science- ([CMIP6](#), [ISIMIP](#)) and industry-oriented platforms ([WRF](#)) replicable methods and best practices for policy analysis under uncertainty. The modeling suite will build on stakeholders' DSS, whose compatibility with our methods has been validated beforehand, to ensure understanding, advocacy and the systematic uptake of the modeling suite and acceptance of modeling results. We will also address issues of affordability and equity, and stimulate inclusive dialogue to build consensus.

- The EC has launched the five Horizon Europe Missions in September 2021. The Implementation plan of the EU Mission on climate adaptation and societal transformation aims to support 150+ European regions and communities and deliver 75+ large-scale demonstrations of systemic transformations to climate change (OJ, 2021b). Our project sets out to work closely with the regions and communities enrolled in and supported by the Mission (T7.3). We will also work in teams with Green Deal and HE projects working on these regions (such as REGILIENCE and projects funded under 2021-CLIMA-02-02 call), as well as with the Mission Secretariat, in assisting communities and regions to mobilize stakeholders, scientific and financial resources for robust TAP adoption.

3.3. Scale and significance of the project's contribution to expected outcomes and impacts

Table 7 shows the scale and significance of our contributions to expected outcomes and impacts. The estimates of significance and scale are intended as **lower bounds**.

Table 7: Scale and significance of our contribution to the expected outcomes and impacts

Outcomes (O) and Impacts (I)	Significance	Scale of outcomes and impacts
(O-1) -Adopt robust TAP in 15+ labs, including 5 large-scale demonstrators in regions enrolled in the Mission on climate adaptation.	Demonstrate institutional and technical feasibility of <i>wide-scale</i> societal transformations towards sustainable and equitable economic and welfare growth under uncertainty, for the first time.	15+ labs including 10+ EU labs representing 6.7% of the 150+ regions to be covered by Mission on climate adaptation, and 5 of the 75+ large scale demonstrators.
(O-2) -Validate ecosystem of innovation in 15+ labs. -Monitor TAP performance using digital technologies in 15+ labs. -Adopt TAP including climate & irrigation services in 10+ labs.	Deploy a flexible water resources management mechanism to achieve sustainable and inclusive growth under deep and growing uncertainty.	15+ labs covering 25+ countries, including 15+ EU countries representing >70% of EU surface and >75% of EU population.
(O-3) -Adopt and validate the ecosystem of innovation in 8+ transboundary labs. -Standardized mechanism for allocation of water in transboundary river basins.	Standardized transboundary water allocation mechanism applicable in the world's 286 transboundary basins , which span 151 countries and represent 42% of world's population and surface.	8+ transboundary basins spanning 20+ countries that represent >10% of world's population and >5% of world's surface.

Outcomes (O) and Impacts (I)	Significance	Scale of outcomes and impacts
(O-4&5) -Adopt impact assessment & water accounting monitoring toolbox in 15+ labs. -Promote toolbox adoption in Mission climate regions. -Increase efficiency by 50%+ and reduce WEI+ by >5% in labs by 2030.	Deploy a flexible impact assessment and water accounting toolbox that monitors policy design and implementation under deep and growing uncertainty, and informs the building of adaptive efficiency across decision makers, so as to rapidly and efficiently adjust to change.	15+ labs covering 25+ countries, including 15+ EU countries representing >70% of EU surface and >75% of EU population.
(O-6) -Multi-sector and multi-stakeholder partnerships that create and operationalize financing mechanisms in 12+ labs.	Secure sustainable investment into, and cost recovery of, TAP, including investments to update TAP in face of change and surprise.	12+ partnerships tapping into 10+ national and 3+ EU financing mechanisms, including CAP, Cohesion Policy and LIFE funds.
(O-7) -15+ local knowledge networks and extended international knowledge network. -Engage 500+ stakeholders. -Talanoa Dialogue in 15+ labs. -Train 150+ stakeholders & 150+ young scientists.	Transform public consultation and stakeholder engagement practices in water resources management by building trust and a strong foundation on which to work alongside stakeholders to co-create knowledge and build consensus.	Validate methods in 15+ labs covering 25+ countries (15+ in EU). Reach out and train transformation agents in 30+ basins spanning 20+ EU countries and 15+ non-EU countries.
(O-8a) -Mainstream uncertainty assessment and robust decision making in all EGD strategies. -Work with regions in the Mission.	Integrate uncertainty assessment and robust decision making into EU agricultural, biodiversity and climate adaptation policy making.	Mainstream project methods and results into all of the 8 EGD strategies; work with all regions in the Mission.
(O-8b) -Increase performance of SDG6.4.1 (+50%), SDG6.4.2 (reduced by >5%), SDG6.5.1 (10+ points), SDG6.5.2 (8+ arrangements), SDG6.1 (8+ sites) and SDG6.B (15+ communities).	Significantly improve 4 out of the 8 SDG6 targets and 6 out of the 11 SDG6 indicators.	15+ labs that are representative of challenges and pressures affecting 2.3 billion people in water-stressed areas worldwide.

Outcomes (O) and Impacts (I)	Significance	Scale of outcomes and impacts
(I-1) -Reach out & inform 10 000+ stakeholders. -Promote the adoption of our groundbreaking ecosystem of innovation in 200+ basins.	Rapid upscaling of the ecosystem of innovation and modeling suite, leveraging on TRL7 service adapted to widely used stakeholders' DSS.	200+ basins representing >40% of the 515 basins worldwide and >75% of EU basins.
(I-2) -Train 1000+ stakeholders & engage 500+ scientists -Foster adoption of robust TAP in 200+ basins (100+ by 2030).	Achieve far-reaching and rapid transformation towards water scarcity- and climate-proof societies.	200+ basins, 75% of the 2.3 billion people in water-stressed areas, and 120+ countries (>60% of world's nations) including all 27 EU MS.
(I-3) -Foster adoption of an impact assessment and water accounting monitoring toolbox in 250+ basins. -Stimulate adoption of modeling suite in 250+ basins.	Rapid upscaling of the monitoring toolbox leveraging on open-source programming and datasets and widely used and customizable web-based interface.	250+ basins, 85% of the population in water-stressed areas, and 140+ countries (>70%), including all 27 EU MS.
(I-4&5) -Foster adoption of TAP that unleash LULUC for carbon sequestration in 100+ basins. -Promote adoption of TAP that store water and carbon through natural water retention measures in 75+ basins. -Adopt TAP that enhance adaptive capacity and resilience of water and soil systems through nature-based solutions and resilience instruments in 100+ basins.	Integrate uncertainty assessment and robust decision making into policy areas beyond water and climate adaptation (notably climate mitigation and agriculture); and systematically assess and exploit synergies across water, agriculture, soil and climate adaptation and mitigation policies.	175+ basins, 70% of the population in water-stressed areas, and 100+ countries (>50%), including all 27 EU MS.
(I-6) -Foster uncertainty assessment in EC's Strategic Foresight reports and all EU policies, to achieve robust management of scarce resources.	Integrate uncertainty assessment and robust decision making into all EU environmental policies and strategies, accelerate societal transformations in the 150+ regions in Mission climate adaptation, and	All 150+ European regions and communities, and all 75+ large-scale demonstrators enrolled in the Mission on climate adaptation.

Outcomes (O) and Impacts (I)	Significance	Scale of outcomes and impacts
-Foster adoption of the groundbreaking ecosystem of innovation to inform systemic transformations to climate change.	deliver systemic transformations on the ground in the 75+ large scale demonstrators.	

4. Knowledge management and protection, and the Intellectual Property Right (IPR) management

4.1. Principles and organization

A considerable amount of “background knowledge” will be brought into TRANSCEND by stakeholders and Consortium partners, thanks to their extensive and active involvement in the relevant areas of research and policy over the past decades. Moreover, the project will collect and generate abundant and varied “foreground knowledge”, in terms of methods, tools, and datasets. The attitude of the Consortium is to **widely share such knowledge** and ensure the maximum level of diffusion (e.g., via workshops, training, website, mobile app). All key deliverables and exploitable results will be made public under gold open access rules and Creative Commons Attribution (CC BY) copyright license, for which anyone will be permitted to adapt, remix, distribute and build upon the project's results, including for commercial use, as long as the source is properly cited, in compliance with the EU copyright legislation.

The Knowledge management and IPR policy will be included in the Consortium Agreement and signed by all partners at the onset of the project. The Knowledge management and IPR rules will regulate [1] granting the Access Rights to the *background* needed for the implementation of the project and exploitation of the results; and [2] the ownership, transfer and dissemination of the *foreground*. The Knowledge management and IPR policy will be based on the following basic principles:

- [1] The background (i.e. the information and rights held prior to accession to the grant agreement) brought into the project remains the property of the partner that has generated it;
- [2] The foreground (i.e. the results of the project activities) generated under the project is owned by the partner who has carried out the work leading to that foreground. When several partners have jointly carried out the work and their respective share of work cannot be determined, they shall have joint ownership of such foreground, and a “joint ownership agreement” may be drawn up for this purpose (the default regime is applied if no “joint ownership agreement” is signed).

4.2. IPR Management Group

USAL, through the project coordinator, will be responsible for the IPR management in order to protect intellectual rights through strong IPR strategy. More specifically, USAL’s responsibilities will be:

- IP management includes ensuring that Foreground knowledge is made publicly and freely available where possible; ensuring access to Background knowledge by partners where necessary; ensuring that partners are made aware of the procedures designed to record IP, maintain its patentability and confidentiality; and keeping a track of potential patents.
- Maintain a register of any IP identified as Foreground or Background knowledge.
- Act as the first point of contact with regard to queries over IPR and ownership offering guidance regarding interpretations of the rules and regulations stated in the GA and CA.

The project coordinator *can* conform an IPR Management Group where needed, to address key issues regarding ownership and patentability. As indicated above, the attitude of the Consortium is to widely share the Foreground knowledge, and to make it Findable, Accessible, Interoperable and Reusable (FAIR). Any attempts to make the Foreground non-public should be thoroughly justified and communicated to the IPR management group, and will be approved only where it unambiguously contributes to the public interest (i.e., it catalyzes, rather than prevents—e.g., through paywalls—, the adoption of the TRANSCEND ecosystem of innovation).

4.3. Management of IPR

The TRANSCEND project is committed to providing free open access to new research data resulting from the project being one of Horizon Europe's main objectives. Therefore, the Consortium will openly make available the content and data produced within the project through a gold open access CCBY model and FAIR (Findable, Accessible, Interoperable and Reusable) data principles.

In this sense, all partners will be encouraged to share their knowledge in order to improve the quality of TRANSCEND work. Most of this sharing will normally be unproblematic, but sometimes the knowledge may represent a significant value for the owner and in these cases, one needs to consider the IP ownership issues. Ownership can then be established as one of the following types:

[1] Background knowledge is brought into the project from other activities. In these cases, the background should be registered in the Attachment 1 of the CA. Further background can be communicated to the IP Management Group. The owners of the IP are registered together with the IP. It is normally a good idea to register the background knowledge as such before it is disclosed to anyone in the project. Note also that registration as background can be denied if it is thought that its ownership is unclear or that the knowledge is not necessary for the project. Registration of background knowledge should be denied for knowledge that can be proven to be already part of the public domain.

[2] Foreground knowledge are the results produced in the project, alone or in cooperation with other partners. As a general rule, the partners that have contributed to the development will have joint ownership to the IP. The IP should be rapidly communicated to the IPR management group to prevent misunderstandings regarding ownership.

The IPR Management focuses on the careful handling of IPR issues in TRANSCEND project, those that are of strategic importance in order to facilitate the exploitation of its solutions. It is aimed at creating a favorable environment for respecting IPR and with the objective of releasing all research outcomes

into the public domain—as fast as possible. Any opportunities for applying for patents or declaring copyrights should be thoroughly justified and communicated to the IPR management group, and will be approved only where it unambiguously contributes to the public interest (i.e., it catalyzes, rather than prevents—e.g., through paywalls—, the adoption of the TRANSCEND ecosystem of innovation).

Therefore, IPR plans will mainly move towards: maintaining a schedule of innovation produced in the course of project development and exploring the opportunity for applying for patents or declaring copyrights; creating and updating a living IPR management database to be revised and extended with new pieces of knowledge (foreground) as project implementation advances; conceiving and executing an optimal patent/IP search and filing strategy.

A specific consideration will be paid to TRANSCEND dissemination. Thus, for the disclosure of project results partners will select the appropriate means (e.g., scientific publications, publication on web sites, conferences, open access, etc.) according to the conditions set forth in the CA. The PDEC in this deliverable has been elaborated to guide partners in designing their IPR strategy, as well as in deploying the dissemination and exploitation activities that have allotted to them using appropriate communication channels and strategy.

4.4. Management of IPR before the project starts

At this stage of the process, the main issues of the IPR Strategy were discussed by TRANSCEND Consortium to achieve a common understanding on such aspects as background, foreground, ownership, transfer of knowledge, dissemination, and access rights during and after the project for research use. Resulting decisions were clearly expressed in the TRANSCEND proposal which included a specific section for the IPR. According to this section, a Consortium Agreement (CA) has been drawn up, based on the DESCAs model. The CA clarifies Access rights to background or foreground IP given by consortium IP owners to other parties (project participants or third parties). It also clarifies access rights to IP upon and after project completion. The CA establishes a detailed procedure to control partner's rights with respect to the dissemination process within TRANSCEND.

4.5. Management of IPR during the project

During this stage, the Consortium will define and execute the IP handling systems and procedures. Key IPR related issues in project development phase include:

- Results ownership: that is, TRANSCEND partners will be kindly asked to improve those provisions of the CA that may not foresee any relevant aspect, for instance, joint ownership.
- Protection of results: by default, all foreground will comply with FAIR principles and be made publicly and freely accessible to any potential user. Partners have to select the most appropriate and effective IP protection tool for every piece of foreground, in accordance with the other partners' legitimate interests and with the future planned use, if direct commercial exploitation or further research will be preferred. Partners must inform the IPR Management Group of these plans, and are recommended to inform other partners about their individual protection activities plans, especially where dealing with potentially joint IP. Any opportunities for

applying for commercial uses should be thoroughly justified and communicated to the IPR management group, and will be approved only where it unambiguously contributes to the public interest (i.e., it catalyzes, rather than prevents—e.g., through paywalls—, the adoption of the TRANSCEND ecosystem of innovation).

- IPR Identification: this means that all IP values within the project will be identified, listed, named, and analyzed in a systematic manner to obtain a project IP portfolio and map, to be included in the annual exploitation, dissemination, and communication report.
- Use of foreground: there may be direct use, when the partners will exploit the results to deliver knowledge to relevant stakeholders (e.g., river basin authorities) in the context of TRANSCEND dissemination activities (workshops, serious games), or indirect use, when they will transfer the foreground to other project partners or third parties, that will exploit such results (e.g., to develop river basin plans). Use will also consist in the utilization of foreground in further research initiatives, aiming at the further enhancement of the developed outputs.
- Dissemination of results: for the disclosure of project results, partners are selecting the appropriate means (e.g., scientific publications, publication on web sites, conferences, open access, etc.) according to the conditions set forth in the CA and in the PDEC.

4.6. Management of IPR after the project

At project termination, TRANSCEND's Final 12-month exploitation, dissemination and communication report & legacy strategy (D6.6) will be submitted, including the selected measures for communication, dissemination and exploitation activities; the overall business plan of the consortium (whose first version will be produced as part of D6.5), highlighting the innovation potential; and will include the mechanisms for data management and publications. In addition, D6.6 will also present the main procedures for knowledge protection and intellectual property rights (IPRs) to be applied beyond project's lifetime.

In the same document, the Consortium partners will also update the final findings concerning IP issues, as well as the final update of the IPR Repository, detailing (if any) the commercial intellectual property rights applied for and registered.

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