

# PARTICIPATORY 3 DIMENSIONAL MAPPING

## FOR REDUCING THE RISK OF DISASTERS IN IROSIN/PHILIPPINES



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1 - Participants to the P3DM for DRR project standing in front of the map in Irosin, Philippines, Jan. 2010, © JC Gaillard

*Integrating a larger array of stakeholders is one of the most pressing contemporary needs for enhancing disaster risk reduction (DRR). These stakeholders should include local communities, local and national government, scientists, NGOs, faith groups, school communities and the private sector. The participation of such a large range of actors in DRR allows for the integration of local and scientific knowledge as well as top-down and bottom-up actions.*

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Participatory 3-Dimensional Mapping (P3DM) has recently been suggested to facilitate the participation of a large array of stakeholders in DRR. It basically consists in the building of stand-alone scaled relief maps made of locally available materials (carton, paper) over which are overlapped thematic layers of geographical information. P3DM enables the plotting of landforms and topographic landmarks, land cover and use, and anthropogenic features, which are depicted in push-pins (points), yarns (lines), and paint (polygons).

P3DM for DRR has lately been conducted in the municipality of Irosin in the Philippines. Irosin is located at the center of Sorsogon province in Southern Luzon (Fig. 1). Irosin has a very irregular terrain characterized by the plain on the valley floor, secluded plains and valleys on the mountaintops, undulating hills

and mountain peaks, including Mt Bulusan which is one of the most active volcanoes in the Philippines. The municipality also experiences several typhoons per year, which trigger flooding, flash floods and landslides. Although primarily relying on agricultural resources, Irosin is also a catchment area catering public and private services to at least five adjoining towns.

The P3DM for DRR project was conducted in the village of Macawayan located in the central plain of the municipality. Cadac-an River traverses the village and sustains the irrigation of agricultural activities mainly rice production. Local people are often forced to evacuate their home along the river during typhoon events and heavy rains. Livelihood of the people is greatly affected since majority of the population relies on rice production that is usually the most affected during flooding.



2 - Members of the local community of Macawayan plotting community features on the map, Irosin, Philippines, Jan. 2010, © JC Gaillard

P3DM for DRR was conducted from 13 to 19 January 2010 with the help of Comité Catholique contre la Faim et pour le Développement (CCFD) through the Integrated Rural Development Foundation (IRDF). The primary objective of the project was to introduce DRR into local development planning (Fig. 1). A number of stakeholders participated including the local community, the village Disaster Coordinating Council, the Municipal Government of Irosin, the provincial government of Sorsogon, the local elementary school community, the Philippine Institute of Volcanology and Seismology, IRDF, the Center for Disaster Preparedness (CDP), and the University of the Philippines Diliman.

The initial activity consisted in the building of a 2.74 m x 2.74 m 3-dimensional map covering the whole village of Macawayan with a land area of 333.33 has. The map enabled to plot natural hazards, vulnerable assets and local resources (Fig. 2). Overlapping hazard-prone areas and vulnerable assets allows people to concretely appraise disaster risk in their immediate environment. P3DM eventually facilitated the planning of actions to reduce the risk of disaster, including measures to reduce people's vulnerability and to enhance capacities to face natural hazards. This P3DM project also featured an innovative indigenous version of Geographic Information System technology connecting the 3D map with columnar tables of the village officials containing data at the household level. This output proved to be very valuable to facilitate health surveys and feeding programmes.

The successful dialogue between local people including usually marginalized (children, elderly, women, non-heterosexuals) government officials, school representatives and scientist using the P3DM as the solid basis of discussions is perhaps the most important and unique contribution of this project. P3DM provided a tangible tool where local people who often have a limited grasp on scientific concepts, were able to discuss DRR with scientists, who on the other hand often have a poor understanding of the local context. All stakeholders were able to contribute their knowledge on the same tool (Fig. 3). P3DM was credible to both locals (including school pupils), who build the map and plot most of the information, and to scientists and government representatives who could easily overlap their own data and plans. In the process, NGO partners served as facilitators and moderators. Such a dialogue resulted in concerted actions including both bottom-up and top-down measures to enhance DRR.

The local government of Irosin is hence interested in reproducing the experience conducted in Macawayan in other villages of the municipality with the help of local IRDF staff. Such a reproduction of the methodology is easy because P3DM is cheap and fosters the use of local materials. Fortunately it will spread beyond the borders of Irosin and result in a significant reduction of disaster risk throughout the region.

3 - Members of the local community discussing hazard-prone areas with a scientist from the Philippine Institute of Volcanology and Seismology and representatives of the local government, Irosin, Philippines, Jan. 2010  
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### MATERIALS NEEDED FOR P3DM FOR DRR

- Push-pins (for point features)
- Yarns (for linear features)
- Acrylic paint (for areal features)
- Tailor pins
- Thimble
- Glue
- Scissors, cutters
- Pencils, felt pens
- Masking tape
- Paintbrushes of different widths
- Carbon paper and crepe paper
- Small hammer and nails
- Wood and plywood for the table
- Corrugated cartons, rubber mats or other layered materials

### STEPS IN CONDUCTING P3DM FOR DRR

01. Consultation with local stakeholders
02. Research and rapport building
03. Selection of the map scale
04. Orientation of the participants
05. Preparation of the support table, base map and other materials
06. Identification of hazards, vulnerable assets, local resources, and preparation of the legend
07. Plotting community information on the map
08. Plotting hazards on the map
09. Disaster risk assessment
10. Planning for disaster risk reduction
11. Finishing of the map
12. (optional). Integration of P3DM data into Geographic Information Systems
13. Turn-over of the map to local stakeholders
14. Updating of the map

### TO KNOW MORE ABOUT P3DM FOR DRR

Gaillard J.-C., Maceda E.A. (2009) Participatory 3-dimensional mapping for disaster risk reduction. *Participatory Learning and Action* 60: 109-118.  
P3DM for DRR website: [www.p3dmfordrr.com](http://www.p3dmfordrr.com)  
Participatory Avenues, the Gateway to Community Mapping, PGIS & PPGIS website: [www.iapad.org/](http://www.iapad.org/)

### THE PROJECT PARTNERS

- Integrated Rural Development Foundation (IRDF)
- Local government of Irosin
- Department of Geography of the University of the Philippines Diliman
- Center for Disaster Preparedness (CDP)

