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F2F 2015: Integrated floods management: Acting locally, linking beyond!

Flood Hazard Mapping: Particapory, Numerical, Geomorphological Approaches

Country/Region: ***Latin America & Carribbean***
Institution: ***Swiss Agency for Development and Cooperation SDC***
Time Frame: 2000 – 2015 (ongoing in Haiti)
Partner(s): Governmental institutions; sub-national and local governments; NGOs
Beneficiaries: Populations affected by flood hazards; public infrastructure
Key words: Flood Hazard, Mapping, Empirical, Participatory, Scientific, Modelling, Geomorphological
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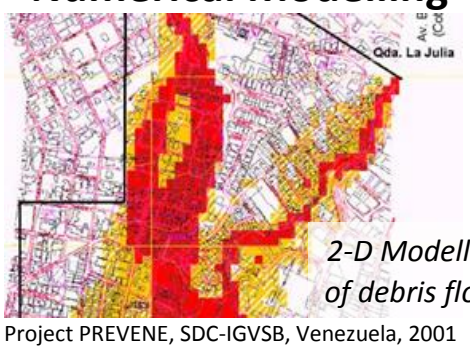
1. Context and rationale

- Floods kill and cost (livelihoods, infrastructure).
- Floods strongly affect the poorest.
- **Hazard / risk information is necessary:** for awareness building, [land use planning], preparedness…
- **Classical methods** for flood hazard assessment / mapping **are based on numerical modelling**. They need good know-how, lots of data (hydrological; topogr.).
- Participatory mapping is unprecise; tends to reflect recently observed events; is deemed "unscientific".
- → We need some compromise or other solutions!

2. Some available approaches

Numerical Modelling



2-D Modelling of debris flows

Project PREVENE, SDC-IGVSB, Venezuela, 2001

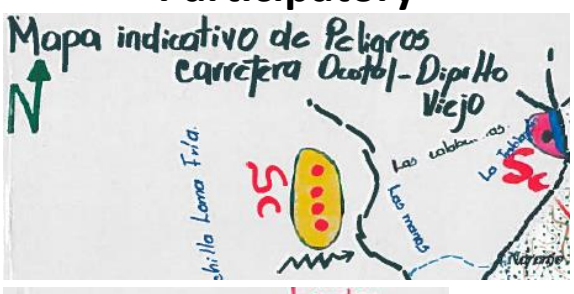
Left: Venezuela (draft); Right: SDC, Haiti, 2015

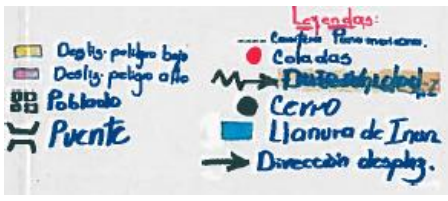
Amenaza muy alta	Riesgo alto	Riesgo alto	Riesgo muy alto
Amenaza alta	Riesgo medio		Riesgo alto
Amenaza media	Riesgo bajo	Riesgo	Riesgo medio
Amenaza baja	Riesgo bajo	Riesgo bajo	Riesgo medio
	Vulnerabilidad baja	Vulnerabilidad media	Vulnerabilidad alta

Risk maping: USEFUL?

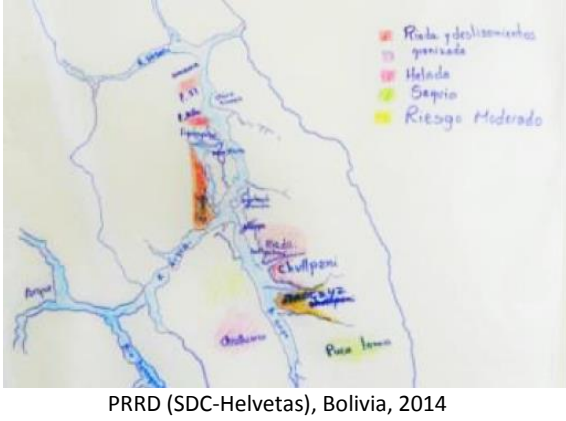
PRRD (SDC-Helvetas), Bolivia, 2014

Participatory



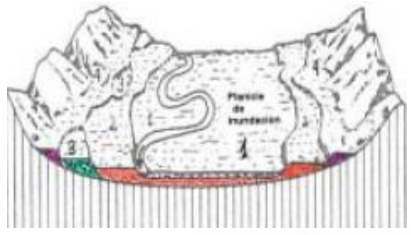


Project ALARN, SDC, Nicaragua, 2005

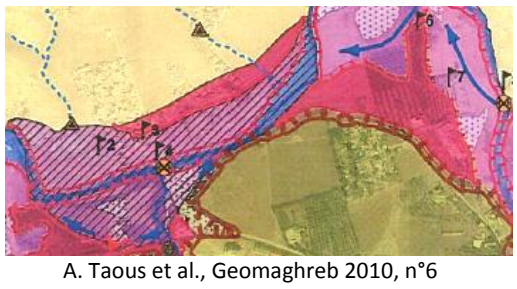


PRRD (SDC-Helvetas), Bolivia, 2014

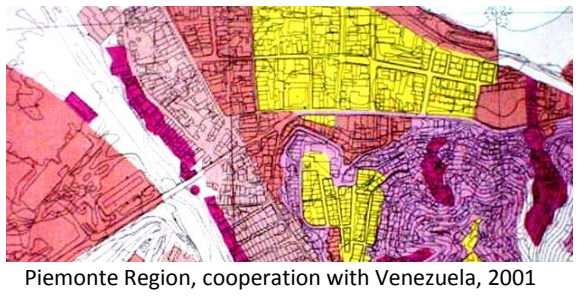
Geomorphological



María Angels Marques & Gloria Furdada, Nicaragua, 2004



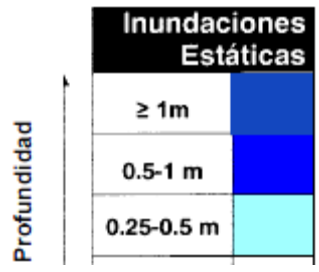
A. Taous et al., Geomaghreb 2010, n°6



Piemonte Region, cooperation with Venezuela, 2001

3. Lessons learnt

- **National institutions** (for hazard mapping / geographical information) and their professionals tend to **favor complex** approaches (including modelling).
- … like to see **rare events** (100-year flood, or 500-year flood) given high importance.
- … tend to **boost hazard levels** (e.g. "lets take 1m water depth as an indicator of high hazard, not 2m").



- Models calculating **"risk"** often misleading and/or produce useless maps.
- **At community level** (e.g. NGOs), the baseline is to rely on **participatory mapping**, but there is openness to science-based inputs.

➢ Generate good examples with other methodologies (e.g. geomorphologic); **combine methods** (participatory-scientific); **differenciate** (≠uses).

➢ Advocacy for importance of lower return periods (e.g. risk calculations).

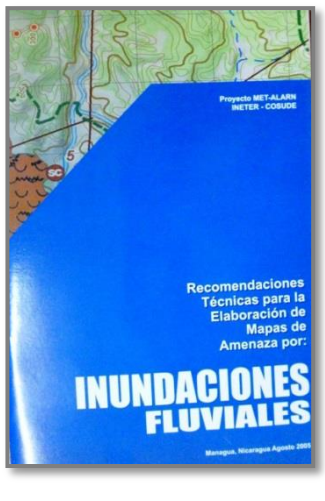
➢ "OK, **there is a margin** for setting the threshholds, but lets try not to inflate the needs for protection too much."

➢ Stick to **hazard maps** and (possibly) simple risk representations.

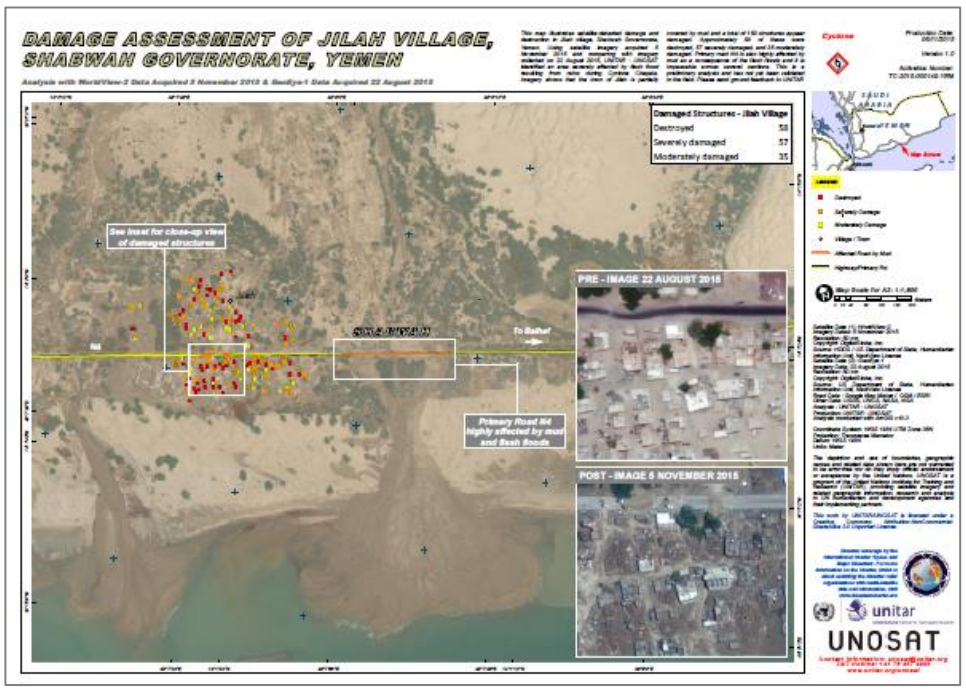
➢ Consider **"rare"** events. If going "scientific": apply robust (proven) methods. Double-check methodology.

4. Entry points for scaling up the approach

- National **working group** on (flood) hazard mapping;
- Comparative **trials** of methodologies (w/ **experts!**) → recommendations.
- **Training** of national professionals.
- Provide **opportunities for application.**



5. Way forward / new technologies



- Develop/ "import" <u>geomorph. expertise</u>
- Support for hydrological data gathering
- Remote sensing → historic flooding ?
- Remote sensing → Dig. Terrain Mod. ?
- Airborne LIDAR (for Dig. Terrain Models) ?

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