Citizen Collaboration in the Design and Evaluation of Sustainable Urban Drainage (COINCIDE: DPLUS)

Technical and diagnostic assessment on urban floods

CONICET

Objectives

Overall goal: Conduct assessments on urban floods, by directly engaging the affected community in data collection and in the proposal of joint solutions incorporating their experience and needs.

Specific goals:

- Perform a diagnostic assessment of the problem, identifying the different hazards to which the community is exposed by zones, depending on its place of residence.
- Work with students at all educational levels and residents in recording and characterizing the rainfall events affecting the community (determine the rainfall level that causes flooding).
- Gauge the amount of stormwater runoff on streets using videos and photographs recorded by the residents previously trained.

Description of citizen participation

The community offers valuable insight into the basin behavior, which is combined with the technical expertise of the research team to produce a conceptual model of the system operation. Both hydrometeorological (rainfall) and hydrological data (flows draining through the streets) must be recorded for this. Additionally, citizens collaborate to define pertinent locations for collecting hydrological data. Different solutions are also proposed in collaboration, working on their sustainability and feasibility, both to be presented to the corresponding governmental institution and to be applied by the community. The research team in charge of the project receives the records created by the community. Reports are created, published, and sent to the community following the record validation.

Type of citizen science project

Co-created project: Citizens participate in all stages of the scientific process.

Participating parties.
- School of Exact, Physical and Natural Sciences (FCEFyN), National University of Córdoba (UNC)/National Scientific and Technical Research Council (CONICET) in Argentina, with the support from affiliated institutions.
- Research teams and people who receive scholarships.
- Members of community organizations (neighborhood centers).
- Overall residents.

Status. In progress.

Time frame. 01/08/2019 – N/A

Frequency of project execution. Uninterruptedly.

Participation period. On a sustained basis.

Scope of the initiative. Local (city, province).

Geographic scope. Barrio Villa Páez, City of Córdoba, province of Córdoba

Project development members. It has been developed with the collaboration of both scientists and participants without formal training.

Number of participants. From 51 to 100.

Action/s involving citizen participation
- Problem identification.
- Data collection.
- Data analysis.
- Phenomenon monitoring.
- Solution design.
- Solution implementation.

Citizens are involved in the entire process.

Technological device/tool required.
- Rain gauge: to measure rainfall occurring in the catchment area
- Cell phone/camera: to record surface water levels, as well as to capture videos to be later processed.
- Materialized scales in the basin for recording levels.

Recruitment methods. Through an approach made by the community (neighborhood association) to the research team. Then, it is consolidated with periodical visits to the area.

Replicability. It is being implemented in another neighborhood in the city of Córdoba and in the city of Villa Carlos Paz.

Scalability. A great interaction with residents was accomplished and the ties with the community were strengthened day by day. New proposals have been made by the community to conduct research on sewage effluents or urban waste issues.

Open access to data. Reports are shared with the community through a WhatsApp group after each rainfall event recorded. Rainfall data are openly shared. Regarding video and photographic records, a georeferenced database is being developed so it may be freely accessed through the Internet. A water level sensor sends real-time data to a website.

Feedback. Following each rainfall event, crowdsourced data are received, and technical reports are made describing the relevant catchment behavior. Periodical meetings are also held (online due to the pandemic) to discuss future advances and ideas.

Linkage with state agency/government.
It has partnered with:
- National Water Institute
- National Meteorological Service
- Provincial Administration of Water Resources of Córdoba
- Neighborhood center of Villa Páez

Institutional funds. Research projects conducted by the National University of Córdoba (UNC, in Spanish).

Awards/distinctions. Do not know/do not answer

Classification of knowledge areas (OECD).
Ingenierías y Tecnologías / Ingeniería Civil.
Ingenierías y Tecnologías / Ingeniería del Medio Ambiente.

Project leaders.
- Carlos Marcelo García Rodríguez, Faculty of Exact, Physical and Natural Sciences (FCEFyN) – UNC, National Scientific and Technical Research Council (CONICET, in Spanish).
- Sebastián López, FCEFYN / UNC and CONICET.
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