

STONEWALLS4LIFE

**Using Dry-Stone Walls as a
Multi-purpose Climate Change Adaptation Tool:
*preliminary results in terms of geological and
geomorphological quantitative analysis.***

Andrea Vigo¹, Andrea Mandarino¹, Giacomo Pepe¹, Emanuele Raso²,
Ugo Miretti³, Alba Bernini³, Andrea Cevasco¹, Ivano Rellini¹
and Marco Firpo¹

¹University of Genova, Department of Earth, Environment and Life Sciences, Genova, Italy

²Cinque Terre National Park, Riomaggiore (SP), Italy

³ITRB Consulting Ltd, Nicosia, Cyprus

Dr. Andrea Vigo
DISTAV – University of Genova

The Project: LIFE Climate Change Adaptation (1/2)

- LIFE EU-project focused on Climate Change Adaptation
- Main target → demonstrate how the ancient technology of **dry-stone walls** can be effectively used to improve the resilience of the territory to climate change
- How → adopting a socially and technically innovative approach, coupling:
environmental & social & economic benefits

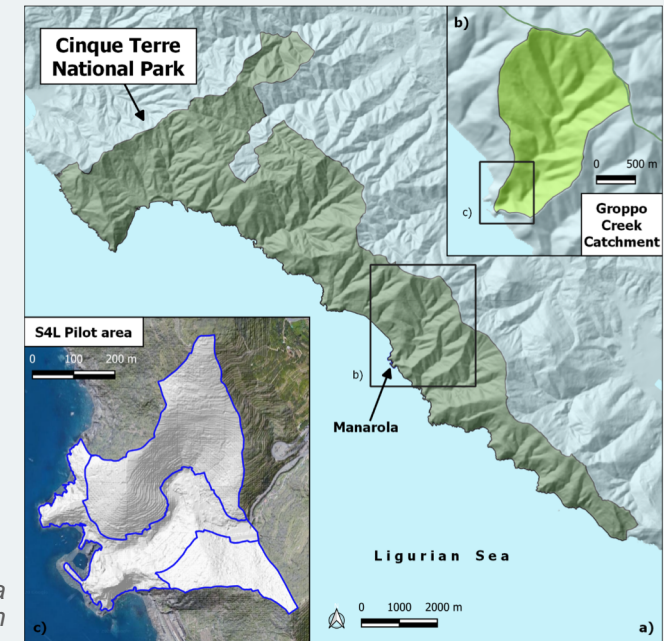


The Project: LIFE Climate Change Adaptation (2/2)

- Where → Cinque Terre National Park
(Cinque Terre area, northern Italy)
- Period → 2019 – 2024



Study Area
Source: Cevasco
et Al., 2013



Pilot Area
location

The Project: Key-Points

- **Sustainability** (replication, transfer)
- **Multipurpose** (geo-hydrological risk, flood management, fire risk, agriculture resilience)
- **Synergies** (new jobs, integration of migrants, transnational project)



Dry-stone retaining walls and vineyards



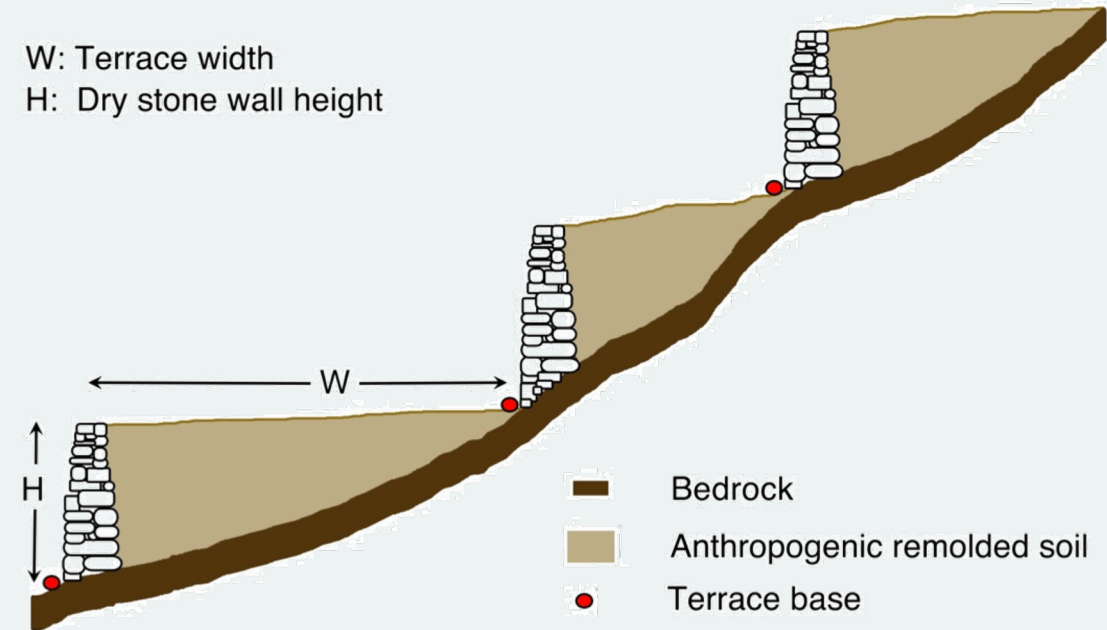
Dry-Stone Wall Terraces

- Century-old agricultural practice in the Mediterranean region
- Landscape modification due to slope terracing
- Walls collapse due to abandonment of land and farming
- Increase landslide and flood risks
- Dry-stone recovery and use like **climate change**

adaptation tool

→ Method: dry-stone and terraces restoring – improve terraces resilience – re-start productive use of terraces

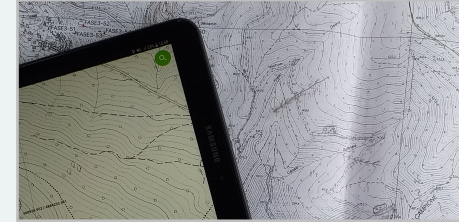
W: Terrace width
H: Dry stone wall height



Source: Paliaga et Al., 2020



Scientific & Technical Analysis (1/2)



- Scientific and technical studies → input data for the **demonstration phase**

Scientific analysis:

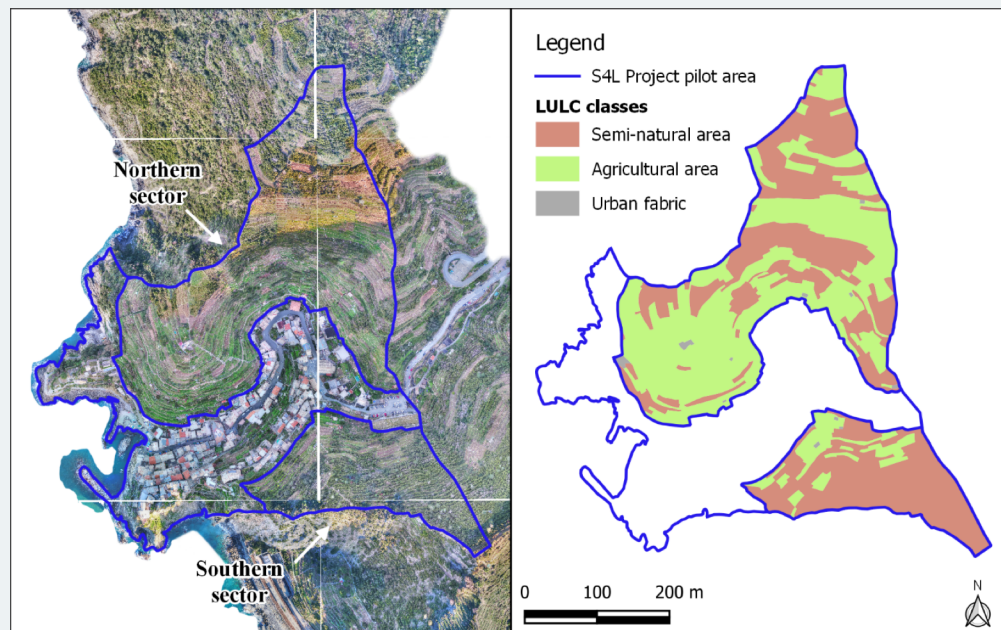
- Detailed geological and geomorphological survey
- GIS analysis
- Mapping of dry-stone walls and man-made structures
- Geological, geotechnical and weather conditions monitoring

Technical analysis:

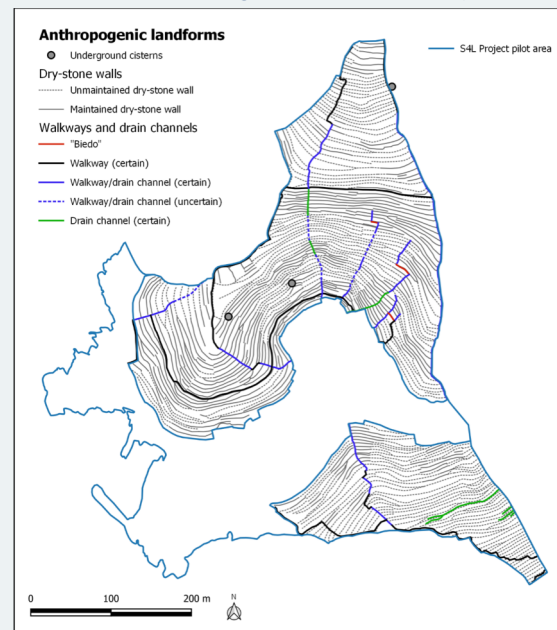
- Innovative construction techniques
- Soil consolidation
- Innovative agricultural techniques



Scientific & Technical Analysis (2/2)



Land Use and Land Cover map

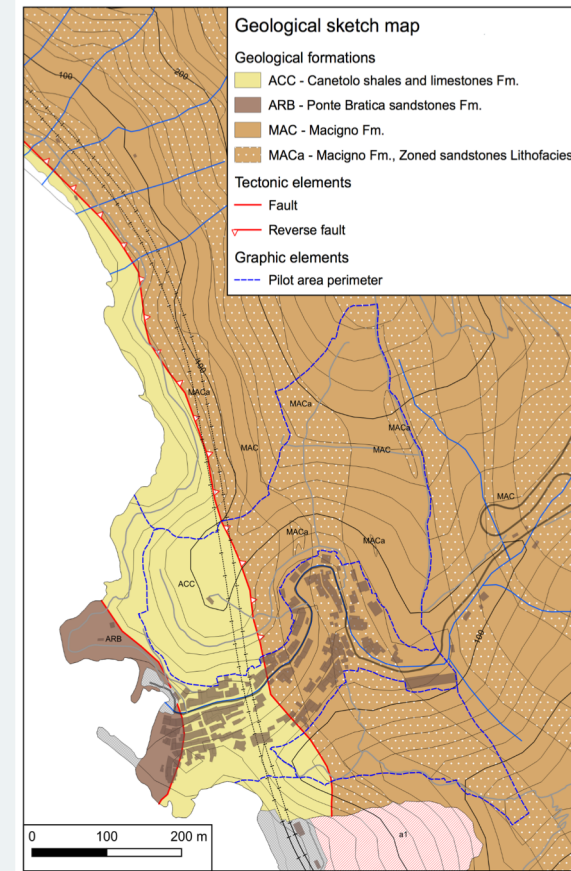


Anthropogenic landforms map

Pilot Area surface: 5 ha (50.000 m²)

Total dry-stone walls length: 28 km

Terraces width: between 3 and 6 m



Geological map

Next phases

- Dry-stone walls recovery in Manarola and in three additional replication sites (two within Cinque Terre National Park, one in Catalonia with dissimilar conditions to test different circumstances)
- Impact assessment of some innovative approaches (construction techniques, farming techniques, etc) for terraced slope restoration and management
- Development of a Handbook on the use of dry-stone walls terraces for climate change adaptation and a
- **Geological and geomorphological characterization outcomes: a solid base for further terraced-slope stability researches**

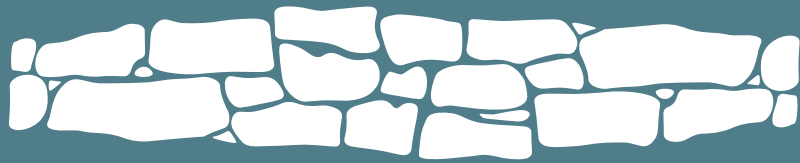


Pilot Area (Manarola – Riomaggiore municipality – La Spezia Province)



University of Genova
**Department of Earth, Environment and
Life Sciences**

*Working group: prof. Marco Firpo (Project Responsible),
prof. Andrea Cevasco, dr. Ivano Rellini, dr. Giacomo
Pepe, dr. Andrea Mandarino, dr. Andrea Vigo*



STONEWALLS

DRY-STONE WALLS FOR CLIMATE CHANGE ADAPTATION

***Thanks!
Grazie!
Gracias!***