

UNISDR Scientific, Technical and Advisory Group Case Studies – 2014 Participatory 3-Dimensional Mapping to foster multi-stakeholder collaboration in Disaster Risk Reduction

The problem

Stakeholders of disaster risk reduction (DRR) seldom work with each other. On the one hand, local communities, usually in collaboration with NGOs, conduct Community-Based Disaster Risk Reduction (CBDRR). However, scientists and national governments tend to dismiss local knowledge and community initiatives as they often find them too subjective and removed from scientific rigorous protocols. On the other hand, scientific knowledge is often difficult to access for those at risk. The absence of common methodologies trusted by all stakeholders makes difficult the integration of bottom-up and top-down initiatives essential to DRR.

The science

Participatory 3-Dimensional Mapping is a recent innovation geared towards fostering collaboration between actors of DRR¹. P3DM comprises the building of stand-alone scaled relief maps made of locally available materials (e.g. carton, paper, etc.)² which are overlapped with layers of information such as the topography (e.g. mountains, hills, valleys, rivers), land cover (forests, farm lands, fishing grounds, settlements), and anthropogenic features (e.g. infrastructure, lifelines, houses, vehicles, animals, marginalised and vulnerable people). These are depicted using push-pins (points), yarn (lines), and paint (polygons). P3DM enables mapping of hazards as well as vulnerabilities and capacities of the local people. It also allows local people to plot desired and useful risk reduction measures (e.g. design and location of early warning systems, evacuation areas and routes, protection of essential resources, relocation of key community assets, infrastructure development) in collaboration with outside stakeholders.

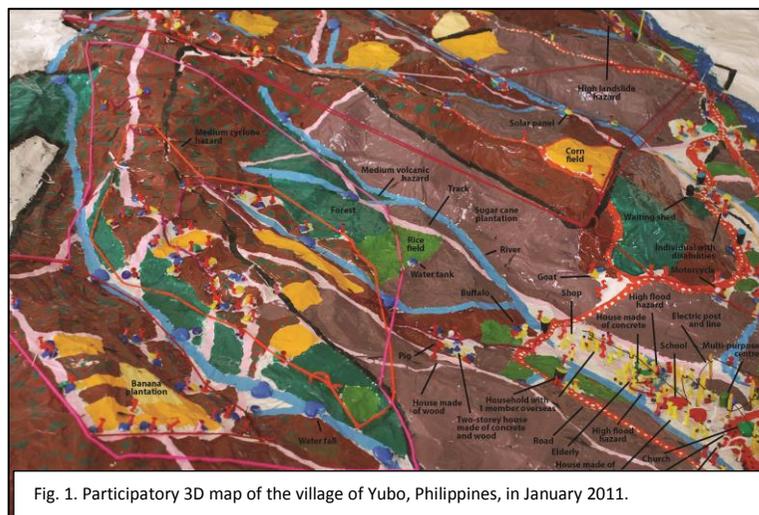


Fig. 1. Participatory 3D map of the village of Yubo, Philippines, in January 2011.

The application to policy and practice

Since 2007, several community-based programmes have utilised P3DM to foster stakeholders' collaboration in DRR. P3DM has proved helpful and efficient in conducting risk assessment and action planning. Since the 3D map is scaled, it is easy for scientists and government agencies to overlap their own hazard maps and other relevant data. By superimposing the information on hazards, vulnerabilities and capacities, risk

becomes more tangible for all the stakeholders particularly to local people and marginalised social groups. The 3D map is thus a solid basis for planning DRR because it provides a clear picture and location of those at risk, and the availability of resources and capacities to face natural hazards³.

In the village of Yubo, situated on the slope of Mt Kanlaon Volcano in the Philippines, the local community in collaboration with outside stakeholders of DRR (i.e. NGO staff, scientists and municipal government officials) have conducted a thorough assessment of disaster risk based upon a 3D map (Fig. 1). The community supported by its partners has eventually designed an

action plan to reduce the risk of disaster, notably in facing volcanic hazards which were considered the most significant threat for the whole village. Evacuation drills were eventually conducted to test some of the components of the action plan (Fig. 2). On the longer term, the municipal government is now considering P3DM in its DRR policy and people from Yubo have started training neighbouring villagers.

Did it make a difference?

P3DM for DRR has several advantages. Firstly, it encourages the participation of local people regardless of their social class, level of education, gender, age, ethnicity, etc. In Yubo, men, women, children, elderly and less wealthy, indigenous people all collaborated around the same map with the common goal to strengthen DRR. Secondly, since the 3D map is scaled, scientists, NGO staff and government agencies are able to convey their knowledge to the local people and vice versa. In essence, P3DM creates a space for dialogue among stakeholders of DRR. Finally, the activity promotes empowerment of local stakeholders and ownership of their knowledge because the 3D map is left with the community which also allows to regularly update risk assessment. In Yubo, a systematic updating of the map was conducted six months after its construction. For example, pregnant women who had given birth were removed from the map and replaced by children. The DRR action plan was simultaneously updated.

Despite all its advantages, P3DM is not a stand-alone tool and needs to be combined with other participatory tools notably to capture the dimensions of vulnerabilities and capacities which are difficult to plot on a map. For example, in Yubo, timelines were combined with P3DM to capture the seasonal dimension of vulnerability and interpersonal relationships. In addition, as for all participatory tools, the contribution and sustainability of a P3DM project depend upon the process of participation and the respect of local needs and aspirations.

More information available from: <http://p3dmfordrr.wordpress.com/>

References

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- ²Rambaldi, G. and Callosa-Tarr, J. (2002). *Participatory 3-dimensional modelling: Guiding principles and applications*. ASEAN Regional Centre for Biodiversity Conservation (ARCBC), Los Baños, Philippines.
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Fig. 2. Evacuation drills conducted in Yubo, Philippines, in June 2011.