

POLICY BRIEF

ENHANCING URBAN ENVIRONMENTAL MONITORING THROUGH CITIZEN OBSERVATORIES: LESSONS FROM GREENGAGE'S THEMATIC CO-EXPLORATION AT DEUSTO CAMPUS

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HIGHLIGHTS

- **Alignment Found:** Citizen perception of air quality closely matched measurements from Atmotube devices.
- **Spatial Insight:** Aggregated Place Suitability Scores (PSSI) revealed spatial strengths and challenges across the campus.
- **Participatory Mapping:** Participants used photos and comments to highlight critical urban features.
- **Demographic Profile:** Participants were predominantly digitally literate adults (age 25–50), unaffiliated with GREENGAGE, ensuring diverse and unbiased input.
- **Urban Mobility Concern:** Key user concern emerged around pedestrian-vehicle space conflicts.

Background

The GREENGAGE project fosters citizen engagement in environmental monitoring via thematic co-explorations that combine digital tools and co-design processes. A recent campaign at the University of Deusto tested this methodology in a real-world urban campus setting. Citizens contributed through surveys, mobile sensing, and spatial feedback, informing both data-driven analysis and urban planning priorities.

Key findings

1. Perception-Measurement Alignment in Air Quality

Citizen ratings of air quality at Points of Interest (POIs) were consistent with Atmotube sensor data, especially visible in visualizations from Superset (e.g., Fig. 9 & Fig. 10). This supports the credibility of citizen-generated environmental insights and justifies their integration into official data streams.

2. Urban Suitability Assessment Reveals Localized Concerns

The Place Suitability Score Index (PSSI), averaged across four POIs, highlighted both strengths and concerns in the campus layout. While overall suitability was rated positively, key issues emerged such as the overlap between pedestrian and vehicular areas, suggesting safety and comfort trade-offs.

3. Citizen Feedback Offers Spatially Explicit Observations

Participants used photo submissions and comments to document notable observations. These qualitative inputs, compiled in Fig. 11, provide granular, location-specific feedback invaluable for urban planners and municipal authorities.

4. Diverse Participation Demonstrates Broad Applicability

Among 10 participants (7 men, 3 women), most were unaffiliated with GREENGAGE and owned a mix of Android and iOS devices. Their backgrounds (masters or PhD level, digitally literate) demonstrate the feasibility of engaging informed citizens in future observatories.

Policy recommendations

1. Incorporate Citizen Feedback into Urban Planning

- **Action:** Formalize mechanisms for including citizen observations and PSSI data into city planning decisions.
- **Responsible Entities:** Local municipalities, urban design departments.
- **Urgency:** High, particularly where conflicts between pedestrians and vehicles are identified.

2. Expand Deployment of Sensor-Enabled Citizen Observatories

- **Action:** Scale GREENGAGE-style campaigns to additional urban campuses and neighborhoods.
- **Responsible Entities:** Environmental agencies, EU-funded initiatives.
- **Implication:** Builds environmental intelligence through democratized sensing.

3. Invest in User-Friendly Digital Platforms for Co-Exploration

- **Action:** Improve accessibility and functionality of tools like Apache Superset and custom HTML mapping.
- **Responsible Entities:** EU tech programs, research consortia.
- **Outcome:** Greater engagement from diverse user profiles, especially outside academia.

4. Encourage Inclusive Recruitment Strategies

- **Action:** Broaden outreach to include non-academic participants, underrepresented age groups, and less digitally literate citizens.
- **Responsible Entities:** NGOs, civic groups, educational institutions.
- **Rationale:** Ensures diverse and representative environmental perspectives.