

# Is global warming the biggest threat to water security?

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RGS Unchained Library Challenge

## Background

### Introduction

Water security refers to the dependable provision of sufficient, safe and high-quality water for people, ecosystems and industries. Different regions of the world face distinct challenges: some possess plentiful raw water but ageing distribution networks; others rely on long-distance pipelines or desalination; and many experience contamination, over-extraction, climate-related variability or rapid population growth. Vulnerabilities may arise at any stage of the water-supply chain, influencing not only domestic access but also food production, industry and public health.

### Factors that affect resilience include:

- Reliability of water sources (rainfall, snowmelt, aquifers, rivers, reservoirs, desalination).
- Transportation and distribution infrastructure (pumping stations, pipe networks, leakage, energy supply).
- Water treatment and sanitation systems (filtration, disinfection, wastewater management).
- Governance, technology and long-term planning.

### Areas of possible significance:

- Large metropolitan centres with ageing infrastructure
- Rapidly expanding cities with rising demand
- Arid or semi-arid regions
- Island communities reliant on rainfall or desalination
- Agricultural areas dependent on groundwater extraction
- Regions with strong seasonal variability

Established solutions used internationally include reservoirs, dams, desalination plants, managed aquifer recharge, inter-basin transfer schemes, rainwater-harvesting systems, pressure-management technologies and wastewater recycling programmes.

## Your Task

1. **Is global warming the biggest threat to water security?**
2. **What can we do to protect water security?**

Your task is to present a well-reasoned argument to answer one or both of these questions.

To answer Q1:

- Explain water security in different geographical contexts.
- Consider physical and human factors that affect water security, and issues such as sourcing, transportation, treatment.
- In light of this, discuss to what extent global warming is a significant threat.

To answer Q2:

- Identify one region where water security is an issue, or could become an issue.
- Analyse the particular challenges that face this region, such as sourcing, storage, sanitation etc.
- In light of this, propose a solution that you think addresses the need.

## Submission Options

Whatever you present, focus on **clarity of reasoning** and **quality of research**.

You may present your work in one of the following formats:

- A video presentation (3–6 minutes).
- An A3 research poster.
- A written report (2–4 pages).
- If your solution is a practical one (for Q2), a physical model of your solution.

**SUBMISSION DEADLINE: 22 May 2026.**

Please submit your response to [theunchainedlibrary@rgsg.co.uk](mailto:theunchainedlibrary@rgsg.co.uk)

## Websites that may help

### **Global & Government / Intergovernmental Perspectives**

#### [CSIS – Water Security Research & Analysis \(USA\)](#)

Policy-focused analyses on water scarcity, climate impacts, infrastructure and geopolitics, with case studies and events.

#### [Water Conservation | PUB, Singapore's National Water Agency](#)

Example of a high tech, sustainable, government-led water management scheme

#### [WHO – Water Safety, Quality & WASH](#)

Public-health perspective on drinking water safety, guidelines, disease burden, and water system risk management.

#### [UNICEF – Global WASH \(Water, Sanitation & Hygiene\)](#)

Global programmes, data and reports on water access and hygiene, especially for children and in humanitarian contexts.

### **Scientific & Research Perspectives**

#### [Frontiers in Water – Leading Perspectives on Water Security](#)

Peer-reviewed research topic hosting perspectives and case studies on global water security challenges and solutions.

#### [Water Security & Sustainable Development Hub](#)

Interdisciplinary tools, case studies, and systems approaches to water security across multiple countries.

International Relations & Policy Perspectives

#### [TRENDS Research & Advisory – Water Security & International Interactions](#)

Analyses of transboundary water issues, climate-linked extremes, and the geopolitics of scarcity and floods.

### **Charity and NGO Perspectives**

#### [We Are Practical Action](#)

Technology charity offering low tech, low cost solutions to water security (and other challenges) in low-income locations

#### [Charity:Water](#)

Field-based NGO illustrating community water access challenges and project outcomes, useful for understanding implementation.

#### [Water.org](#)

NGO focused on sustainable financing models and household-level water and sanitation solutions in low- and middle-income countries.

## Mark scheme

### Quality of Research (10 marks)

Basic (0-3 marks): small number of sources, from limited perspectives.

Competent (4-7 marks): good range of sources with varied perspectives.

Advanced (8-10 marks): excellent range of sources with analysis of perspectives.

### Critical thinking (10 marks)

Basic (0-3 marks): work is largely descriptive with little analysis

Competent (4-7 marks): appropriate vulnerabilities or solutions discussed

Advanced (8-10 marks): well-reasoned comparisons of vulnerabilities or solutions.

### Coherent, persuasive argument (10 marks)

Basic (0-3 marks): claims are not substantiated, ideas are weakly linked.

Competent (4-7 marks): ideas are linked, mostly logical structure, solutions appropriate.

Advanced (8-10 marks): cause / effect chains well argued. Solutions justified.

## Exemplar answer outlines:

### Exemplar Outline – Q1

Introduction: Define water security; introduce the idea that multiple threats exist, including but not limited to global warming.

Different Geographical Contexts: Contrast contexts such as Singapore, California, Sahel, and the UK. Discuss variability in sources, infrastructure, and governance.

Threats to Water Security: Analyse climate impacts (droughts, floods, variability) alongside non-climate threats (urbanisation, over-extraction, ageing infrastructure).

Evaluation: Argue relative significance: in some regions climate dominates; elsewhere governance or pollution may be more critical.

Conclusion: Offer balanced judgement acknowledging diversity of contexts.

### Exemplar Outline – Q2

Introduction: Identify region (e.g., Cape Town, South Africa). Explain extent of water-security concerns.

Challenges: Discuss factors such as reliance on rainfall, reservoir depletion, population growth, governance, and infrastructure strain.

Proposed Solution: Present solution such as large-scale wastewater recycling or managed aquifer recharge. Justify with research.

How Solution Addresses Challenges: Explain reduction in demand pressure, resilience to drought, improved reliability.

Evaluation & Limitations: Acknowledge cost, energy demand, need for public acceptance.

Conclusion: Summarise benefits and overall feasibility.