Adaptation & Resilience

Theme Introduction

global sustainability challenge

Our focal point this year: *Water*

Climate change is already resulting in diverse environmental hazards that are impacting exposed and vulnerable people, nature, and assets globally. To help us all talk about very different local manifestations of climate impacts and types of resilience, our focal point under the theme this year is *water*. This can mean tackling flooding, crop failures, drought (and associated wildfires), and much more.

While we encourage all entries to be creative and make an effort to connect with this focal point, other submissions within the broader theme of adaptation and resilience are still welcome.

Table of Contents

The Problem

Water variability

Water is resource for life, ecosystems, and economies, but increasingly subject to unpredictable swings in availability. The primary causes can be linked to:
(1) climate change (alters precipitation patterns, increasing frequency of heavy storms and the direction of dry periods), and
(2) land-use change and over-extraction (creates local water stresses and shifts in regional water cycles).

This can result in droughts, floods, or abrupt swings between extremes, affecting the lives and livelihoods. The issue cuts across multiple UN SDGs, and we present few examples on the right.

UN Sustainable Development Goals

SDG 2: Zero Hunger

End hunger, achieve food security and improved nutrition and promote sustainable agriculture

SDG 14 & 15: Life on Land and in Water

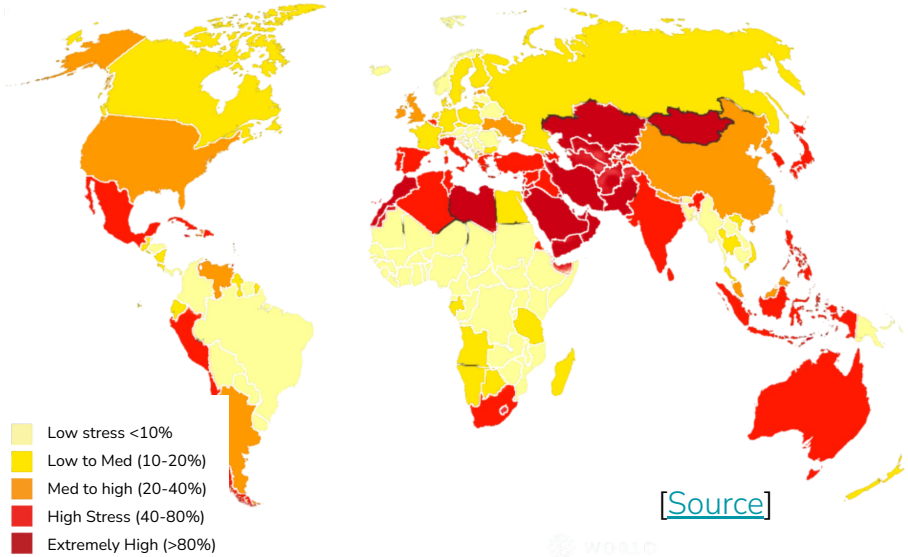
Conserve & sustainably use oceans, seas & marine resources.
Protect, restore & promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

SDG 6 & 11: Clean Water, and Sustainable Cities & Communities

Ensure availability and sustainable management of water and sanitation for all
Make cities and human settlements inclusive, safe, resilient and sustainable

Why does this matter?

Water stress increasing rapidly



[Source]

Water Stress by Region, 2023

UN Sustainable Development Goals

SDG 2: Zero Hunger

e.g. Kenya had severe drought in 2008 to 2010 with compromised livestock and food security for 11 million, affecting vulnerable pastoral communities.

SDG 14 & 15: Life on Land and in Water

e.g. California has seen increased wildfires due to drought, impacting biodiversity, forest cover and local wildlife.

SDG 6 & 11: Clean Water, and Sustainable Cities & Communities

e.g. Copenhagen (Denmark) was designed for temperate rain, but now experiences cloudbursts and summer droughts.

e.g. Climate change is impacting clean water access in Bangalore (India) through reduced rainfall, increased temperatures, and subsequent water scarcity.

Impact of Geographic Context

Resilient strategies can look very different depending on the region

	DROUGHT-PRONE	FLOOD-PRONE	SEASONAL/VARIABLE	URBAN AREAS
VULNERABILITIES	Irregular rainfall, groundwater depletion, crop failures	Heavy rains, river floods, storm surges	Alternating between droughts and floods, unpredictable seasonal shifts	Stormwater overload, aging infrastructure, contamination risks
STRATEGIES	*Ecosystem restoration, plant breeding*	*Flood barriers, floodplain restoration, early warning systems*	*Flexible water storage, insurance, integrated water resource management*	*Green infrastructure, permeable pavements, smart drainage*

TRANSBOUNDARY DISPUTES ON WATER USE & FLOWS

Your role?

Help solve the water crisis!

Develop a solution that enhances the resilience and ability of people, infrastructure, or natural systems to withstand and adapt to the intensifying impacts of climate change. Solutions may address disaster preparedness, resilient infrastructure, climate-smart agriculture, water security, or other critical adaptation needs through technical, policy, design, or social approaches.

Want more details on the problem?
Check this Theme Overview for Students


Sounds great! Where do I start?

Start engaging with your local community and the global GSC collective!

1 **Start Local**
Talk to your community

2 **Problem Understanding**
Deep dive to research the issue

3 **Problem Definition**
Define your problem statement

4 **Brainstorm & Innovate**
Generate creative solution ideas

5 **Prototype and Test**
Develop and test your solution

6 **Think Global**
Adapt for a global audience!

Want more details? Check these Tips for Students!

Inspiration Board

Young innovators and community leaders across the world have developed solutions to solve parts of this problem.

Here are some successful solutions as inspiration for you!

Run4Salmon (US): Virtual Reality for Public Awareness

Piipee (Brazil): Reduce Flushing Water using Natural Spray

My H2O (China): Data Platform for Rural Drinking Water

DetoXyfi (India): Water Purification for Disaster Relief

Climate AI (Global): Climate Risk Prediction for Agriculture

YouthNet (Bangladesh): Community awareness & Action

Need more inspiration to start?

Here are some problem statements to help get started.

Example 1: Rethinking How Communities Collect and Use Rainwater

Example 2: Reducing AI's water usage

Example 3: Hyperlocal weather & extreme events production

Please note that these are just examples. You should feel free to find problem statements beyond these or that go deeper into the issues.

We encourage innovative and cross-disciplinary thinking!

Rethinking Collection & Use of Rainwater

Problem Statement

In many parts of the world, communities face periods of either too much water (flooding) or too little (drought). Climate change is intensifying this pattern, making water access unpredictable. Yet, even during heavy rains, much of the water goes to waste — running off roads, rooftops, and open grounds. There is a need for innovative, affordable, and locally adaptable solutions that help communities harvest and use rainwater, especially in areas where traditional water sources are drying up or becoming unreliable. These solutions must be designed to strengthen community resilience to climate-related challenges.

How to find a solution?

Step 1: Research traditional and modern rainwater harvesting methods used in your region or other countries

Step 2: Interview families, teachers, or local officials about how they manage water during dry or rainy seasons

Step 3: Brainstorm designs that can capture, store, and use rainwater creatively - on rooftops, roadsides, playgrounds, or farms. Understand barriers to adoption of rainwater harvesting - technology, business model, policy or awareness, etc. Design solution accordingly!

Resources

🔗 Article: DoE Rainwater Harvesting Overview
🔗 Article: Rainwater Harvesting and Treatment: State of the Art and Perspectives

Reducing AI's water usage

Problem Statement

The rapid advancement of Artificial Intelligence (AI) comes with a significant environmental cost: massive water consumption. Training and running large AI models like those behind ChatGPT require vast data centers. These data centers generate immense heat and rely on water-intensive cooling systems. As AI becomes more integrated into our daily lives, its demand for water is projected to soar, potentially reaching 4.2 to 6.6 billion cubic meters by 2027. This strains global freshwater resources, especially in drought-prone regions where many data centers are located, creating competition between the tech industry, agriculture, and local communities for a scarce resource.

How to find a solution?

Step 1: Identify how data centers are cooled today, and identify the drives of water usage in the process.
Step 2: Research alternative and efficient cooling methods for data centers that reduce water dependency. This could include technical innovations like liquid cooling, air cooling in suitable climates, and closed-loop systems that recycle water or business model solutions for shared infrastructure.
Step 3: Understand what is hindering adoption (technology, policy, financing) and design a solution accordingly.

Resources

🔗 Article: Data Centers and Water Consumption
🔗 Video: How Canal Water Cools Data Centers
🔗 Article: How to manage AI's thirst for water?

Hyperlocal Weather & Extreme Event Prediction

Problem Statement

Increasing exposure to escalating extreme weather is directly responsible for substantial agricultural losses, fatalities from increased frequencies of disasters, and strain on critical infrastructure and resources, especially water. Current broad-area and regional forecasts are not sufficient to capture the localized, high-intensity events in many regions, resulting in delayed responses and significant socio-economic damage.

Forecasting tools and predictive data for weather events at a hyperlocal level are critical to reduce our vulnerability to extreme weather events.

How to find a solution?

Step 1: Understand the current weather risks and measurement, prediction or warning systems that exist

Step 2: Identify the gaps in the current systems by interviewing local regulators, businesses, farmers and residents

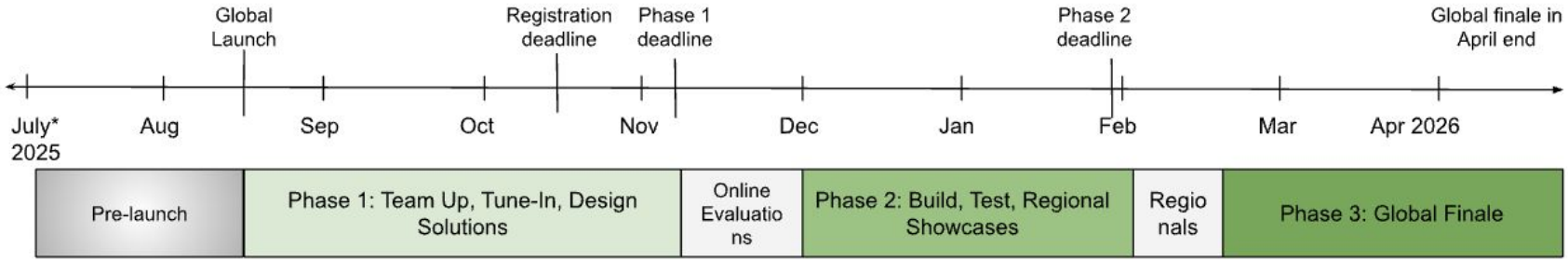
Step 3: Brainstorm to design a solution than can enable higher resolution (longer lead-time, more accurate or more precise) warning system.

Resources

🔗 Article: Climate Change could stump AI Weather Prediction
🔗 Video: Community-based Early Warning Systems

Challenge Phases

What to expect



Phase 1: Team Up, Tune In, Design Forward
Start a team. Choose a subtheme, understand the problem space, and define a problem statement. Generate possible solution approaches. Design the solution. Create a mockup of the idea (sketch, video, etc.).

Phase 2: Build, Test, and Showcase
Build and test a concrete representation of the idea (e.g. working prototypes, testable pilots). Iterate and refine your solution. Showcase at the Regional Finals.

Phase 3: Global Finale
Iterate and refine your solution and pitches. Showcase at the Global Finale.

Deliverables

Submitting an application

- **Phase 1**: Sign up on the challenge portal here: **globalsustainabilitychallenge.org**. Fill out the submission questions on the challenge platform including problem statement, research process and findings. Upload a detailed solution concept including a video of the idea and any mockups or sketches.

- **Phase 2:** Fill out the submission questions on the challenge platform to outline your concrete solution further, provide insights from user testing, and implementation plan for real-world impact. Present a 5 min live pitch (demos encouraged) at Regionals.

- **Phase 3:** Present a 3-5 min live pitch (demos encouraged) at the Global Finale.

Judging Criteria

What we are looking for

- **Problem Definition & Relevance**. Clarity and importance of the problem based on research, user/stakeholder insight, and local/global context.
- **Innovation & Multidisciplinarity**. Originality of the idea and how creatively it combines disciplines, tools, or strategies.
- **Feasibility & Execution**. Realism of the solution, strength of the plan or prototype, iteration based on testing and feedback.
- **Impact & Scalability**. Potential for real-world climate or community impact; adaptability and growth beyond the initial context.
- **Communication & Storytelling**. Clarity, engagement, and persuasiveness of the team's pitch, presentation, and supporting materials

Thank you

Join the challenge today: **globalsustainabilitychallenge.org**

global sustainability challenge