



TRANSCEND

Deliverable 1.3: GUIDELINES FOR SCENATHONS

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Deliverable D1.3 – Guidelines for scenathons

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Executive summary

The document provides guidelines on how to develop Scenathons or scenario marathons, as a methodology to achieve a positive and open interaction with decision-makers related to water management. Scenathons are a type of serious game used to foster the integration and understanding of complex scientific models in the decision-making processes. They are part of a broader stakeholder engagement process named knowledge networks. In this project, knowledge networks are fundamental to building trust, credibility, and the willingness of stakeholders to co-create and implement the TAPs.

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Annex 2. [Serious Game USAL](#)

1. Introduction

In this document, guidelines for developing workshops to co-create **Transformational Adaptation Policies (TAP)** are presented. TRANSCEND has developed a groundbreaking ecosystem of innovation that combines knowledge networks, an actionable modeling suite, and an accounting and monitoring toolbox. The knowledge networks look for a transparent stakeholder engagement and knowledge-sharing method, allowing the co-creation of TAPs in living labs, where active, informed, and equal participation is essential for TAPs adoption.

The TAP co-creation process can be complex due to several reasons. 1) stakeholders usually have diverse objectives and needs for resource management, particularly water, where in times of scarcity or crisis individual needs take precedence over general interests; 2) Informing water management decisions is a complex task because available water depends on factors with high uncertainty such as climate, land cover, economic instruments, and socio-cultural habits. This uncertainty undermines the credibility of the models and the use of information for decision making. 3) the degree of participation of the actors varies according to their interests, roles and responsibilities, capacity for involvement, and power relations (Bresney et al., 2023).

To respond to these challenges, methodologies have been developed that focus on coordinating the efforts of decision-makers and developing strategic planning processes (Council of the European Union, 2009; Hassing et al., 2009; Savenije & Van Der Zaag, 2008). The Robust Decision Support (RDS) framework proposes the integration of the development and use of water resource management models with a structured participatory process that promotes the negotiation of interests, the collaborative construction of models to simulate reality and define several strategies to simulate and compare to make better decisions according to different scenarios (Purkey, David et al., 2018).

In each living lab part of TRANSCEND there are previous relationships with stakeholders, helping to build the knowledge networks that will be used as platforms for the co-creation of TAPs. The knowledge networks seek to improve the decision-making process and TAP co-creation through continuous engagement with stakeholders. However, this co-creation will not necessarily be conducted to the TAP implementation, because this implementation depends on the willingness of decision-makers to take the TAP completely or partially in real-life water management. The co-creation includes a monitoring process in each living lab to inform and develop the models and characterization of the uncertainty. The models facilitate the understanding of features (e.g. water quantity and quality, water demand), relations (e.g. water demand and supply balance), tradeoffs (e.g. changes in land use due to urbanization increase flood risk and at the same time could reduce water consumption converting agriculture to drinking water use) in complex systems.

To achieve engagement with the actors, it is useful to have a clear roadmap to guide the TAP co-creation process for its application during workshop methodologies design, making each meeting a successful moment to achieve the objectives of TRANSCEND. In this sense, this document develops 1) a roadmap to guide the TAP co-creation process and 2) guidelines to develop workshops for the TAP Co-creation process, called **Scenathons**.

2. A roadmap to guide the TAP co-creation process.

Multiple experiences in the strategic planning process for water management show the need for a structured participatory process that allows interaction and negotiation among stakeholders with multiple objectives (Roovers & Van Buuren, 2016). The Robust Decision Support RDS Framework is characterized by engaging with stakeholders through a co-creation process starting from a shared understanding of reality, the development of models to characterize complex water systems, and the simulation of scenarios to evaluate and compare possible actions or strategies using TAP indicators. The decision-making process will depend on the negotiation between stakeholders to meet their objectives with a broad view of the water system, the credibility of the models that represent the system, and the visualization tools applied to analyze diverse scenarios and facilitate agreements based on the system response data (Purkey, David et. al., 2018).

In Figure 1, an adjustment of the RDS framework is presented to integrate the Scenathons, as workshops to co-create the TAPs in TRANSCEND. To achieve a clear and transparent participatory process, stakeholders should have a clear understanding of the iterative steps that are part of the co-creation of TAPs. The phases of the participatory process i.e., preparation and formulation, evaluation and agreement, and implementation and monitoring, include a series of numbered steps that are described in detail in [Annex1](#). In this roadmap, the information presented in Figure 1 is explained comprehensively, including the phase, step, methodology proposed, and strategies for engagement (see Table 1), relation with deliverables (see Table 2), and a preliminary list of TAP that could be included in each living lab (Table 3).

Steps 1 and 2 in the roadmap are key to the TAP co-creation process. Step 1 seeks to understand the decision-making space that can produce the desired transformation. In this sense, it is also necessary to pre-identify the transformation that is expected to be achieved through the definition of the TAPs. This transformation should be validated and confirmed as the project develops. The space for decision-making where the TAPs are expected to fit can be planning instruments such as environmental, territorial, or sectoral plans, climate change adaptation plans, and action plans for communities or organizations in land management, among other planning instruments.

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In step 2, actors that should be part of the co-creation process are identified, which are those actors that are part of the decision-making process and that can produce transformations in the territory and the use of water. Representatives of the sectors affected by water management, the lack of water resources, and the alteration of its quality should also be included. A detailed description of the Stakeholder map, power relations, and space for decision-making is presented in Deliverable 1.1 Stakeholder Mapping by Lab.

For each Scenathon, an objective is defined accordingly with the phase in the Co-creation TAP process. The arrows in Figure 1 mean that this co-creation process may not be linear, but rather iterative. Once strategies have been evaluated it may be identified that a return to scenario definition and vulnerability assessment is required when not finding a TAP in line with stakeholder expectations. It may also happen that its impacts do not generate the expected results and, therefore, the system's problems and vulnerability need to be re-evaluated. More information about the RDS framework can be found in (Purkey, David et al., 2018)

In the Scenathons, we are going to use two types of indicators: Engagement Champion indicators and TAP indicators:

Engagement Champion indicators: These indicators are defined to measure the stakeholder engagement in the project and our ability to integrate stakeholder feedback into the project workflow and results (See Table 1). A dashboard to consult the indicators of all living labs can be found on this [link](#)

TAP indicators: These indicators are defined to compare the possible results of the TAPs in each system. These indicators are defined for each living lab according to the variables to be addressed in each system. They could be impact indicators e.g., water available, demand served, percentage decrease in system losses; or performance indicators e.g., percentage of municipalities with designed tariff systems.

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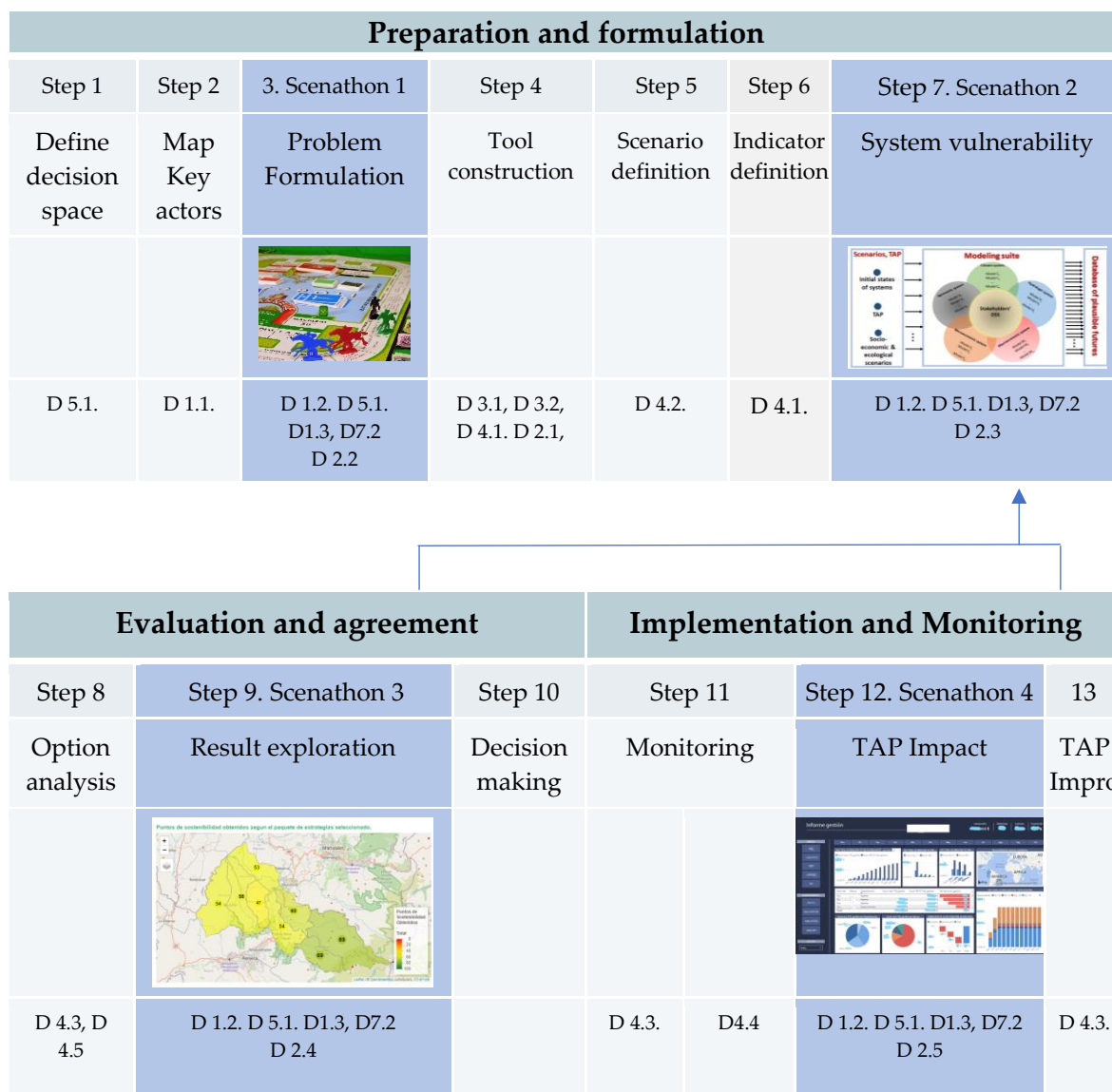


Figure 1. TAP Co-creation process based on RDS Framework (Adapted from Purkey, 2018)

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Table 1. Engagement Champions Indicators

	Indicators on balanced and inclusive involvement	Targets
1	Number and % of women that are part of the living laboratories (attending, reporting, contributing) and WS	50%
2a	Number of gender-related feedback (particularly on adaptation strategies) collected during WS	50%
2b	<i>Describe gender-related feedback</i>	
3a	Number of different categories of organizations (public authorities and regulators, utilities, users, civil society organizations, industry, and scientists) involved in the Laboratories	
3b	<i>List categories of organizations involved (public authorities and regulators, utilities, users, civil society organizations, industry, and scientists)</i>	
	Indicators of interactions with stakeholders	
4	Number and % of stakeholders involved in the workshop (% over total number of members in the knowledge network of that lab)	100%
5a	Number of tools used to collect feedback in the workshops (e.g. questionnaires, Delphi, serious games, scenathons)	
5b	<i>List the tools used to collect feedback</i>	
6a	Number of stakeholder meetings other than workshops (bi- and multi-lateral meetings with specific stakeholders, in person or online) carried out in the laboratory	
6b	<i>Number of people involved in these meetings</i>	
7a	Number of other interactions with stakeholders other than meetings/workshops (such as mail, social media, other)	
7b	<i>List the type of interactions used and the <u>number</u> of interactions per type</i>	
	Indicators of contributions to co-creation by Stakeholders	
8a	Number of stakeholder models proposed by stakeholders for their incorporation into the modeling suite	
8b	<i>Number of stakeholder models proposed by stakeholders that are effectively incorporated into the modeling suite</i>	
8c	<i>List the stakeholder models effectively incorporated into the modeling suite (e.g., AQUATOOL)</i>	
9a	Number of scenarios co-designed by stakeholders	
9b	<i>Number of scenarios co-designed by stakeholders effectively modeled in the modeling suite</i>	
9c	<i>% of scenarios co-designed with stakeholders over total scenarios simulated</i>	100%
10a	Number of Transformational Adaptation Policies (TAP) co-designed by stakeholders	
10b	<i>Number of TAP co-designed by stakeholders effectively modeled in the modeling suite</i>	
10c	<i>% of TAP co-designed with stakeholders over total TAP simulated</i>	100%
11a	Number of dashboards (or other tools) to share results and impacts of TAP Implemented	
11b	Number of evaluations of stakeholders about the dashboard or other tools, and the utility.	

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12	Number of publications, change stories and lessons learned shared with stakeholders	
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Table 2. Deliverables in TRANSCEND

Del. No.	Deliverable name	WP	Lead	Type
D7.1	Inception Report and Roadmap	WP7	USAL	R
D6.1	Detailed and revised PDEC and IPR strategy	WP6	USAL	R
D6.2	Data management plan	WP6	UU	R
D7.2	Ethics Management Plan	WP7	UPV	R
D1.1	Stakeholder mapping by lab	WP1	CMCC	R
D1.2	Rules of Engagement	WP1	CMCC	R
D3.1	White paper: methods & models	WP3	USAL	R
D4.1	White paper: monitoring & enforcement	WP4	UoM	R
D4.2	White paper: socioeconomic scenarios by lab	WP4	CMCC	R
D5.1	White paper: governance/policy enablers/barriers	WP5	USAL	R
D2.1	Blueprints of the modeling suite by lab	WP2	UPV	R
D1.3	Guidance for scenathons	WP1	SEI	R
D4.3	Database of TAP monitoring & sourcebook	WP4	UoM	R&DAT
D6.3-6	Exploitation, diss. and communication reports	WP6	ARPAE	R
D7.3-6	Progress, Impact, and Contingency Risk	WP7	USAL	R
D2.2-5	Co-creation Reports (I-IV)	WP2	SEI	R
D3.2	Modeling suite prototype and sourcebook	WP3	USAL	R&S
D4.4	Water accounting & impact assessment toolbox prototype	WP4	UoM	R&S
D5.2	White paper: financing mechanisms	WP5	CMCC	R
D1.4	Knowledge Networks mid-term report	WP1	SEI	R
D4.5	Scenarios database & sourcebook	WP4	CMCC	R&DAT
D4.6	Populated water accounting and impact assessment toolbox	WP4	UoM	R&DAT
D1.5	Knowledge Networks Final report	WP1	CMCC	R
D5.3	Policy notebook	WP5	USAL	R

Table 3. Transformational Adaptation Policies TAP (TRANSCEND proposal)

- 1) water allocation systems (e.g., ‘unbundled’ allocation systems that first set the allocable renewable resources, and then allocate resources within this limit— via shares, priority rights, or others—, water allocation systems that recognize return flows and prevent negative impacts from higher consumptive rates on downstream users— via “net” consumption rights or ad-hoc reductions of withdrawal rights),
- 2) economic instruments (e.g., pricing, insurance, subsidies, payment for ecosystem services/PES, trading, penalties—e.g., against water theft),
- 3) digital technologies (e.g., irrigation and climate services),

- 4) non-conventional water (desalinated water, treated wastewater),
- 5) nature-based solutions (e.g., wetlands for aquifer recharge),
- 6) resilience instruments that enable rapid and sound recovery when unfavorable events occur (e.g., insurance, state aid, solidarity fund).

3. Guidelines for Scenathons

According to the TRANSCEND grant agreement, *“Exchanges in knowledge networks will be conducted through scenathons or “scenario marathons”, a type of serious game used to foster the understanding and integration of complex scientific modeling and related outputs into decision-making processes (FABLE, 2020); and managed through an inclusive, empathic, participatory and transparent conversation inspired in the Talanoa Dialogue (UNFCCC, 2018), to build understanding and constructive and respectful debate”*. Interaction with the model results allows stakeholders to understand, based on monitoring and data, what the current status and trends of the water resources are if we do nothing and consider the TAPs. These scenarios incorporate historical climate trends and climate change scenarios, population growth, and trends in land cover changes. These scenarios have an associated uncertainty that will be discussed with the participants.

In the TAP Co-creation process, four workshops are proposed, which are highlighted in blue in Figure 1. To achieve articulation with stakeholders and overcome the challenges in participation, serious games or Scenathons are proposed as approaches to develop interactions with stakeholders in each living lab. Serious Games have been previously developed by some of the members of TRANSCEND and are presented as examples in Figure 2. These examples of Serious Games are based on virtual dashboards that allow to sharing of model results, scenarios analysis and comparison, and uncertainty. These examples are developed for specific basins and work with a context. Other kinds of Serious Games are developed to play in fictional contexts and could be replicable without any adaptation. A complete explanation of this Serious Game can be found in the following folder [D1.3](#).

1 	Formulación del POMCA del río Campoalegre Formulation of Strategic Watershed Plan of Campoalegre River, Colombia https://latinoamericasei.shinyapps.io/juego_Serio_POMCA_Campoalegre/
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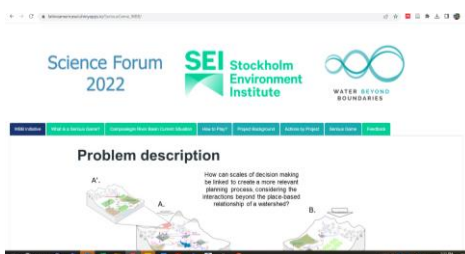
2		Water Beyond Boundaries Initiative https://latinoamericasei.shinyapps.io/SeriousGame_WBB/
3		Modelo para la toma de decisiones participativas. Cuenca La Paz- Choqueyapu, Bolivia Model for participatory decision making. La Paz- Choqueyapu watershed, Bolivia. https://latinoamericasei.shinyapps.io/MTDP_CuentaAltaRioLaPaz/

Figure 2. Examples of Serious Games platforms

3.1. Scenathon 1: Problem Formulation.

Objective: To identify conflicts around water management, as well as modeling and monitoring gaps.

Methodology: Workshop with three moments (identification of problems related to water management, monitoring, and a survey about modeling gaps). In each moment a set of questions will be explored for each living lab to respond to common questions.

Narrative: This scenathon has great importance because it is the first approach of the project to the stakeholders. It is fundamental to perceive the existing power relations, whether it requires extending the call to other relevant stakeholders and identifying the main partners for the model's co-creation. Some of the partners for model co-creation could be information providers, water users, and water authorities. The identification of top-down or bottom-up decision-making processes applied in the living lab study is key to defining a practical strategy to engage the discussion related to TAP implementation, its potential effectiveness, efficiency, flexibility, sustainability, and replicability (Sherman & Ford, 2014). In this workshop, it is expected to see each relevant stakeholder's objectives, and if there is a joint motivation to implement TAPs in the water system, and with that information define a lead stakeholder to work with for the implementation of a transformational approach to through the TAPs, once limitations and opportunities are clear

Engagement Champion Indicators: 1 to 8 (See Table 1)

Inputs: Map Stakeholders,

Outputs: Problem Formulation, Gaps Modelling, and Monitoring. Stakeholder identification to work the transformational approach of the project.

3.2. Scenathon 2: System Vulnerability

Objective: To validate vulnerabilities of the study area of the living lab for current and future scenarios using the model suite and to identify and define necessary improvements by providing specific targets that will help to define achievable TAPs.

Methodology: In this Scenathon, the modeling suite developed to respond to regional needs will be used to inform vulnerabilities in the water system. This will be the first scenathon where the stakeholders will get to know the modeling suite developed in each living lab. Therefore, the information supporting the implemented coupled model, calibration, and validation should be presented. The scenathon will have two moments: First, the stakeholders will explore the model suite in current conditions and future scenarios, without any TAP implemented or in the framework of different emission scenarios from moderate to business as usual. Second, the identification of specific targets according to the issues and problems of the study area will be discussed and identify according to stakeholder's preferences and interests. It is important to show with the modeling suite the tradeoffs, relation, and dependency of strategical features of the system (linearity, non-linearity, correlation, proportionality) to acknowledge with the participants that some changes not only could make improvements to reach one target but also could decrease the performance of the system for other targets. This conversation is key to building a shared idea of the current and future situations of the living lab between the project team and the stakeholders.

Narrative: For this exploration a serious game with different challenges will be introduced, to identify the implications of current and future conditions. The future conditions will be the combination of several scenarios such as climate change, population growth, change in land cover according to agricultural activities, infrastructure development e.g., hydropower facilities, and so on. The built of the scenarios will be under the consideration of showing a feasible range to represent the uncertainty of the projections and at the same time highlight the credibility of the modeling suite through the reporting of the efficiency metrics of the models (robust approach) to visualize the outcomes of the simulations (Purkey et al., 2018). With these results, the stakeholders could suggest some targets to obtain (e.g. keep a minimum stream flow rate, increase the coverage of drinking water in a given city, the optimal level of production for the minimum level of earnings for a given agriculture sector) and alternatives that will not yet be simulated in the models, but which will be used to search and design the proposed TAPs for the next Scenathon. The set of targets discussed

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during this scenathon will provide a clear idea about the transformational approach of the living lab to be reported for the project.

Engagement Champion Indicators: 1 to 9 (See Table 1)

Inputs: First version of the model suite, Climate Change Scenarios, population growth. Uncertainty analysis, built with the help of the identified stakeholders from the previous Scenathon, to properly represent and visualize the current and future features of the system

Outputs: Validations of current and future vulnerabilities in the water system with stakeholders using the model suite, including uncertainty. Collection of targets according to agreed issues to be acknowledged for possible TAPs suggested by stakeholders during the workshop and blueprint for the coordination in the design of the TAPs.

3.3. Scenathon 3: TAPs Exploration

Objective: To compare and define feasible TAPs using model simulations and comparison between targets through TAP performance indicators.

Methodology: Simulations of TAPs and comparison with the “business as usual scenario” (BaU). This comparison will be conducted using TAP performance indicators responding to the need to reach the identified targets to improve the BaU condition of the system.

Narrative: According to the targets identified for the system and the collected and designed TAPs developed from the previous scenathon, In Scenathon 3 stakeholders will be comparing the situation “with” and “without” the TAPs, using a set of performance indicators. The same challenges introduced in the previous workshop will be used to discuss with the stakeholders the tradeoffs of implementing or not a given set of TAPs, the serious game may consider the conformation of groups to define a given set of TAPs to reach, if possible, the targets defined in the previous scenathon. The group of stakeholders choosing the TAPs or action combination that provides better indicator performance will be the winner in the game. At the end, a dialogue about the mechanism to implement the TAP will be discussed.

Engagement Champion Indicators: 1 to 8, 10 (See Table 1)

Inputs: Model with socio-economical, climate change, and population growth scenarios, adjusted to simulate the TAPs considering the identified targets in the previous scenathon. TAP Indicators to compare TAPs.

Outputs: Set of TAPs defined with stakeholders. Agenda and schedule of the next iteration of Scenathon 3 if required (adjust the model for a specific TAP or performance indicator not covered in the prepared modeling suite).

3.4. Scenathon 4: TAP Impact

Objective: To evaluate in a co-creation process the impacts of the TAPs and identify opportunities to achieve the implementation.

Methodology: For this workshop, an evaluation of the TAP adoption and impacts will be conducted. A monitoring toolbox will be defined to measure these variables.

Narrative: In this scenathon an evaluation of TAP adoption and impacts will be conducted, using a monitoring toolbox previously developed. The TAP indicators used in previous scenarios will be included and others identified with stakeholders. In this session, some “change stories” of stakeholders may be recorded about transformative adaptation policies TAP.

Engagement Champion Indicators: 1 to 8, 11,12 (See Table 1)

Inputs: Evaluation of TAP performance using indicators.

Outputs: TAP performance assessment using indicators and change Stories of stakeholders.

4. Scenathons design

Developing each session with stakeholders requires some steps we describe below, including tips recommended from our experience in conducting workshops. See Figure 2.

4.1 Preparation: In this phase, all different variables related to the Scenathon development should be characterized. Consider the following items:

- 4.1.1. Define stakeholder invited according to the actor’s map. Include key institutions, sectors, academia, communities, indigenous groups, and other vulnerable actors. Consider including actors with good local knowledge and/or developing actions to transform the territory. Consider gender balance and inclusion of vulnerable communities, to include several perspectives of solutions
- 4.1.2. Define the agenda step by step. Include the following items:
 - Introduction: stakeholders introduction, Scenathon objective according to the stage of the TAP co-creation process, presentation of rules of engagement (See D 1.1.), agenda
 - Icebreaker: Activity to engage stakeholders in the dynamic and space.
 - Summary of previous scenathon and main conclusions: This participation process has a chain structure, where each activity is a product of the previous interactions. To remind the participants of the previous results that have fed the activity to be carried out and to update those who are new to the process, it is suggested to make this summary of the activities previously carried out and the main conclusions. In

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this moment of the Scenathons, participants could identify some gaps, new problems, or strategies. This new information could be included in future interactions.

- Describe your Scenathon: a narrative must be developed that actively involves the participants and allows the objective to be achieved. According to the narrative, the rules of the game will be included.
- Development of the scenathon: Identify all resources required (e.g., space, tables, computers, videobeam). Before the session, a rehearsal may be conducted to verify the model suite operation, visualizations, and coherence between the narrative and model suite results.
- Conclusions: share the results of the game and how the objective of the workshop was fulfilled. Open the space for dialogue, comments, and questions.
- Evaluation of the process using surveys or short questionnaires, interviews, or open questions to all participants. The engagement champion indicators quantification should be included in the evaluation.
- List space requirements, type of table organization, materials, and communication (translation).
- Define the role of each participating team member in the workshop (moderator, presenter, notes, help in roundtables if required) and how many roundtables are required according to participants.

4.2. Implementation: Development of each workshop or scenathon. Some tips are included below:

- 4.2.1. Invite stakeholders well in advance to ensure participation.
- 4.2.2. Confirm their participation.
- 4.2.3. Implement pre-registration (by Internet or other media).
- 4.2.4. Start on time and follow times and agenda but maintain flexibility. Each location has its dynamics so try to flow accordingly.
- 4.2.5. Maintain the focus on the participants, listening and connecting. In these workshops, the center is around participants, their opinions, and information.
- 4.2.6. Observe if all stakeholders are participating and try to include all of them in the conversations. Usually, some representatives of vulnerable groups, women, indigenous communities, or other groups do not feel confident to speak in public.
- 4.2.7. If possible, record the session, define one person to take pictures, and notes, and interview some participants about the methodology and results.

4.2.8. Enjoy the interaction and try to maintain a positive environment.

4.3. Documentation: information about the workshop should be documented in a report and record material. Consider the following tips:

- 4.3.1. Report: The main objective of the report is to synthesize the information produced in the scenathon. This report includes the information contributed to the TAP co-creation process, the tools and models, and the monitoring information required in each TAP.
- 4.3.2. Incorporate information, comments, and conclusions of stakeholders.
- 4.3.3. Include an evaluation of the workshop in terms of the instrument used e.g., survey, interviews, open questions. Explicitly mention what you did well and wrong.
- 4.3.4. Include recordings, pictures, and interviews.
- 4.3.5. Engagement Champion Indicators: these indicators help to evaluate the engagement of stakeholders in each Scenathon, so an analysis comparing the targets and the results should be included in the report for each Scenathon. These indicators help us to identify if we need to rethink some aspects of each living lab. A dashboard of engagement champions indicators can be consulted [here](#)

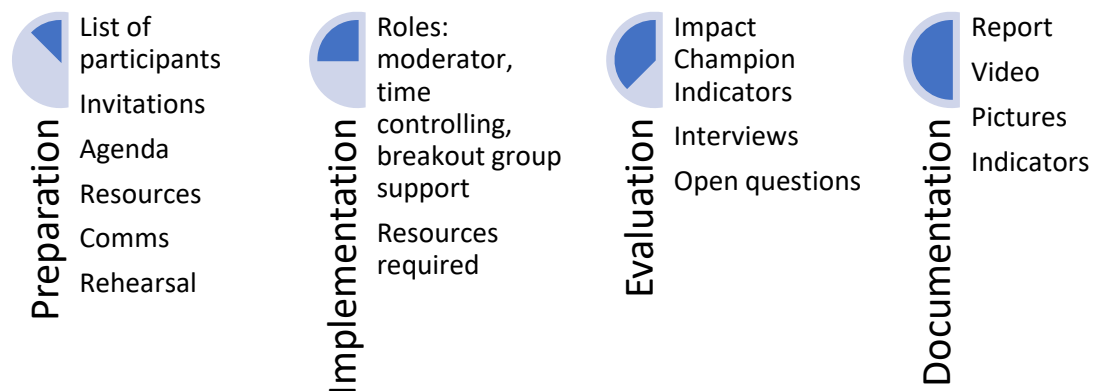


Figure 2. Scenathon design

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