



Challenges in climate change impact and risks in Jerusalem by the I-CHANGE Jerusalem Living Lab citizens science

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The I-CHANGE (Individual Change of HABits Needed for Green European transition, 2021-2025) project promotes the active participation of citizens to address climate change. It engages citizens and local stakeholders to take part in science initiatives and support more sustainable behaviour. To this aim, a set of Living Labs located in very different eight cities of socio-economic contexts (Amsterdam, Barcelona, Bologna, Dublin, Genova, Hasselt, Jerusalem and Ouagadougou), were chosen. The I-CHANGE Living Labs address different environmental issues comprising: (i) extreme events, mainly focusing on heavy rainfall, and heat waves, (ii) air pollution & linkages with sustainable transport, (iii) the water cycle and (iv) Waste Management.

Here, the implementation plan for JLL (Jerusalem Living Lab) of the eight Living Lab in the project, is presented. In JLL our main expertise is Atmosphere sciences and Commercial Microwave Links (CML), a new tool for environmental monitoring. The major partner is the Jerusalem municipality interested in mapping urban shadow cover especially over the routes children take to school (summer temperatures reach 40°C). Another partner is the Jerusalem Science Museum which has the joint goal with Tel Aviv University to increase the scope to meteorological parameters and air pollution as well as the Discomfort index for the school routes. In addition, Mapping of Jerusalem LL high-resolution abovementioned variables, particularly humidity from both CMLs (Rubin et al, 2023) and Meteotrackers that measure solar insolation (Alpert, BAMS, 1991).

Jerusalem City is unique in its diversity of populations with ~million inhabitants and is located at the border of Mediterranean climate with a significant variability between the coastal area, including Jerusalem City (annual rainfall ~200-700 mm) and the most arid zone of the Dead Sea, 20-30 km to the east (annual rainfall ~50 mm). The spatial-temporal variation of rainfall intensity is the main and not well-known driver that generates the majority of flash floods in the nearby Judean Desert. Hence, its monitoring is crucial in this area as in other remote arid areas worldwide.

Recently, extensive research was performed related to global warming potential risks and their effects on rainfall and temperature over the East Mediterranean. Several major risks were pointed out including extreme temperatures, heat waves, colder nights, and floods. Our first super-high-resolution global climate model projections projected that the ancient "Fertile Crescent" considered as the cradle of civilization, will nearly disappear by the year 2100 (Kitoh et al. 2008).

Also, Jerusalem temperatures both maximum and minimum, show that significant increases occurred during 1950-2020 (homogenized dataset, Yosef et al., 2019). A fact that led to definition of the Mediterranean as a “Hot Spot” of global warming.

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References:

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