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DISASTER RISK REDUCTION

In theory, disaster risk reduction (DRR) must be inclusive of a large array of stakeholders in order to integrate actions from the bottom up and the top down to address both the root causes of peoples' vulnerability and enhance their intrinsic capacities to face natural and other hazards (Gaillard and Mercer, 2013).

Yet in practice, this is rarely the case. There is still a significant gap between insiders; those immediately concerned and at risk, and outsider stakeholders, such as scientists, non-governmental organisations (NGOs), and local governments (see Figure 1). Participatory mapping (PM) is now being widely used by scientists and practitioners within community based DRR initiatives to attempt to address this gap.

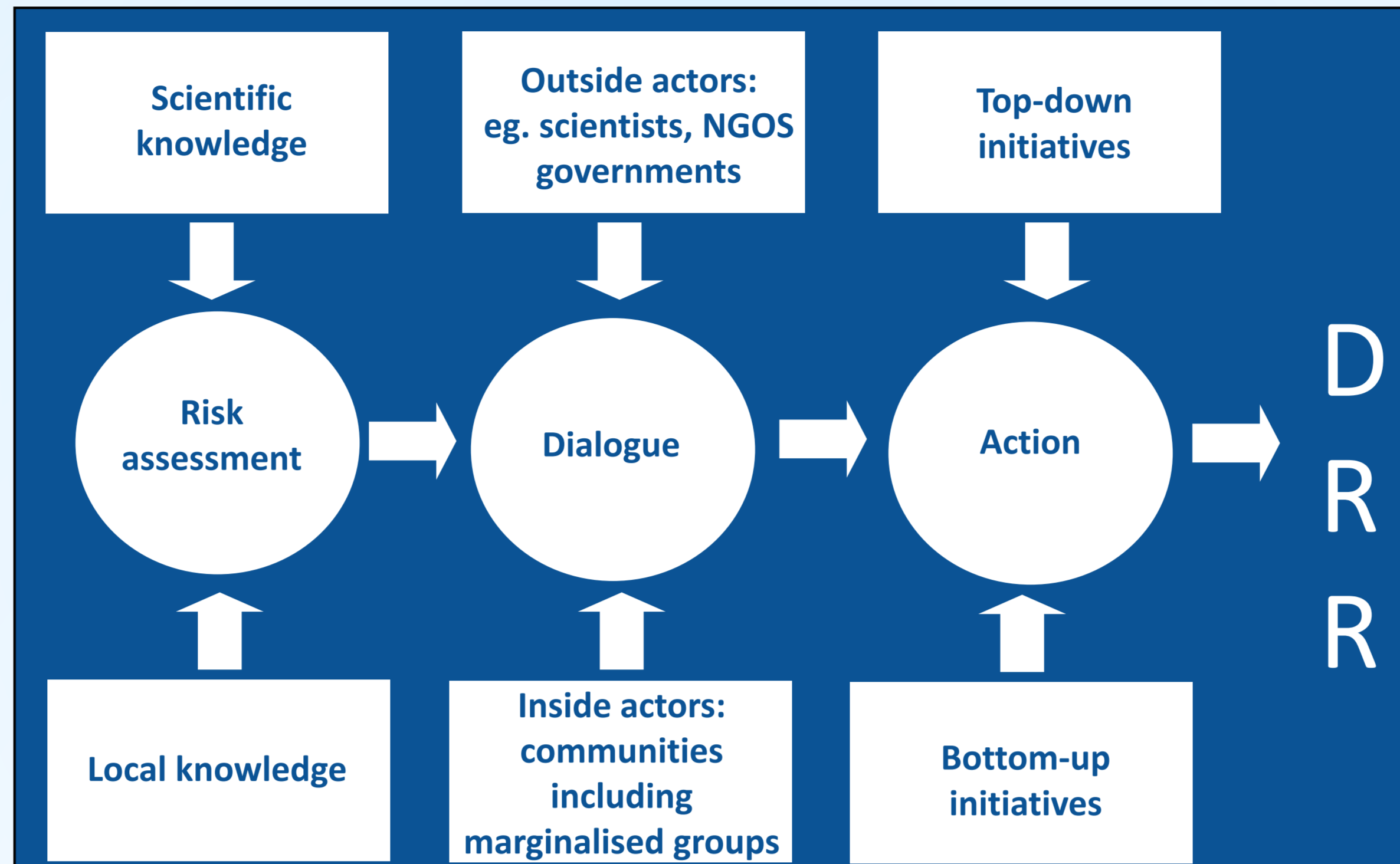


Figure 1: A road map for integrative disaster risk reduction (Gaillard and Mercer, 2013)

PARTICIPATORY MAPPING

Maps are powerful tools that can provide a visual representation of perceived or desired realities (Chambers, 2008). Participatory mapping has the potential to integrate diverse information and generate understanding of the dynamic processes of DRR (Bauer, 2009). Physically representing components of abstract concepts such as disaster risk and vulnerability makes them tangible and thus assessable. In addition, participatory mapping allows for plotting of desired future risk reduction actions (Cadag and Gaillard, 2012).

The proliferation of participatory mapping as a tool in DRR and other fields in development can be attributed to its power, versatility, and the relative ease of facilitation (Chambers, 2008).

TYPES OF PM

EXAMPLES

STRENGTHS

WEAKNESSES

GROUND MAPPING

People draw the map in the sand or ground with their fingers and use locally available materials



Beach mapping with GEOG325 students in Auckland in May 2013



Ground mapping with high-school students in Savo, Solomon Islands in March 2011

- Very easy and cheap to set up
- Familiar to most people
- Less eye contact
- Easy to correct and adjust

- Temporary
- Limited signs and symbols
- Not scaled or georeferenced
- Not valued by all stakeholders

SKETCH MAPPING

People draw the map on a sheet of paper with coloured marker pens and pencils



Sketch map for DRR on slopes of Mt. Merapi, Indonesia in July 2009



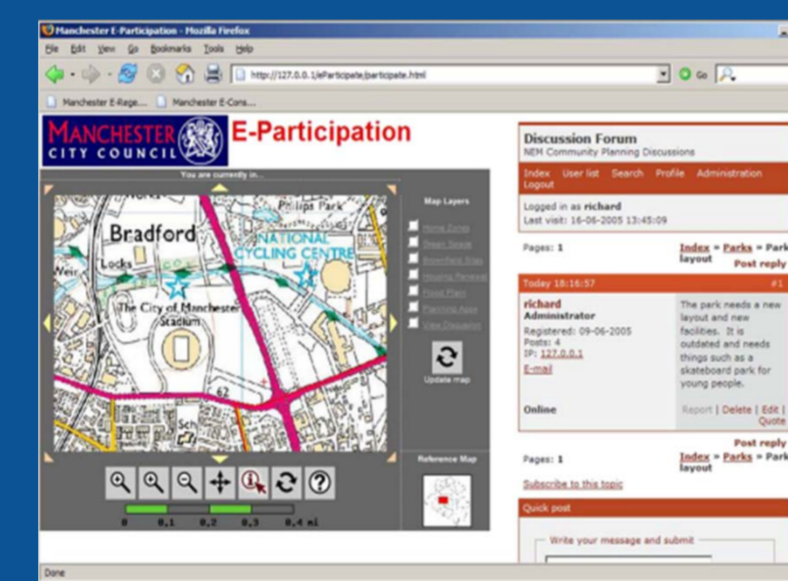
Participatory map with children with disabilities in Auckland, NZ in August 2014

- Very easy and cheap to set up
- Permanent
- Large semiology
- Most often stored locally

- Unfamiliar to many people
- Difficult to correct and adjust
- Not scaled or georeferenced
- Not valued by all stakeholders

GIS / GPS MAPPING

People walk around and map an area based on GPS points. Web-GIS maps get people to contribute to web-based GIS databases



Participatory web-GIS mapping in Manchester, UK in August 2007 (White et al., 2010)



Participatory GPS mapping for DRR in Jakarta, Indonesia in August 2007 (French Red Cross)

- Permanent
- Scaled and georeferenced
- Large semiology
- Valued by government officials and scientists

- Unfamiliar to most people
- Costly and difficult to set up
- External facilitation required
- Techno-centric approach
- Space for external manipulation

DRONE MAPPING

People use drones to capture images of an area for mapping



Drone mapping for post-disaster needs assessment in Tacloban, Philippines in March 2014 (Drone Adventures)



Balloon participatory mapping in the U.S. n.d. (Public Laboratory)

- Permanent
- Expansive areas covered
- Scaled and georeferenced
- Valued by all stakeholders

- Unfamiliar to most people
- Costly and difficult to set up
- External facilitation required
- Technologically intimidating

2D / 3D MAPPING

People use 2D or 3D modelled maps to plot and discuss community risks and hazards



Participatory mapping for DRR in Hastings, NZ in November 2011



A volcanologist, municipal planning officer, school principal, village chief and local people discussing DRR in Irosin, Philippines in January 2010

- Permanent and adaptable
- Scaled and georeferenced
- Use of local materials
- Valued by all stakeholders

- Unfamiliar to some people
- Training of facilitators required
- Sometimes time consuming
- Extensive groundwork required

WAYS FORWARD

- The medium and means of mapping will determine who is involved and how (Chambers, 2008).
- Participatory mapping is a powerful but not stand-alone tool for disaster risk reduction. It should be combined with other tools such as scoring and ranking, proportional pilling, and Venn diagrams to apprehend dimensions of disaster risk which can hardly be located in space.
- The process of mapping is as, if not more important than the map itself as it reflects the process of participation and empowerment of those constructing the map. In DRR, mapping is a tool to involve local actors, who are usually excluded from mainstream DRR initiatives, in plans to reduce vulnerabilities and build capacities to cope with natural hazards that are self-developed, culturally relevant, and which incorporate both inside and outside knowledge.
- For this reason, participatory mapping gives overarching importance to downward accountability.
- The ability of participatory mapping to integrate knowledge in DRR, foster dialogue between stakeholders, and implement actions that are both top down and bottom up will depend largely on the attitude and behaviour of the facilitators and others who control the process (Chambers, 2008).

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