EU CONEXUS

Co-funded by the European Union

SCHOOL DOUKAS

SCHOOL DOUKAS

The Mass Water Consumption By Technology And AI "Visualizing The Invisible"

Marios Kourtis, Michalis Laloumis, Stelios Birbakos, Christoforos Asprogerakas-Grivas

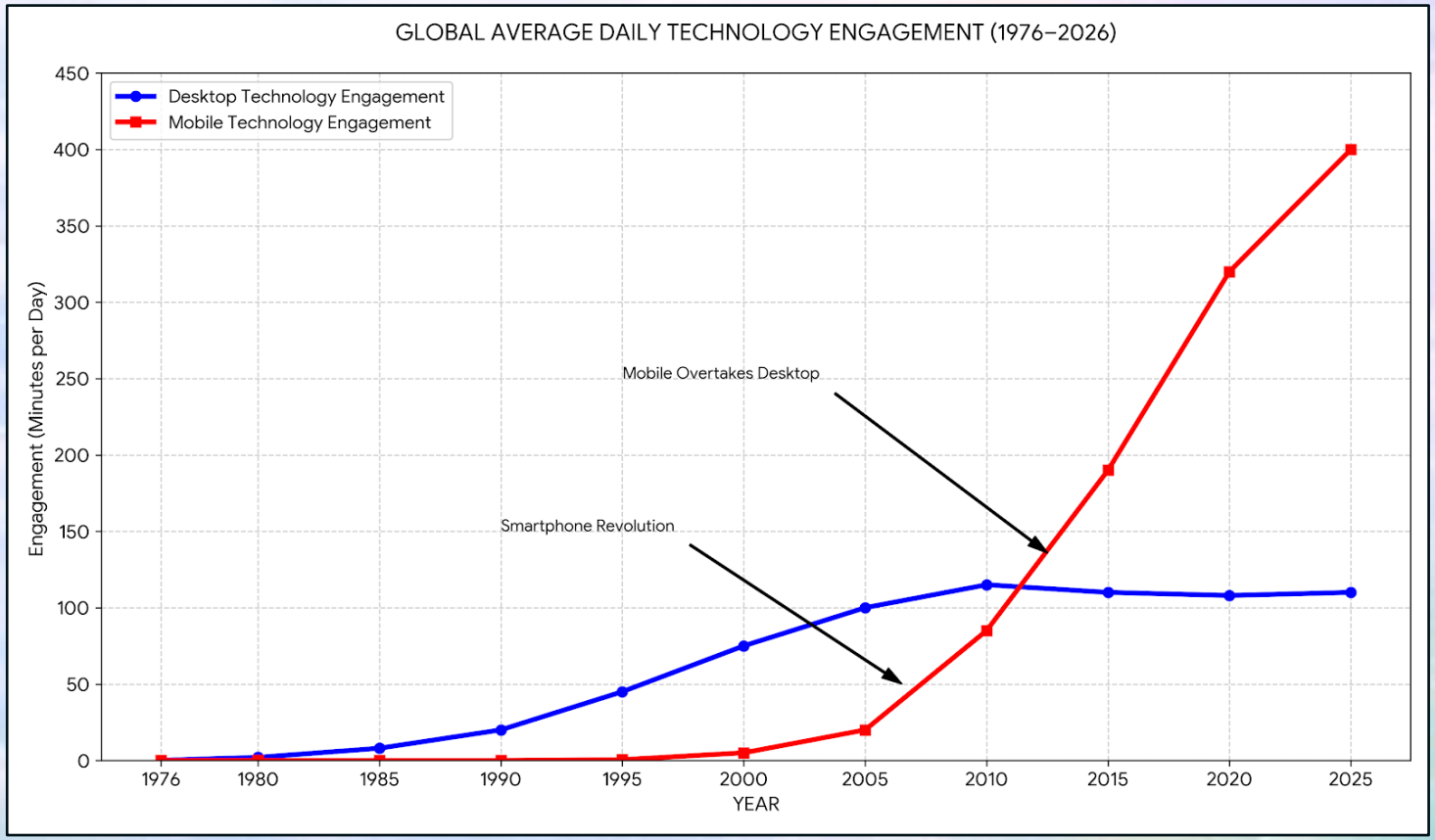
6th edition

Introduction to the Topic

The mass water consumption by technology and Artificial Intelligence

How is the issue developing?

It is spiraling out of control in recent years, due to an increase in the use of technology in almost every aspect of our day



Source: Gemini 1.5 Flash via custom prompting, based on Utrecht University & NOAA Datasets

Introduction to the Topic

The mass water consumption by technology and Artificial Intelligence

What is happening that **we cannot see?**

Without us even knowing or seeing anything, every technological aspect of our daily lives is wasting mass amounts of water to cool down the Data Centres that are used to store data

Source: Envato video generation

Introduction to the Topic

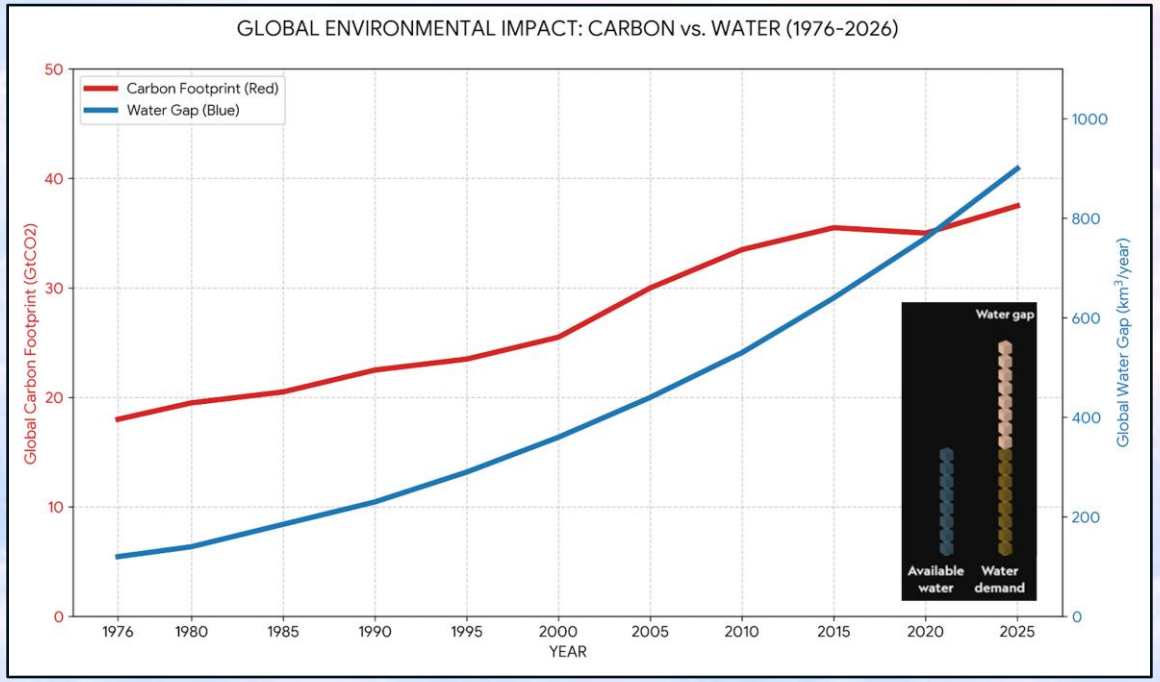
WATER GAP

WATER STRESS

WATER FOOTPRINT

Introduction to the Topic

WATER GAP



Source: Gemini 1.5 Flash via custom prompting, based on Utrecht University & NOAA Datasets

This issue arises when people use more water than the land and water cycle can provide. We deplete aquifers because human extraction is eight times higher than a century ago.

Introduction to the Topic

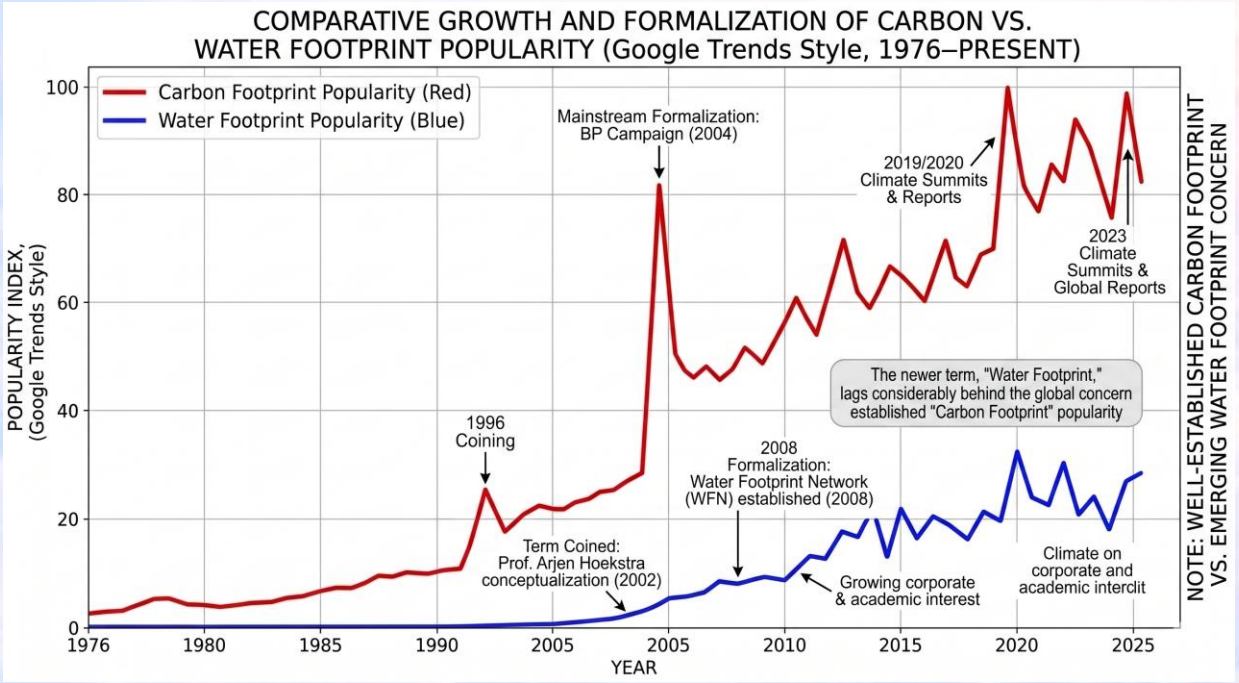
This phenomenon refers to human needs for water compared to actual availability.

WATER STRESS

Countries experience this when clean water availability per person falls below 1,700 cubic meters per capita annually.

Introduction to the Topic

It is the total volume of freshwater used to produce goods and services, directly or, it is mostly indirectly. For technology indirectly. For technology "invisible" water used for manufacturing and cooling data centers

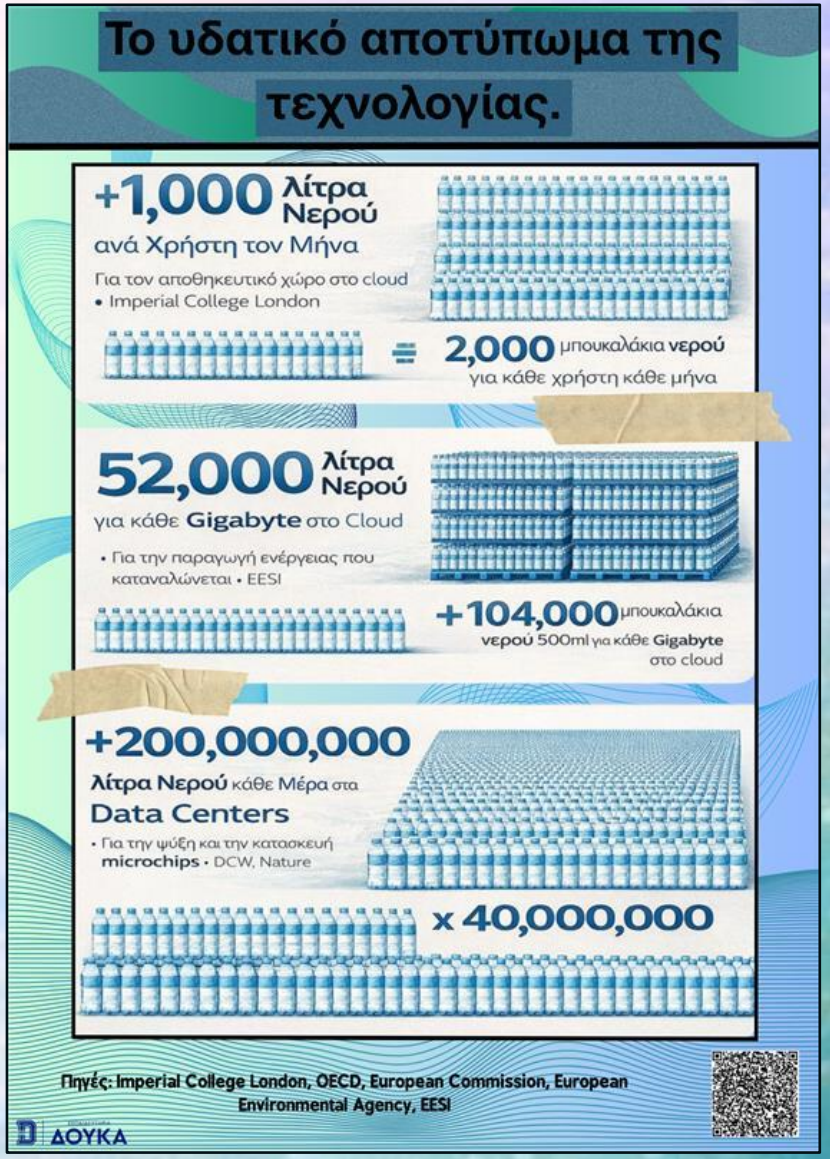


Source: Gemini 1.5 Flash via custom prompting, based on Utrecht University & NOAA Datasets

WATER FOOTPRINT

Community Awareness

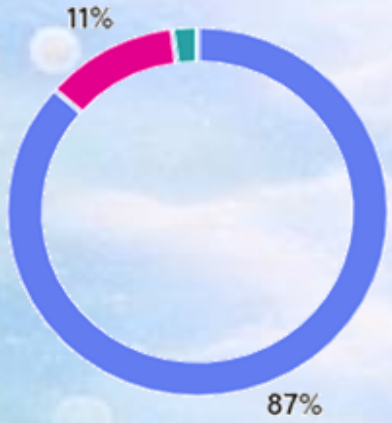
We took some initiatives and we designed some posters that we put up in school classrooms to spread awareness and draw interest to our classmates about this sustainability issue



Community Awareness

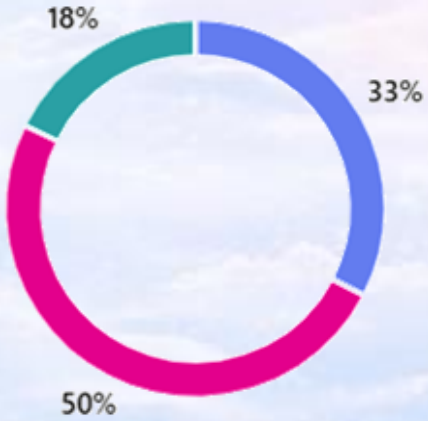
In our school, we have taken multiple actions to make our classmates aware of this issue. First, we created a **small questionnaire** which we shared with young people from 7th grade up to the 12th

Do you consider water waste to be an existing problem in our society?



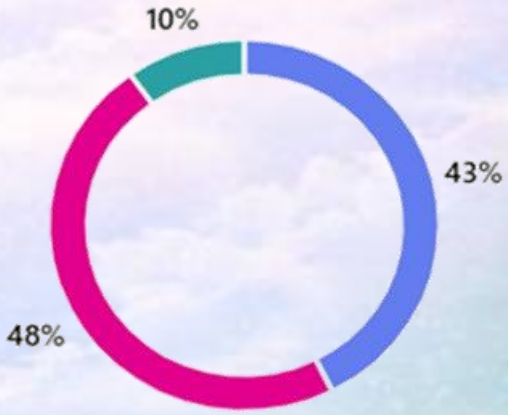
Yes	122
Maybe	16
No	3

Were you aware that technology consumes water?



Yes	46
No	70
I'm not sure	25

Would you be willing to change some of your digital habits if you knew that it reduces water waste??



Yes	60
Maybe	67
No	14

Immersion Cooling

What is Immersion Cooling?

Immersion cooling is: an alternative cooling method for data centers that significantly reduces water and energy consumption and It works by fully submerging the servers in a thermally, but non-conductive liquid

https://www.youtube.com/watch?v=fQfolP7NoNc

The Two Types of Immersion Cooling

Single-phase Immersion Cooling is:	Two-phase Immersion Cooling is:
The method in which the single-phase coolant never changes state; + It does not boil nor freeze, It always remains in its liquid form.	The working fluid can exist in both a liquid or gas state. + the gas then rises above the pool where it is then condensed back to its saturation temperature and falls back into the tank.

The Water Footprint Behind Video Streaming

TOTAL | AI TEXT GENERATION | VIDEO CALLING | DATA STORAGE | DOOM SCROLLING | VIDEO STREAMING | AI IMAGE GENERATION

PER HOUR: ↑ 02 ↓ RESET

PRE-COMPUTATION (ENCODING)	0.10 – 0.20 L
EDGE DELIVERY	0.30 – 0.45 L
NETWORK INFRASTRUCTURE	0.35 – 0.55 L
USER DEVICE	0.15 – 0.25 L
SERVER DATA RETRIEVAL	0.25 – 0.40 L
LOCAL PROCESSING (BUFFER)	0.10 – 0.15 L
TOTAL CONSUMPTION:	1.25 – 2.00 L/hour
EST. (2 × 1X):	3.25L

7
500ML WATER BOTTLES

MULTIPLIER: 480p | 720p | 1080p | 4K

MANAGE SERVICES

AI Text Generation	0.20 – 0.44L/prompt
Video Calling	1.15 – 1.95L/hour
Data Storage	0.15 – 0.38L/GB
Doom Scrolling	0.66 – 1.20L/hour
Video Streaming	1.25 – 2.00L/hour
AI Image Generation	0.42 – 0.85L/image

Combined Water Footprint All Selected Services

TOTAL | AI TEXT GENERATION | VIDEO CALLING | DATA STORAGE | DOOM SCROLLING | VIDEO STREAMING | AI IMAGE GENERATION

AI TEXT GENERATION (4 PROMPTS × 1X)	1.3L
VIDEO CALLING (4 HOURS × 1X)	6.2L
DATA STORAGE (8 GBS × 1X)	2.14L
DOOM SCROLLING (4 HOURS × 1X)	3.72L
VIDEO STREAMING (2 HOURS × 1X)	3.25L
AI IMAGE GENERATION (5 IMAGES × 1X)	3.18L
GRAND TOTAL:	19.79L

40
500ML WATER BOTTLES

MANAGE SERVICES

AI Text Generation	0.20 – 0.44L/prompt
Video Calling	1.15 – 1.95L/hour
Data Storage	0.15 – 0.38L/GB
Doom Scrolling	0.66 – 1.20L/hour
Video Streaming	1.25 – 2.00L/hour
AI Image Generation	0.42 – 0.85L/image

But why only explain to you when we can show you!!!
https://visualisingtheinvisible.com

Source: watercalculator.org, what-uses-more.com, ChatGPT 5.3 custom prompting

The ECO-VISION team
BACK TO MAP
The ECO-VISION team
BACK TO MAP

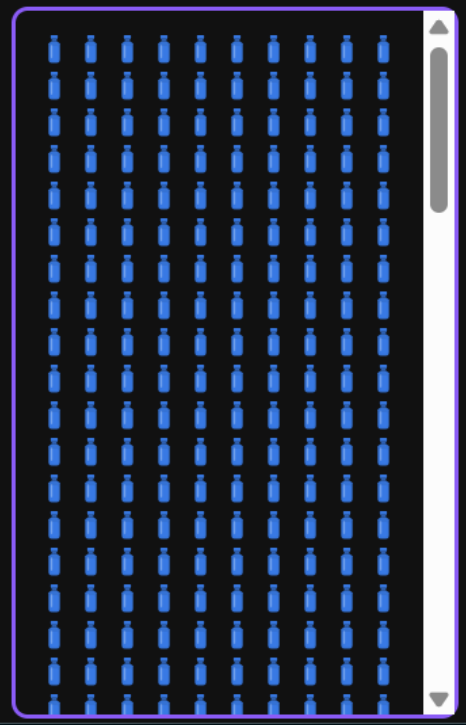
Combined Water Footprint
All Selected Services

TOTAL | AI TEXT GENERATION | VIDEO CALLING | DATA STORAGE | ~~DOOM SCROLLING~~ | VIDEO STREAMING | AI IMAGE GENERATION

AI TEXT GENERATION (537 PROMPTS × 1X)	174.53L
VIDEO CALLING (32 HOURS × 1.2X)	59.52L
DATA STORAGE (79 GBS × 1X)	21.13L
VIDEO STREAMING (27 HOURS × 1X)	43.88L
AI IMAGE GENERATION (91 IMAGES × 1X)	57.79L
GRAND TOTAL:	356.85L

714

500ML WATER BOTTLES

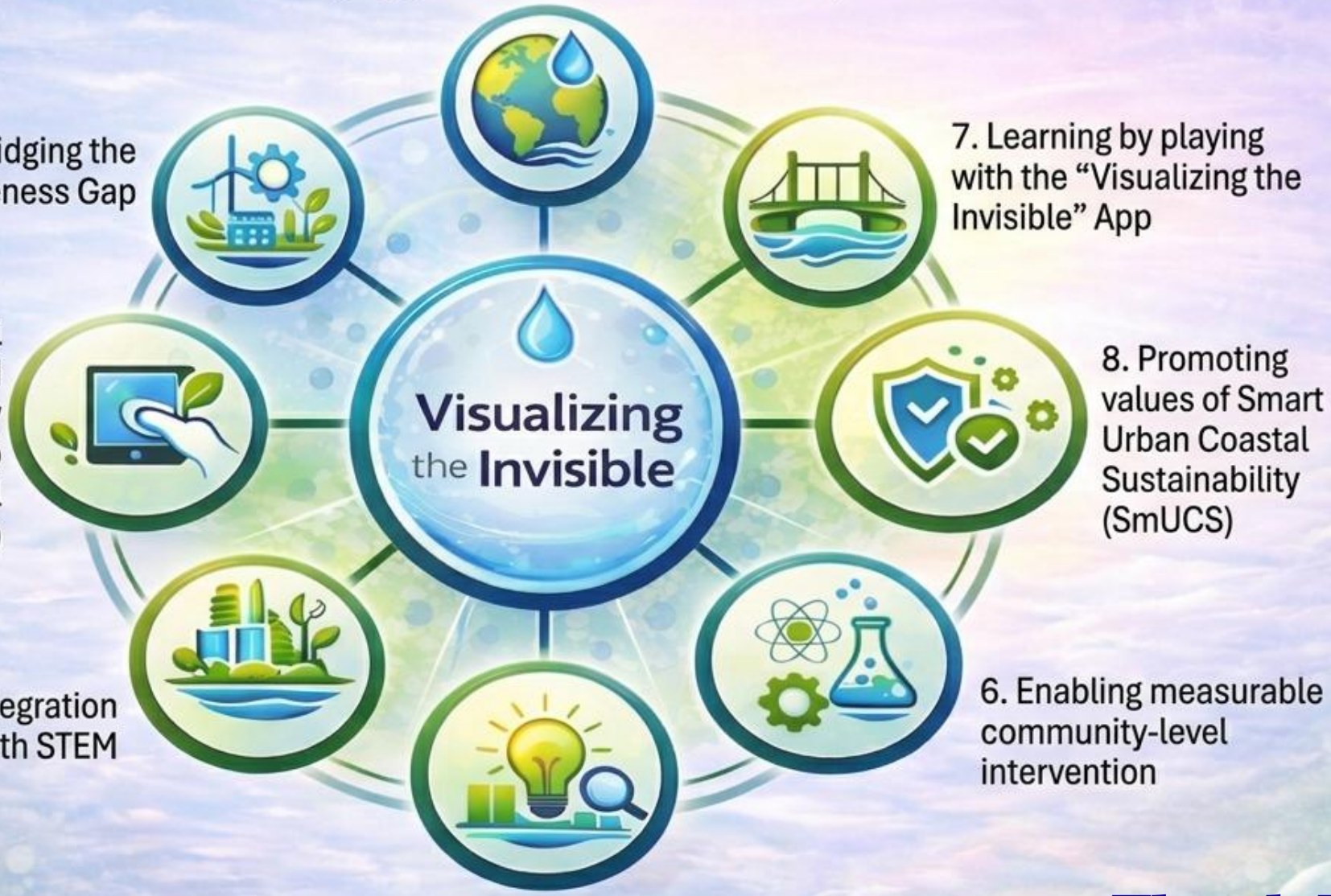


MANAGE SERVICES

AI Text Generation	0.20 – 0.44L/prompt
Video Calling	1.15 – 1.95L/hour
Data Storage	0.15 – 0.38L/GB
~~Doom Scrolling~~	~~0.66 – 1.20L/hour~~
Video Streaming	1.25 – 2.00L/hour
AI Image Generation	0.42 – 0.85L/image

Our Project Water Footprint

Positive Impact



Thank You
for your attention