

Fostering Environmental Awareness Through Innovation: Outcomes from the I-CHANGE Project

Antonio Parodi (CIMA) and the I-CHANGE team

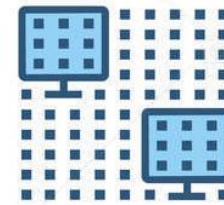


Main objectives

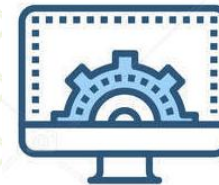
Raise **awareness** of natural hazards and of the impacts of climate change



through **direct collection** of environmental data



with **new and user-friendly tools**
(sensors, monitoring devices, simplified models and apps)



to enable adaptation and mitigation through behavioural change

- I-CHANGE: Individual Change of HAbits Needed for Green European transition
- Duration: 42 Months (2021 – 2025)
- EU contribution: about 5 mil euro
- Coordination team:
 - Antonio Parodi (CIMA, Project Coordinator)
 - Silvana Di Sabatino (UNIBO, Scientific Coordinator)

16
Organizations

12
Countries



ALMA MATER STUDIORUM
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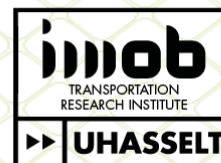
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CLIMATE
MEDIA
FACTORY

What were the gaps in literature

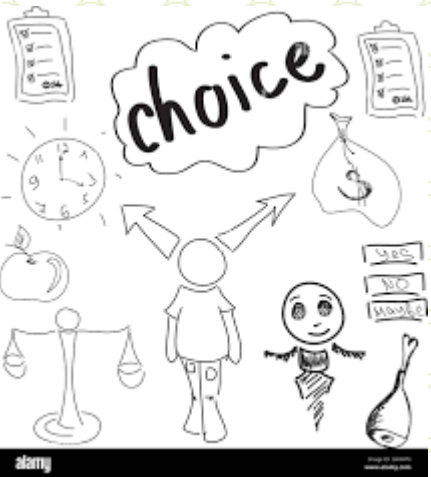
- Role of **citizen science** and co-creation of observational initiatives in motivating the shift to sustainable behaviors and climate action poorly addressed
- **Data** collected in citizen science monitoring activities often not publicly available and properly documented in terms of data quality
- Gaps in **qualitative and quantitative methods** to assess the **effectiveness of behavioral and consumption** towards mitigation and adaptation to climate change

What did we achieve in the project

- **Documented role** of citizen science and monitoring activities in the I-CHANGE LLs in the observations of climate change and environmental impacts of personal lifestyle options
- Promotion of good practices in **sharing data and data quality checks** via the dashboard
- **Validated novel qualitative and quantitative methods** to assess the effectiveness of behavioral and consumption patterns in mitigating and adapting to climate change

Environmental and climate challenges addressed from two perspectives:

1. Empowerment through knowledge acquired through **hands-on participation** in the monitoring and assessment
2. Understanding the role and the impact of **individual choices** (behaviour, lifestyle and consumptions) in the daily life and its consequences on the environment



The Three Pillars of I-CHANGE

Science

- Climate change awareness and education
- Validated methodologies to observe the environment and environmental impacts of individual behaviors

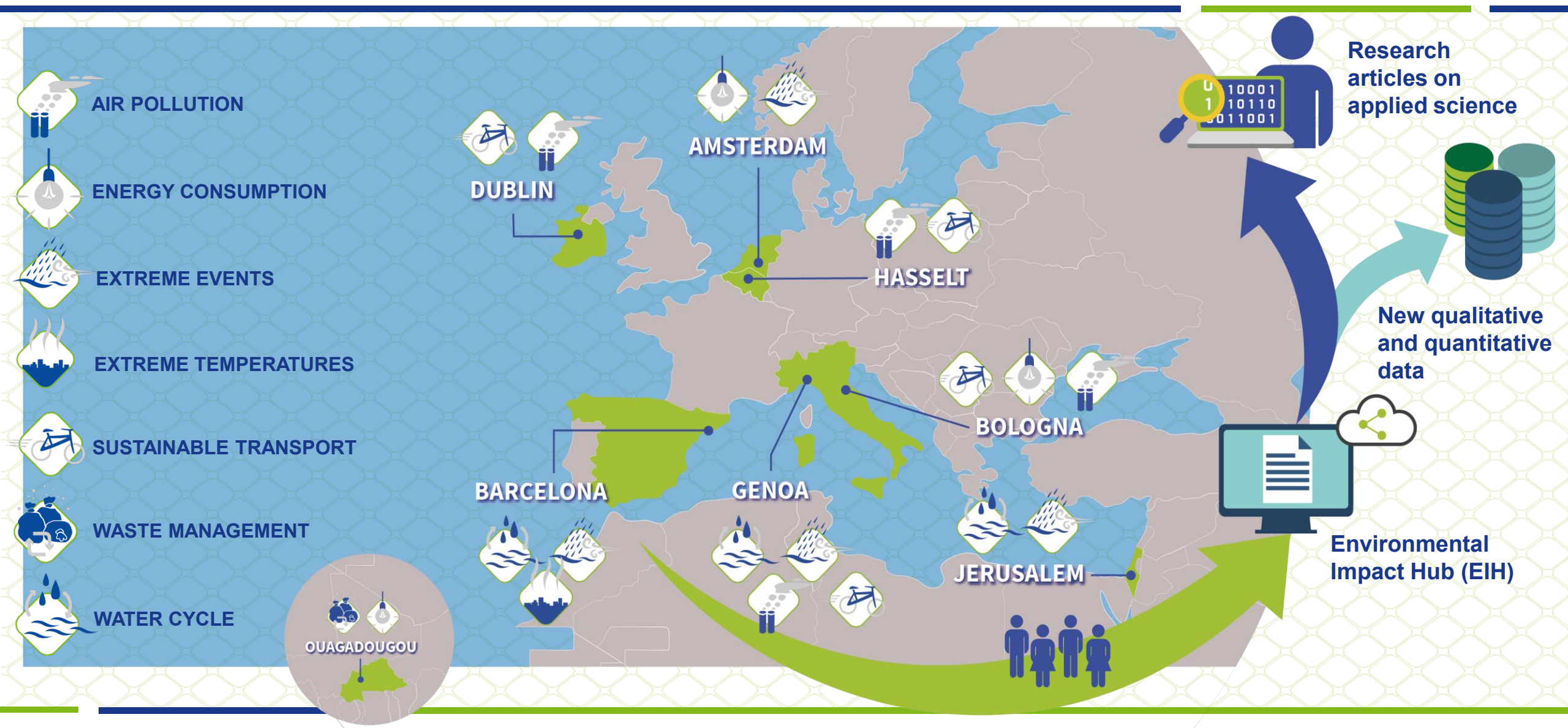
Technology

- Improvement of data usability and interoperability
- Set of low-cost sensors and dedicated tools for observation and assessment of impacts of personal behaviors

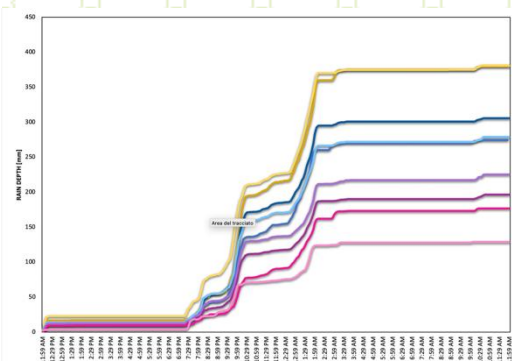
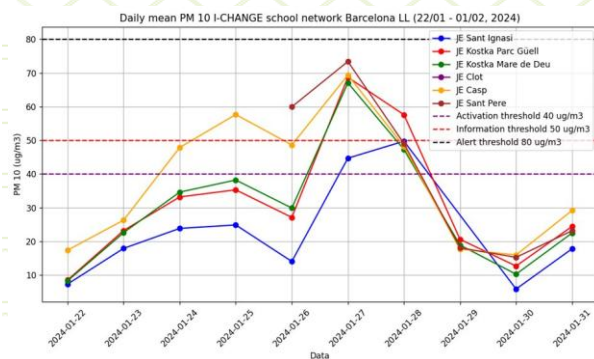
Citizen Engagement

- Active participation of citizens
- Active observation of the environment and of the communities within the environment

8 Living Labs



Citizen science in the LLs: The process



SENSORS

APPS
SURVEYS

Volunteer recruitment
and Citizen engagement

Data collection and
documentation

Data from official sources
+ scientific knowledge

Data understanding, analysis
and reflection from LLs participants

INTERACTIVE WORKSOPS

Increase individual
awareness and
knowledge in climate
change issues in
the LL environment

Convey a dialogue
with local LL
stakeholders on
mitigation solutions

Reflect about our roles in
climate change impacts
and how we can contribute
to mitigate them or adapt to
new realities



Citizen science in the LLs: key figures

Over 6400 participants engaged through
the 8 project Living Labs

1253 implementations of 43 codesigned citizen science campaigns

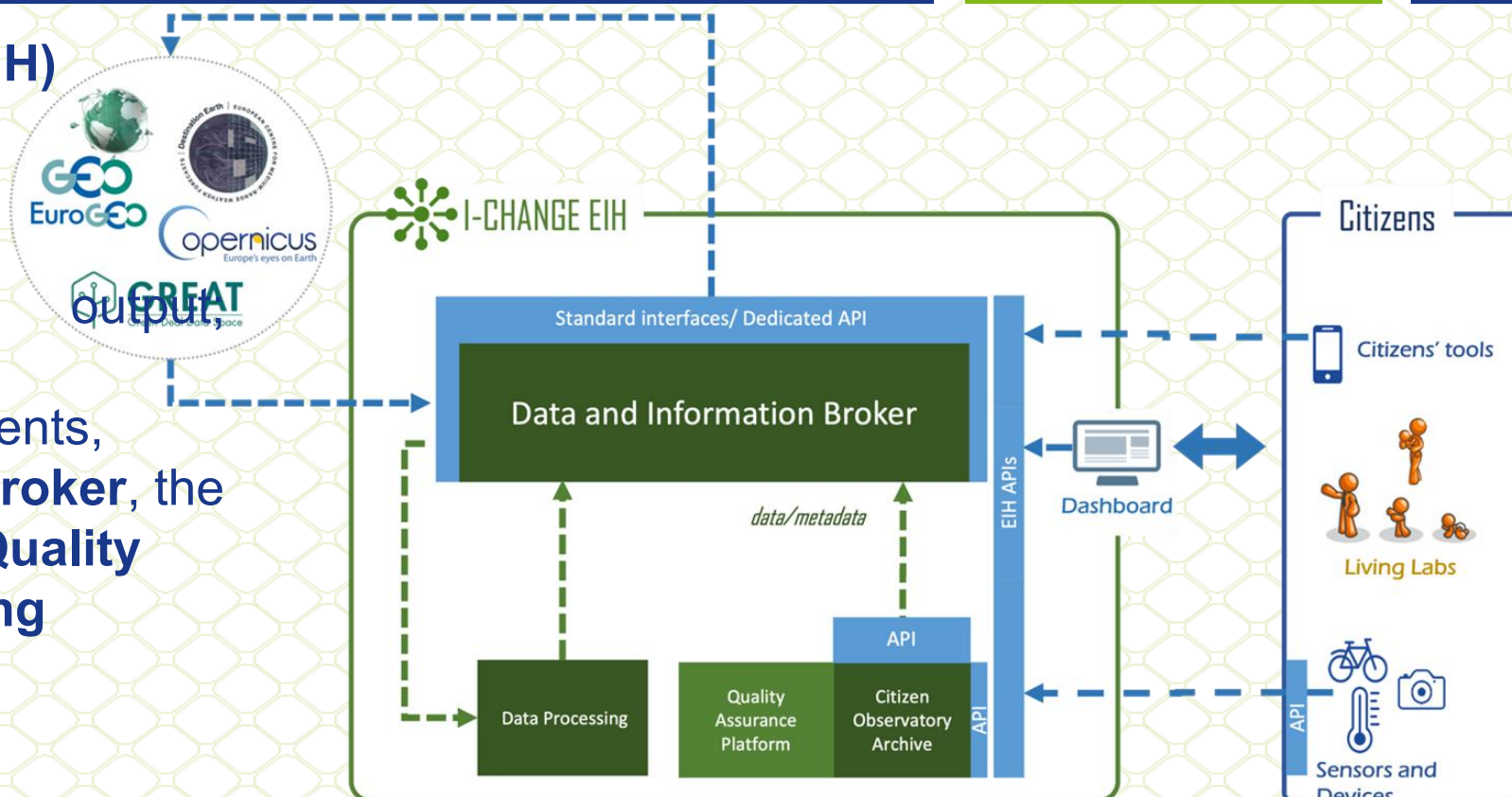
46%	Short term (≤ 3 days)
26%	Mid term (≤ 1 month)
28%	Long term (> 1 month)

For those implementations, 289 low cost sensors where deployed

26%	Indoor thermometers
32%	Compact and mobile meteorological stations (MeteoTracker, MT)
19%	Low cost air pollution stations (Smart Citizen Kits, SCK)
14%	Meteorological stations
9%	Other sensors

Main achievements: EIH and real-time citizen science data

- The **Environmental Impact Hub (EIH)** is a data infrastructure developed within the framework of I-CHANGE to enable easy, user-friendly access to the project's data and analysis
- The EIH integrates different components, namely the **Data and Information Broker**, the **Citizen Observatory Archive**, the **Quality Assurance Platform**, the **Processing Platform**, and the **Dashboard**;
- EIH, as a participatory platform, collecting **real-time observational datasets from heterogeneous sources** as **personal weather stations (e.g. Acronet)**, **meteorological sensors that can be attached to motorised vehicles and bicycles (e.g. MeteoTrackers)**, **air quality sensors (e.g. SmartCitizenKit)** amongst others, as well as manually collected observations datasets.



Main achievements: I-CHANGE dashboard

Main use cases:

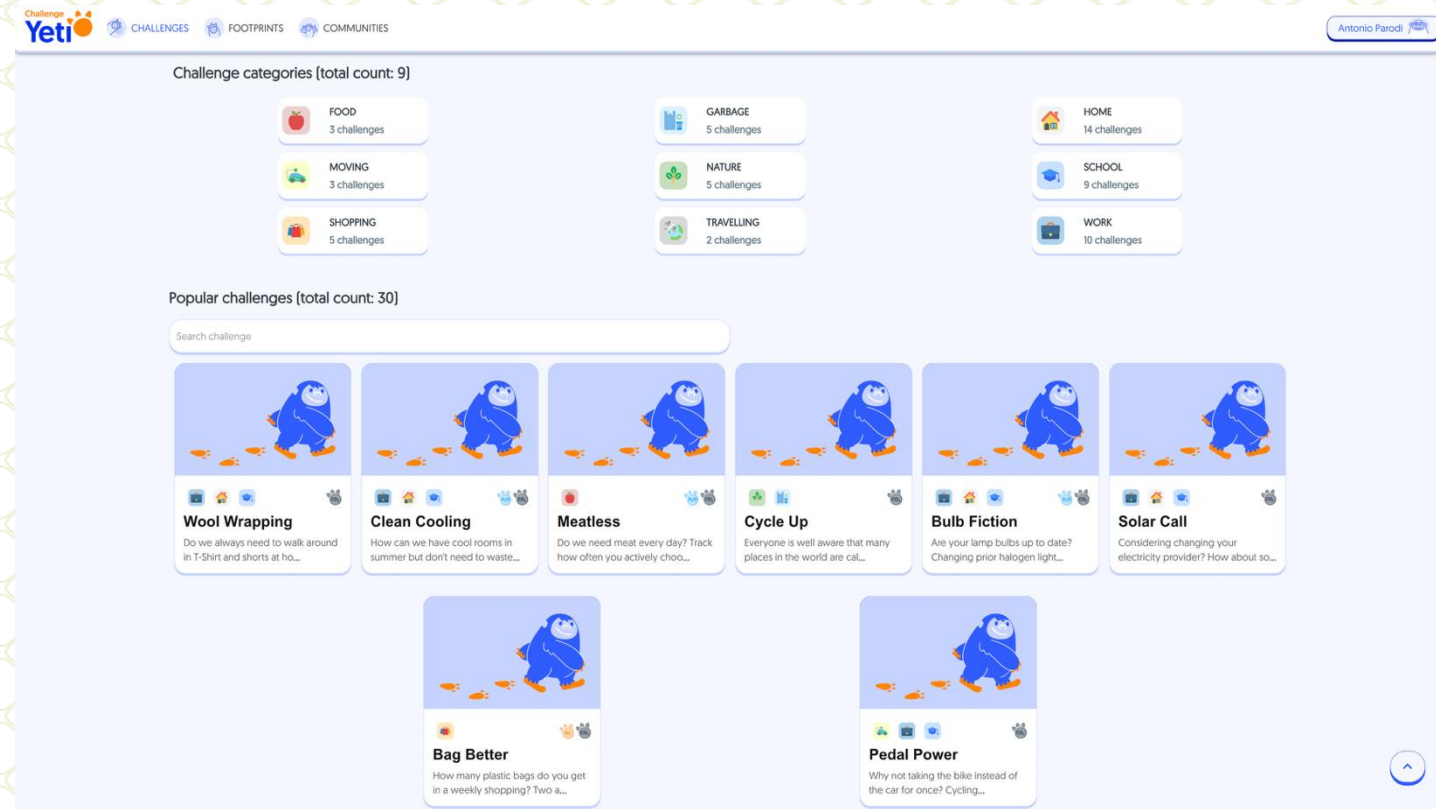
- **Acknowledge oneself** with hazards through interactive informative pages (home page, Climate Storylines);
- **Engage citizens in science** with the crowdsourcing tool (Climate Campaigns);
- **Empower citizens** by technically supporting them in understanding and contextualizing collected sensor data through the project;
- **Trigger behavioural changes** step by step through the avoided carbon footprint app and the I-CHANGE Game.



<https://citizens4climate.com/>

Main achievements: YETI app

- **Beyond Carbon Calculators:**
ChallengeYeti is not just another app for measuring carbon footprints, it rather inspires us to take tangible steps towards an eco-friendly lifestyle;
- **Incremental Changes:**
It encourages us to adopt small, manageable actions that collectively lead to significant environmental benefits;
- **Community Engagement:**
ChallengeYeti stirs us to involve friends, family, colleagues, and others to join the movement and act together, creating a supportive and motivating environment;
- **Knowledge Sharing:**
app allows users to both discover and contribute new actions, making everyone an active part in the journey towards sustainability.



<https://challengeyeti.com/>

The

app allows users to both discover and contribute new actions, making everyone an active part in the journey towards sustainability.

Main achievements: Citizen science campaigns

The citizen science campaigns in place for observing and monitoring meteo-hydrological risks from extreme weather events can be summarized as:

- **Meteotrackers campaigns:** in high schools projects (BALL, GELL, DULL, HALL), cycling campaigns (AMLL, BALL, BOLL, GELL), walking activities (BALL, GELL, JELL) and in a daily data collection campaigns in boats and city buses (GELL)
- **Apps:** FLOODUP and other apps to collect information from extreme weather events, floods and landslides (BALL, GELL, OULL) and a crowd-sourcing app through the dashboard to collect indoor temperature and citizens' perceptions and feelings during heatwave events
- **Other citizen science experiments:** workshops on early warning actions for severe hydrometeorological events (GELL)





Main achievements: Climate Actions Training Schools

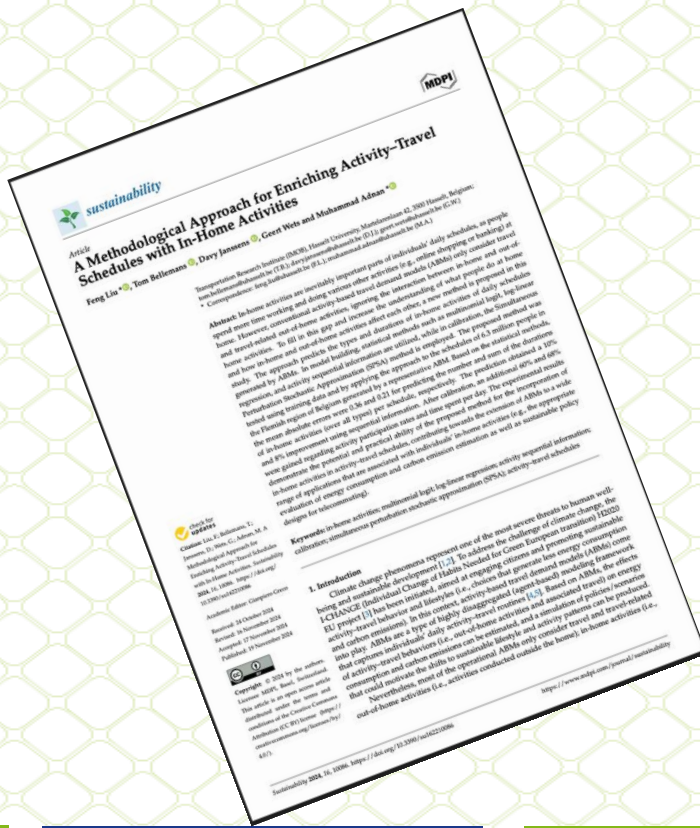
Presentations, discussions,
interactive games,
interactive demonstration,
showcase of sensors, walk
and demonstration, and
participatory mapping





Main achievements: Scientific publications

- 26 accepted peer-reviewed publications
- 2 publications under review/in preparation



Main achievements:

Photo book

The digital camera emerged as significant instrument for fostering citizen participation; photography has resulted as a vital communication tool to engage the public and encourage active involvement in matters related to climate change, sustainable development, and environmental conservation. With a digital camera, an amateur photographer can transform into a citizen scientist, while photography contests and related activities stimulate interest and enhance public consciousness regarding climate change.

691
👁 VIEWS

863
⬇ DOWNLOADS

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EU-level Learnings How to Improve European Citizens' Behavioral Shift Towards Sustainable Lifestyles

Insights from the I-CHANGE Project

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Take-Home Messages

Strategic stakeholder management, encompassing analysis, engagement, and the cultivation of long-term relationships, is essential for fostering collective climate action. Engaging a diverse array of actors ensures that climate solutions are co-developed, contextually relevant, and widely supported.

Living Labs serve as locally embedded platforms for collaborative climate innovation. By translating citizen science into actionable change, these spaces empower communities to co-create practical solutions and serve as testbeds for behavioral and technological interventions.

The **co-creation and dissemination of knowledge are vital to promoting scalable, sustainable lifestyles across Europe.** Through inclusive, bottom-up approaches, communities can be empowered with the tools, knowledge, and motivation to enact meaningful change. Promoting sustainable lifestyles requires not only systemic shifts at the institutional level but also individual behavioral transformations. While large-scale solutions are critical, the aggregation of informed individual choices can significantly influence environmental outcomes.

Policy Brief
April 2025

Citizen Science for Multi-Risk Applications and Behavioural Change

Insights from the I-CHANGE Project

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Anna Molter
Juan Esteban
Laura Esbri



Policy Brief
April 2025

Take-Home Messages

To achieve the maximum benefits, citizen science activities must be rooted in both scientific (evidence from measurements and observations of the environment) and local knowledge (history of the target area), empowering citizens with the possibility to make a difference.

Technological and non-technological tools offer a powerful possibility for engaging citizens by offering practical means to sense the environment, learn and increase personal awareness, and challenge friends to have an impact. All of this contributes to generating a willing community and providing a long-term perspective to any activity while generating innovative and resourceful data.

Citizens are volunteers, fuelled by motivation and rewarded by the difference their actions can make. Challenges, whether individual or collective, are a great way to motivate participants and support the long-term efficiency of citizen science.

Integrated Modeling Chain for Tailored Interventions

Insights from the I-CHANGE Project

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Policy Brief
April 2025

Take-Home Messages

Understanding the impact of emission/concentration reduction policies on citizens' mobility behaviour is pivotal for crafting effective strategies. **The use of a numerical modeling chain favours the accurate assessment of policies encompassing various measures**, including incentives for public transportation, traffic restrictions in specific zones, the establishment of infrastructure for bicycles and electric vehicles, and urban planning initiatives aimed at creating pedestrian-friendly environments.

Investing efficiently in mobility strategies, tailored to citizens' needs, can support a durable change of habits that makes the policy effective. **Mobility changes are effective only if the citizens' reactions are sustainable in reducing emissions. It becomes crucial to foster public-private partnerships as well as citizen engagement** to ensure the successful implementation of emission reduction policies and the creation of sustainable urban ecosystems.

Leveraging on a single, yet flexible, methodology, the **Integrated Modeling Chain enables to prioritize the interventions through a consistent and effective evaluation of cost-benefits of different scenarios for the local needs.**

○ Main lesson learnt

- **Improved granularity of data availability** through the LLs
- Improved observation of the environment and environmental, social and economic impacts
- Development and validation of 2 **original modeling chains** for assessment of the effects of behavioral changes on the mitigation of air pollution and climate change
- **Impact assessment** based on results from a survey based on COM-B model
- Citizen science experiments in the LLs:
 - setup and validation of **distributed network of heterogeneous sensing tools**
 - **awareness rising** on climate change and air pollution
 - tailored suggestions for **promotion of sustainable lifestyles and reduction of environmental and carbon footprint**

○ Challenges

- **Multiple hazards approach** in the LLs
- Diversity in the geographical, cultural context and scientific background

Find out more

<https://ichange-project.eu/>

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