Policy Brief

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Participatory 3-Dimensional Mapping for Disaster Risk Reduction: A Review of 10 years of practice in the Philippines

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Figure 1. P3DM for DRR in La Carlota, Philippines, January 2011

What is Participatory 3-Dimensional Mapping for Disaster Risk Reduction?

Participatory 3-Dimensional Mapping (P3DM) consists of building stand-alone, usually large-scale relief maps made of locally available and cheap materials (e.g. cardboard, polystyrene, carton paper) which serves as a tool for plotting overlapping thematic layers of geographic information. These layers can display a wide range of geographic information, from physical landforms to anthropogenic features. Data points are most commonly visualised by pushpins (points), yarn/string (lines), and paint (polygons).

While P3DM has been used for multiple purposes, it has proved particularly valuable within the realms of disaster risk reduction (DRR). People who build such maps are often local people who face hazards and deal with disasters as well as other actors of disaster risk reduction, such NGOs and local government agencies. Through P3DM, local people can define their vulnerabilities and capacities in such a manner that is inclusive and communicable to a wide range of stakeholders, both local and external alike. Hazard-prone areas and threatened local resources can be delineated which can aid in the planning of DRR in a manner which emphasises the inclusion and involvement of top-down and bottom-up actors across scales.

P3DM for DRR was introduced in the Philippines in 2007 and has since being utilised across the country. Ten years on, a national workshop was held for past stakeholders to share their experiences and discuss ideas moving forward. This workshop was held on 12-13

January 2018 in La Trinidad, Benguet, a municipality that has utilised P3DM to significant success. The workshop was hosted by the Municipality of La Trinidad and facilitated conjointly by practitioners and academics from The University of Auckland (New Zealand) and the University of the Philippines Diliman. The event involved local civil society leaders, staff of NGOs and local government agencies, researchers and representatives from international organisations. To honour the themes of

Figure 2. P3DM for DRR in Mercedes, Philippines, December 2012

participation upon which P3DM leans on, the workshop was conducted in an interactive fashion; methods such as carousels, listing activities, force-field analysis and various matrixes were utilised to facilitate an open-ended exchange of ideas. This policy brief serves as a summary for all the activities in the two-day workshop, detailing the ideas and recommendations expressed therein and avenues for future implementation.

How do we use P3DM for DRR and beyond?

The primarily consensus for the use of P3DM was its flexibility. Participants agreed that if they started to use P3DM for assessing disaster risk and designing DRR actions, they eventually expanded its utilisation to other priorities, from teaching and training to tax mapping and ancestral domain mapping. Four major themes were particularly identified regarding the use of P3DM in DRR and beyond (Table 1): DRR, everyday development, teaching and learning and resource management.

Resource Management	Everyday Development
• Baseline data collection • Household profiling and validation • Assessment and monitoring of crops planted, animals raised and areas devoted to farm uses • Coral reef and mangrove mapping • Assessment of health services	• Local land-use planning • Fisheries policies and regulations • ''Community' engagement • Indigenous people ancestral domain mapping • Spatial awareness
Learning/Teaching	**DRR**
• Gamification • Teaching aid for school children • Spatial awareness raising • Training tool for diverse fields and contexts	• Risk assessment, including hazards, vulnerabilities and capacities • Climate change adaptation planning • Evacuation management

Opportunities and challenges associated with P3DM for DRR

Ranking	Upsides of P3DM for DRR
1	Spatial awareness of local realities (local issues / Hazards, vulnerabilities and capacities / village overview)
2	Participatory process (inclusive participation and ability to reflect on this process / dynamism)
3	Planning facilitation (DRR, public health, land-use, natural resource management)
4	Boundary and other territorial mapping (administrative boundaries, fishing grounds, alternative to Google Map/Earth)
5	School teaching and learning (integration in school curriculum)
6	'Community' strengthening (sense of camaraderie and collective labour in building the map, including with schools)
7	Fun
8	Local ownership of the process and tool

Note: ranking from 1 to 8 reflects workshop participants' assessment

Ranking	Downsides of P3DM for DRR
1	Ownership of the tool (depends on local leadership) and unintended uses (discrimination, profiling)
2	Sensitivity of personal information
3	Conflictual and confusing information
4	Diversity of participants in building the map and subsequent traction of the tool and process
5	Existing land tenure and territorial issues
6	Size of the map and difficulty to find a venue to store it
7	Difficulty to source building materials and use of polystyrene
8	Lack of baseline data and pre-existing/updated topographic map

Note: ranking from 1 to 8 reflects workshop participants' assessment

Figure 3. P3DM for DRR in Josefina, Philippines, January 2010

Opportunities and challenges to maximise upsides and overcome downsides

Our workshop participants referred to striking similarities in the opportunities and challenges they encountered in using P3DM for DRR and other areas of developments, independently of the contexts of their experiences (urban vs rural, coast vs mountain, large vs small towns, externally or internally initiated). The multiple dimensions of funding were undeniably the most significant of the following issues.

Participation and participants
Managing participants' schedules
Participants coming and going
Dominant participants
Inactive/passive participants
Exclusion of vulnerable social groups
Sourcing painting/carpenter skills
Participants' spatial awareness

Funding
Source
Availability
Duration of funding
Paperwork to release funding
Counterpart/ownership of budget
Budget sustainability
Budget prioritisation

Others
Comfort of venue
Credibility and accuracy of data
Commitment to updating/validating the data
Scheduling and strategies for engaging stakeholders
Peace and order

Facilitation skills
Limited level of facilitation skills and P3DM making experience
Skills in managing 'dominant' participants
Time-management skills
Continuity of facilitation skills
Facilitator's rapport with participants
Language barriers
Language and terms used by facilitator
Commitment of facilitator (time and engagement)
Youth facilitators
GIS skills to produce base maps

Required materials
Limited availability
Pollution
Transportation of materials
Accuracy of base map
Venue/storage
Bulky and heavy
Printing of tarpaulin/base map
Lifespan/longevity
Glass over: difficulty in transporting

Figure 4. P3DM for DRR in Mercedes, Philippines, December 2012

Sustaining P3DM for DRR

The overall usefulness and contribution of P3DM for DRR is largely contingent on sustainability, especially whether or not the map continues to be utilised and updated beyond the initial map making process. Local stakeholders, in all their diversity, need to remain engaged with the map and sufficient resources need to be allocated to ensure it remains updated. For many local stakeholders of DRR, sustaining P3DM also entails replicating the initial mapping process in multiple other locations. In this perspective, the following issues deserve particular attention.

Maintenance	Updating	Replication
Identify a focal person	Plan monitoring of data	Identify a local facilitator
Focal person should keep initial leftover materials to for updating of the map	Consider in- and out-migrations	Consider the training of local facilitators
	Consider perishable data	Assign a documenter
Regular updating	Store mapping resources	Consider the unique features of different locations
Lacquer coating and glass cover to preserve the map and its legend	Identify who will update what	Prioritise locations
		Source local materials
Plastic cover if glass cover is not feasible or possible	Make sure that all hazards, including new ones, are mapped	Consider local funding opportunities and challenges
Plan sufficient budget		Plan timing carefully
		Get commitment of local government agencies
Strategic location for storage	Anticipate required staff-power	Consider creating video tutorials of the mapping process
The map should be movable		Support the production of base map