Mapping

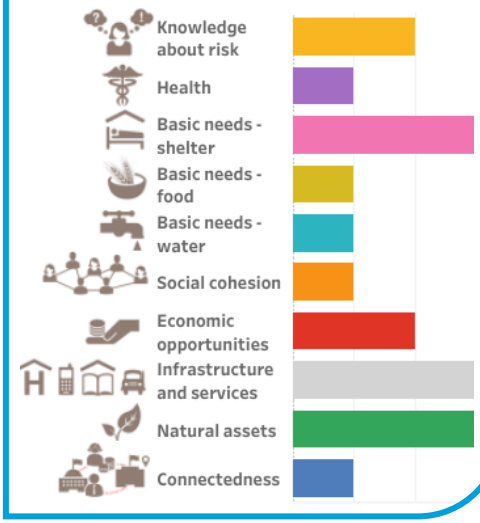
What is it?

Mapping is a way to visualise the resources, vulnerabilities and hazards in a community. Maps can be used to identify locations with exposure to hazards such as areas prone to floods or health hazards, indicating which groups and infrastructure such as health clinics, schools, houses are vulnerable, as well as map out location of resources and services (e. g. shops and businesses, clinics, schools, markets) that are capacities within the community. Maps facilitate communication and stimulate discussion, help people to understand complex spatial relationships and allow visual comparison of information.

2 hours per map

Paper and pens, or map print outs, or digital mapping tools.

Resilience characteristics covered:



Community mapping in Nepal Source: Danish Red Cross.

Use it to…

- **Identify risk exposure** by mapping who and what is most exposed to hazards and other threats and issues facing the community.
- **Show** the different vulnerabilities, capacities and resources in the community and stimulate discussion.
- **Obtain** general information for different sectors (livelihoods, health, and shelter, etc).
- **Analyse** the links and patterns of risks in the community by overlaying hazard location, infrastructure, service distribution and other resources.
- **Identify** risk factors in the environment outside the immediate community boundaries, such as upstream watershed management issues or infrastructure development with potential positive or negative spill-over effects on community risks.

Tool additional considerations

This tool has been revised to include basic aspects related to climate change, gender and diversity, livelihoods and health. However, if you want to understand these considerations more in-depth we have compiled additional considerations here. These should be read and used as a complementary note to the steps described below.

How to do it

Step 1. Determine who will participate

One group or several smaller groups?

- Consider if it would be beneficial to separate the group so that women, men, children, disabled people or other groups will be able to participate more freely.
- If you do separate into groups, make sure you have appropriate facilitators for each a woman for women's group for example.
- Make sure you support people with disabilities to ensure their participation, for example visually impaired people could use a 3D map.

Step 2. Explain the scope of the map

There are four main types of maps, or layers on the same base map:

- **Spatial map**: the base map of the community which shows an overview of the main layout and features and structures of the community. The base map could be based on a printout of existing maps or satellite images (obtained from Google Earth, Open street map or other internet sources).
- **Hazard and exposure map:** it shows the areas where hazards and threats impact the community, it also shows where risks have been getting worse and identifies exposed elements in the area (EVCA step 5).
- **Vulnerability and capacity map:** to show the vulnerabilities to different hazards and the capacities present in the community (EVCA step 7).

- **(Optional) Dream map**: used later during the planning phase (EVCA step 8) to show the aspirations of the community and help to inspire actions.

You work on all layers of the map in one session or start with a basic base map and then start adding exposure, vulnerabilities and capacities gradually by collecting information through other tools (e.g. transect walk, secondary data, etc).

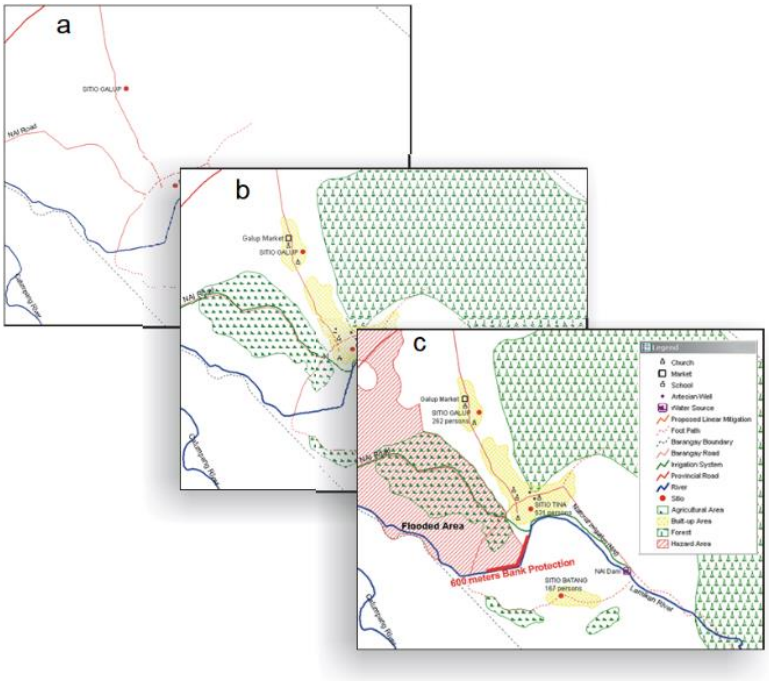
Step 3. Decide how the map will be developed

Maps can be drawn on the ground, on a paper sheet, blackboard, a printed map or aerial photographs. If available, you could also use participatory GIS or other digital mapping tools, but you need to make sure the community can actively participate using these tools. Free software used by the Red Cross Red Crescent includes Open Street Map, Google Earth and Q-GIS. See IFRC introductory guide on GIS and PASSA Youth digital track of a community map.

> *TIP!*
> It is best to make the map out of material that can be preserved so you can use the map at a later stage. Laminating or using good quality paper are some options, you can also take photographs and/or make a video to keep an accurate record of the map (especially if drawn on the floor or on the ground). Agree with the group on a central location, such as the community centre or government office, where the map can be displayed. If you used digital tools for the map share the final products with the community.

Community map with transparent layers for each hazards, Indonesian Red Cross Society (PMI)

Comparing community map with printout from Google Earth, Indonesian Red Cross Society (PMI)



Example of community map transferred into GIS - with a) base map, b) resources, c) flood zone and suggested large scale risk reduction project along the river, Philippine Red Cross.

Step 4. Develop the map(s)

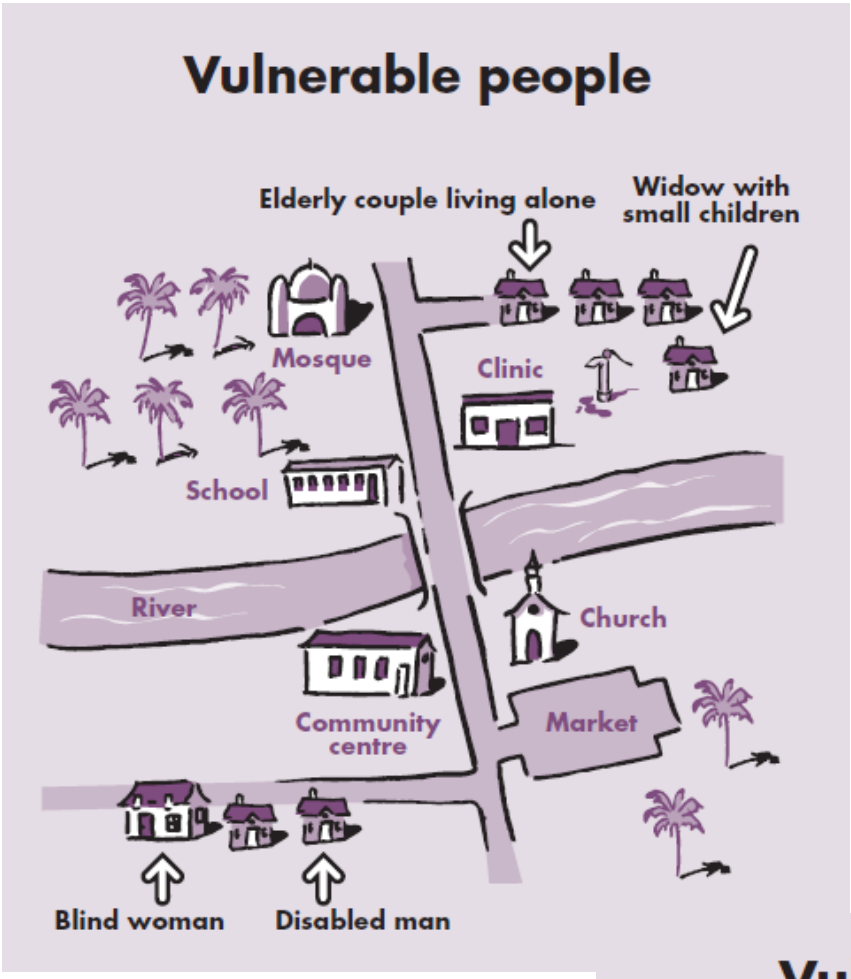
In this step the community draws or points out the elements on the map:
Start with the spatial map including the main features of the community such as:

- Main land features
- Roads, bridges, water points and other infrastructure.
- Housing areas
- Schools, hospitals and health clinics, markets, shops, places of worship, sports fields, etc.
- Land use (farms, fields) and open spaces such as parks, forests etc.
- Rivers, ponds and other water resources.
- Add key surrounding features that are outside the immediate community border but might have an impact (e.g. upstream watershed management, surrounding mountains, nearby border, etc.)

When adding the hazards and exposure, map the location of **hazards and threats** and consider the **exposure** of the elements below in relation to them. If hazards or threats are difficult to locate on a map such as droughts note them at the side of the map.

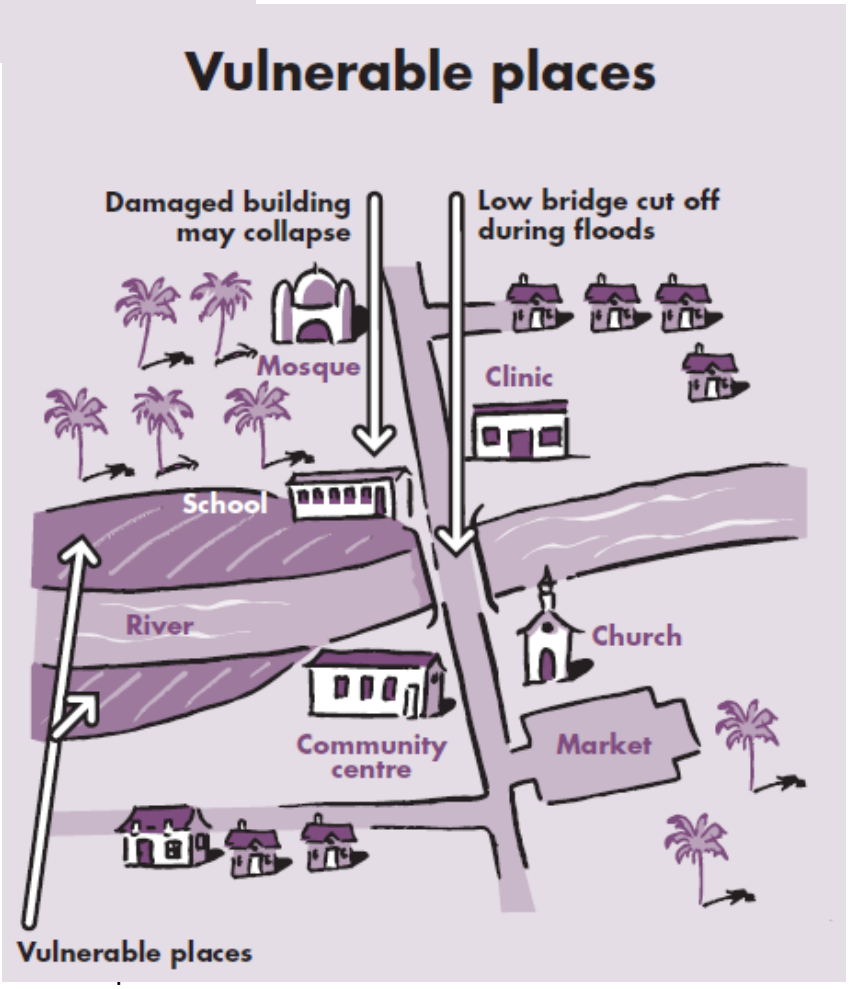
When marking the vulnerabilities and capacities on the map, consider the **state of weakness or strength of the elements** in the community in relation to the hazards or threats. You can use the resilience characteristics as guide to assess the different aspects of the community.

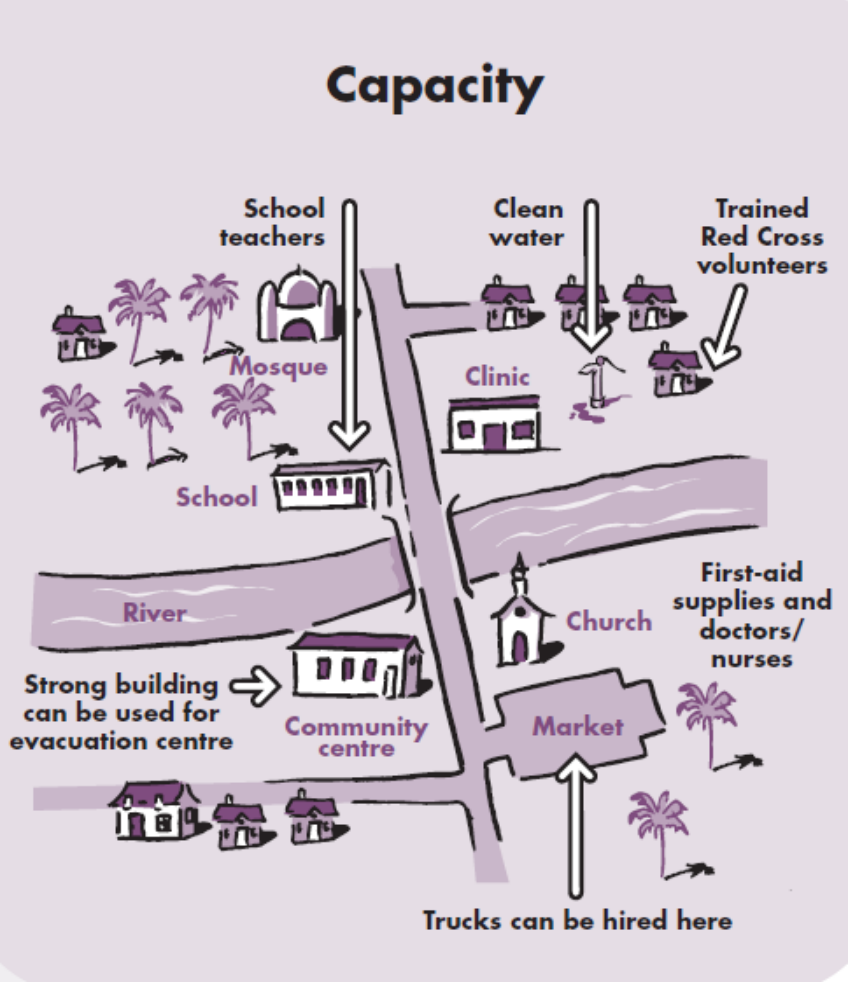
Optional: When drawing the dream map, draw what the area would look like within the next five to ten years if the community works hard to manage their risks.



Example from Indian Red Cross Society, Training of Trainers Curriculum for Community Based Disaster Management.

The following maps show how to map different vulnerable people and places or buildings in the community. The third map shows how to identify capacities to face risks within the community such as a strong building that can be used as an evacuation centre.

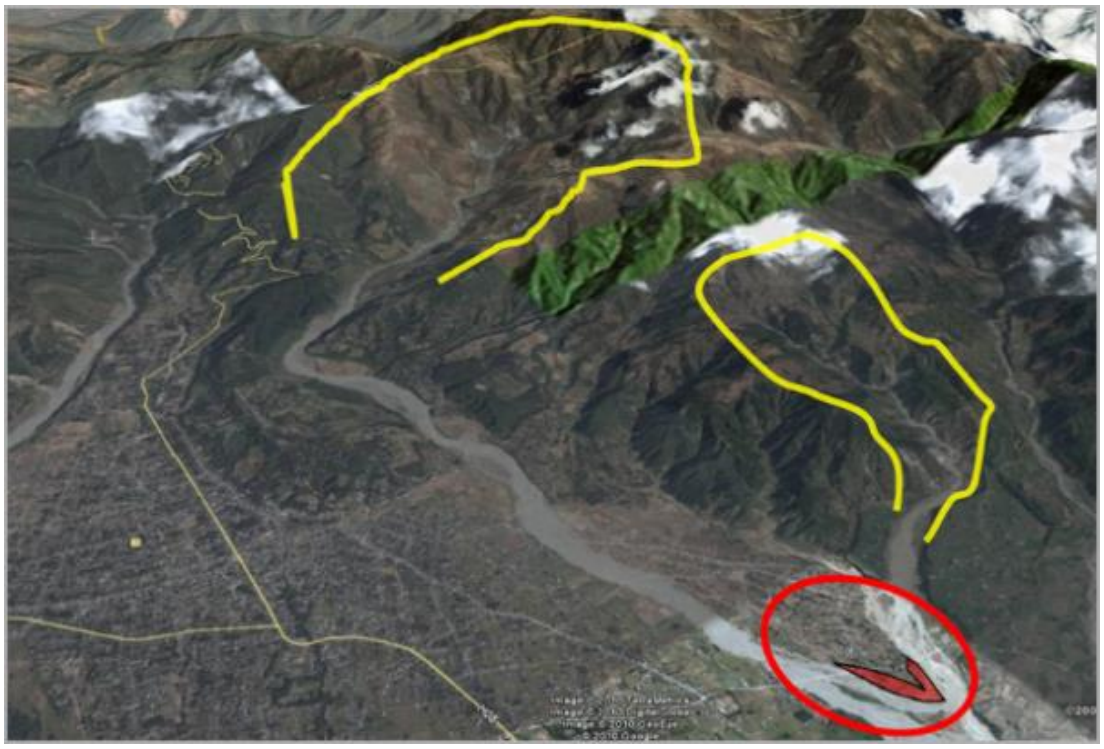




TIPS!

- While developing the maps ask people to describe not only the current situation but also how it may be changing. Try to map, e.g., flood zones in the past, and most recent flood zones - or even try to map areas that might become inundated if the next flood would be higher than ever before.
- Try to ensure that the map includes major environmental changes.
- Visit the mapped area with local people to verify the information (on a transect walk, for example).
- Contrast community inputs with scientific data on land use and the status of ecosystems (and again to validate observations).

Community map from Nepal including "normal" flash flood zone (dark red), "likely future" flash flood zone (light red); also note marking of households inhabited by people with disabilities (PWD, green circle). This is an example of how to map changing risks with expected new extreme weather events, Nepal Red Cross Society.



The same community (red circle) and flood zone from community map indicated on a Google Earth 3D image; the yellow areas are the upper, deforested watersheds that generate the flash floods. This is an example of how to consider the external environment in local risk assessment, Nepal Red Cross Society.

Step 5. If different groups were made, bring the groups together to discuss the maps

Facilitators should discuss with each separate group the key issues before bringing the community together again.
Then different maps must be brought together to discuss the differences and similarities between women, men, disabled and other groups. This will create a discussion around different perceptions and priorities which will support the development of solutions in the community.

Next Steps

Analyse the information presented on the maps. Depending on the map drawn you will get different information to analyse:

The hazard and exposure map can provide you with information about the spatial location and impact of hazards and threats in the community and the exposure of different elements in the community to these hazards as well as its possible variations due to climate change. You can summarise that information in the table below.

Hazard	**Level of exposure (elements)**

The vulnerability and capacity map can provide you with spatial information about the vulnerability or capacities in the communities that can correspond with the resilience characteristics (see example table below). For example, under the characteristic of infrastructures and services you can analyse how many health facilities the community has and how well do they function, are they properly staffed and equipped? Is the building built robustly and away from the flood zones? This analysis will help you determine if the health facilities are in fact a capacity, or if they are vulnerable to specific hazards or threats. In the Roadmap to Resilience, you could also use this to later develop a community resilience indicator such as: number of health facilities build robustly and well-staffed & equipped.

Tip!
Try to reflect on the six characteristics of resilience when adding vulnerability and capacity to the map in relation to the hazards and the exposure.

Resilience characteristics	Coverage of characteristic by tool	Example of information that can be collected	Vulnerabilities identified	Capacities identified
Knowledge about risk		Knowledge of risk location, e.g. flood zones, dangerous roads with high frequency of accidents, etc.		
Health		Health facilities, sport facilities, poor sanitation facilities and garbage dump sites, overcrowded areas, neighbourhoods with previous disease outbreaks, etc.		
Basic needs – shelter		Location of settlement areas and houses -might identifying weak and strong structures, houses in risk locations, etc.		
Basic needs – food		Location of nutrition gardens, food storage, etc.		
Basic needs – water		Location of water sources, wells, pipes, etc.		
Social cohesion		Places of social activities like community centre, recreation areas, areas with high crime rates (social violence).		
Economic opportunities		Location of fields, farms, businesses, workplaces, markets, shops, etc.		
Infrastructure and services		Location of roads, streets, bridges, drainage, hospitals/clinics, schools, mobile network tower, etc.		
Natural assets		Location of rivers, forests, protected zones, green zones/parks, etc.		
Connectedness		Location of government offices, RC/RC branch, distance to nearest city/centre		

The dream map can help you plan projects with the community members based on the changes they want to see.

You can also use this tool at a later stage to monitor the progress of a project. What has changed? What improvements have been made or new issues have come up?
Use it as a tool to generate discussions with community members about the problems in the community, such as:

- What can the community **CHANGE** on their own?
- How can the community **INFLUENCE** change with the support of others in the medium term? Which hazards or threats may be caused (mostly) by factors outside the community, e.g. watershed management, and can the management of those areas/hazards be influenced through dialogue and advocacy - drawing on the 'connectedness' of the community?
- What must the community **TRANSFORM** which requires long-term support and technical and financial means?

Constraints and pitfalls

- Mapping can require a lot of time and space to work in, participants need to be informed in advance of how long the session may take.
- Conflicts may result if inequities become apparent or old hostilities are rekindled.
- A cross section of the community is required to validate the overall perceptions of the community. It is suggested you do a transect walk in the area with community members to verify the information.
- One person may dominate or direct the mapping if the facilitator does not adequately guide everyone in the group to contribute.
- Aerial photographs or GPS printouts may be difficult to obtain or expensive to buy and might be hard to read and interpret. District maps or urban blueprints may reflect administrative boundaries that may not accurately represent the community.
- If you are using digital mapping technology you must make sure it does not hinder community participation, if so it may be better to do the exercise manually first and record the information digitally afterwards.