

Article

Coping Capacity, Adaptive Capacity, and Transformative Capacity Preliminary Characterization in a “Multi-Hazard” Resilience Perspective: The Soccavo District Case Study (City of Naples, Italy)

Agnese Turchi ^{1*}, Rosaria Lumino ² Dora Gambardella ² and Mattia Federico Leone ³

¹ PLINIVS-LUPT Study Centre, University of Naples Federico II, Via Toledo 402, 80134, Naples (NA), Italy

² Department of Social Sciences, University of Naples Federico II, Vico Monte della Pietà, 80138, Naples (NA), Italy; rosaria.lumino@unina.it; dora.gambardella@unina.it

³ Department of Architecture, University of Naples Federico II, Via Toledo 402, 80134, Naples (NA), Italy; mattia.leone@unina.it

* Correspondence: agnese.turchi@unina.it; Tel.: +39 3299383098

Supplementary materials

Citation: Turchi, A.; Lumino, R.; Gambardella, D.; Leone, M.F. Coping Capacity, Adaptive Capacity, and Transformative Capacity Preliminary Characterization in a “Multi-Hazard” Resilience Perspective: The Soccavo District Case Study (City of Naples, Italy). *Sustainability* **2023**, *15*, 10877. <https://doi.org/10.3390/su151410877>

Academic Editor: Nikos A. Salingaros

Received: 12 June 2023

Revised: 4 July 2023

Accepted: 6 July 2023

Published: 11 July 2023

Publisher’s Note: MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.

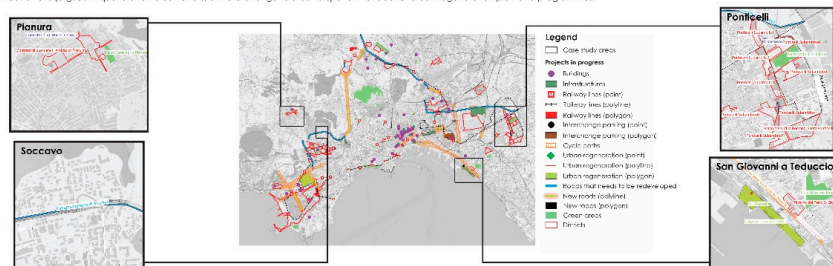


Copyright: © 2023 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

City of Naples: impact scenarios to define DRR/CCA strategies at municipal scale

Case studies

Case studies were selected taking into account the analysis of criticalities/opportunities within four main key-districts (i.e. Pianura, Soccavo, Ponticelli, and San Giovanni a Teduccio) of the City of Naples, which are particularly representative of multi-risk conditions (e.g. earthquake and volcanic risk, climate change related risks) and intended for urban regeneration plan and programmes.



In the eastern side of the City of Naples, an area intended to the Camaldoli Park regeneration and to District Contracts was identified within **Pianura** district, which is notoriously exposed to geophysical risks related to the Campi Flegrei activity (e.g. earthquakes, bradyseism, ash falls, etc.). In **Soccavo** district, an area characterized by large pre-fabricated and many public and private spaces with impermeable surfaces was chosen for urban transformations in a sustainable and resilient perspective.

In the western side of the City of Naples, which is the most exposed to floods and close to the red zone (according to the National Emergency Plan for Vesuvius), an area intended to the Rapid Transit Bus (RTB) project and to the Regeneration Urban Plan (PGR) was identified within **Ponticelli** district. Instead, the area intended to urban transformation in terms of implementation of new cycle paths, regeneration of the ex-Casasini factory, construction of a new University Centre and Apple Academy was chosen in **San Giovanni a Teduccio** district.

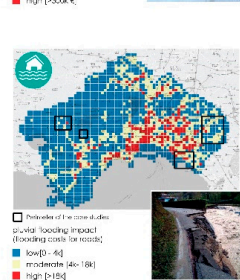
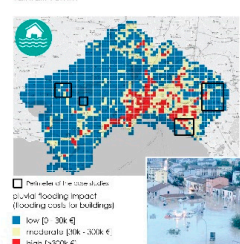
From the analysis of impact scenarios to a DRR/CCA urban transformation strategy



Impact scenario analysis at municipal scale

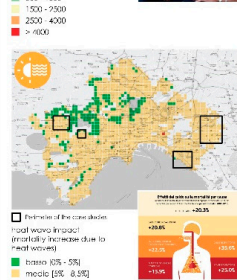
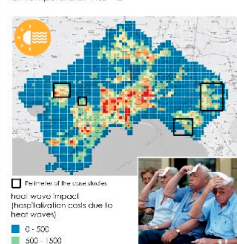
PLUVIAL FLOODS

period: 2041-2070
occurrence: occasional (5 times in 30 years)
rainfall: 90mm



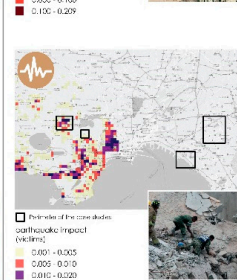
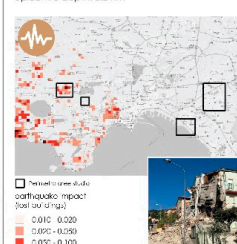
HEAT WAVES

period: 2041-2070
occurrence: occasional (5 times in 30 years)
air temperature: 41.5 °C



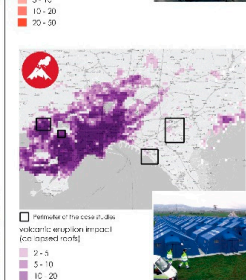
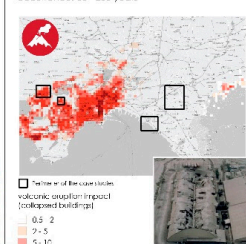
EARTHQUAKES

volcanic earthquakes in Campi Flegrei area
magnitude: 4.2
epicentre depth: 3.2 Km



VOLCANIC ERUPTIONS

Vesuvius and Campi Flegrei eruption
eruption type: sub-plinian
occurrence: 60 - 200 years



CO-FRAME_NA Project
Comprehensive multi-hazard & multi-risk Framework_Napoli

Figure S1. Preliminary information at municipal scale disseminated during the community building, which was the first step of the workshop.

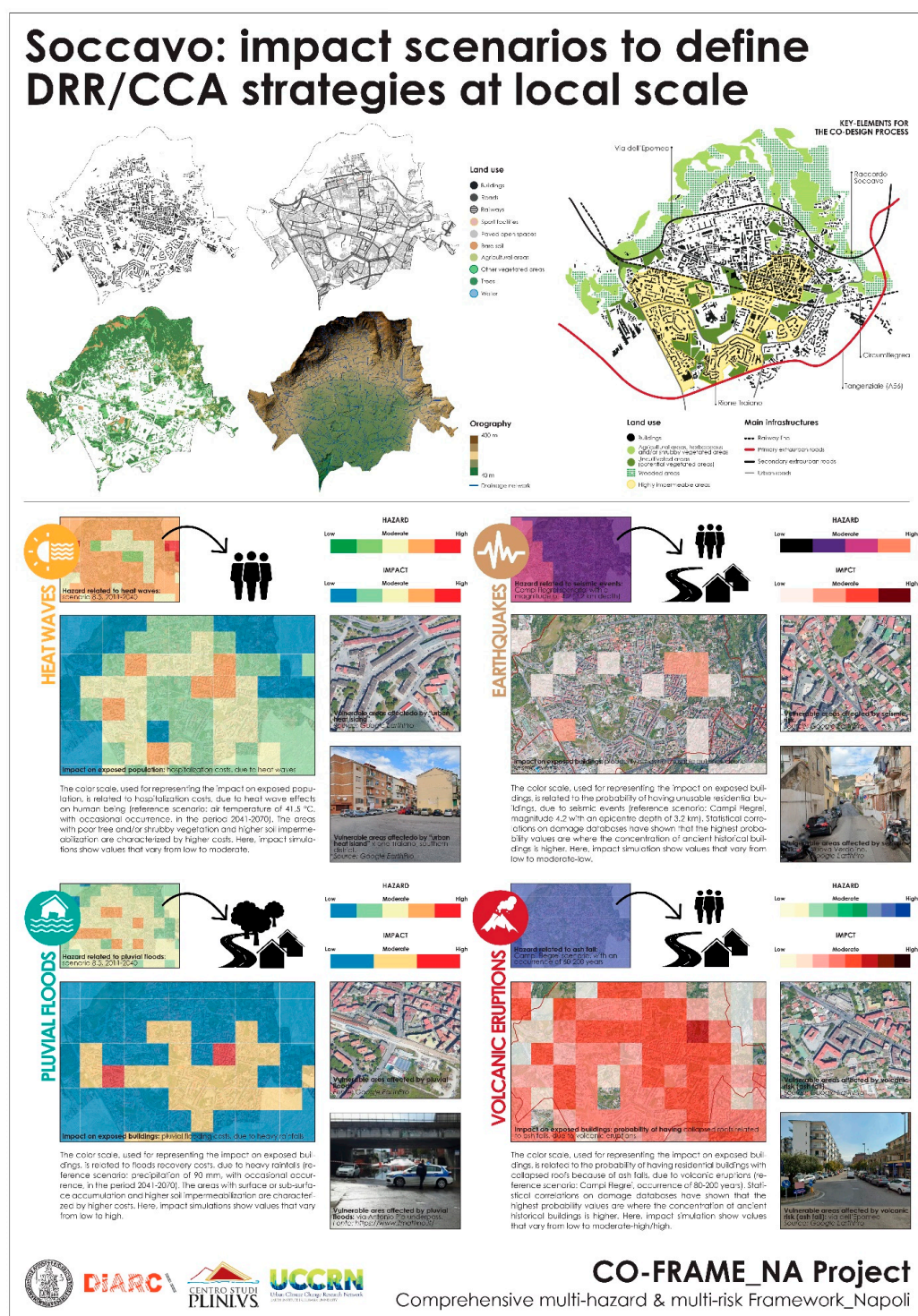


Figure S2. Preliminary information at local scale disseminated during the community building, which was the first step of the workshop.

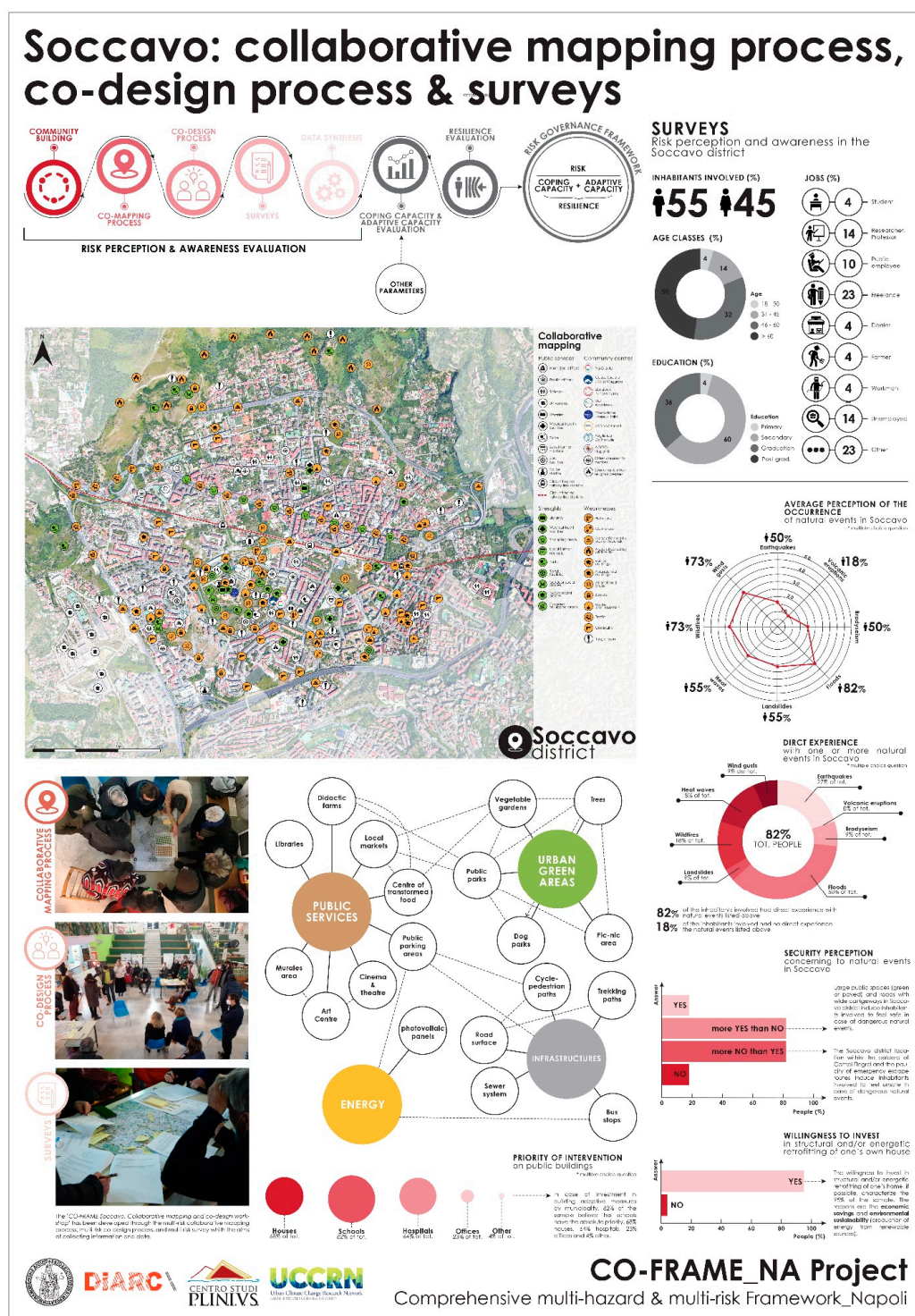


Figure S3. Main results of the workshop, obtained through the community building, multi-risk collaborative mapping process, multi-risk co-design process, and multi-risk survey to inhabitants.