

Tips on how to go about the challenge: Adaptation and Resilience

The Adaptation and Resilience Challenge asks teams to develop and test ideas for interventions that could help tackle specific context-dependent water variability challenges. To do this, you should take the following steps:

Steps

1. **Choose and Frame your Challenge.** You will define the problem and scope.
 2. **Gather Evidence.** You will collect data that helps you map the system, identify dynamics, and any vulnerabilities.
 3. **Design & Prototype.** Your team will create and test a real-world intervention.
 4. **Reflect & Learn.** You will rapidly iterate your prototype, refining the design based on stakeholder feedback and performance data
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Step 1: Choose Your Challenge

In this step, your team will identify a specific challenge. This helps you to

- Narrowing a broad issue into a concrete, manageable project scope, enabling targeted analysis and action.
- Ensure your challenge is contextually relevant. Challenges differ significantly by place and influence appropriate solutions, e.g., floods in Bangladesh vs. drought in Turkey.
- Align stakeholders towards a common vision. A shared understanding of the problem guides engagement by ensuring everyone works on the same, explicitly stated problem.

What to Do

1. **Select a tangible issue to tackle. Example themes in water include:**
 - o Flooding (e.g., stormwater, river overflow, coastal inundation)
 - o Drought and water scarcity
 - o Water quality (e.g., contamination, access to clean drinking water)
 - o Variable cycles (alternating between flood and drought)
2. **Define the *geographic* and *temporal* context:**
 - o Decide whether you're focusing on a local community, urban neighbourhood, watershed, region, or nation.
 - o Set the timeframe for your study (e.g., a particular rainy season, a multi-year drought period).

3. Frame the problem clearly:

- o Specify the “what,” “where,” and “why now.”
- o Identify the impacts you intend to address (e.g., health, food, infrastructure, ecosystem).

Illustrative Example (you’ll need to be more detailed)

Element	Example
Water Issue	Frequent urban flooding due to intense rains
Location	Central Istanbul, at the intersection of old and new construction
Timeframe	Expected high-rainfall season—from November to February
Problem Statement	“During intense rainfalls of 25 mm+, street flooding damages homes and disrupts transport.”

- If you have a clear and targeted focus and framing, this will help you with the next steps.
- For example, in the **Gather Evidence** phase, your team might measure rainfall, map flood zones, or interview affected residents. This then influences the design of your intervention.

Step 2: Gather Evidence

In this step, your team will gather evidence, data and information to help you better understand your challenge. The better you can understand the situation as it is today and how it affects the communities, the more relevant your intervention can be. You could collect the data yourselves, use secondary data from publications and reports, or use proxy data from public datasets.

The evidence also gives you a baseline for estimating the impact that your intervention may have. Baseline data may include hydrology (rainfall, streamflow, groundwater levels) and social impacts (household water access, flooding history).

You should aim to map the interactions and vulnerabilities using simple system visuals. This will help you see the complexity of the water system and avoid unintended consequences. Mapping may include causal-loop diagrams to help you identify feedback loops, thresholds (e.g., rainfall quantity triggering floods). or the “5-Whys” method to help you trace root causes (dec.ny.gov).

Illustrative Example

In a dry-season village, teams record streamflow and interview farmers about water shortages. A causal loop diagram could show how over-extraction leads to lower water levels

that are available for irrigation. This in turn leads to crop failures and consequently increased extraction by farmers. This illustrates a reinforcing feedback loop and could indicate a risk of the water-food system collapsing.

Step 3: Design & Prototype your Intervention

In this step, your team will develop an intervention that helps communities, regions or nations adapt to the issue you identified in step 1. It should be informed by the evidence you collected in step 2 and the causal loop diagram that you drew.

Examples of intervention could be a physical artefact (e.g. a storm surge barrier), a financial tool (e.g. micro-insurance), a policy (e.g. to strengthen ownership rights in a region). There will be many other ideas that you could develop.

In this step, you should

- **Use your causal loop diagram and brainstorm 3–5 interventions that are targeted at system leverage points (e.g., storage, policy, behaviour). Focused interventions on leverage points can shift system behaviour more effectively than superficial fixes.**
- **Ensure your intervention is equitable and that the poorest or most marginalised benefit and do not have to bear the costs.**
- **Evaluate your intervention. Important criteria include assessing how feasible it is, gathering stakeholder support and understanding whether it is equitable and fair for all stakeholders, and identifying potential co-benefits or trade-offs that you may have to mitigate against. It's important that you conduct ethical research and ensure you have permission to collect the data.**
- **You should then develop and build a minimal prototype appropriate to the challenge: a physical model, policy brief, app mock-up, or financial prototype. Prototyping will help you test real-world assumptions and allow you to learn and refine early in the process.**
- **You should develop indicators that allow you to assess how effective your intervention may be.**

Illustrative Example

Your team builds a miniature rain-garden module that is a prototype to illustrate how water runoff can be filtered to reduce street flooding. You can show how effective this is by calculating the amount of water in the street with and without your module.

You write a short policy memo for the town council that outlines an incentive scheme for homeowners to install permeable surfaces.

Step 4: Reflect & Learn

The prototype you developed in step 3 will need to be refined based on your feasibility assessment, stakeholder feedback and the actual performance of the initial model. Prototyping should be rapid and iterative: short-cycle feedback ensures projects are continuously improved and stay grounded in real-world needs.

You will need to identify important stakeholders (e.g. homeowners, local council), show them the working prototype, and gather quantitative or qualitative feedback. With the actual performance data, you can adjust the design of your prototype in an informed manner.

Learning, refining and adapting are essential for adaptation and resilience. The world is rarely static, and you need to take the dynamic nature into account [withwayfinder.com](https://www.withwayfinder.com), [researchgate.net](https://www.researchgate.net)). You should ensure you document important findings, the changes you make, and future directions.

Illustrative Example

Users of your rain-garden module report that it works for light rain but overflows during heavy storms. You collect data to verify this observation and then adapt your prototype by adding overflow channels and low-cost sensors. You document this in a short report and poster summarising what worked, what didn't, and what you did next