INTERNATIONAL SUMMER SCHOOL 2024

ALTA SCUOLA

CHIARA BISCARINI

Professor in Water Engineering
Unesco Chair in *Water Resources Management and Culture*
Università per Stranieri di Perugia

"A CULTURAL, SOCIAL AND INNOVATIVE APPROACH TO WATER MANAGEMENT"

WE ARE

UNESCO Chair on **"Water Resources Management and Culture"**

The UNESCO Chair on "**Water Resources Management and Culture**", established in Perugia in 2013 following the Agreement between Unesco, the **University for Foreigners of Perugia** and the **Honors Center of Italian Universities (H2CU)**

The **specific objectives of the Chair** are:

- develop course on ***Integrated Water Resources Management (IWRM)***
- by combining ***technical and cultural aspects***, and to train students, faculty, water and development professionals, water service providers, institutional decision makers and trainers;
- carry out ***researches*** jointly with partners to enhance knowledge that would inform ***innovative and interdisciplinary strategies to manage water***, and disseminate results widely;
- help establish a ***network of experts and institutions*** to facilitate collaborations and the sharing of knowledge and ***good practices in water management***;
- foster the realization of ***scientific, social and management support systems*** to facilitate/strengthen ***cooperation among relevant institutions*** at the national and regional level;

Chair Holder
Prof. **Lucio Ubertini** –
Sapienza University of Rome
Full Professor and H2CU Director

Board
- SCIENTIFIC COMMITTEE
- ADVISOR COMMITEE
- AFFILIATED FACULTIES
- GRADUATE STUDENTS

WE ARE

H2CU Honors Center of Italian Universities of Sapienza University of Rome

H2CU (Honors Center of Italian Universities)
of Sapienza University of Rome

- an association of 21 Italian universities and
- 3 institutes of the Italian National Research Council (CNR),

which supports educational programs in collaboration with

- 5 American universities
- Massachusetts Institute of Technology,
- Polytechnic Institute of New York University,
- Pace University, Columbia University,
- Florida International University

The activities promoted by H2CU include
short periods of study to pursue research for
the thesis and individual double degree programs.

To date, about **250** students have participated in academic and scientific programs sponsored by the H2CU Center and about **140** of these have earned the US Master of Science Degree.

INTERNATIONAL SUMMER SCHOOL 2024

"A CULTURAL, SOCIAL AND INNOVATIVE APPROACH TO WATER MANAGEMENT"

The discussion about "Cultural, Social and Innovative Approach to Water Management" explores comprehensive strategies for managing flood risk and vulnerability through an interdisciplinary lens.

New professional profiles in **water jobs** and in **water education** that integrating cultural and social dynamics with technological innovation to create resilient water management systems.

An example the complexities of flood risk by examining historical patterns, community engagement, and advanced forecasting technologies.

Additionally, it underscores the pivotal role of **water diplomacy** in resolving national and international water-related issues.
By fostering cooperative frameworks and equitable resource sharing, water diplomacy emerges as a critical tool for mitigating flood impacts and ensuring sustainable water management. This holistic approach aims to enhance preparedness, foster resilience, **and promote peace** in regions prone to water-related challenges.

WHEC 2022

UNESCO World Higher Education Conference

UNESCO World Higher Education Conference (WHEC2022) aims at reshaping ideas and practices in higher education to ensure sustainable development for the planet and humanity.

rimodellare idee e pratiche nell'istruzione superiore per garantire uno sviluppo sostenibile per il pianeta e l'umanità.

Results from UNESCO World Higher Education Conference 2022

Education 2030

Reshaping ideas and practices in higher education to ensure sustainable development for the planet and humanity

LEAVING NO ONE BEHIND

1. Opening the door to new, innovative, creative and visionary models of higher education
2. Highlight higher education opportunities and priorities in the upcoming decade
3. Anticipate and prepare youth for their role in tomorrow's society
4. Pave the way for a future learning community that is inclusive of all lifelong learners
5. Define and prepare the roadmap for a new era of higher education systems: **HED 2030 Roadmap**

A global conversation on higher education

Disruptive and innovative
Continuous participation process to achieve the conference milestones (pre-conference and post-conference)

Worldwide reach
Representation and participation from all regions

Inclusive
Governmental and intergovernmental organisations, international networks, universities, NGOs, private sector, etc.

Youth engagement and empowerment
A special strategy to involve, empower and inspire youth

Education

IMPLEMENTATION OF A GLOBAL INDICATOR ON WATER EDUCATION

56th session of the IHP Bureau 20-22 February 2018 → 23rd session of the IHP Intergovernmental Council 11-15 June 2018 → Resolution XXIII-8

United Nations Educational, Scientific and Cultural Organization

Intergovernmental Hydrological Programme

2. WATER AND EDUCATION NEXUS

SDG 4

QUALITY EDUCATION

Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

"A fundamental change is needed in the way we think about education's role in global development, because it has a catalytic impact on the well-being of individuals and the future of our planet"

Irina Bokova, UNESCO's former Director-General

SDG 6

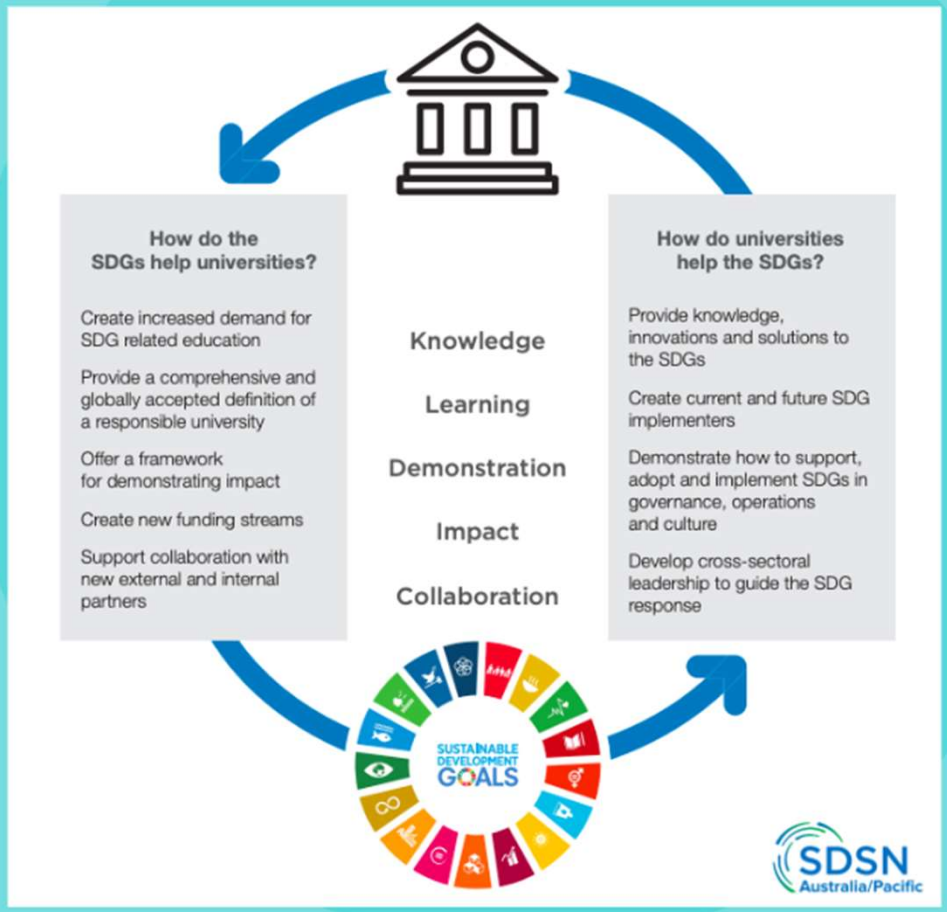
CLEAN WATER AND SANITATION

Ensure availability and sustainable management of water and sanitation for all

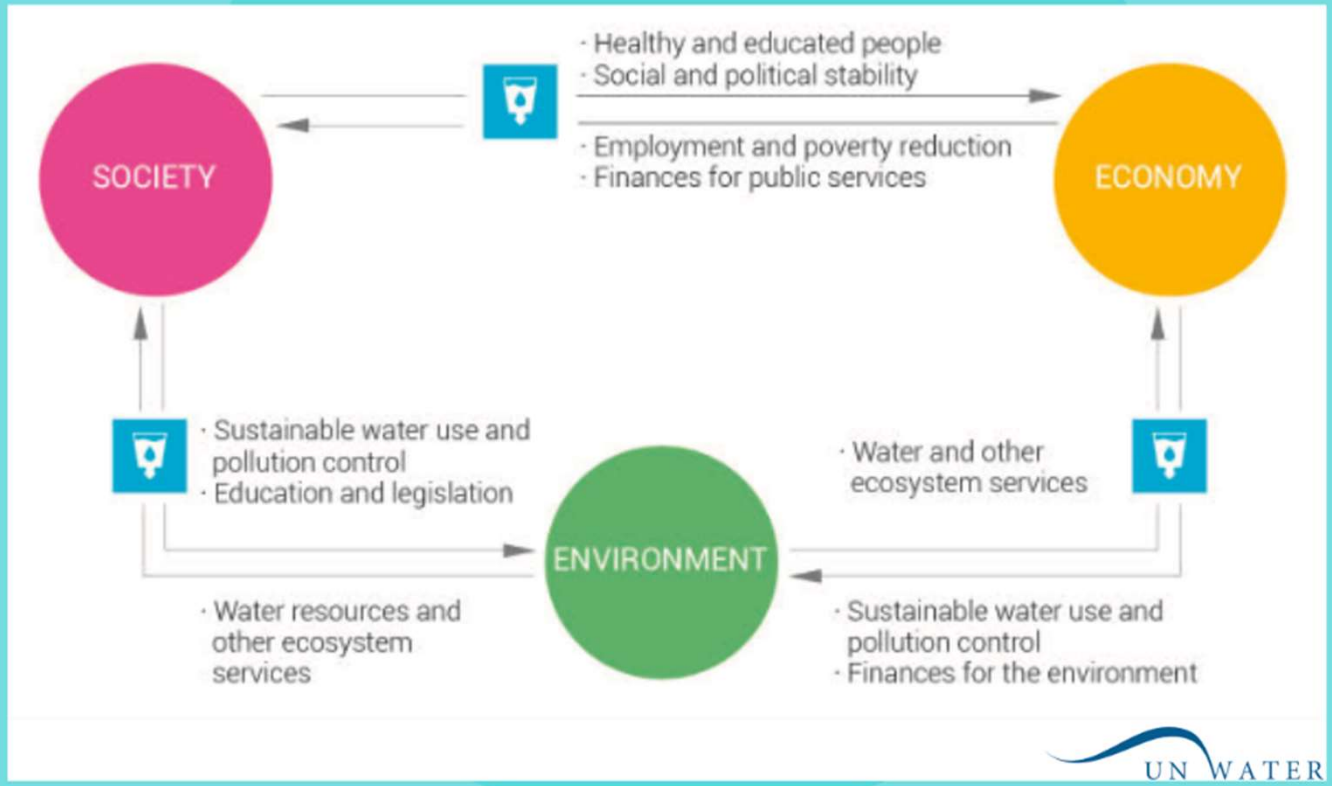
"There is still enough water for all of us – but only so long as we keep it clean, use it more wisely and share it fairly"

Ban Ki Moon, UNESCO's former Director General

UNIVERSITY ENGAGEMENT in the SDGs



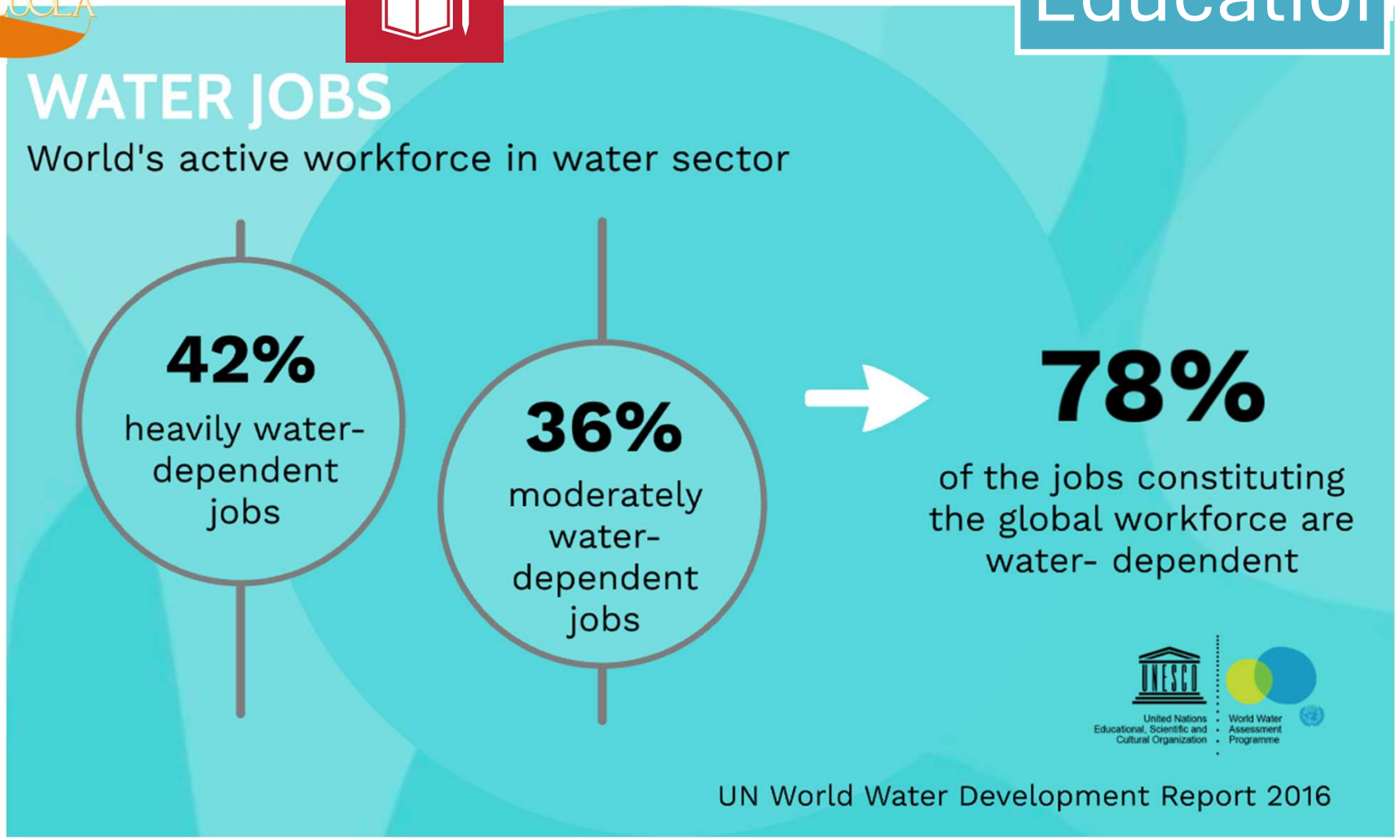
WATER and three dimensions of SUSTAINABLE DEVELOPMENT



Education


WATER PROFESSIONALS DEMAND
Greener economy
• Markets
• Jobs
• Practices
• Technologies
INCREASING DEMAND FOR WATER PROFESSIONALS
Cross-cutting nature of issues relating water
Water related degrees
• SUSTAINABLE AWARENESS
• WATER RELATED CAREER

Education


4 QUALITY EDUCATION
WATER JOBS
World's active workforce in water sector
42%
heavily water-dependent jobs
36%
moderately water-dependent jobs
78%
of the jobs constituting the global workforce are water- dependent
United Nations Educational, Scientific and Cultural Organization
World Water Assessment Programme
UN World Water Development Report 2016

Water education indicator

Methodology

Water Education Indicator proposal:
WEi able to assess the level of acquired knowledge of water-related subjects both for the bachelor's and master's degrees, evaluating the occurrence of Water Related Subjects and their weight in terms of credits or corresponding hours

SELECT

- Subjects
- UNESCO Hydrology Thesaurus
- Water related subjects
- Bachelor WE and Master WE

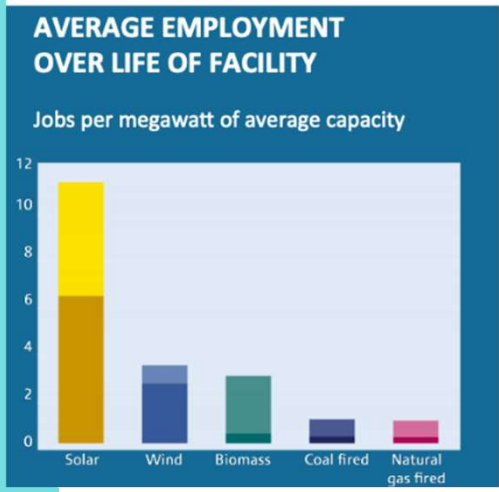
CALCULATE

- Ratio
- Quartiles

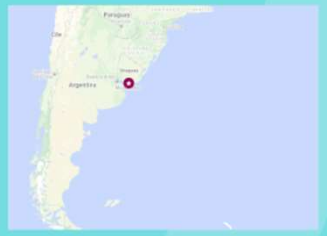
LEVELS

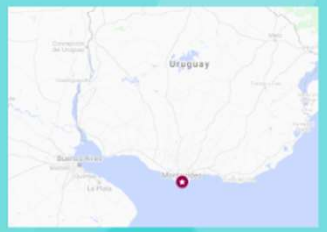
- **L1** Beginnner
- **L2** Medium
- **L3** Medium-High
- **L4** High

NEW OPPORTUNITIES
through **INNOVATION**
in a **GREEN ECONOMY**



Water education indicator

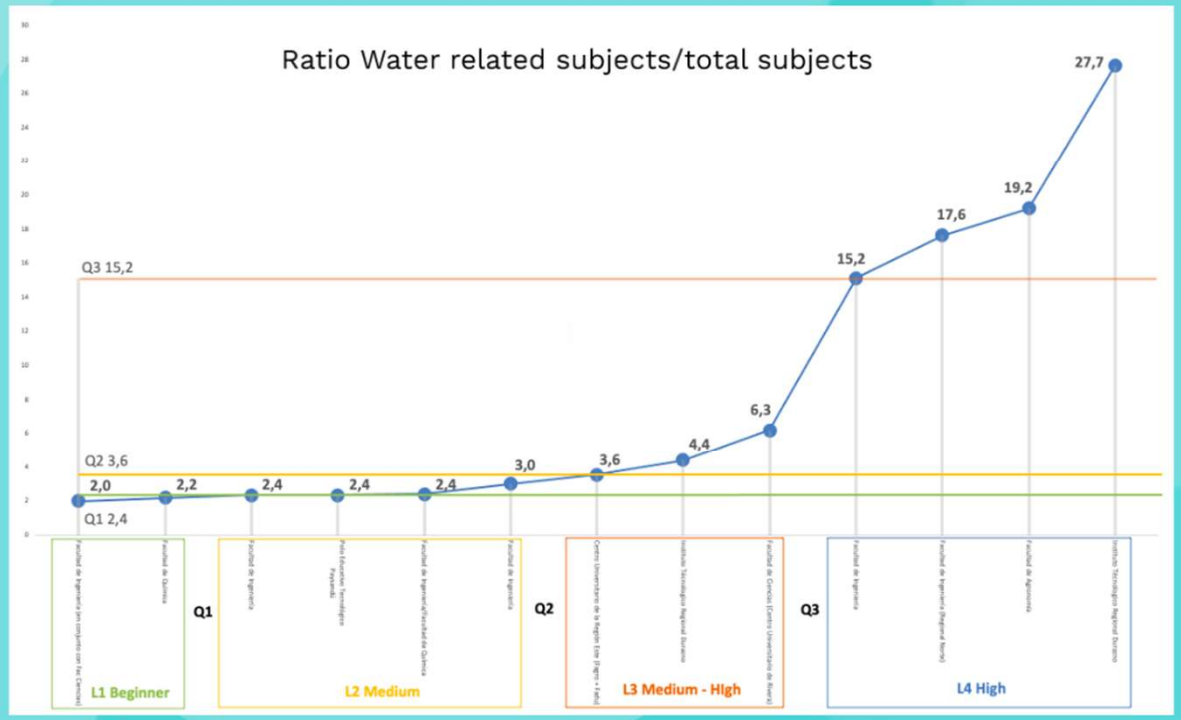




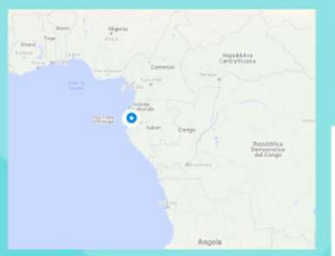
UNESCO Chair on Water and Culture. Faculty of Humanities and Education. University of the Republic. Uruguay

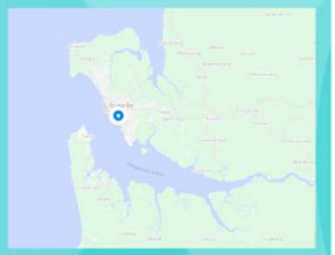
QUARTILES	
Q1	2,4
Q2	3,6
Q3	15,2

Uruguay Bachelor degree



Water education indicator

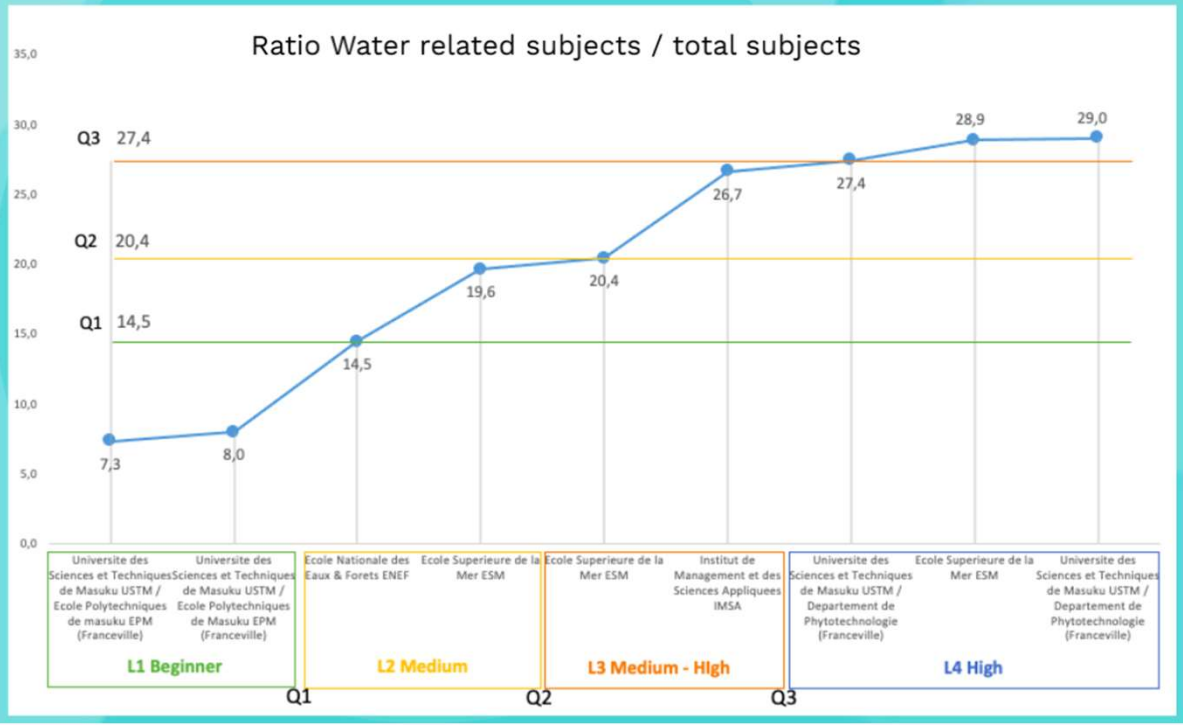




National Scientific and Technological Research Center

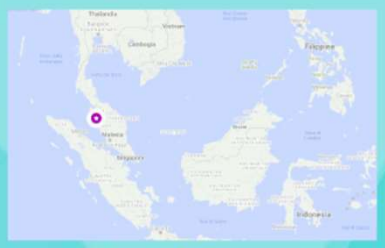
QUARTILES	
Q1	14,5
Q2	20,4
Q3	27,4

Gabon Bachelor degree



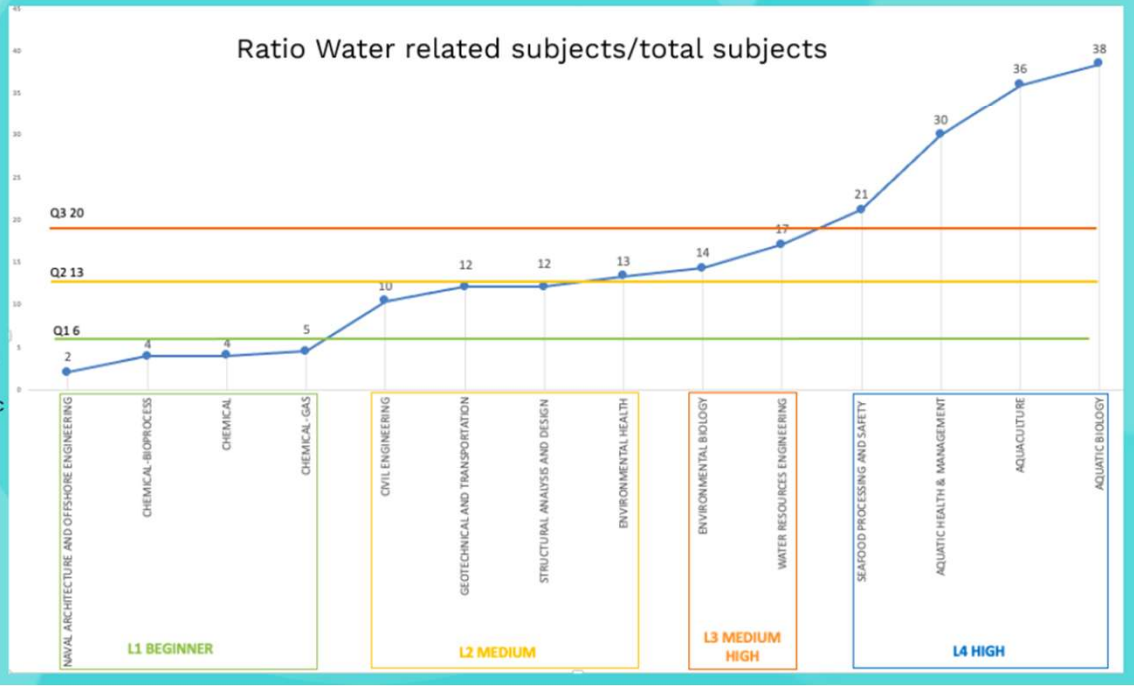
Water education indicator

Malaysia Bachelor degree

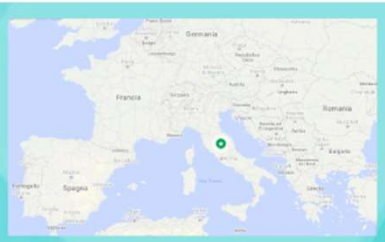


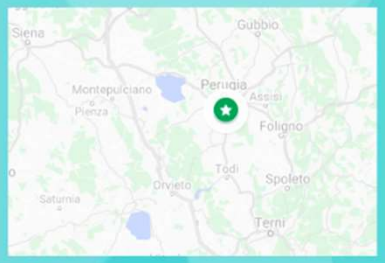
UNESCO Chair on Ecohydraulics for Sustainable Water Infrastructures for SDG 6 in the Asia and the Pacific Region, Universiti Sains Malaysia, Pulau Pinang

QUARTILES	
Q1	6
Q2	13
Q3	20



Water education indicator





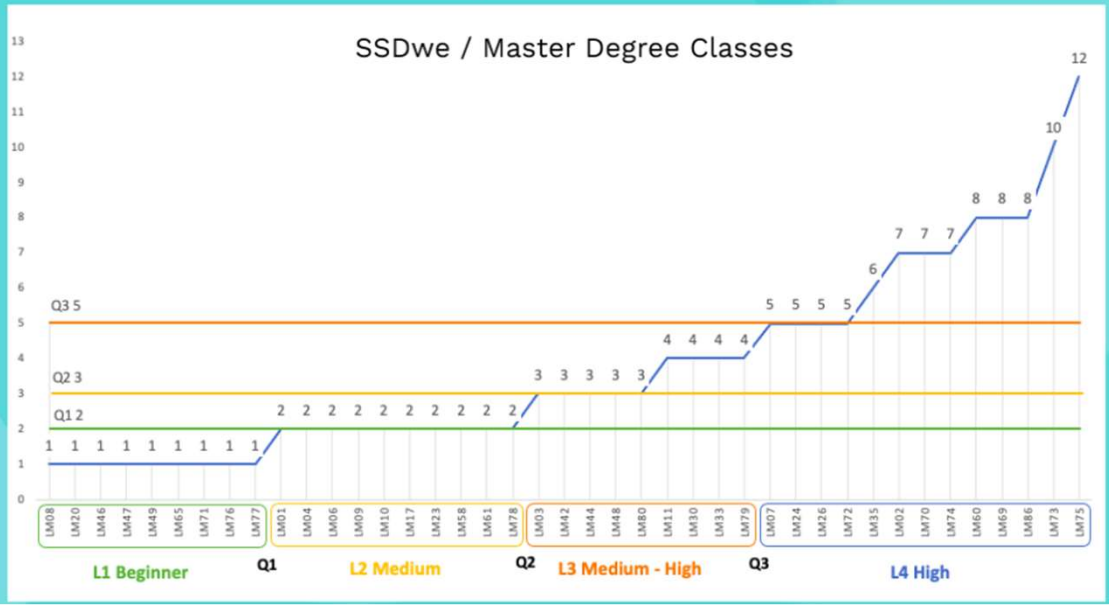
UNESCO Chair on Water Resources Management and Culture, University for Foreigners in Perugia

QUARTILES	
Q1	2
Q2	3
Q3	5

Italy Degree Classes

SSDwe = Settori Scientifico-Disciplinari Water Education (24/370)

Master Degree Class = Classi di Laurea Magistrale che prevedono tra le rispettive attività formative indispensabili e caratterizzanti SSDwe (40/94)



Water education indicator

4. Conclusion

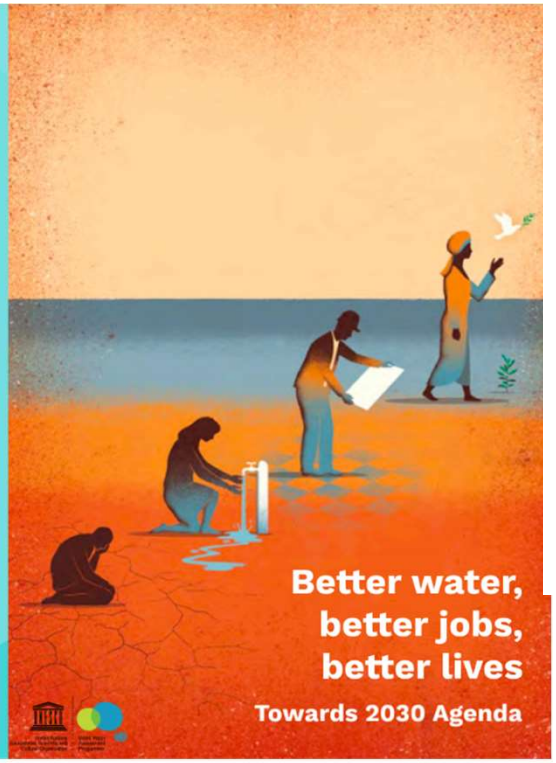
- Interlinkages between water and other SDGs
- Water and Jobs
- Definition of a global Water Education Indicator
- Case studies

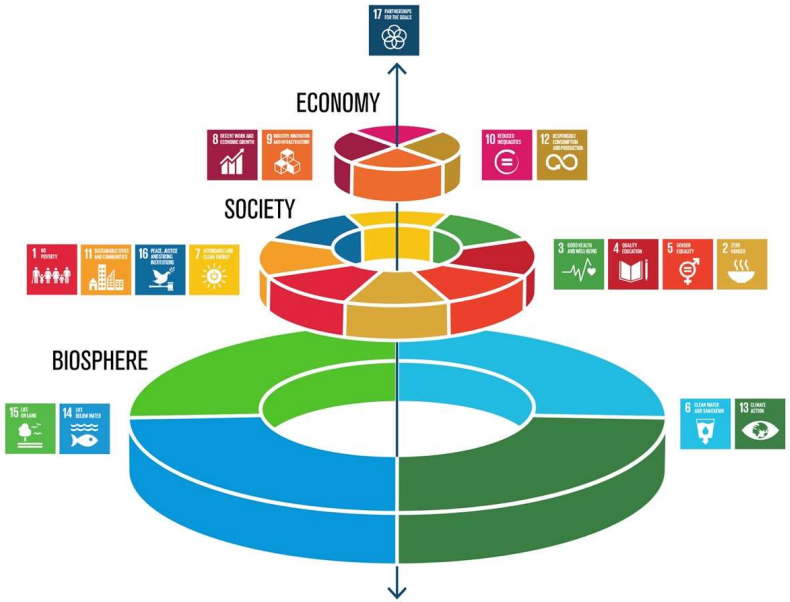
FUTURE OPPORTUNITIES

- From case study to real test case
- Data collection planning
- Italy's participation as a pilot test case

FOR UNISTRAPG

Why don't making LM52 International Relations and LM81 Development Cooperation Sciences, Degree Classes Water Education?





Research

GEST-RIVER

Eco - Sustainable Management of Flooding Risk in natural protected areas and Economic Valorisation of Resources

project aims to develop and promote a sustainable protocol for the management of flood risk areas and the re-use of biomasses and muds coming from those areas for energy production and construction purposes.

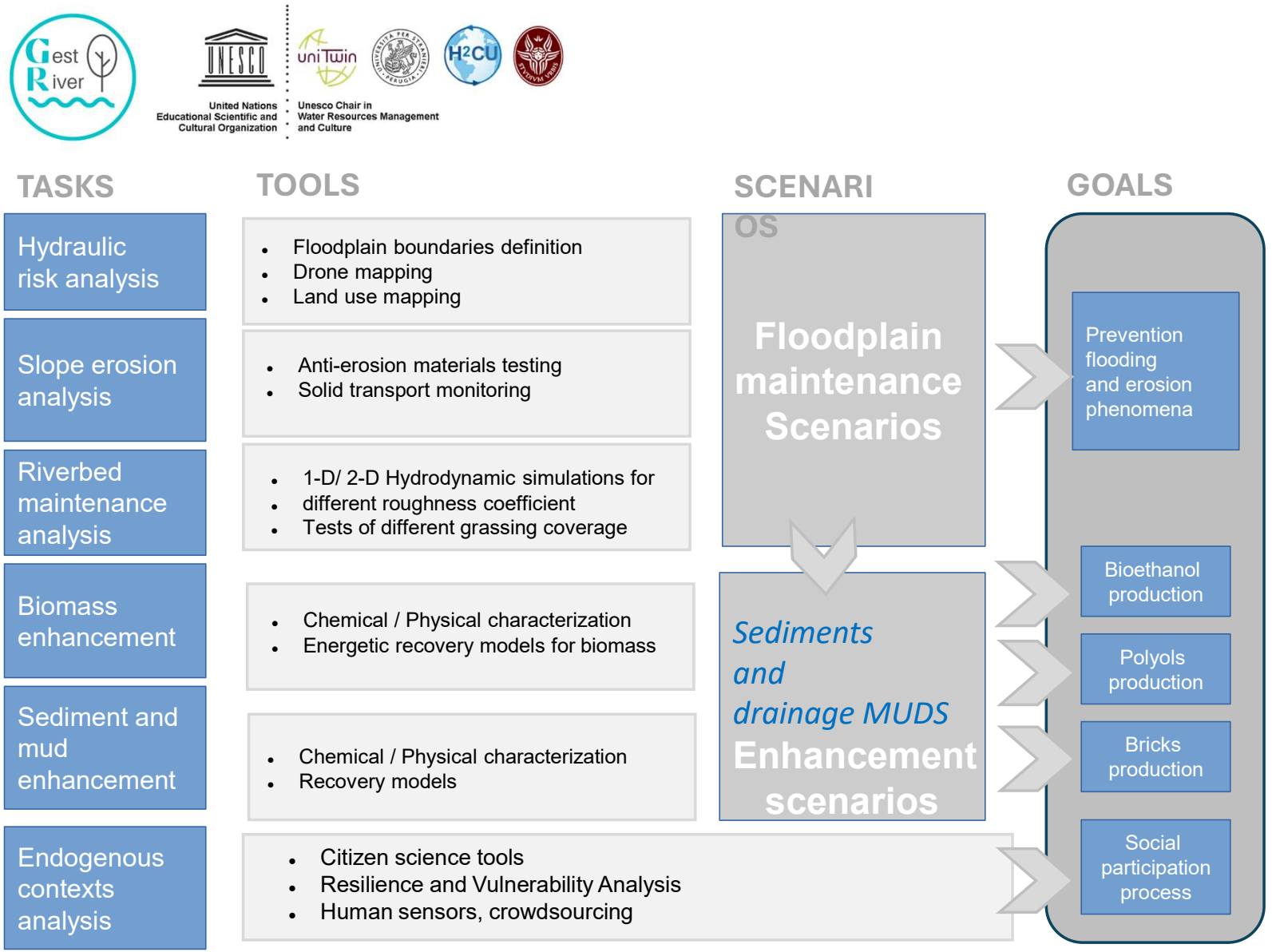
The creation of a supply chain for the exploitation of biomasses from river areas is thepurpose of on-going

CIRIAF Centro Interuniversitario di Ricerca sull'Inquinamento e sull'Ambiente - "Mauro Felli"

Università per Stranieri di Perugia

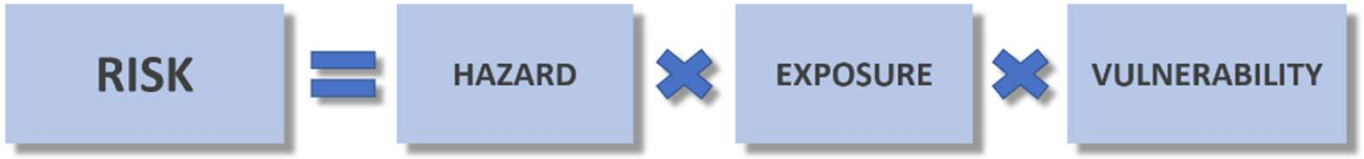
United Nations Educational Scientific and Cultural Organization

Unesco Chair in Water Resources Management and Culture


TASKS
TOOLS
SCENARIOS
GOALS
Hydraulic risk analysis
Slope erosion analysis
Riverbed maintenance analysis
Biomass enhancement
Sediment and mud enhancement
Endogenous contexts analysis
Floodplain boundaries definition
Drone mapping
Land use mapping
Anti-erosion materials testing
Solid transport monitoring
1-D/ 2-D Hydrodynamic simulations for
different roughness coefficient
Tests of different grassing coverage
Chemical / Physical characterization
Energetic recovery models for biomass
Chemical / Physical characterization
Recovery models
Citizen science tools
Resilience and Vulnerability Analysis
Human sensors, crowdsourcing
Floodplain maintenance Scenarios
Sediments and drainage MUDS Enhancement scenarios
Prevention flooding and erosion phenomena
Bioethanol production
Polyols production
Bricks production
Social participation process

Risk is a forward-looking concept, as opposed to a present situation or a past event. It aims to assess the final result of combining the following measurable items: hazard, exposure and vulnerability.

Disaster risk can be understood as the likelihood (or probability) of loss of life, injury or destruction and damage from a disaster in a given period of time. Or, more clearly: disaster risk is the consequence of the interaction between a hazard and the characteristics that make people and places vulnerable and exposed.



Know the meaning of the three risk components:

- **Hazard**: a dangerous event that may cause loss of life, injury or other health impacts, as well as damage and loss to property, infrastructure, livelihoods and services, social and economic disruption and, or environmental damage; as a component of risk, it is the **probability of experiencing** a certain intensity of hazard (eg. earthquake, cyclone, etc.) at a specific location and is usually determined by a historical or user-defined scenario, probabilistic hazard assessment, or other methods. Some hazard modules can include secondary perils (such as soil liquefaction or fires caused by earthquakes, or storm surge associated with a cyclone).
- **Exposure**: the presence and number of people, property, livelihoods, systems or other elements in hazard areas (and so thereby subject to potential losses); as a component of risk, it represents the **stock of property** and infrastructure exposed to a hazard, and it can include socioeconomic factors.
- **Vulnerability**: the set of characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard; as a component of risk, it accounts for the **susceptibility to damage** of the assets exposed to the forces generated by the hazard. Fragility and vulnerability functions estimate the damage ratio and consequent loss respectively, and/or the social cost (e.g., number of injured, homeless, and killed) generated by a hazard, according to a specified exposure.

Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction

United Nations General Assembly

F. Cotana*, A. Nicolini, F. Rossi, I. Pigliautile, A. L. Pisello

Results of the scientific research project GEST-RIVER

CIRIAF-CRB, Università degli Studi di Perugia

5th International Conference on Countermeasures to Urban Heat Islands
02 - 04 December 2019
International Institute of Information Technology - Hyderabad, India

Abstract

The GEST-RIVER project project aims to develop and promote a sustainable protocol for the management of flood risk areas and the re-use of biomasses and muds coming from those areas for energy production and construction purposes. The project leans on the synergy among three Italian research groups: CIRIAF – Inter-University Research Center on Pollution and Environment (Perugia), Università per Stranieri (Perugia), and Università della Tuscia (Viterbo). The project comprises six different tasks moving from (T1) the identification of a case study (i.e. Fosso del Montecalvello) carefully investigated by means of both direct inspection of the site and remote sensing by means of UAV technologies. Project task 2 aims to experimentally investigate the performance of vegetable coverings to contain slope erosion while the definition of an integrated method for maintaining and managing the hydrographic network is the final goal of task 3. The creation of a supply chain for the exploitation of biomasses from river areas is the purpose of on-going task 4 which mainly focuses on usage of river rods. Sediments and drainage muds are analyzed and characterized with the final aim to be adopted in bricks for the construction sector as deeply investigated by task 5. Finally, the project wants to point-out also the socio-economic vulnerability of the areas exposed to flood risk by carrying out specific analysis in the frame of task 6.

Keywords: Flood risk management; Biomasses; Bio-based building materials; UAV monitoring;

On-going research activities and scientific results of the GEST-RIVER project

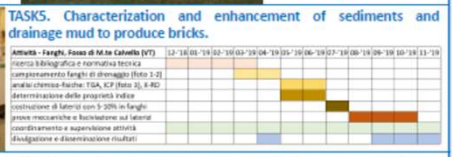
TASK1 - Delimitation of the river area of interest (classification of river sections according to criticality and potential)

TASK2 - Preliminary study on the performance of vegetable coverings for containment of slope erosion

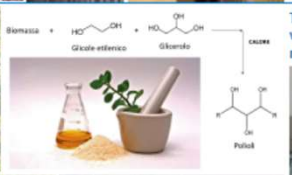
The analysis are conducted by specifics laboratories at Università della Tuscia (www.mechydrolab.org) through rainfall simulator and the experimental test-bad *Cope Fear*.

Preliminary results highlight the necessity to realize a windbreak structure to enhance the reliability of performed tests.

TASK5. Characterization and enhancement of sediments and drainage mud to produce bricks.



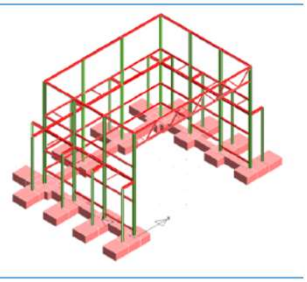
TASK4.A Development of innovative methods and systems for the valorization of biomasses deriving from the maintenance of riverbeds.



*Corresponding author: cotana@crbnet.it – CIRIAF-CRB Università degli Studi di Perugia Via G. Duranti, 63 06125 PG

United Nations Educational Scientific and Cultural Organization

Unesco Chair in Water Resources Management and Culture



sustainability

MDPI

Article

Hillslope Erosion Mitigation: An Experimental Proof of a Nature-Based Solution

Ciro Apollonio [1], Andrea Petroselli [2,*], Flavia Tauro [3], Manuela Cecconi [4], Chiara Biscarini [5], Claudio Zarotti [6] and Salvatore Grimaldi [3]

1 DAFNE Department, Tuscia University, 01100 Viterbo, Italy; ciro.apollonio@unitus.it
2 DEIM Department, Tuscia University, 01100 Viterbo, Italy
3 DIBAF Department, Tuscia University, 01100 Viterbo, Italy; flavia.tauro@unitus.it (F.T.); salvatore.grimaldi@unitus.it (S.G.)
4 DI Department, University of Perugia, 06125 Perugia, Italy; manuela.cecconi@unipg.it
5 SHeC Center Sustainable Heritage Conservation, Università per Stranieri di Perugia, 06123 Perugia, Italy; chiara.biscarini@unistrapg.it
6 PRATI ARMATI SRL, Opera, 20090 Milan, Italy; claudio.zarotti@pratiarmati.it
* Correspondence: petro@unitus.it

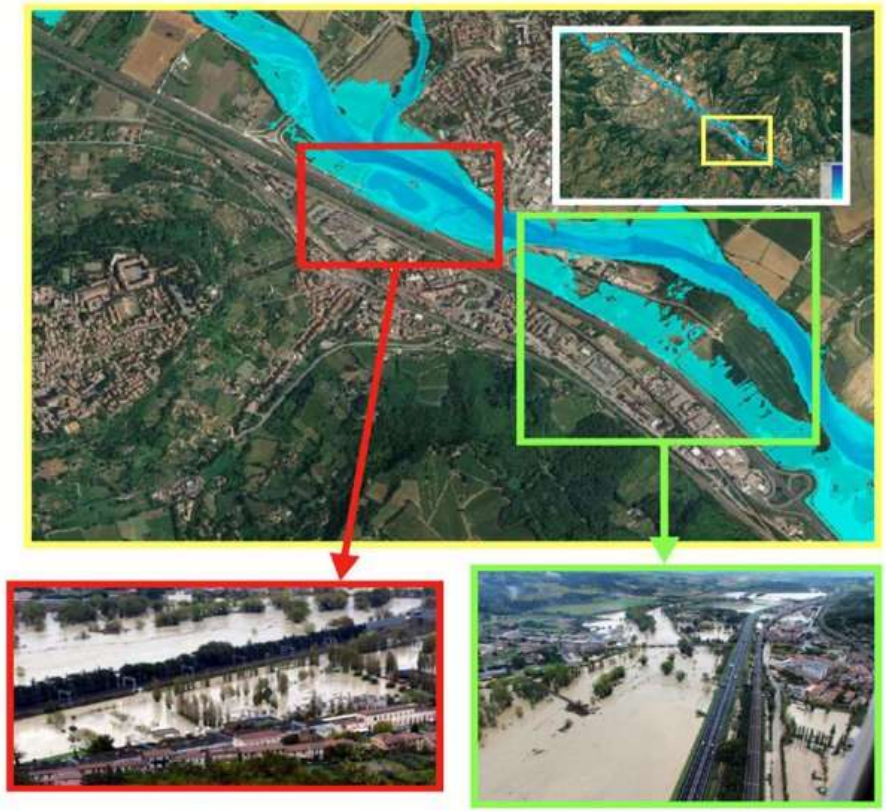
Abstract: Soil erosion during rainfall events is affected by several factors, such as topography, soil type, land management, and vegetation cover. In this study, a series of tests investigates the influence of selected perennial herbaceous plants with a deep and strong rooting system, called MC1, on runoff generation and soil erosion. The tests on the investigated nature-based solution have been performed in the Cape Fear experimental hillslope with natural and artificial rainfall and for different vegetation heights. For all the experiments, runoff, soil moisture, and erosion data were observed and collected. The results obtained in this study suggest the following conclusions: (1) MC1 is effective in terms of soil erosion reduction already with a minimum vegetation height equal to 30 cm; (2) MC1 maximum efficiency, in terms of soil loss reduction, has been reached for a vegetation height equal to 70 cm; (3) In terms of the eroded material, the use of MC1 allows for a reduction of soil loss up to 300 times higher than the bare soil condition; (4) The use of MC1 allows for a reduction in the runoff coefficient up to 1/3 of the corresponding value in the bare soil condition.

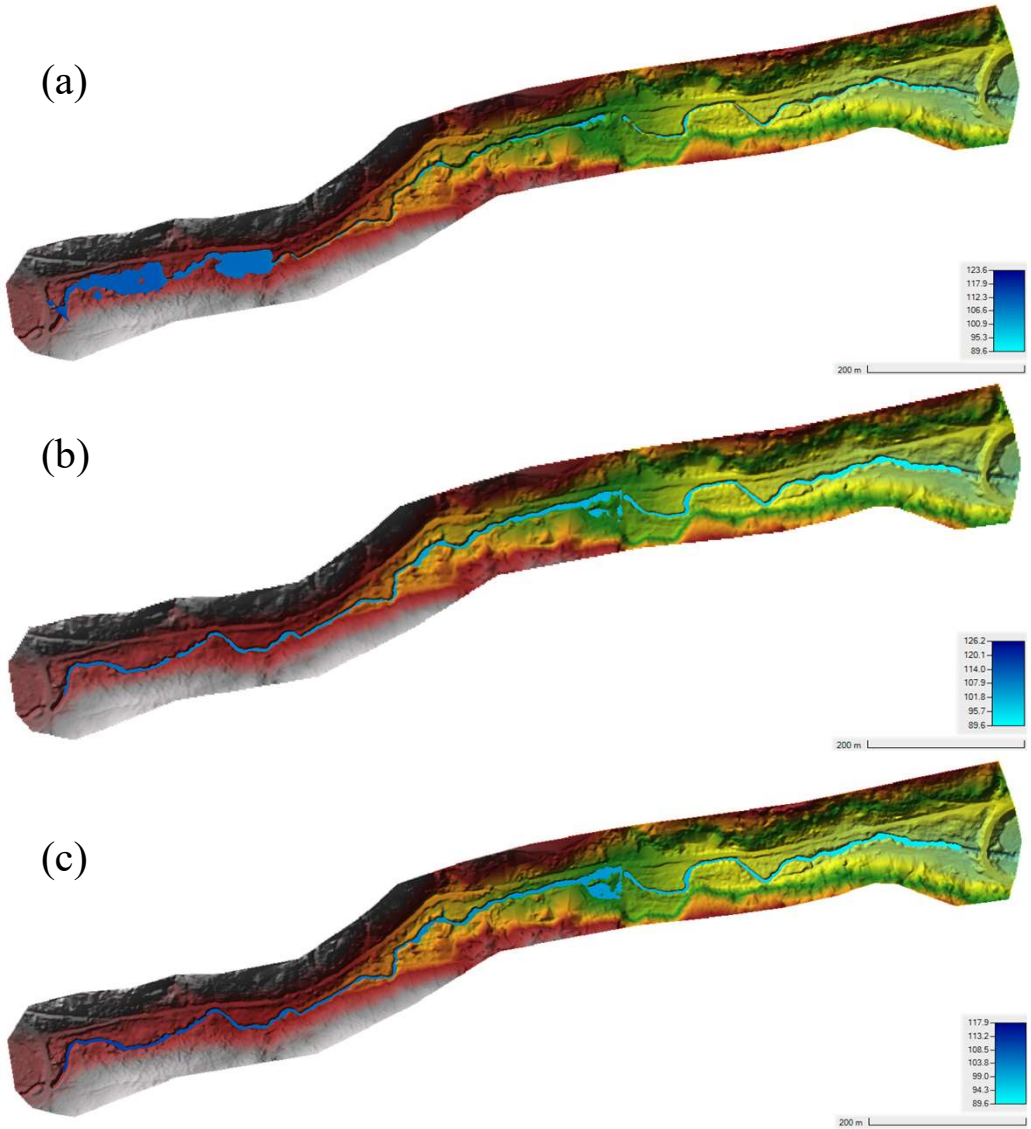
check for updates

Citation: Apollonio, C.; Petroselli, A.; Tauro, F.; Cecconi, M.; Biscarini, C.; Zarotti, C.; Grimaldi, S. Hillslope Erosion Mitigation: An Experimental Proof of a Nature-Based Solution. *Sustainability* **2021**, *13*, 6058. https://doi.org/10.3390/su13116058

Flood risk mitigation

- Without maintance(a)
- rugness 50 cm (b)
- rugness 100 cm (c)





United Nations Educational Scientific and Cultural Organization

Unesco Chair in Water Resources Management and Culture

NDT & E International
Volume 115, October 2020, 102287

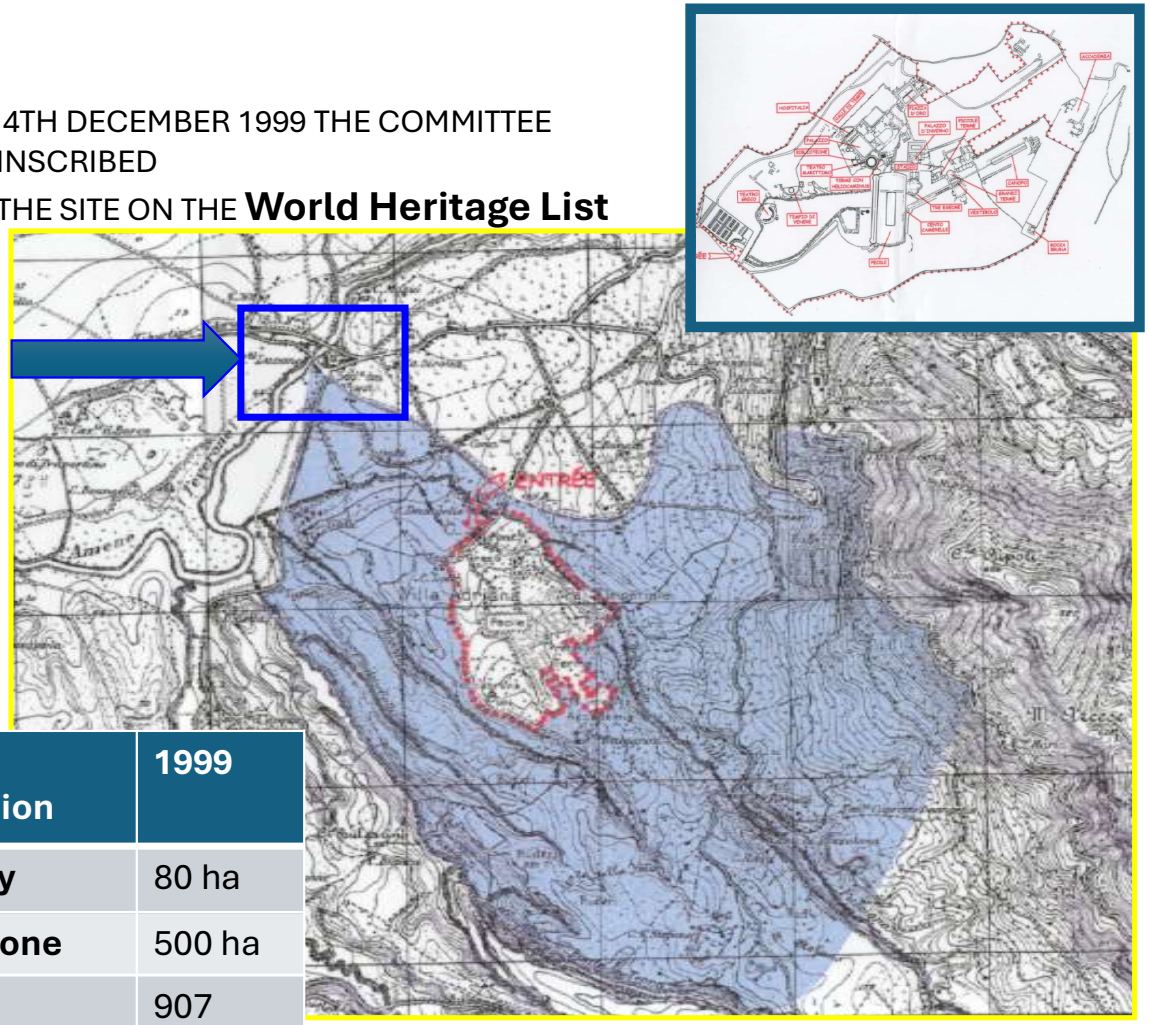
UAV photogrammetry, infrared thermography and GPR for enhancing structural and material degradation evaluation of the Roman masonry bridge of Ponte Lucano in Italy

C. Biscarini [a], I. Catapano [b], N. Cavalagli [c], G. Ludeno [b], F.A. Pepe [c], F. Ubertini [c]

Abstract

This paper presents a case study regarding the cooperative use of non-destructive contactless diagnostic investigations as a tool to aid and assist the degradation evaluation of an iconic Roman masonry bridge: Ponte Lucano in Tivoli, Italy. Specifically, unmanned aerial photogrammetric surveys are considered to perform detailed visual inspections and obtain a geometrical 3D model; infrared thermography analyses are carried out to characterize the thermal surface map of the structure detecting anomalies related to material degradation, such as the presence of humidity; ground penetrating radar investigations are performed to improve knowledge of the bridge subsurface structure. The results of the analyses demonstrate that the integration of mentioned diagnostic tools provides information regarding the degradation state of the stones and its causes, as well as regarding the evolution of the structure from its construction up to the present configurations.

4TH DECEMBER 1999 THE COMMITTEE INSCRIBED
THE SITE ON THE **World Heritage List**



Date of Inscription	**1999**
Property	80 ha
Buffer zone	500 ha
Ref:	907

METHODOLOGY

Analisi di pericolosità idraulica

- Simulzione idraulica fully 2D
- Modellazione Ponte Lucano
- Lidar 1 x1 m PCN

Aree inondabili TR= 50, 200 anni

Valutazione vulnerabilità del territorio

- CORINNE land Cover (1990:2012)
- Edificato PCN
- Buffer zone UNESCO Heritage

Zonazione

Ex Post Risk Scenario

Mitigazione del rischio: misure strutturali

- Misure strutturali
  - argini
  - laminazione
  - canali scolmatori e di bypass

Mitigazione del rischio: misure non strutturali

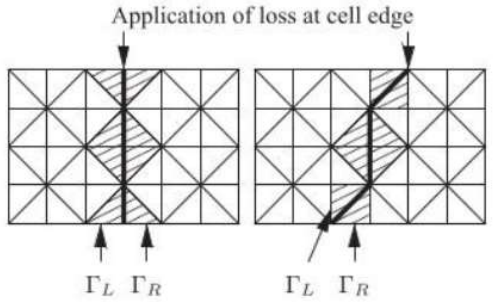
- Misure non strutturali
- Sistemi di preallarme e preallerta
- Opere di food proofing
- PASSIVE FLOOD MITIGATION
- citizen partecipation Monitoraggio volontari

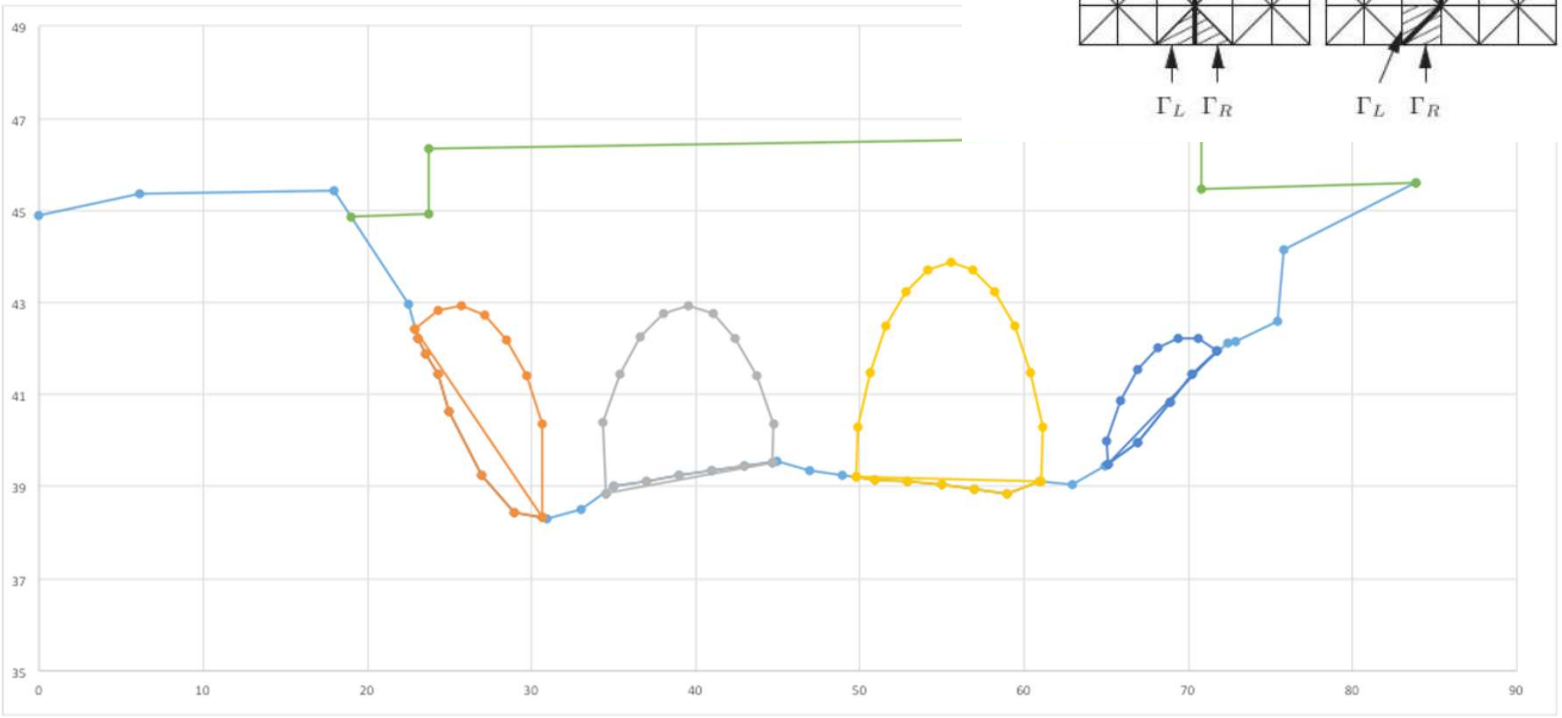
Valorizzazione patrimonio Paesaggistico Storico Culturale

Ex Ante Scenario DRR

Hydraulic Risk

2D fluid dynamic model PONTE LUCANO





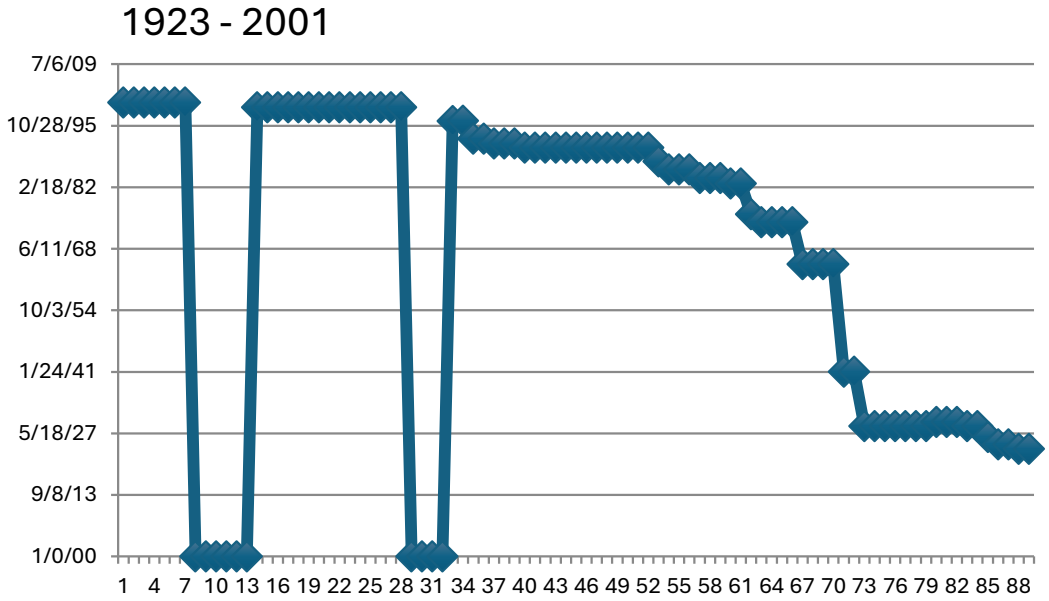
Flood map

TR= 50 anni

Output
Simulation 2D
Watre depth

Flood HISTORICAL EVENTS

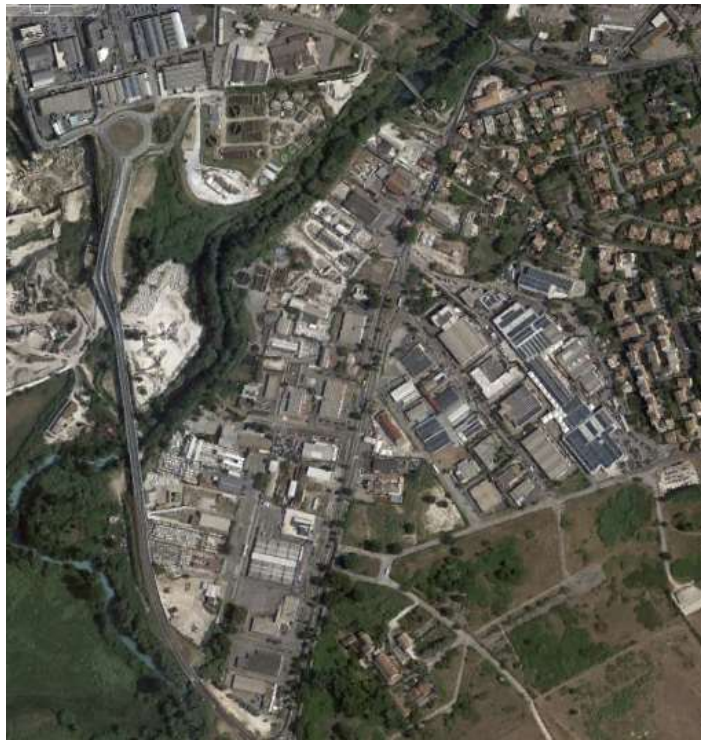
10200040	Ponte Lucano		08/01/01	Valle maggiore	F. Aniene
10200037	Albuccione		27/12/00	Pianura	F. Aniene
10200037	Guidonia - Lungo la linea ferroviaria		27/12/00	Pianura	F. Aniene
10200037	Ciciliano		27/12/00	Pianura	F. Aniene
10200037	Castel Madama (Comune di)		27/12/00	Pianura	F. Aniene
10200037	Vicovaro (campagne di)		27/12/00	Pianura	F. Aniene
10200037	Ponte Lucano		27/12/00	Pianura	F. Aniene
10200027	Tivoli - Via V. Bellini	/11/1999		Pianura	F. Aniene
10200030	Ponte Lucano	/2/1999		Pianura	F. Aniene
10200030	Guidonia - Ponte Lucano (tra le due località)	/2/1999		Pianura	F. Aniene
10200030	Anticoli Corrado	/2/1999		Pianura	F. Aniene
10200030	Madonna della Pace	/2/1999		Pianura	F. Aniene
10200030	Agosta	/2/1999		Pianura	F. Aniene
10200028	Villa Adriana		14/12/99	Pianura	F. Aniene
10200028	Tivoli - Zona in prossimità dell'abitato		14/12/99	Pianura	F. Aniene
10200028	Ponte Lucano - Via Maremmana inferiore		14/12/99	Pianura	F. Aniene
10200028	Subiaco - Zona delle sorgenti delle Cerreta		14/12/99	Pianura	F. Aniene
10200028	Roviano		14/12/99	Pianura	F. Aniene
10200028	Roma - Nei pressi dell'abitato		14/12/99	Pianura	F. Aniene
10200028	Roma - Ponte Mammolo		14/12/99	Pianura	F. Aniene
10200028	Aniene (lungo la valle del fiume)		14/12/99	Pianura	F. Aniene
10200028	SS. 7 Tiburtina		14/12/99	Pianura	F. Aniene
10200028	Albuccione - Via Vincenzo Bellini		14/12/99	Pianura	F. Aniene
10200028	Castel Madama		14/12/99	Pianura	F. Aniene
10200028	Anticoli Corrado - All'altezza del ponte sull'Anie		14/12/99	Pianura	F. Aniene
10200028	Agosta		14/12/99	Pianura	F. Aniene
10200028	Roma (Provincia di)		14/12/99	Pianura	F. Aniene
10200028	Trevi nel Lazio		14/12/99	Pianura	F. Aniene
10200019	Aniene (lungo la valle del fiume)	/11/1997		Pianura	F. Aniene
10200019	Roma (Comune di)	/11/1997		Pianura	F. Aniene
10200019	Ponte Lucano	/11/1997		Pianura	F. Aniene
10200019	Tivoli	/11/1997		Pianura	F. Aniene
8200006	Ponte Lucano - Villa Adriana lungo lungo la SS		18/11/96	Collina	F. Aniene
8200007	Ponte Lucano - Nei pressi di Villa Adriana		26/11/96	Pianura	F. Aniene
6200006	Lunghezza		05/12/92		F. Aniene
6200006	Ponte Lucano		05/12/92		F. Aniene
6200003	Ponte Lucano		16/11/91		F. Aniene
6200003	Subiaco (Comune di)		16/11/91		F. Aniene
6200003	Agosta (Comune di)		16/11/91		F. Aniene
200053	Valle Pantanella		09/12/90	Pianura	F. Aniene
4200110	Ponte Lucano		12/12/90		F. Aniene
4200110	Via Maremmana		12/12/90		F. Aniene
4200110	Roma		12/12/90		F. Aniene
200053	Ponte Lucano		09/12/90	Pianura	F. Aniene
200053	Subiaco		09/12/90	Pianura	F. Aniene
200053	Corcolle		09/12/90	Pianura	F. Aniene
200053	Tomba dei Plauti		09/12/90	Pianura	F. Aniene
200053	Albuccione		09/12/90	Pianura	F. Aniene
200053	Marano Equo - Lungo la strada Sublacense ver		09/12/90	Pianura	F. Aniene
200053	Agosta - Lungo la strada Sublacense verso Mar		09/12/90	Pianura	F. Aniene
200053	Lunghezza		09/12/90	Pianura	F. Aniene
200053	Madonna della Pace		09/12/90	Pianura	F. Aniene
200085	Ponte Lucano		27/11/87	Pianura	F. Aniene
4200105	Ponte Lucano		03/02/86		F. Aniene
4200105	Roma (Comune di)		03/02/86		F. Aniene
200088	Ponte Lucano		30/01/86	Pianura	F. Aniene
200104	Vicovaro		26/02/84	Pianura	F. Aniene
200104	Tor Cervara		26/02/84	Pianura	F. Aniene
200104	Ponte Lucano		26/02/84	Pianura	F. Aniene
4200101	Ponte Lucano		23/12/82		F. Aniene
4200101	Subiaco		23/12/82		F. Aniene
200092	Tivoli (Comune di)		16/02/76	Pianura	F. Aniene
4200088	Ponte Lucano		07/05/74		F. Aniene
200065	Ponte Lucano		03/05/74	Pianura	F. Aniene
200065	Lunghezza - Lungo la SS n. 5 Tiburtina		03/05/74	Pianura	F. Aniene
200065	Vicovaro (campagne di)		03/05/74	Pianura	F. Aniene
4200073	Roma - Casal de' Pazzi		30/12/64		F. Aniene
4200073	Roma - Prati Fiscali		30/12/64		F. Aniene
4200073	Roma - Tiburtino III		30/12/64		F. Aniene
4200073	Ponte Lucano		30/12/64		F. Aniene
200091	Ponte Lucano		05/02/41	Pianura	F. Aniene
200091	Roma - Montesacro		05/02/41	Pianura	F. Aniene
200086	Martellone		03/01/29	Pianura	F. Aniene
200086	Sant'Eusebio		03/01/29	Pianura	F. Aniene
200086	Salone		03/01/29	Pianura	F. Aniene
200086	Roma (Comune di)		03/01/29	Pianura	F. Aniene
200086	Lunghezzina		03/01/29	Pianura	F. Aniene
200086	Lunghezza		03/01/29	Pianura	F. Aniene
200086	Casal del Cavaliere		03/01/29	Pianura	F. Aniene
4200018	Tivoli - Lungo la linea tranviaria Roma-Tivoli		20/11/29		F. Aniene
200089	Ponte Lucano		18/11/29	Pianura	F. Aniene
200089	Roma (Comune di)		18/11/29	Pianura	F. Aniene
200086	Tivoli		03/01/29	Pianura	F. Aniene
200086	Ponte Lucano		03/01/29	Pianura	F. Aniene
4200149	Tivoli		14/07/26	Pianura	F. Aniene
4200011	Roma - Lungo la SP Roma-Tivoli		08/12/24		F. Aniene
4200011	Ponte Lucano		08/12/24		F. Aniene
200062	Subiaco (Comune di)		07/12/23	Collina	F. Aniene
200062	Ponte Lucano		07/12/23	Collina	F. Aniene



Land use: change

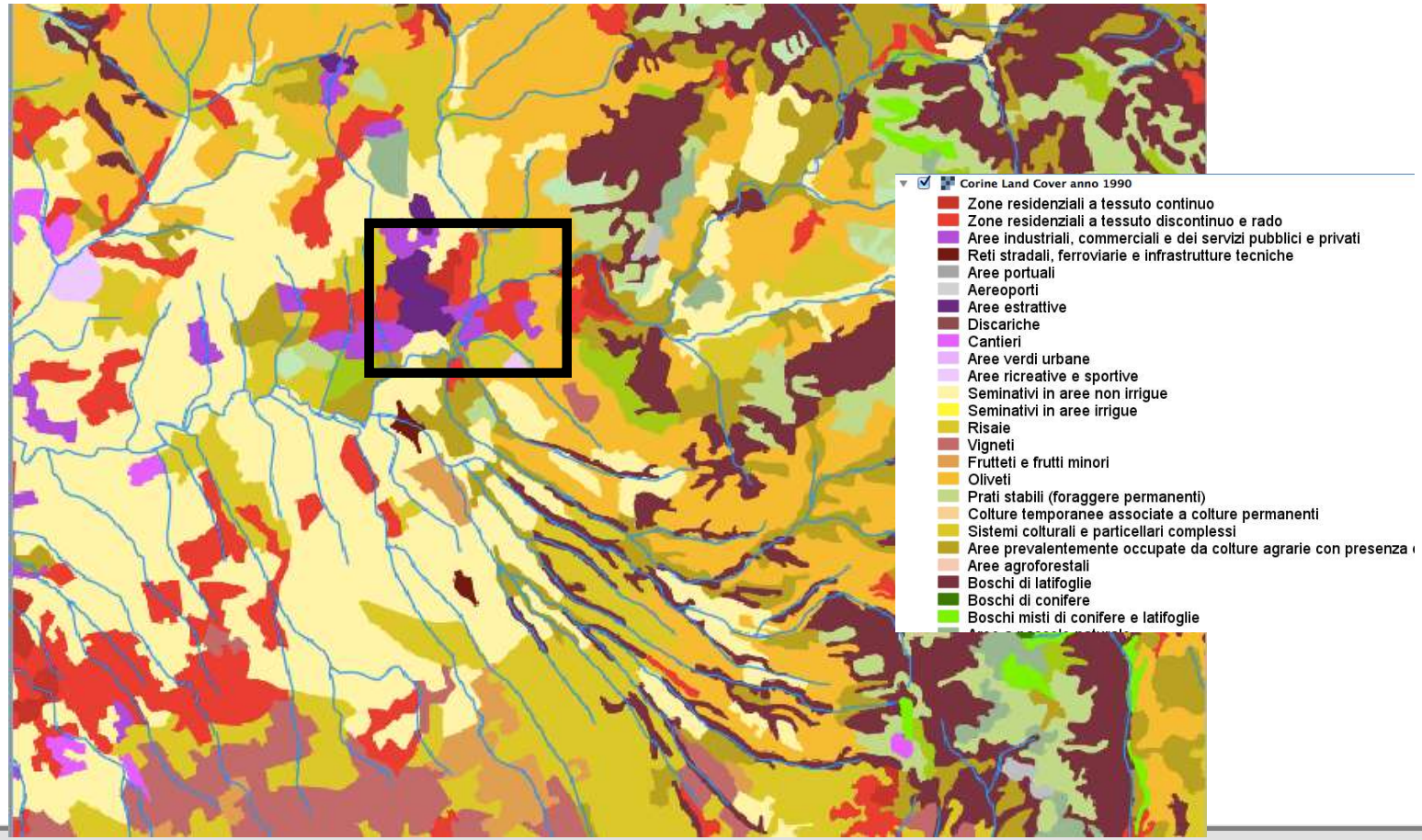
2004

2016



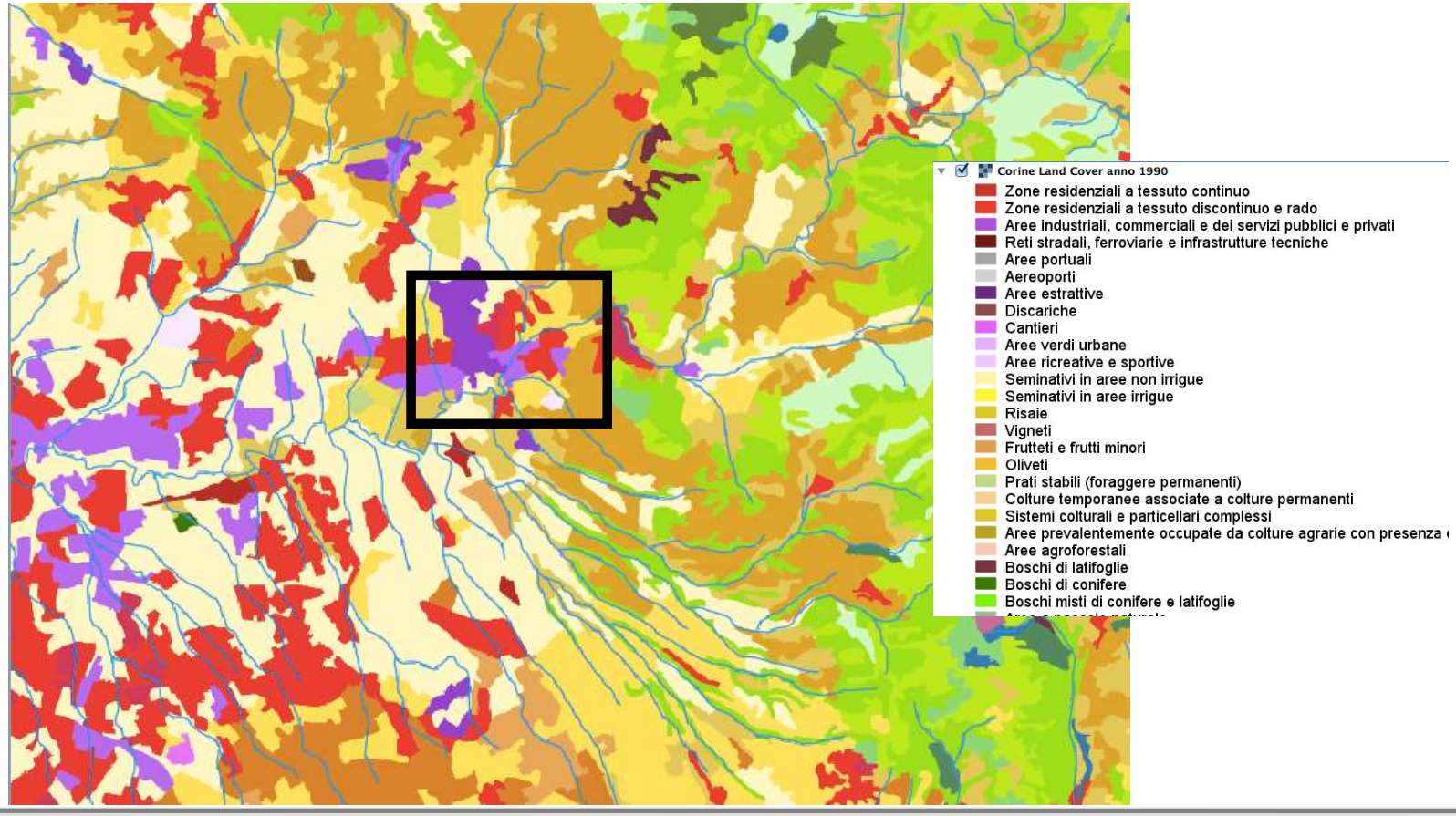
land use and vulnerability

Corinne Land cover 1990

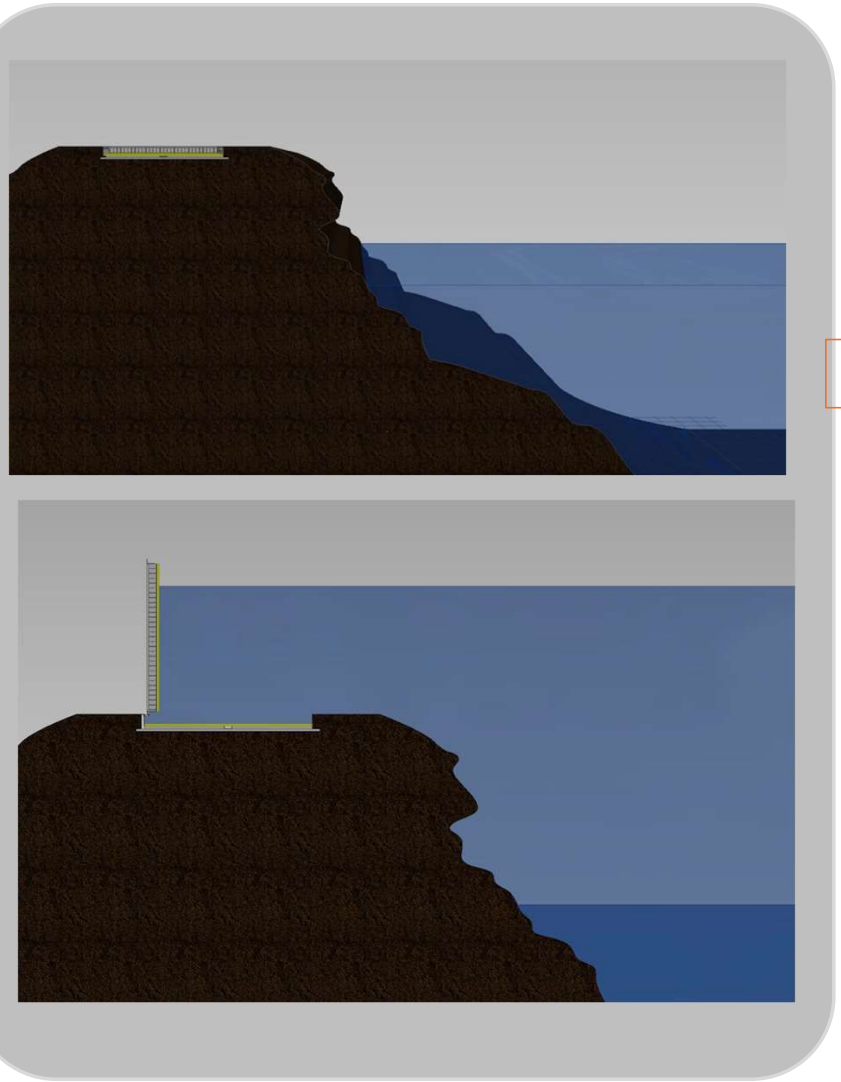


land use and vulnerability

Corinne Land cover 1990

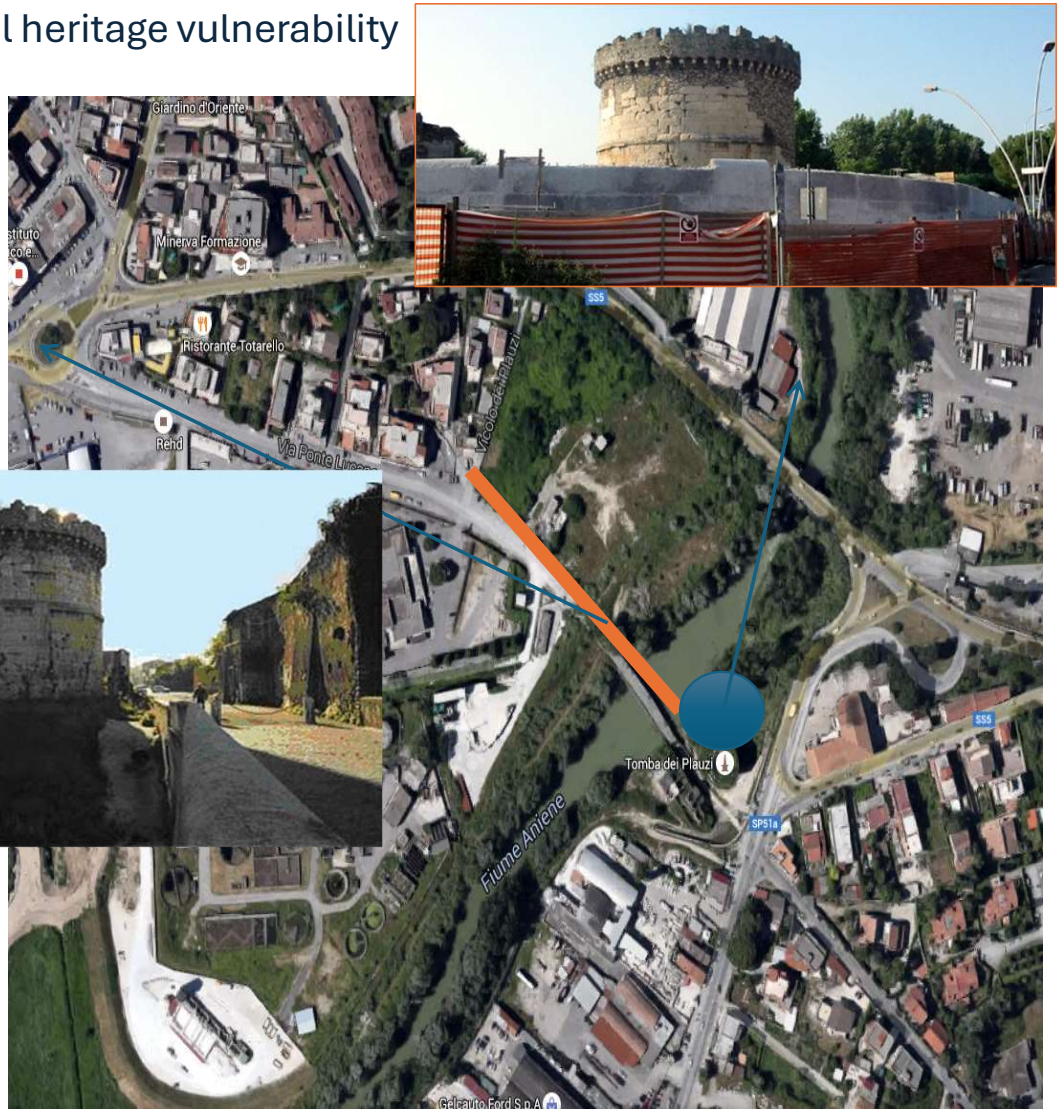


Free View Levee Topper
PASSIVE FLOOD MITIGATION

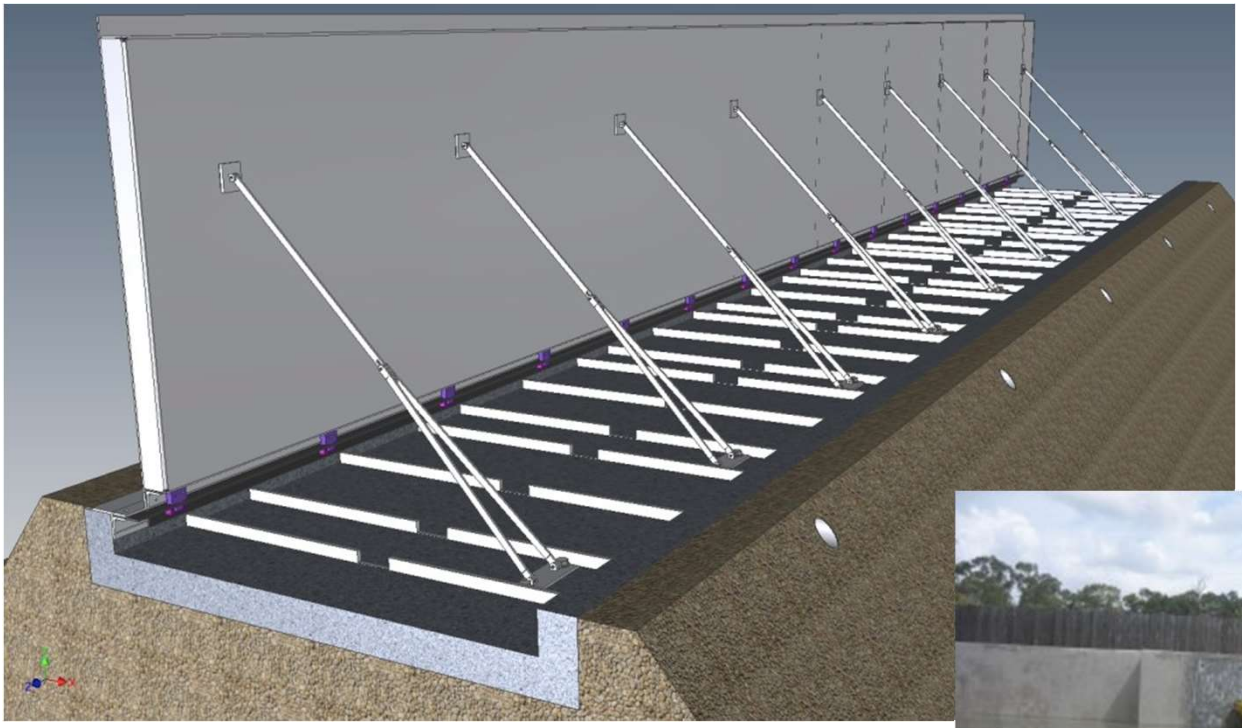


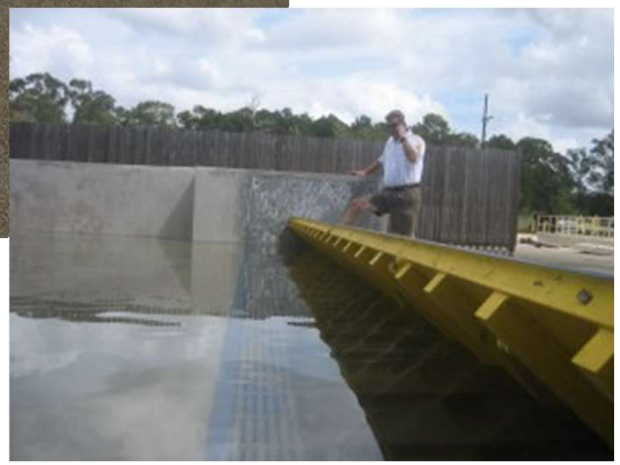
Cultural heritage vulnerability

Ponte Lucano

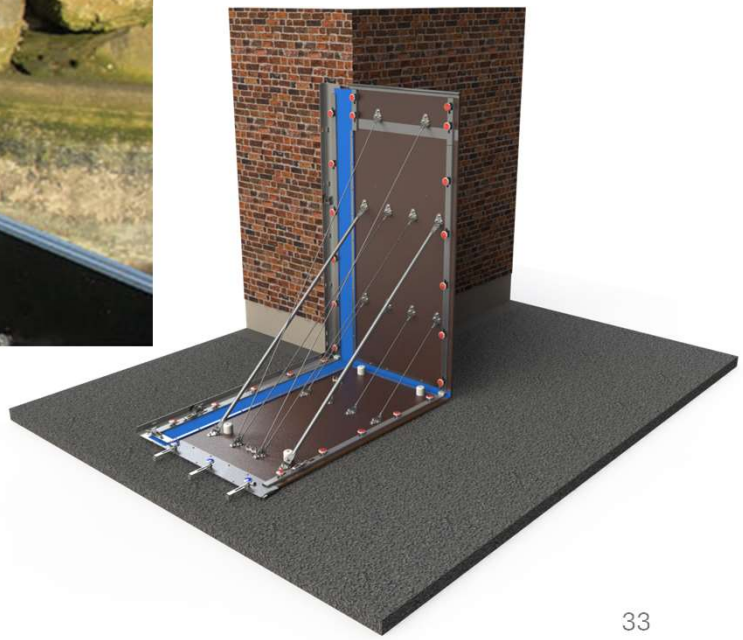


PASSIVE FLOOD MITIGATION Levee Topper

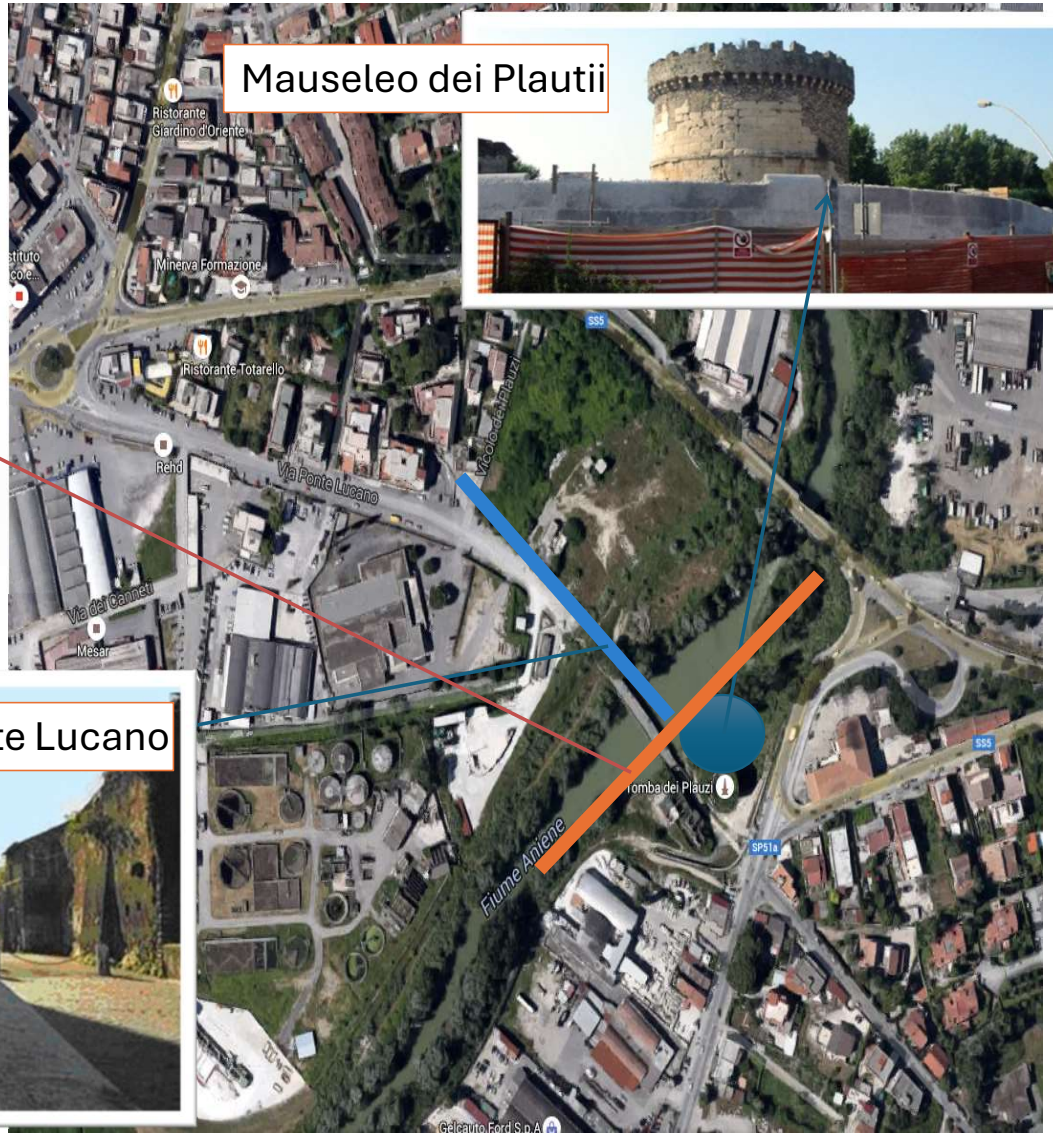




PASSIVE FLOOD MITIGATION – Flood proofing mobile



PASSIVE FLOOD MITIGATION: Flood proofing MOBILI Best Practice


Mauseleo dei Plautii
Ristorante Giardino d'Oriente
Minerva Formazione
Ristorante Totarello
Rehd
Via Ponte Lucano
Via dei Cannet
Mesar
SS5
Fiume Aniene
SP51a
Gelcauto Ford S.p.A.

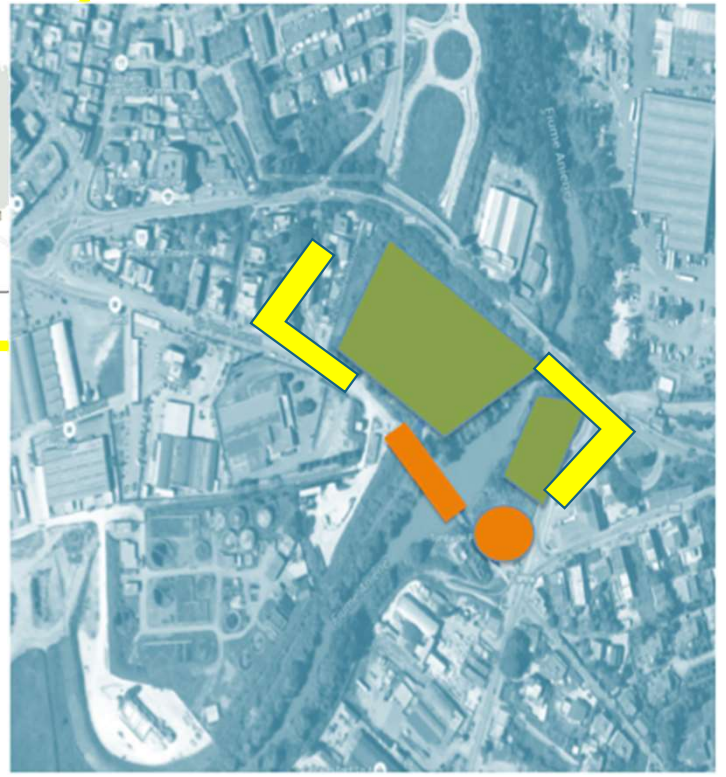

Ponte Lucano


Ristorante Giardino d'Oriente
Minerva Formazione
Ristorante Totarello
Rehd
Via Ponte Lucano
Via dei Cannet
Mesar
Fiume Aniene
Fiume Aniene
Tomba dei F
SS5
SP51a
Gelcauto Ford S.p.A.

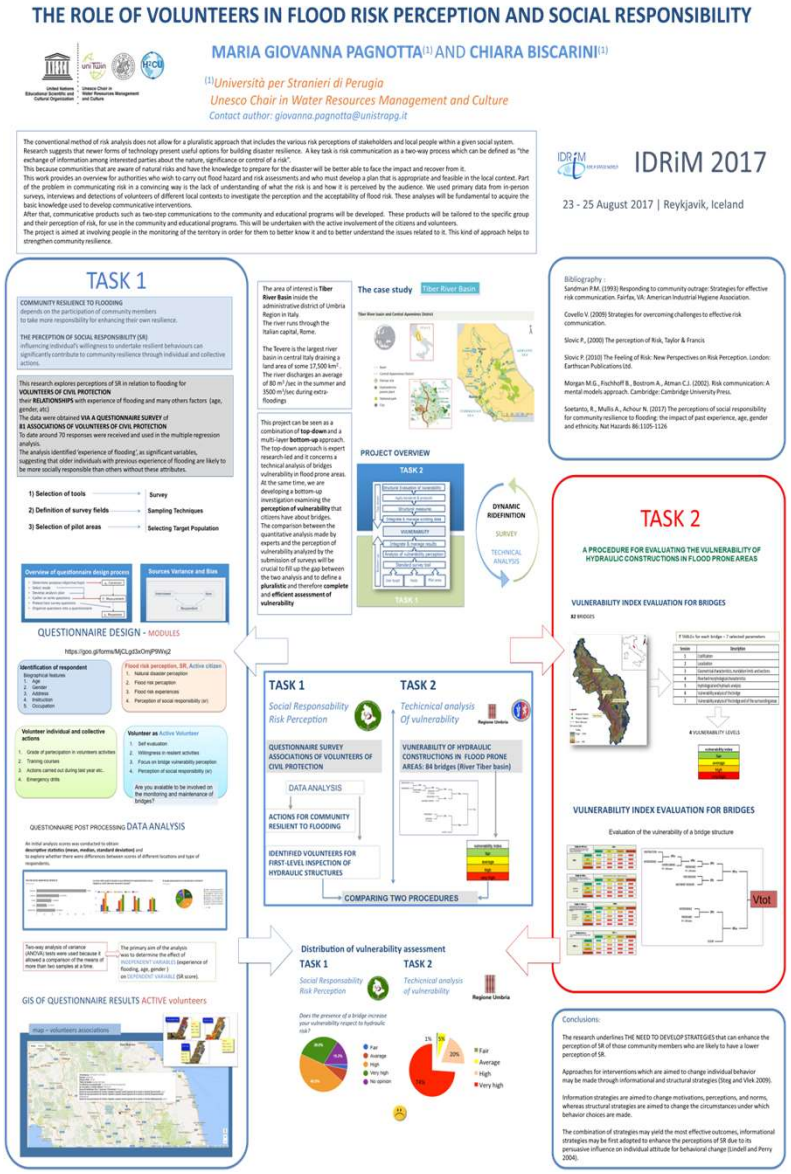

sx


dx

Archeological and fluvial park



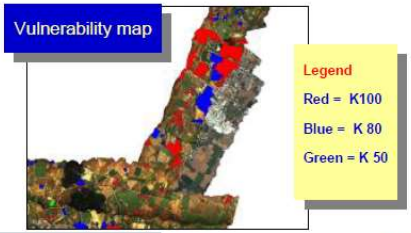
Archeological and fluvial park

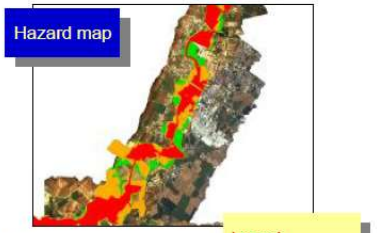


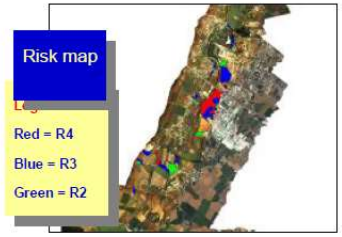
Tiber River Basin

- The Tiber River basin has approximately 4.7 million inhabitants

- The annual average discharge of the Tiber River into the Tyrrhenian Sea is 225 m3/s or approximately 7 billion m3







Flood Risk Maps

R1 → LOW RISK – high Tr – low susceptibility

R2 → MEDIUM RISK – Tr 200- Tr 500 – very high / high susceptibility

R3 → HIGH RISK – Tr 50 – Tr 200 - very high susceptibility

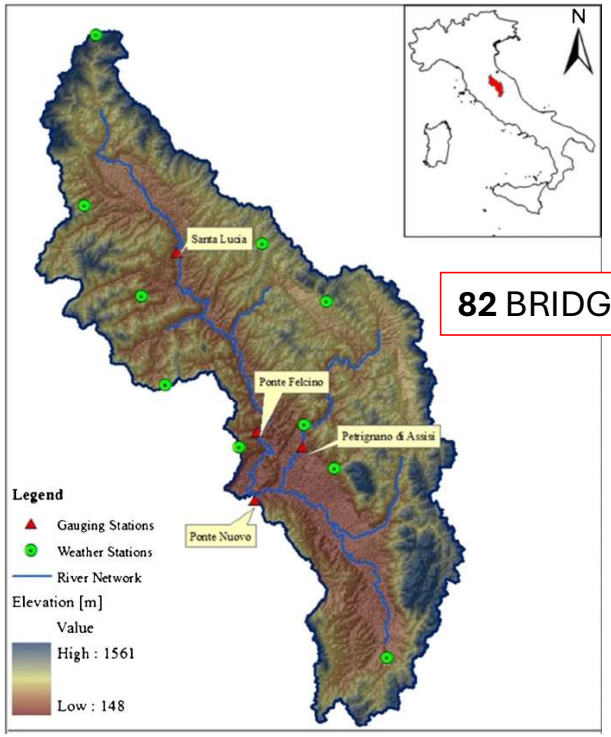
R4 → VERY HIGH RISK - Tr 50 – very high susceptibility

A PROCEDURE FOR EVALUATING THE VULNERABILITY OF HYDRAULIC CONSTRUCTIONS IN FLOOD PRONE AREAS

Silvia Di Francesco, Niccolò Cusano University - Italy, **silvia.difrancesco@unicusano.it**
Sara Venturi, University of Perugia - Italy, **sara.venturi@unipg.it**
Chiara Biscarini, Unesco Water Chair - University of Foreigners Perugia - Italy , **chiara.biscarini@unistrapg.it**
Arnaldo Pierleoni, Niccolò Cusano University - Italy, **arnaldo.pierleoni@unicusano.it**
Piergiorgio Manciola, University of Perugia - Italy, **piergiorgio.manciola@unipg.it**

Pontecuti Bridge – Tiber River

La Barca Bridge (Deruta) – Tiber River



82 BRIDGES

7 TABLEs for each bridge – 7 selected parameters

Session	Description
1	Codification
2	Localization
3	Geometrical characteristics, inundation limits and sections
4	Riverbed morphological characteristics
5	Hydrological and hydraulic analysis
6	Vulnerability analysis of the bridge
7	Vulnerability analysis of the bridge and of the surrounding areas

4 VULNERABILITY LEVELS

grado di vulnerabilità
fair
average
high
very high

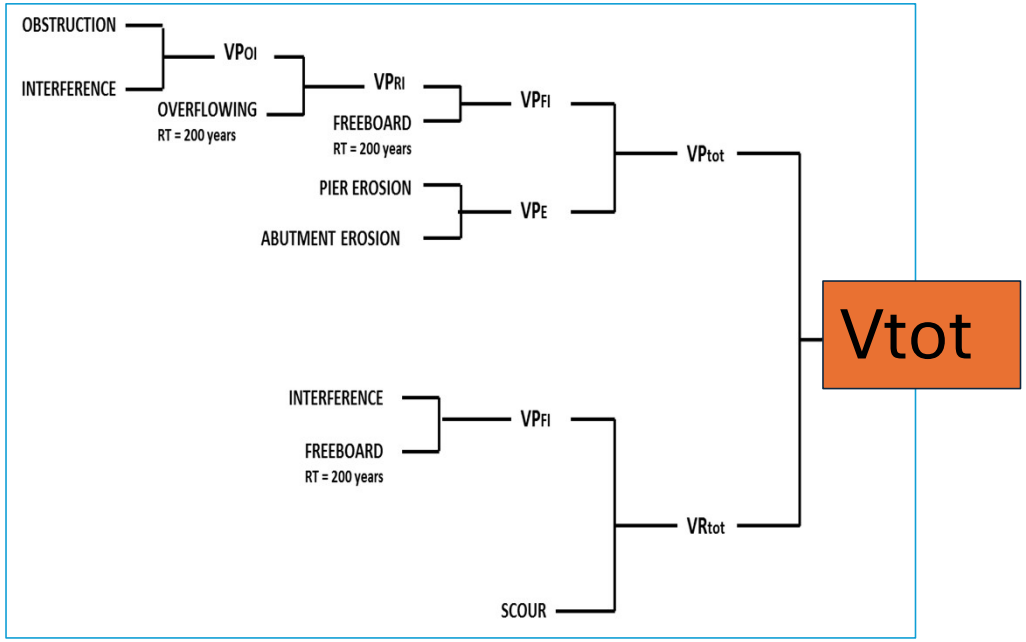
Evaluation of the vulnerability of a bridge structure

TAB.5-VPTOT Vulnerabilità del ponte in funzione del franco, delle interferenze con il corso d'acqua e dell'erosione		VPFI			
		ADEGUATO	MEDIO	ELEVATO	MOLTO ELEVATO
VPE	ADEGUATO				
	MEDIO				
	ELEVATO				
	MOLTO ELEVATO				

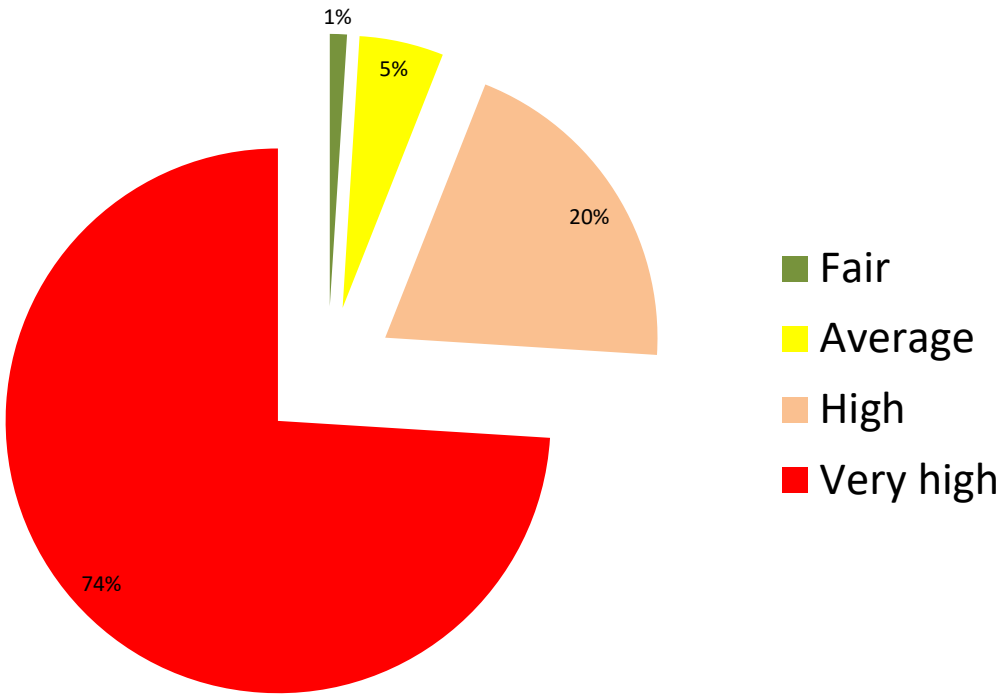
TAB.6-VRFI Vulnerabilità del rilevato di accesso in funzione del franco e delle interferenze con il corso d'acqua		INTERFERENZE CON IL CORSO D'ACQUA			
		ADEGUATO	MEDIO	ELEVATO	MOLTO ELEVATO
FRANCO TR=200	ADEGUATO				
	MEDIO				
	ELEVATO				
	MOLTO ELEVATO				

TAB.7-VRTOT Vulnerabilità del rilevato di accesso in funzione del franco e dell'erosione potenziale e delle interferenze con il corso d'acqua		VRFI			
		ADEGUATO	MEDIO	ELEVATO	MOLTO ELEVATO
EROSIONE POTENZIALE AL PIEDE	ADEGUATO				
	MEDIO				
	ELEVATO				
	MOLTO ELEVATO				

TAB.8-VTOT Vulnerabilità del rilevato di accesso e del ponte		VPTOT			
		ADEGUATO	MEDIO	ELEVATO	MOLTO ELEVATO
VRTOT	ADEGUATO				
	MEDIO				
	ELEVATO				
	MOLTO ELEVATO				



Distribution of vulnerability assessment



Outcomes: fragility of the calculation of the flood risk from the point of view of vulnerability because of the lack of an accurate risk mapping like the one analyzed.

Such assessment enable real-time flood management → citizen should be part of the management process

Citizen participation

Quantitative Analyses

Participative Activity

grado di vulnerabilità
adeguato
medio
elevato
molto elevato

SURVEY MODEL

Analysis of the affected population sample and of its risks perception

- Biographical features
- Main types of houses
- Having or having not ever experienced natural disasters
- Their level of satisfaction regarding their personal home area
- Their intention of leaving
- Data about the risks perception

Respondents' assessment on the institutions and the information process functions concerning the natural risks

-Appropriateness of the current prevention rules

-Effectiveness of the intervention organisation

-Attention given to this issue by the institutions

-The media system ability to provide objective information

Level of clearness, credibility and expertise belonging to the many actors who take part in the communication process

-Civil protection
-Fire department
-Experts
-Mayor
-Voluntary / Environmental organisations
-Law enforcement
-Region
-Teachers
-Journalists
-Politicians

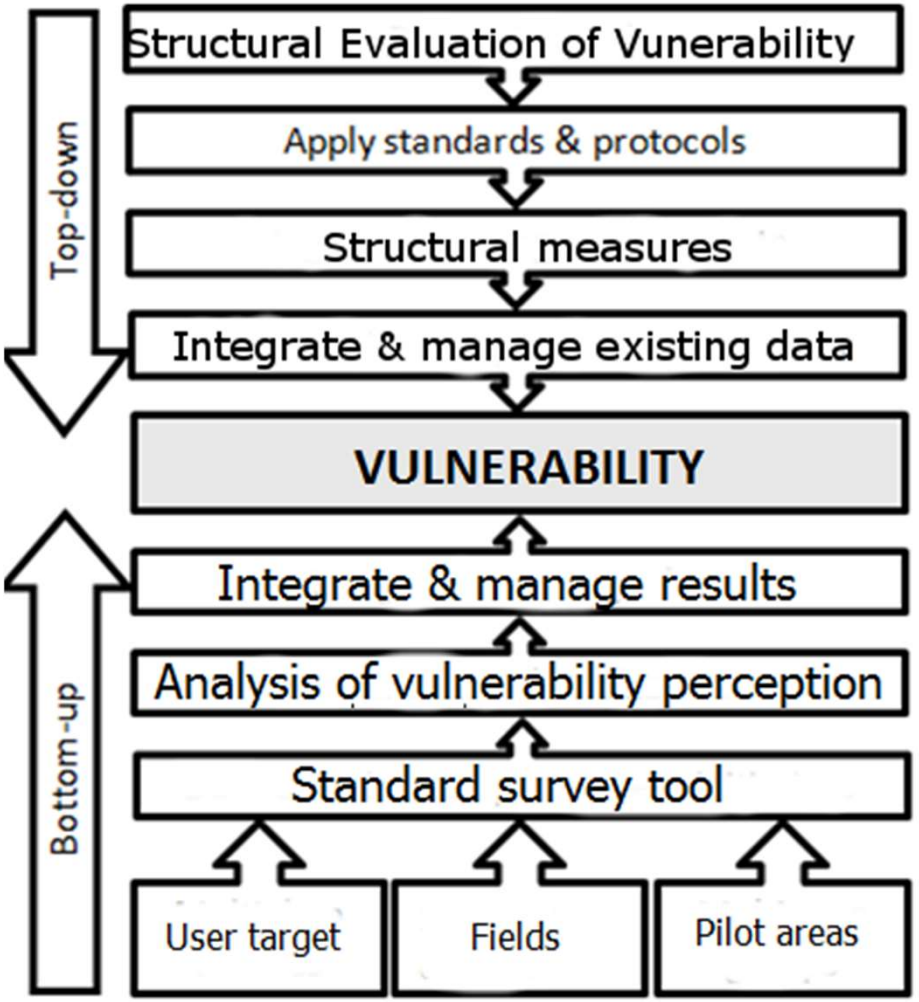
Are you avaiable to help expertises with the resilience process?

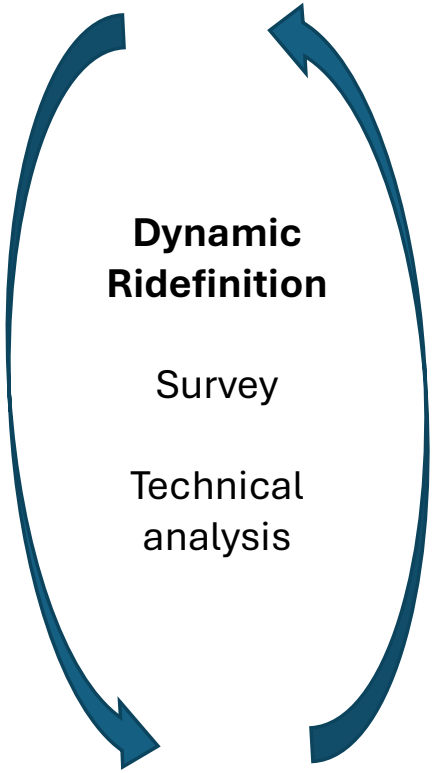
Citizen Perception of Risk (Bridges) and participative management

Session	Description
1	Codification
2	Localization
3	Geometrical characteristics, inundation limits and sections
4	Riverbed morphological characteristics
5	Hydrological and hydraulic analysis
6	Vulnerability analysis of the bridge
7	Vulnerability analysis of the bridge and of the surrounding areas

Are you avaiable to be involved on the monitoring and maintenance of bridges?

?


Structural Evaluation of Vunerability
Apply standards & protocols
Structural measures
Integrate & manage existing data
VULNERABILITY
Integrate & manage results
Analysis of vulnerability perception
Standard survey tool
User target
Fields
Pilot areas
Top-down
Bottom-up


Dynamic
Ridefinition
Survey
Technical
analysis

Citizens' perception and risks management evaluation in Natural Disasters

Maria Giovanna Pagnotta (1), Chiara Biscarini (1), Ilaria Baffo (2), Giuliano Fabbri (2)

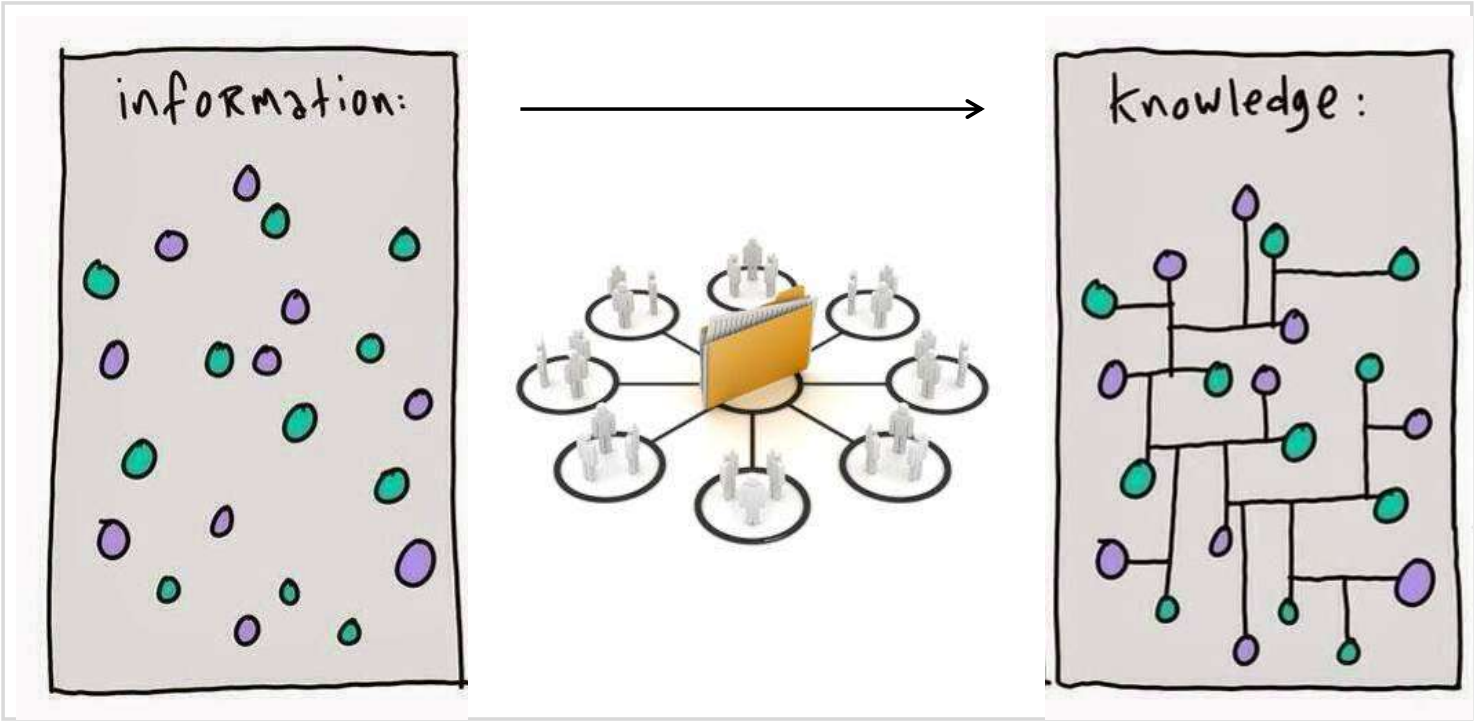
Università per Stranieri di Perugia

United Nations Educational Scientific and Cultural Organization

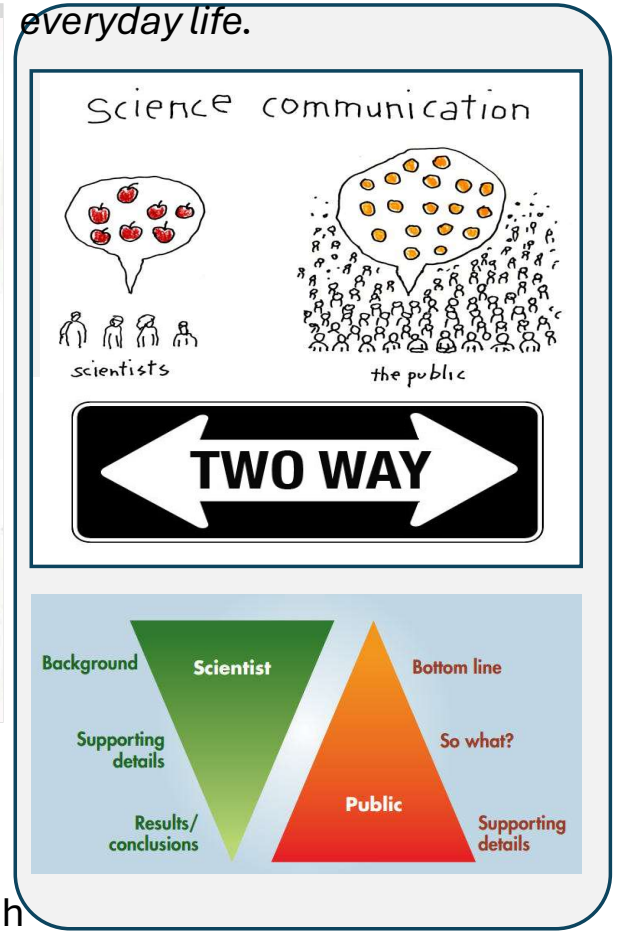
Unesco Chair in Water Resources Management and Culture

(1) UNESCO Chair in Water Resource Management and Culture, Università per Stranieri di Perugia, Perugia, Italy
(giovanna.pagnotta@unistrapg.it), (2) DEIM Università della Tuscia, Viterbo, Italy

Resilient Communities: Perception, Communication and Vulnerability for an ecological transition



connecting non-scientists with your research and its role in everyday life.



The **platforms** =➔ teams of **scientists** who focus on a subject
➔ to carry out **projects** that could not be done within a single research

Resilient Communities: Perception, Communication and Vulnerability for an ecological transition

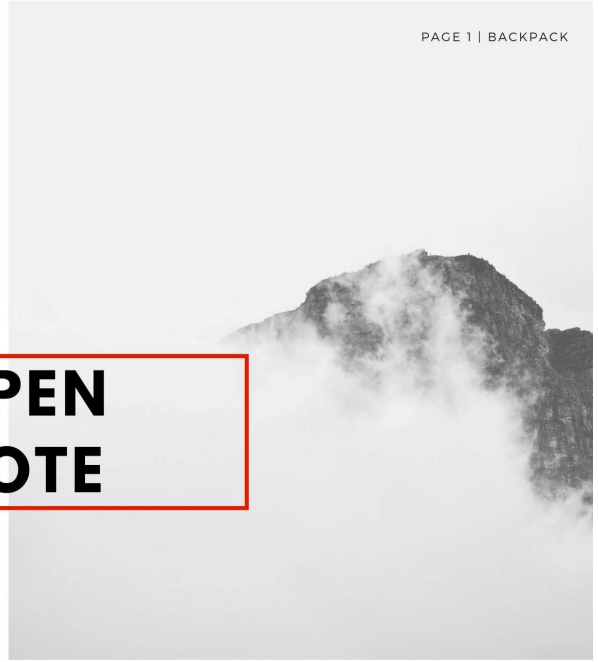
To ensure an exchange between scientific experts, governmental institutions, and the general public, scientists must be able to communicate effectively with diverse audiences

Main goals are

- **improve and extend** science communication
- **explore approaches** to science communication
-investigate **how public audiences receive** and use scientific information
-the project will also **assess the impact of effective** community engagement on the relationship between scientists and the general public.

The overarching purpose of the project was to **discern learning from the science** and to reflect upon how this learning can be

OPEN NOTE



The editor in chief heads all the departments of the organization and is held accountable for delegating tasks to staff members and managing them. The term is often used at newspapers, magazines, yearbooks, and television news programs. The term is also applied to academic journals, where the editor in chief ultimately decides whether a submitted manuscript will be published. This decision is made by the editor in chief after seeking input from reviewers selected on a basis of relevant expertise.

OPINION

A skilled backpacker minimizes their impact on the environment, including staying on established trails, not disturbing vegetation, and carrying garbage out. The Leave No Trace movement ethos is direct: "Leave nothing but footprints. Take nothing but photos. Kill nothing but time. Keep nothing but memories

Backpacking camps are usually more spartan than campsites where gear is transported by car or boat. In areas with heavy backpacker traffic, a hike-in campsite might have a fire ring (where permissible), an outhouse, a wooden bulletin board with a map and information about the trail and area. Many hike-in camps are no more than level patches of ground free of underbrush. In remote wilderness areas hikers must choose their own site. Established camps are rare and the ethos is to "leave no trace" when gone.

Backpacking is an outdoor recreation where gear is carried in a backpack. This can include food, water, bedding, shelter, clothing, stove, and cooking kit. Weight is necessarily key. Backpacking trips consist of at least one night and can last for weeks or months, sometimes aided by planned resupply points or drops.A backpacker's modern lightweight dome tent near Mount Anne in a Tasmanian Wilderness area
In some regions, varying forms of accommodation exist, from simple log lean-to's to staffed facilities offering escalating degrees of service. Beds, meals, and even drinks may be had at Alpine huts scattered among well-traveled European mountains. Backpackers there can walk from hut-to-hut without leaving the mountains, while in places like the Lake District or Yorkshire Dales in England hill-walkers descend to stay in Youth hostels, farmhouses or guest houses.

CONTENTS

TRASFORMAZIONE TEMPORANEA DELLO SPAZIO PUBBLICO

URBANISTICATATTICA

Words Sven Bannuscher
Photography Svenler
Styling Madi Ross

L'urbanismo tattico è un'esperienza giovane rispetto ad altre pratiche utilizzate nelle grandi città. Non credo sia una pratica obsoleta, ma che deve maggiormente entrare nelle procedure delle pratiche delle amministrazioni pubbliche del nostro paese e che permette di accelerare alcune trasformazioni in senso positivo. Accelerare vuol dire che ci permette di fare interventi leggeri, non solo infrastrutturali, e di testarli e capire se le persone hanno poi degli ottimi risultati ed un beneficio da quelle che sono le esperienze dalla **trasformazione temporanea dello spazio pubblico.**

Questo garantisce una partecipazione e una adattabilità degli strumenti urbanistici a quella che è la risposta della cittadinanza.

Dall'altra parte, l'urbanismo tattico ha una duplice valenza, perché non è solo un ripensare lo spazio pubblico e voler rimettere al centro le persone, ma garantisce maggior spazio fisico ai cittadini dove, in un contesto come l'emergenza da Covid, viene richiesto di avere un distanziamento fisico e le persone si ritrovano ad avere sempre più bisogno di spazi più ampi per le proprie esigenze quotidiane.

Soprattutto nei contesti delle città italiane dove, a differenza di realtà come ad esempio Parigi e Barcellona, la maglia molto fitta dei nostri centri storici va in contrasto con i concetti "auto-persone-distanziamento fisico" dovuto dall'emergenza pandemica. Ritengo che quello che l'urbanismo tattico non solo sia una delle esperienze più appropriate oggi per rispondere all'emergenza pandemica,

RESILIENT IN PRACTICE

WRITTEN BY CRISTIANA MAPELLI

PIERO PELLIZZARO

CHIEF RESILIENCE OFFICER COMUNE DI MILANO

Nominato "Chief Resilience Officer" nel 2017 per guidare la strategia di resilienza del Comune di Milano per il più ampio progetto internazionale della Fondazione Rockefeller "**100 Resilient cities**", Piero Pelizzaro si occupa da oltre dieci anni di resilienza urbana e di cambiamento climatico. Un interlocutore ideale sul tema particolarmente attuale delle città che cambiano, anche ai tempi del coronavirus e che è stato protagonista di un webinar organizzato dall'Università per Stranieri, introdotto dalla professoressa Chiara Biscarini e coordinato da Lisa Bitossi.

Dottor Pellizzaro, nella sua esposizione ha introdotto il concetto di urbanismo tattico: una pianificazione dello spazio pubblico che mette al centro il cittadino, richiamandolo alla condivisione degli spazi. In questa prospettiva, crede che la crisi pandemica in corso, modificando le esigenze dei cittadini e la loro libertà di movimento, imponga un ripensamento dell'urbanistica tattica o la renda in qualche modo obsoleta?

ma anche per rispondere all'emergenza climatica, anche perché in questi anni abbiamo visto le auto come elementi di inquinamento, ma i mezzi parcheggiati raggiungono temperature molto alte e contribuiscono alla creazione del fenomeno delle isole di calore nelle nostre città.

L'urbanismo tattico ha, quindi, tantissimi punti a favore e può essere migliorato per diventare uno strumento di valutazione e di monitoraggio prima di fare una trasformazione definitiva anche costosa per la pubblica amministrazione italiana».

CENTRI STORICI PEDONALI E CICLABILI

Ripensare una città come Perugia si può?

La vocazione di tutte le amministrazioni pubbliche dovrebbe essere quella di andare verso città più pedonali e ciclabili. Penso a Perugia e al suo centro storico che dovrebbe essere solo pedonale, libero dal transito continuo di auto. Il centro storico di Perugia è un patrimonio Unesco, di tutta l'umanità, che deve essere tutelato e goduto al meglio. Fare il contrario significa una perdita di natura economica, di qualità dell'ambiente in cui viviamo e una mancata opportunità per meglio godersi il poco spazio a disposizione dei centri storici».

La realtà territoriale italiana è tipicamente di provincia, come quella perugina, e presenta non pochi ostacoli geografici e infrastrutturali, pensa che possa esistere una sorta di ricetta per la sostenibilità?«

La sostenibilità non ha una ricetta ma ha delle pratiche ed è una scelta di visione per chi deve decidere il destino dei nostri territori, quindi dei governi nazionali, regionali e comunali. La ricetta è rendersi conto che non abbiamo più tempo a disposizione perché il clima non cambierà domani ma è già cambiato oggi. La sostenibilità non è un costo aggiuntivo per la collettività o per la pubblica amministrazione. Si può e si devono fare scelte sostenibili utilizzando le risorse che si hanno a disposizione.«

Facciamo un esempio pratico: se devo riqualificare un edificio residenziale pubblico e lo faccio progettandolo come si faceva negli anni'70 e '80, scelgo di non essere sostenibile. Invece progettando l'edificio oggi con dei criteri di efficienza energetica, ventilazione naturale ed interazione del verde ha un costo leggermente superiore a quello delle pratiche di 40 anni fa, ma un risparmio e un impatto sulla salute e la qualità del vivere delle persone che è ben più alto.

EARTH PROVIDES ENOUGH TO SATISFY EVERY MAN'S **NEED**, BUT NOT EVERY MAN'S **GREED**.

MAHATMA GANDHI


YOUR
PODCAST
ANGELA SAGNELLA
"DRR e Sviluppo Sostenibile"


YOUR
PODCAST
ANITA FLORIDI
"Le professioni dell' Acqua"


YOUR
INTERVIEW
ANGELA SAGNELLA
"Le professioni dell' Acqua"


YOUR
PODCAST
GIOVANNA SCOCOZZA
"Dialoghi di pace"


YOUR
PODCAST
LISA BITOSSI
"DRR e Sviluppo Sostenibile"


YOUR
PODCAST
CRISTIANA MAPELLI
"Counicare la scienza"

United Nations
Educational, Scientific and
Cultural Organization

DIALOGHI DELLE CATTEDRE UNESCO

un laboratorio di idee per il mondo che verrà

UN PERCORSO DI INCONTRI WEBINAR DELLE CATTEDRE UNESCO ITALIANE

1 Ambiente, mobilità, rifiuti e territorio
2 Energia, clima e risorse
3 Welfare sociale
4 Salute, cibo e benessere
5 Sviluppo economico e occupazione
6 Sviluppo territoriale
7 Educazione universitaria per la Sostenibilità
8 Istruzione di qualità, inclusiva ed equa

8 TAVOLI MAGNIFICI INCONTRI CRUI 2019

35 CATTEDRE UNESCO ITALIANE

1 Educazione universitaria alla sostenibilità e alla resilienza
2 Istruzione di qualità, inclusiva, equa, ed efficace per la gestione consapevole del cambiamento e della complessità
3 Cultura di pace, diritti umani, migrazioni e welfare sociale
4 Cooperazione internazionale e partecipazione
5 Benessere, salute, cibo e sviluppo territoriale
6 Sviluppo economico, creatività e nuovi modelli occupazionali
7 Ambiente, territorio e mobilità
8 Patrimoni culturali e paesaggi
9 Energia, acqua, clima e risorse
10 Nuove tecnologie e futuro
11 Scienza, ricerca ed etica
12 Nuovi paradigmi e saperi per la sostenibilità, la resilienza e l'evoluzione umana

12 STANZE

17 OBIETTIVI DELL'AGENDA 2030

si scelgono 1o 2 stanze, in cui collocare il webinar

si scelgono da 1 a 3 SDGs da associare al webinar

DIALOGHI DELLE CATTEDRE UNESCO

un laboratorio di idee per il mondo che verrà

UN PERCORSO DI INCONTRI WEBINAR DELLE CATTEDRE UNESCO ITALIANE

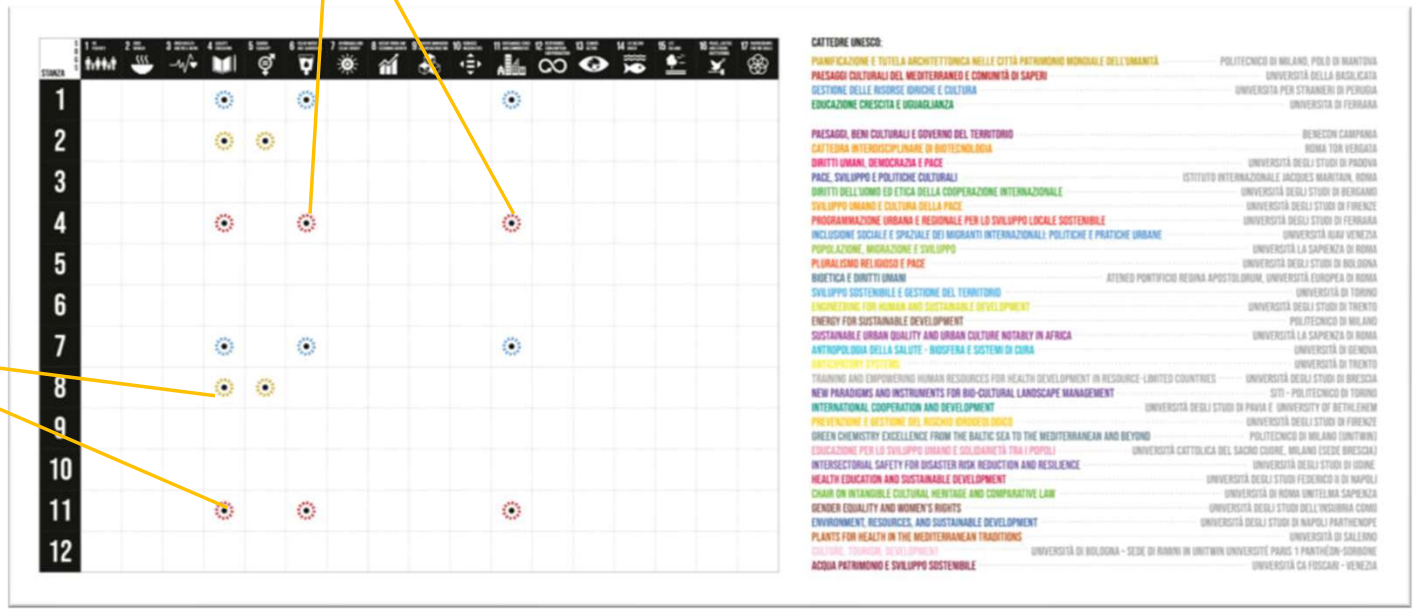
DIALOGHI *delle* CATTEDRE

United Nations
Educational, Scientific and
Cultural Organization

DIALOGHI DELLE CATTEDRE UNESCO

un laboratorio di idee per il mondo che verrà

UN PERCORSO DI INCONTRI WEBINAR DELLE CATTEDRE UNESCO ITALIANE



United Nations
Educational, Scientific and
Cultural Organization

DIALOGHI DELLE CATTEDRE UNESCO

un laboratorio di idee per il mondo che verrà

UN PERCORSO DI INCONTRI WEBINAR DELLE CATTEDRE UNESCO ITALIANE

UNESCO CHAIR Ferrara - Prof. Ceccarelli

JNESCO CHAIR Poli. Milano - Prof.ssa Colombo

UNESCO CHAIR Padova - Prof. Mascia

JNESCO CHAIR Mantova - Prof. Bucci

JNESCO CHAIR BRESCIA - Prof. Castelli

UNESCO CHAIR Udine - Prof. Grimaz

UNESCO CHAIR Firenze - Prof. Canuti

DIALOGHI delle CATTEDRE

UNESCO CHAIR Pavia - Prof. Vaggi

JNESCO CHAIR Roma - Prof.ssa De Rose

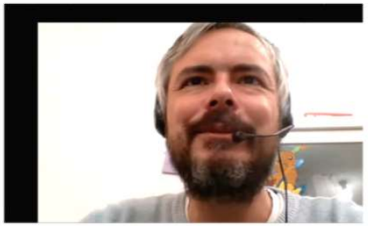
UNESCO CHAIR Milano/Brescia - Prof. Simeone

RUS - Presidente Prof.ssa Lombardi

JNESCO CHAIR TRENTO - Prof. Zolezzi

JNESCO CHAIR Unitelma Roma - Prof. Petrillo

UNESCO CHAIR Venezia- Prof.ssa Marcon



United Nations
Educational, Scientific and
Cultural Organization

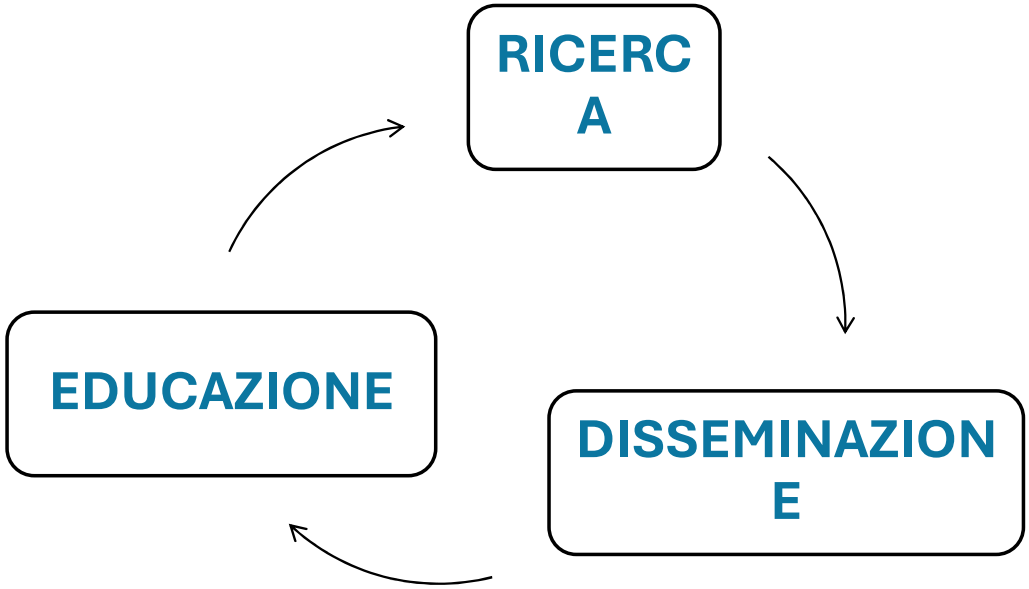
DIALOGHI DELLE CATTEDRE UNESCO

un laboratorio di idee per il mondo che verrà

UN PERCORSO DI INCONTRI WEBINAR DELLE CATTEDRE UNESCO ITALIANE

DICHIARAZIONE
DELLE CATTEDRE UNESCO ITALIANE PER LA SOSTENIBILITA'

Dichiarazione delle Cattedre UNESCO Italiane per la Sostenibilità



United Nations
Educational, Scientific and
Cultural Organization

EDUCAZIONE

DICHIARAZIONE
DELLE CATTEDRE UNESCO ITALIANE PER LA SOSTENIBILITA'
Dichiarazione delle Cattedre UNESCO Italiane per la Sostenibilità

- Educare al pensiero complesso, attraverso lo sviluppo di competenze per "imparare a diventare"

- Il ruolo centrale dell'educazione e la riorganizzazione della conoscenza per affrontare la sfida ambientale e sociale nella loro interdipendenza, con un approccio all'educazione come "bene comune" e alla conoscenza come "bene comune globale"

United Nations
Educational, Scientific and
Cultural Organization

RICERCA

DICHIARAZIONE
DELLE CATTEDRE UNESCO ITALIANE PER LA SOSTENIBILITA'
Dichiarazione delle Cattedre UNESCO Italiane per la Sostenibilità

- Creare un ambiente di ricerca transdisciplinare;
- Diventare una "comunità di saperi";
- Praticare una conoscenza scientifica di eccellenza, condivisa con tutti gli attori sociali
- Attuare un approccio educativo transdisciplinare e transnazionale e promuovere un ambiente educativo e di ricerca culturalmente aperto

United Nations
Educational, Scientific and
Cultural Organization

DISSEMINAZIONE

DICHIARAZIONE
DELLE CATTEDRE UNESCO ITALIANE PER LA SOSTENIBILITA'
Dichiarazione delle Cattedre UNESCO Italiane per la Sostenibilità

- Open Science Recommendation dell'Unesco adottata con una risoluzione durante la 40th sessione della Conferenza Generale dell'UNESCO nel 2019

- Cattedre UNESCO come una delle interfacce necessarie a far comunicare il mondo scientifico con quello dei "profani", rivalorizzando dove possibile quei saperi che possiamo definire "dimenticati" o "sepolti"

Declaration

DECLARATION
OF THE ITALIAN UNESCO CHAIRS FOR SUSTAINABILITY

Dichiarazione delle Cattedre UNESCO Italiane per la Sostenibilità

The Italian UNESCO Chairs, which with the *DIALOGHI DELLE CATTEDRE UNESCO: un laboratorio di idee per il mondo che verrà / DIALOGUES OF THE UNESCO CHAIRS: a laboratory of ideas for the world to come* project have started a process aimed at operating as a collective body, interacting and proposing themselves as a "community of knowledge", have drawn up a Declaration for sustainability and socio-ecological transition.

The Declaration is an expression of the commitment and contribution of the Italian UNESCO Chairs in the development of education and knowledge in relation to the global environmental challenge. The many specificities of the Italian UNESCO/UNITWIN Chairs converge on this point and, speaking with one voice, they intend to propose a contribution of ideas and expertise to national, European, and international policies and to the UNESCO itself.

The Declaration is also addressed to the national university institutions, within which the UNESCO Chairs are committed to the achievement of sustainable development objectives. They responsibly assume the role of producers of new knowledge, preparing programs aimed at responding more promptly and independently to the renewed demand for new learning and research in a world undergoing rapid economic, social, and technological change.

Create transdisciplinary research environment;

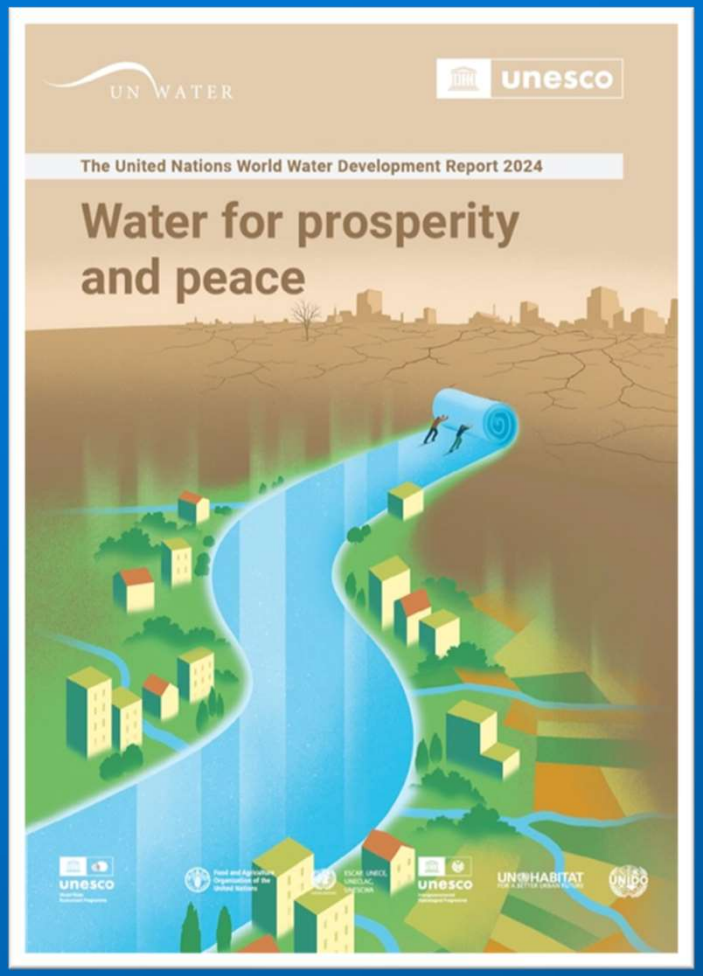
- Become a “community of knowledge”;
- Practice scientific knowledge of excellence, shared with all social actors, embracing the principles and tools of “post-normal science” and “citizen science”;
- As a collective subject with a high scientific profile, adopt complex thinking, able to contribute to the definition of transition strategies towards a just and sustainable ecological society (for the “transition from below”, and the “just transition”);
- Practice strategies of interrelationship between issues and problem areas by bringing the links on a plane of superordinate logical order, in order to deal effectively with complexity;
- Develop tools to verify processes through the definition of appropriate quantitative and qualitative indicators

ACADEMIC WATER DIPLOMACY

Debates and dialogues about the theory and practice of water diplomacy.
Why water diplomacy?
What does diplomacy have to do with water?
Is cooperation ove the exclusive domain of diplomats and foreign policy experts, which is the role of water professionals negotiating agreements on shared water resources?
Why should non-governmental stakeholders, university, scientist be involved in diplomatic water dialogues?
How do we describe synergy between the technical and social science knowledge that can address incompatibilities and erode barriers over shared freshwater resources?

Nexus with GAME CHANCE
Nexus with key water priority of IHP-IX Strategic Plan

https://www.sciencedirect.com/special-issue/10WN60270MX



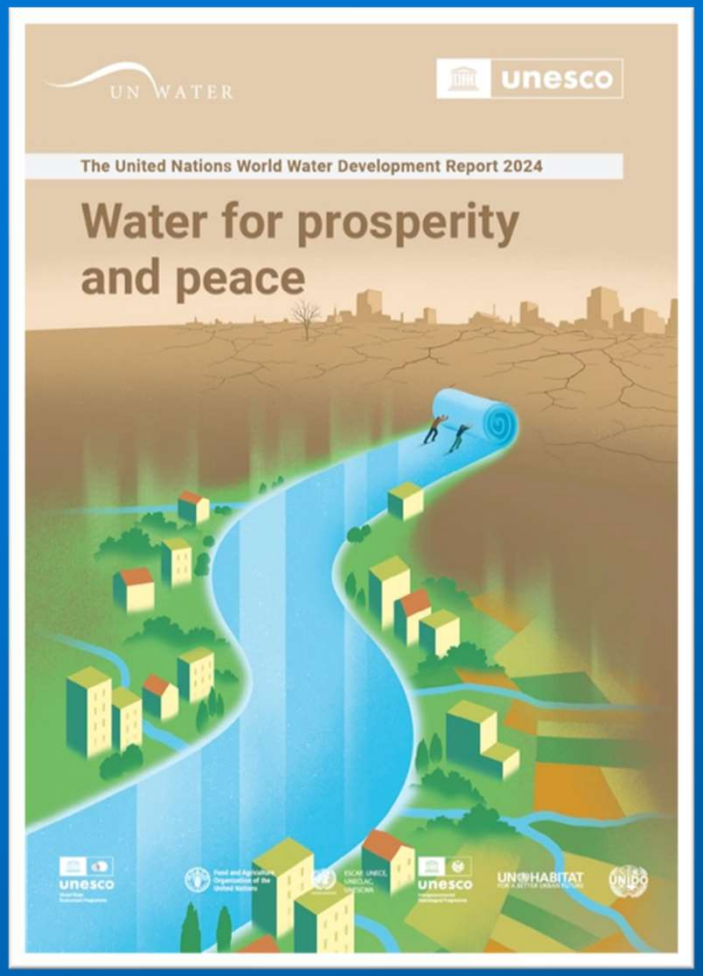
UN WATER

unesco
World Water Assessment Programme

Water for prosperity and peace

The United Nations World Water Development Report 2024

The UNESCO World Water Assessment Programme is financed by the Italian Government



unesco
World Water Assessment Programme

Food and Agriculture Organization of the United Nations

UNITED NATIONS
ESCAP, UNECE, UNECLAC, UNESCWA

unesco
Intergovernmental Hydrological Programme

UN HABITAT
FOR A BETTER URBAN FUTURE

UNIDO

The World's Water Crises in Numbers

UN WATER unesco

Main Water Use Sectors

Global water demand increases **by about 1% annually**

UN WATER

unesco

Water withdrawal by sector (% of total freshwater withdrawal) by income group, 2020

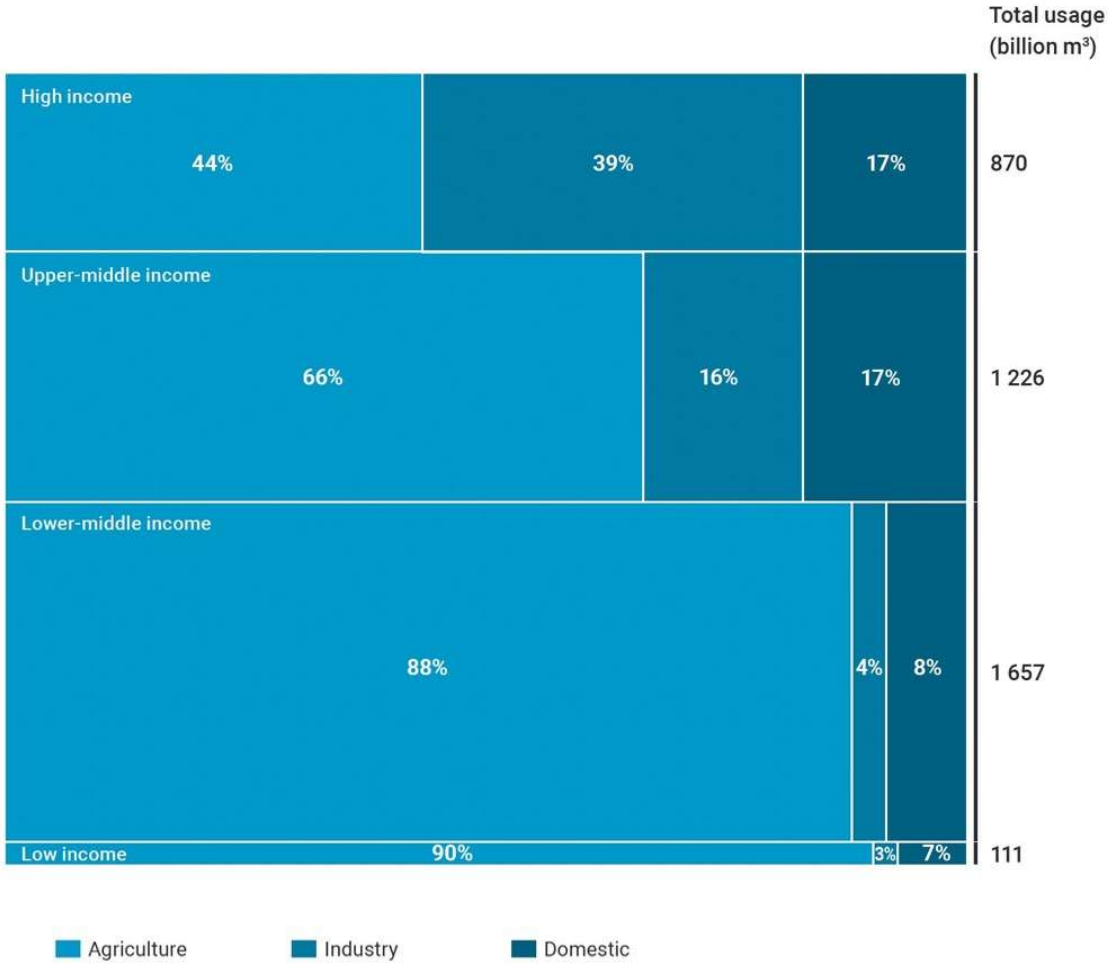


Figure P.1 (UN WWDR 2024)

Water Stress

One quarter of the world's population face 'extremely high' levels of water stress

UN WATER

unesco

The number of months per year with severe water scarcity (ratio of water demand to availability >1.0)

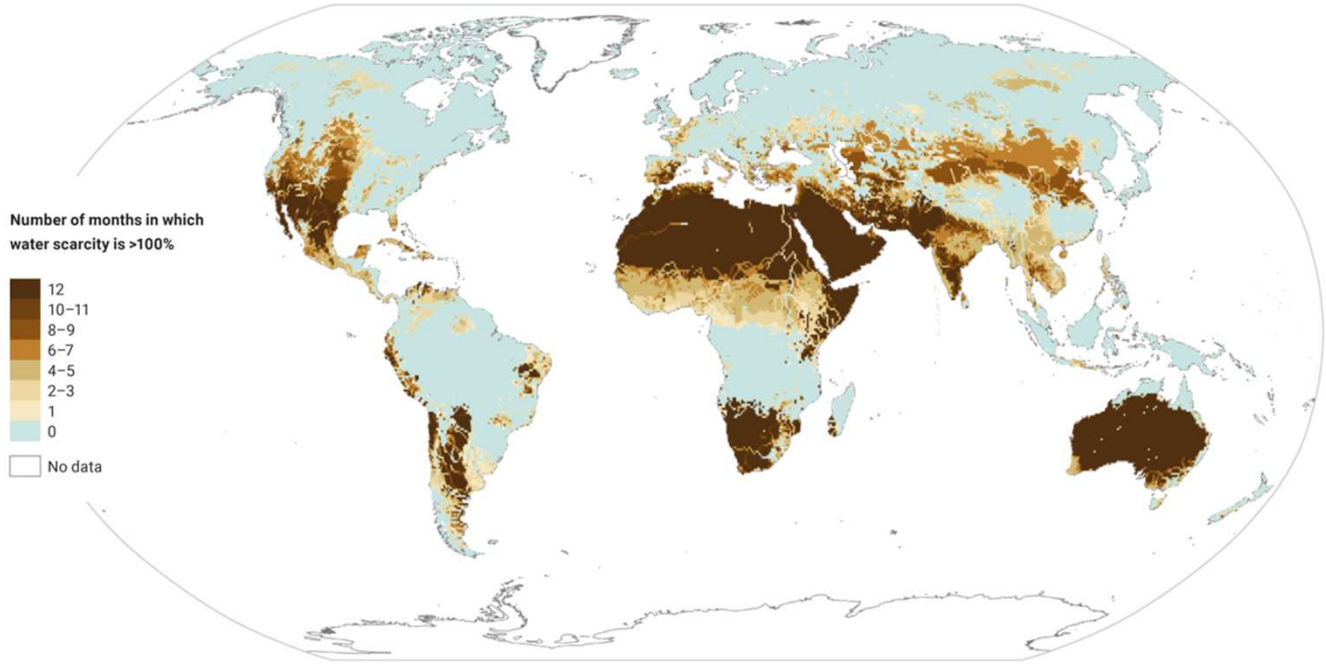


Figure P.4 (UN WWDR 2024)

Access to Water Supply and Sanitation

2.2 billion people are without access to safely managed drinking water

UN WATER

unesco

Global urban and rural population without safely managed drinking water, safely managed sanitation, and basic hygiene services, 2015/17–2022

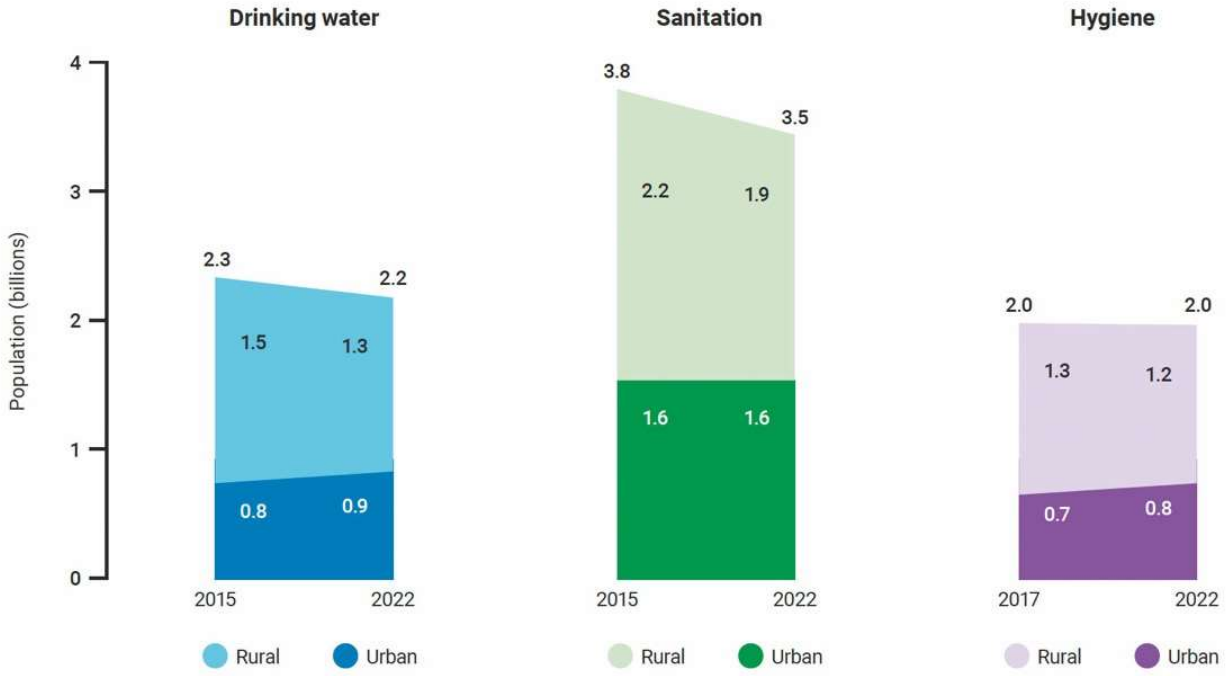


Figure P.7 (UN WWDR 2024)

Water Quality

Pollution from untreated wastewater is a major cause of water-related disease and death

UN WATER

unesco

Global risks of poor water quality

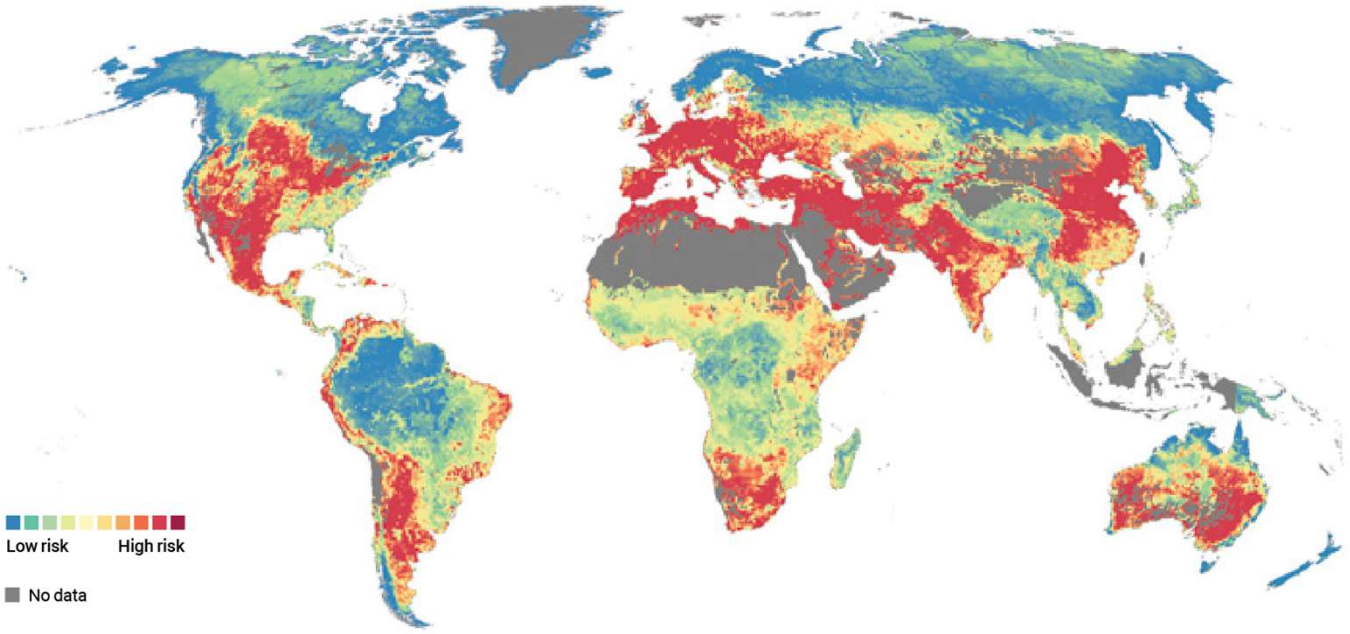


Figure P.6 (UN WWDR 2023)

Climate Change and Extreme Events

Global warming increases the frequency and severity of droughts and floods

UN WATER

unesco

Drought vulnerability index, 2022

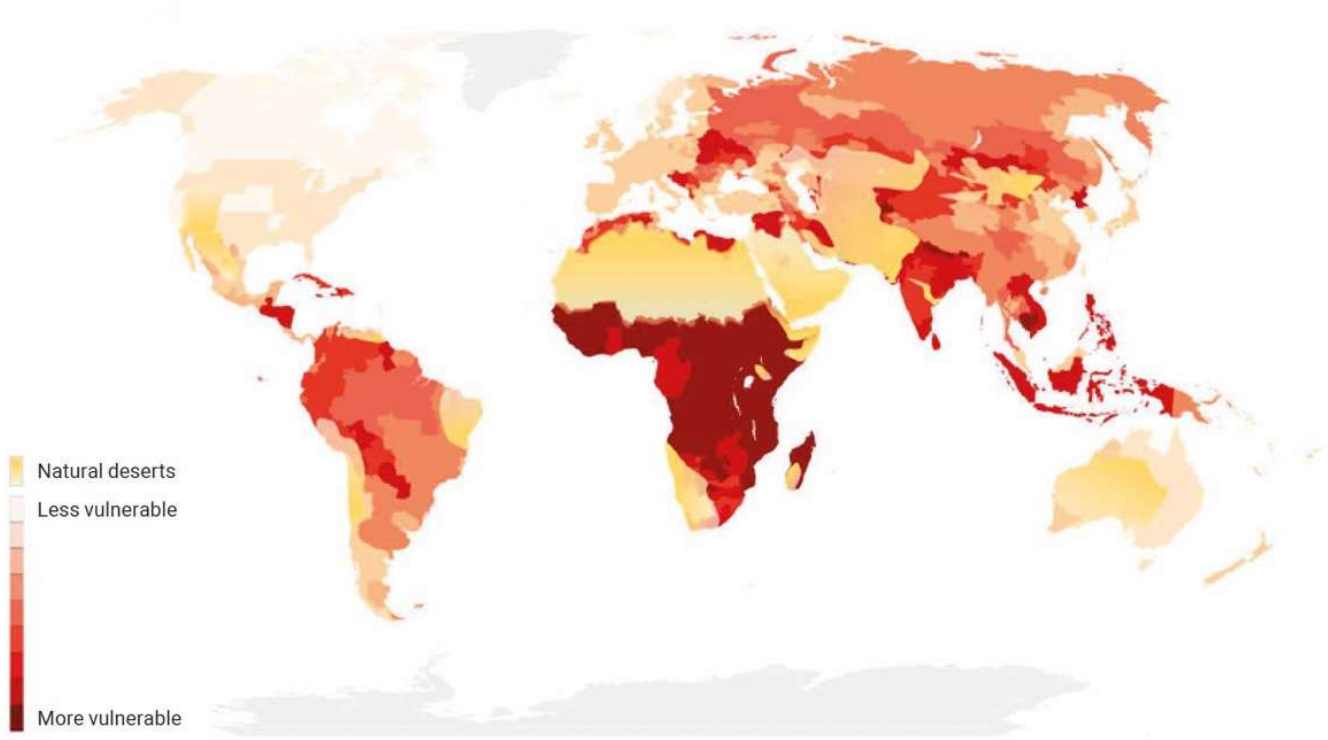


Figure P.5 (UN WWDR 2024)

Water and Prosperity

Water Availability and Economic Growth

There is no clear relationship between a country's per capita GDP and its water availability

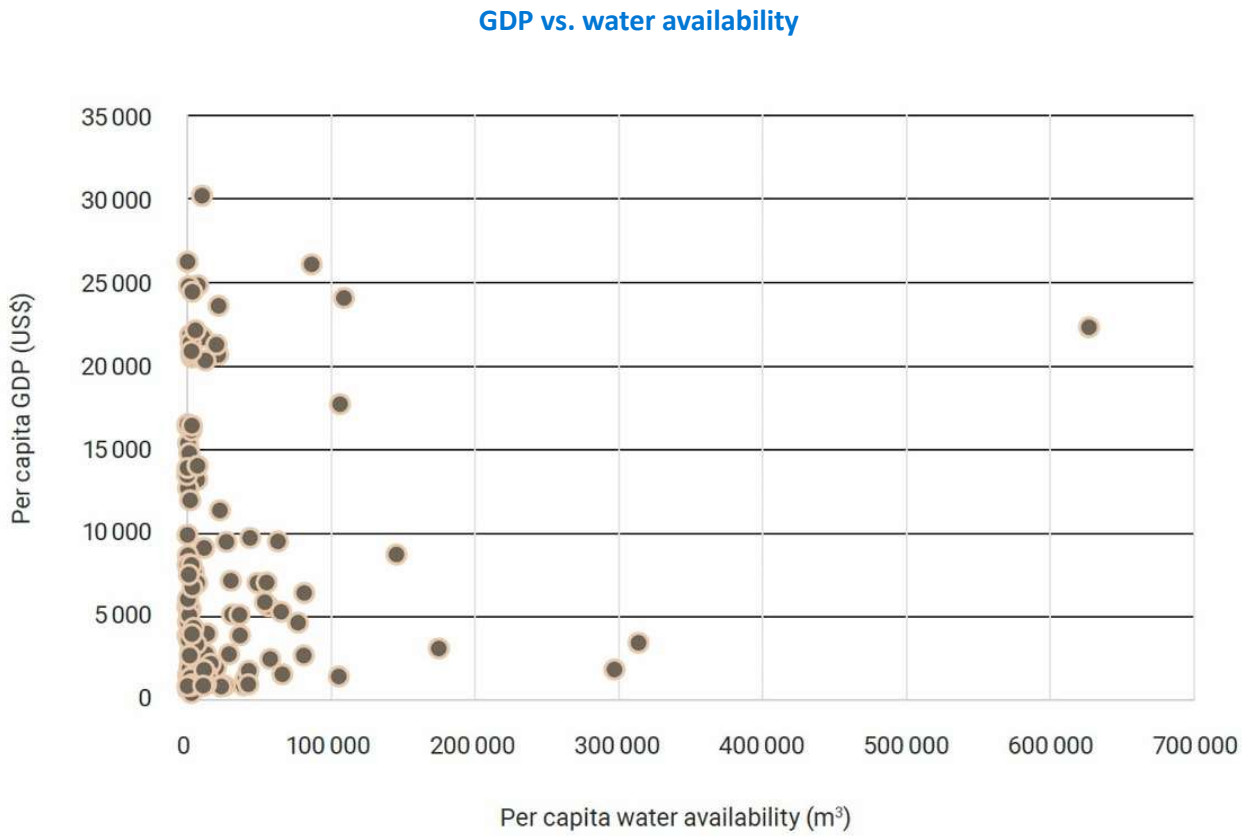


Figure P.9 (UN WWDR 2024)

Water and Employment

80% of jobs in low-income countries are water-dependent

UN WATER

unesco

Workforce water dependency by country income level, 2021

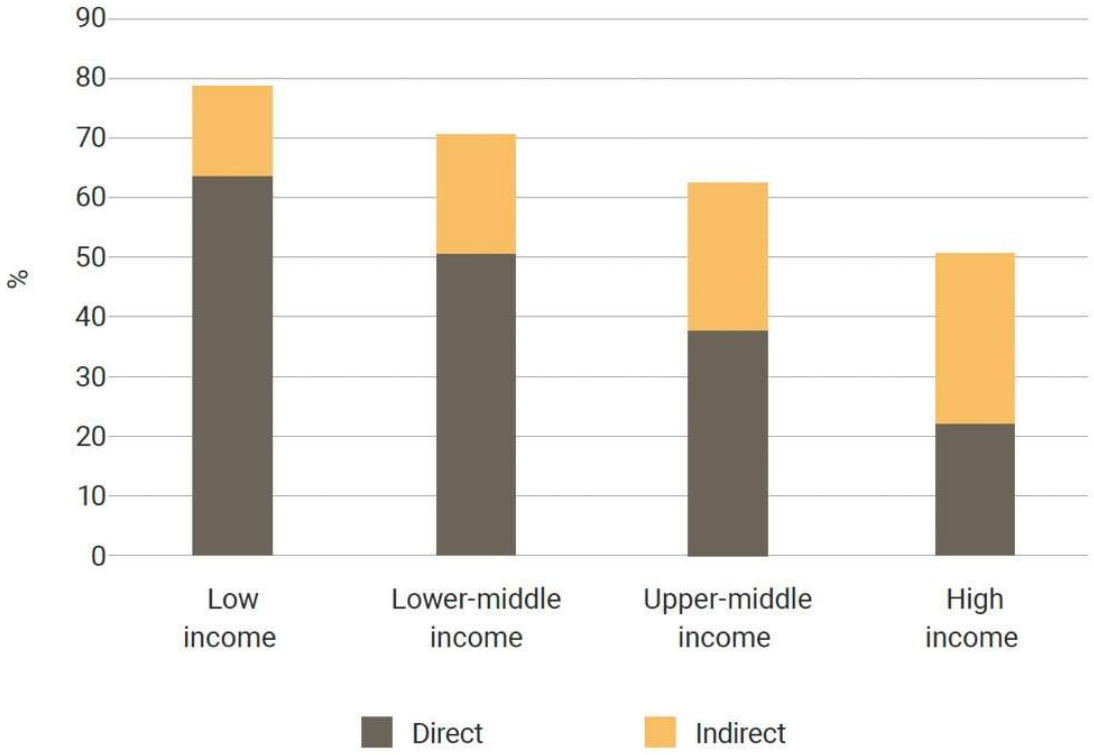


Figure P.10 (UN WWDR 2024)

Water and Peace

UN WATER

unesco

Water and Conflict Situations

Water has not typically been the principal cause of war

Thematic Focus

Food and Agriculture

Irrigation stabilizes production, increases profitability, and reduces risk of crop failure

Human Settlements

Inequalities in access to water and sanitation services can provoke tensions amongst and between communities

Industry

Decoupling water from industrial productivity can improve water availability and quality

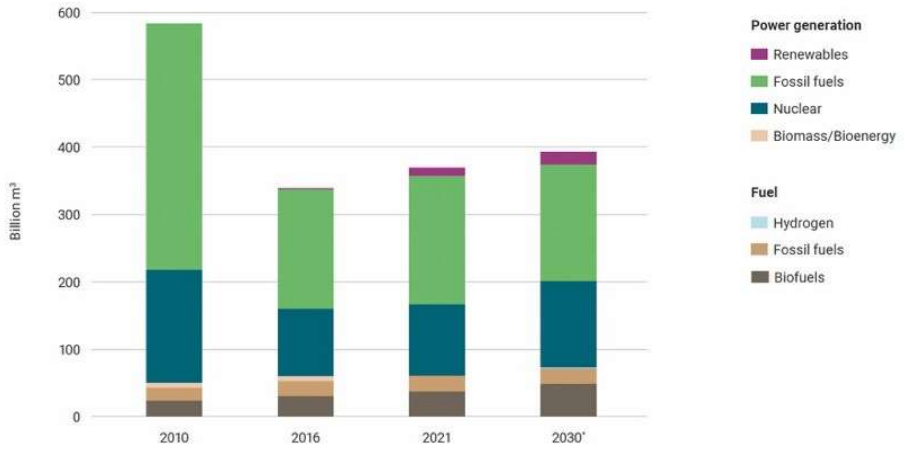
Energy

Water is extensively used for electricity generation

UN WATER

unesco

Global energy sector: Water withdrawal by fuel and power generation type



Global energy sector: Water consumption by fuel and power generation type

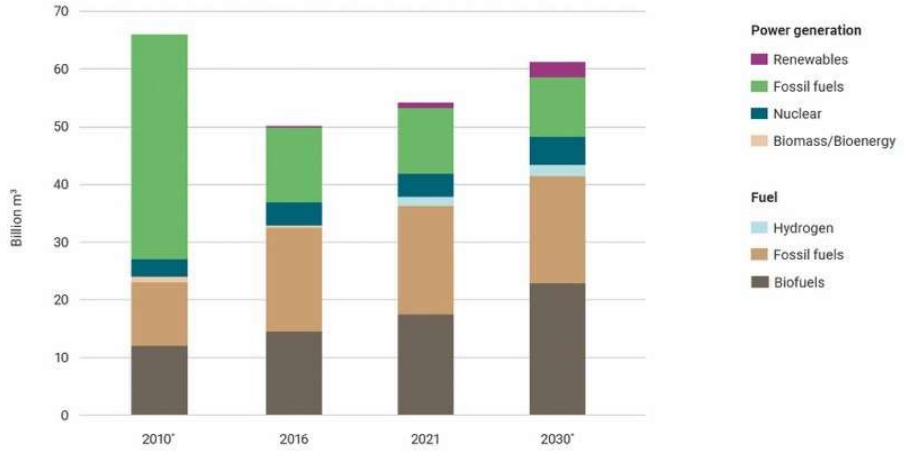


Figure 5.2 and 5.3 (UN WWDR 2024)

Energy

700 million people lack access to electricity

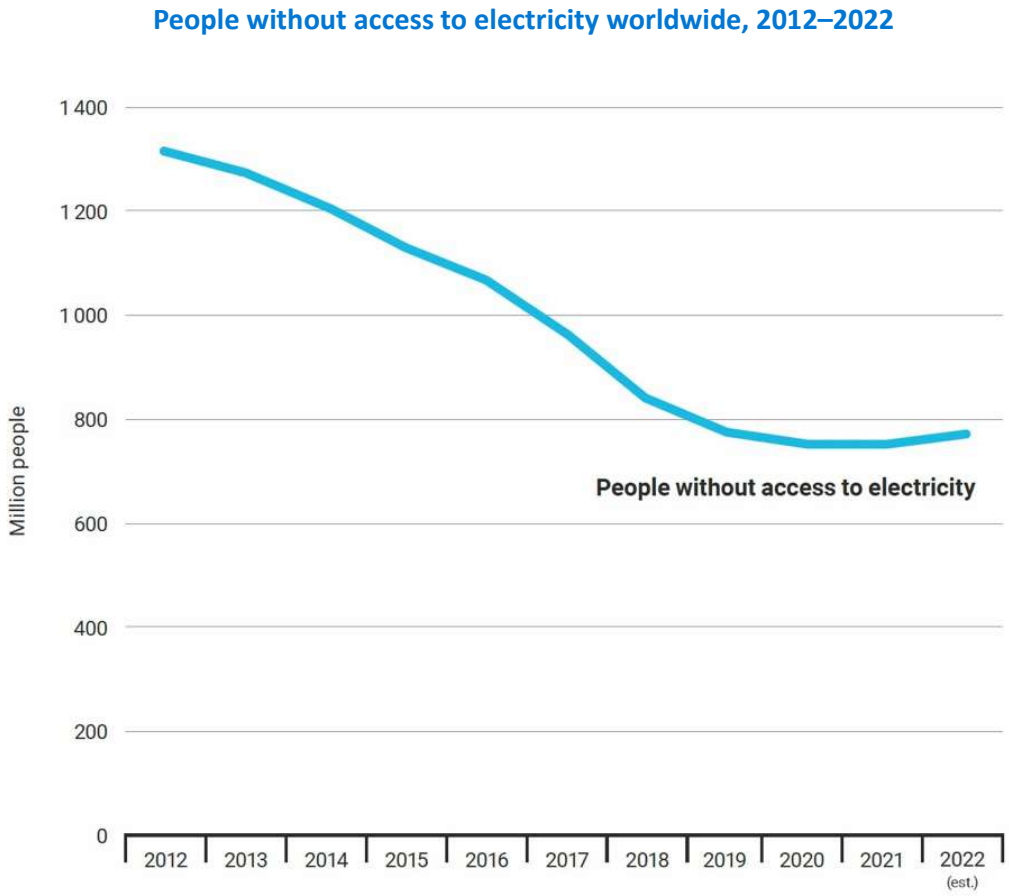


Figure 5.1 (UN WWDR 2024)

Energy

Wind and solar-photovoltaic (PV) production have more than doubled between 2011 and 2019

World electricity generation by source (%)

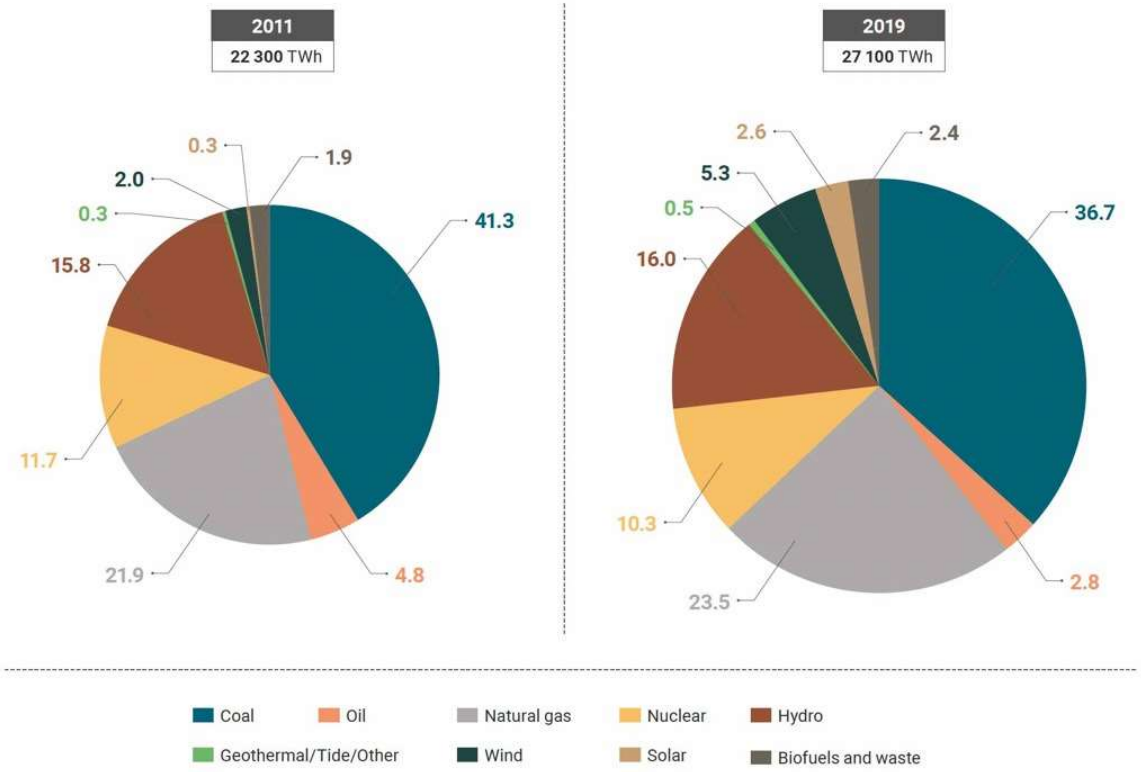


Figure 5.4 (UN WWDR 2024)

Ecosystems

Ecosystems regulate water quality and availability

Response Options

Governance

Water governance involves collective, multi-level action over water allocation and reallocation

Transboundary Cooperation

Awareness and support of joint transboundary aquifer management is increasing

Science, Technology and Information

The number of gauging stations desperately needs to increase

UN WATER

unesco

Global distribution of river gauging stations

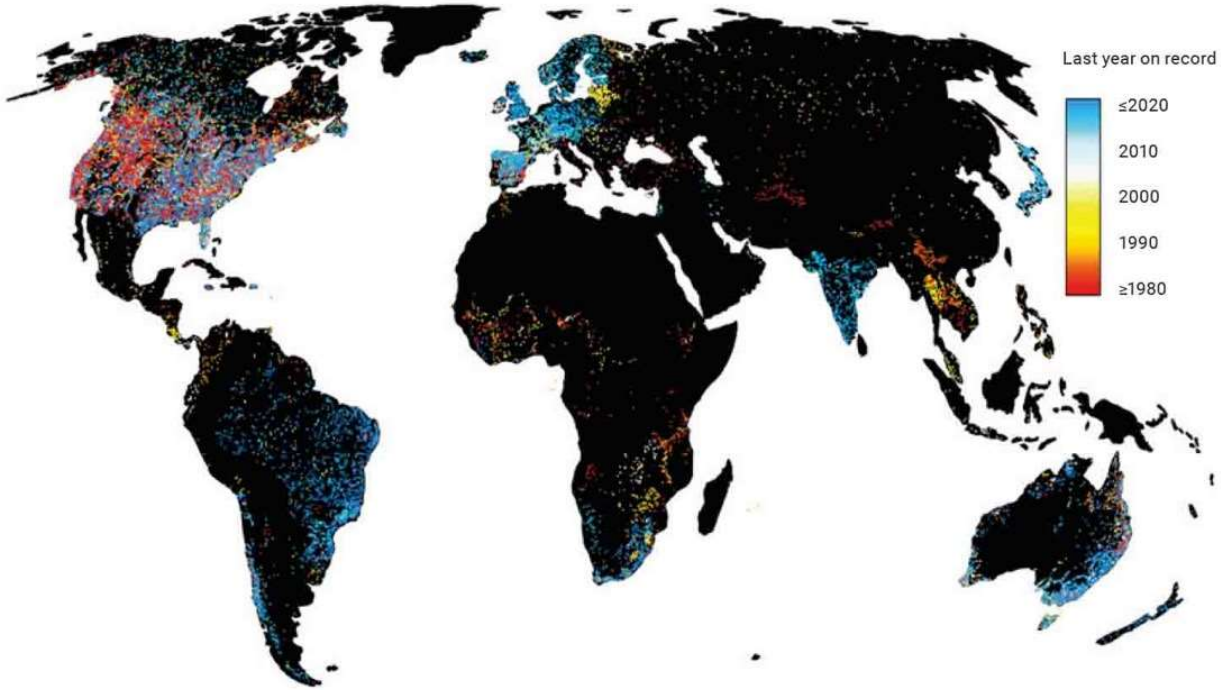


Figure 10.1 (UN WWDR 2024)

Education and Capacity Development

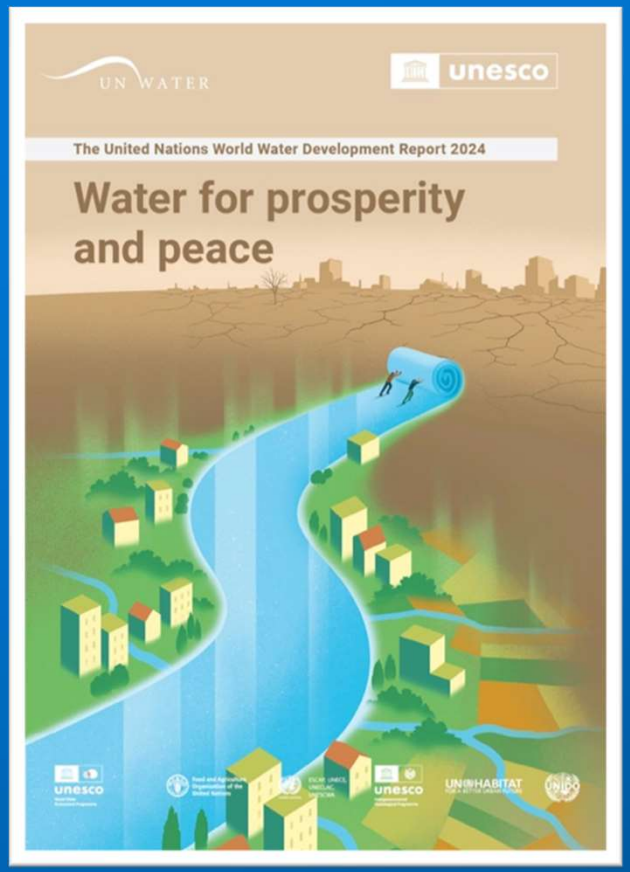
Citizen science represents an opportunity for both data collection and public participation

Financing

Nearly all solutions to the water crisis will require capital

Take Away Messages

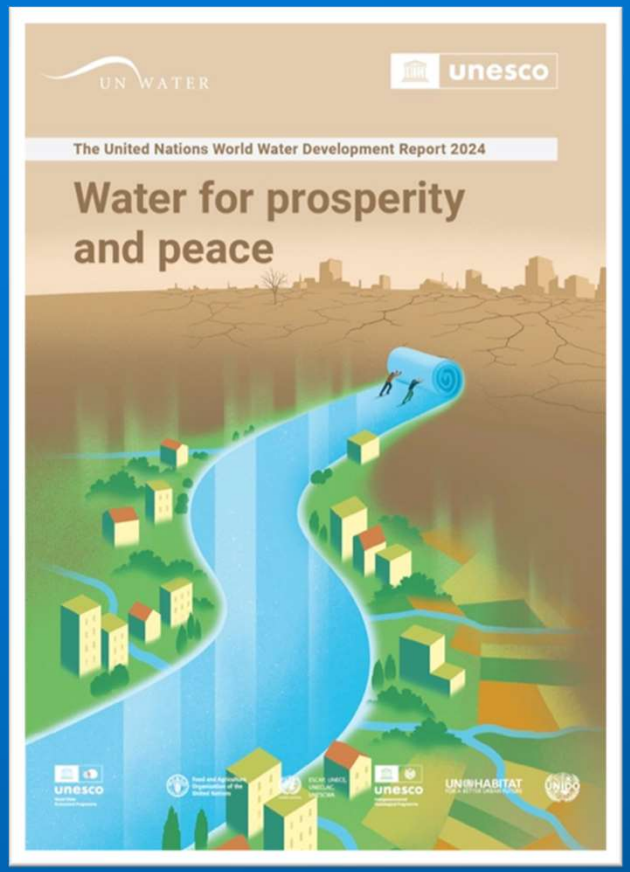
Take away messages



- Water infrastructure and resources management promote growth
- Water supply and sanitation systems foster prosperity
- All water-dependent sectors are vulnerable to climate change
- Ecosystem protection/restoration addresses many water-related challenges
- Affordable water supply and sanitation technologies are emerging

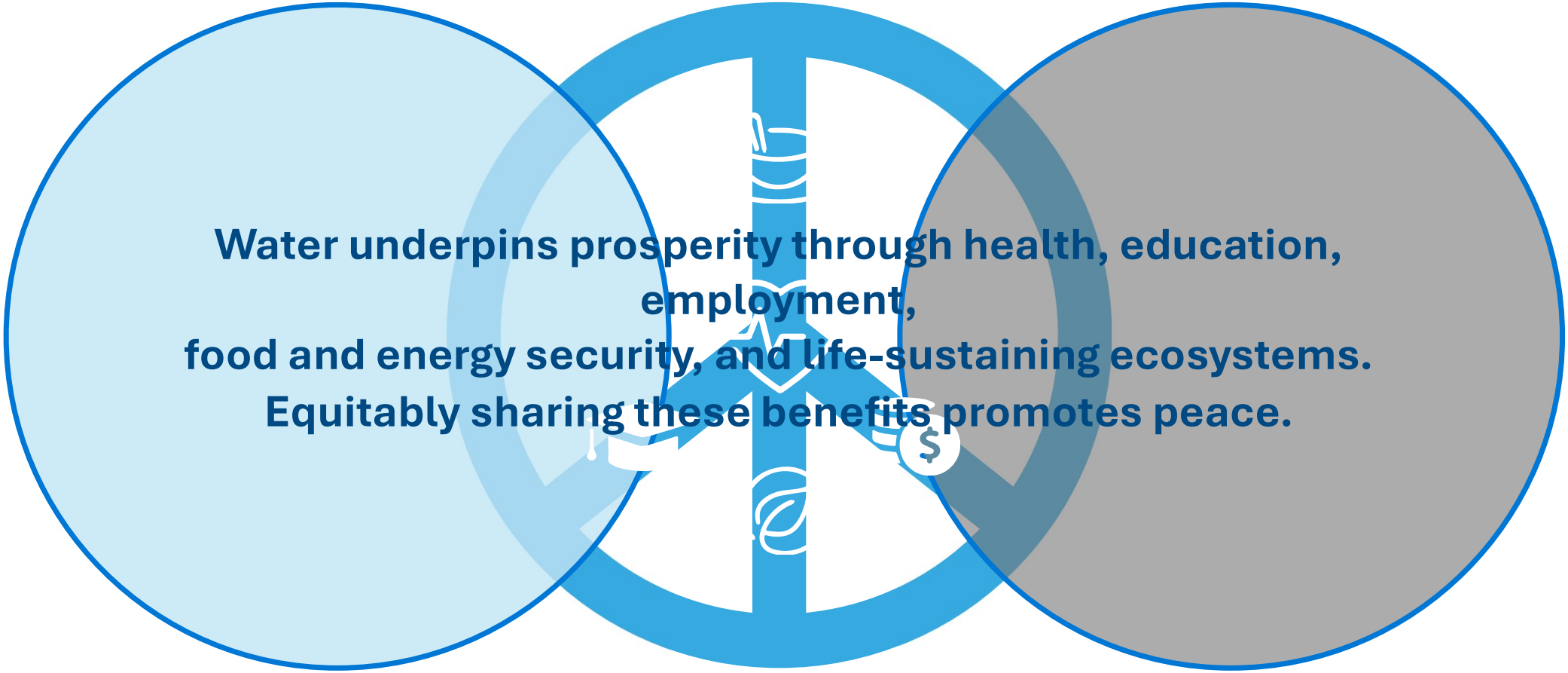
UN WATER unesco

Take away messages



- Appreciation for local/traditional knowledge and stakeholder involvement is growing
- Benefit-sharing is central to equitable water allocation and governance
- Transboundary cooperation strengthens regional integration
- Investing in water delivers (multiple) social, economic and environmental co-benefits

UN WATER unesco


Water underpins prosperity through health, education, employment,
food and energy security, and life-sustaining ecosystems.
Equitably sharing these benefits promotes peace.
Water
Prosperity

UNESCOWATERCHAIR

UNESCO CHAIR - WATER RESOURCES MANAGEMENT AND CULTURE

SHEC

We are

We do

We share

WE ARE

WE DO

WE SHARE

SHeC
CENTRE FOR SUSTAINABLE HERITAGE CONSERVATION

THE LATEST from UNESCO Chair

https://www.unistrapg.it/it/unescowaterchair

Italian Water Week

GIORNATA MONDIALE DELl'ACQUA

22 Marzo 2024

ACQUA FONTE DI PACE

UN WATER
22 MARCH
WORLD WATER DAY
2024 Water for Peace

L' acqua può essere fonte di pace o di conflitto. Quando è scarsa o contaminata, o quando le persone lottano per accedervi, le tensioni possono crescere. Collaborando sul fronte idrico, possiamo bilanciare le necessità di tutti e contribuire a stabilizzare il mondo.

La prosperità e la pace dipendono dall'acqua. Quando le nazioni affrontano i cambiamenti climatici, le migrazioni di massa e le agitazioni politiche, devono mettere la cooperazione idrica al centro dei loro piani.
L'acqua può essere la via d'uscita dalle crisi. Possiamo promuovere l'armonia tra comunità e nazioni unendoci per un uso equo e sostenibile dell'acqua, dalle convenzioni delle Nazioni Unite a livello internazionale alle azioni locali.

www.italianwaterweek.it

www.unesco.org/reports/wwdr/en/2024

Thank you

UN WATER

unesco
World Water
Assessment Programme

Chiara Biscarini
Uiversità per Stranieri di Perugia
chiara.biscarini@unistrapg.it