Participatory Mapping Disaster Risk Reduction: Cartagena, Chile

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CIGIDEN

Centro de Investigación
para la Gestión Integrada
del Riesgo de Desastres

The Research Center for Integrated Disaster Risk Management (CIGIDEN) is a chilean center of Excellence that conducts interdisciplinary research on disaster risk from geophysical processes to community resilience and governance. By integrating social, economic, and cultural dimensions, the center strengthens disaster response and recovery. CIGIDEN unites experts from four leading Chilean universities to collaboratively address risk management challenges.

The Project

Cartagena is a coastal City in central Chile, classified as a complex socio-ecological system due to the convergence of multiple hazards such as landslides and tsunamis within its boundaries. According to recent hazard modelling efforts, there is a latent danger of future seismic events with a highly destructive tsunamigenic potential.

Reliable, accurate and up-to-date geographic information is essential input to achieve effective disaster risk reduction. This requires conducting data collection at regular intervals and integrating various methodologies in data gathering. Participatory Mapping has great potential for integrating different perspectives on the same territory from a critical and analytical viewpoint, moving away from the tendency to be passive agents and being restricted to merely receiving knowledge.

SketchMapTool

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Why was the Sketch Map Tool used?

The group mapping activity allows to identify issues associated with the risks that most concern and interests the community. The dimensions of vulnerability they recognize in their territories, historical memory related to the behavior of hazards, or also the territorial factors that contribute to strengthening community resilience in the face of disasters are examples for that. The method allows us to highlight evacuation routes while still factoring in local conflicts, such as weekly markets disrupting the path. At the same time, the mapping process facilitates community empowerment through the achievement of consensuses and the identification of shared issues and strengths.

How was the Sketch Mapping organized?

Nine participants took part in a group mapping activity on an A1 map. They marked areas of significance, risk, and resilience in four color-coded categories:

- Community-valued sites & infrastructure (green)
- local conflicts (yellow)
- socio-natural hazards (red)
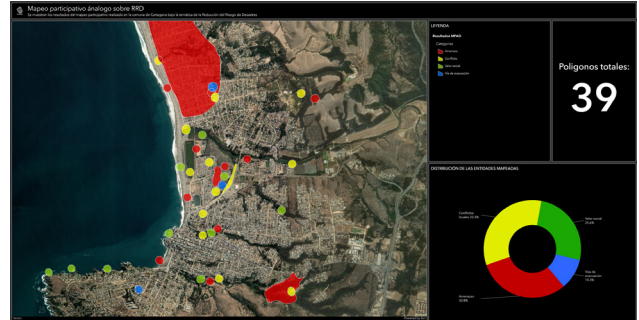- evacuation routes and safe zones (blue)

The categories were explained to the participants and they were then enabled to choose either stickers or markers of the respective color to put their markings in context and bring their knowledge to the map. A color legend on the site of the map helped participants to guide the mapping. The activity took place in the Coastal Marine Observatory which had the advantage of having a good view on the places that were to be mapped.

Coastal Marine Observatory where the mapping activity took place

How were the Sketch Maps analyzed?

The detected markings where obtained as GeoJSON from the Sketch Map Tool. Then adhancing the attribute table, each of the colored polygons identified during digitization was assigned to a category (value, conflict, threat, or evacuation route), and descriptive and contextual information was added to the mapped polygons.

The results of the participatory mapping carried out in the commune of Cartagena.

Results and Impact

A public dashboard was created to display the 39 mapped entities and their category distribution, with Local Conflicts and Threats being most common. This demonstrates the capacity of the local inhabitants to generate geographic information, applying a comprehensive and even multidisciplinary perspective on the dimensions that make up disaster risk. The results will also be shared in the local newspapers and on social media to raise awareness, support informed decision-making, and strengthen local risk management.

Lessons Learnt

1. Although both stickers and pens were provided, participants largely preferred using stickers.

2. In some areas, different categories overlapped, which highlights the complex socio-ecological system of the Cartagena municipality. In scenarios where dynamic and overlapping uses and valuations coexist, disaster risk management and reduction are constantly challenged. Mapping this on the same map at the same time was challenging for all participants.

Mapping results where integrated with the results obtained during a transect walk using ESRI Field Maps. Relevant community points based on specific threats, vulnerability factors and exposure present along a predefined route where mapped and categorized.

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