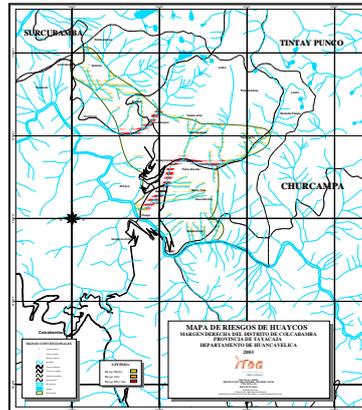




# PREPARATION OF RISK MAPS

## Introduction

This document addresses the risk maps that resulted from the experience carried out in the emergency preparedness project in Peru. The methodology will have to be revised according to other more comprehensive risk reduction experiences and strategies that are being implemented institutionally but that lack instruments such as the one described here.



## Conceptual Approach

### Risk

Risk is defined as the probability that people may suffer injuries or damages because of a disaster.

Risk may be calculated, based on three elements:

a) the frequency and severity of a threat, b) the vulnerability, and c) capacity of people, communities and institutions to respond to such a threat and recover from its impact.

Therefore, the greater the risk, the greater the vulnerability of a community and the lower its response and recovery capacity.

### Risk map

The purpose of a risk map is to identify and classify areas, taking into account the probable damages that could occur as a result of a disaster.

### What is a threat?

A threat is defined as the probability that a potentially destructive or damaging phenomenon or event may occur (earthquakes, “huaycos,” floods, landslides, tsunamis, droughts, wars, epidemics), and impact on determined vulnerability conditions.

### What is vulnerability?

Vulnerability is defined as the characteristics of individuals, groups, or societies that determine its degree of exposition to a threat or risk. Key characteristics include class, ethnicity, gender, disability, age, and condition.



Risk map prepared by a member of the community

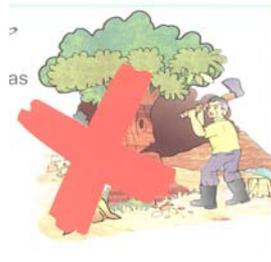
The groups that are especially vulnerable are those for whom it is difficult to survive and to rebuild housing following a disaster.

## Outline for the preparation of risk maps by using geographic information systems

### How are threat maps prepared?

#### 1. Initial inputs

- Analogical maps of the work area.
- Available digital maps of the area at the scale on which the work is to be carried out .
- Typing of the maps.



Actions that may raise our vulnerability

#### 2. Field trip

- Identification of the work area
- Identification of existing threats
- Plotting of GPS points of the threats
- Plotting of control points of the town centre



#### 3. Preparation of threat maps

- Identification of existing threats
- Determination of physical variables (precipitation, soil type, slope, meteorological event) to use in generating the threat map
- Definition of the specific work area
- Preparation of the threat map in quantitative values.
- 



#### 4. Analysis of the threat map

The threat map obtained in the previous step is made up of numbers that need to be reclassified to assign them qualitative values.

For example, the following table displays the numbers obtained in the threat map.

Quantitative Value	Qualitative Value
1	Low
2	Medium
3	High
4	Very high

<b>Low:</b>	Expresses minimal values and does not constitute a potential threat
<b>Medium:</b>	Expresses intermediate values and could constitute a potential threat
<b>High:</b>	Expresses high values and constitutes a threat
<b>Very high:</b>	Expresses very high values and constitutes an extreme threat

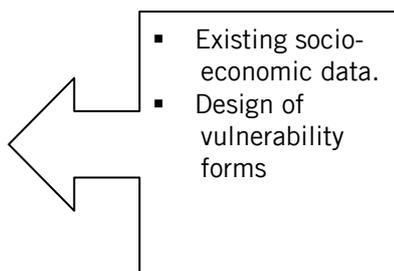
#### For example

A community which is located on a steep slope and receives a lot of precipitation in the summer months is considered at a value of 4, whereas the same community in a slightly flat area, but also receiving precipitation is considered at a value of 1.

#### 5. Validation of the landslide map in workshop and preparation of the final version.

#### How are vulnerability maps prepared?

##### 1. Initial inputs



**FICHA DE VULNERABILIDADES DE LA VIVIENDA Y FAMILIA**

<b>A. UBICACIÓN Y DE DESCRIPCIÓN GENERAL</b>		Código	Fecha	
Localidad	Barrio/Sector	Ubicación: o GPS o Mapa	Coordenados: UTM / Grados X: Y:	
Nombre del Propietario	Dirección	Habitantes por vivienda	Familias por vivienda	Habitado meses de 1 2 3 4 5 6 7 8 9 10 11 12

**B. CARACTERÍSTICAS GENERALES DE LA VIVIENDA**

<b>1. UBICACIÓN</b> OBSERVACIONES	<b>2. TERRENO</b>	<b>3. TENENCIA DE LA VIVIENDA</b>
Zona plana	Area Total	Propia
Zona baja	Area Construida	Alquilada
Pendiente	Area Libre	Otros (explica)
Ladera		<b>4. OTROS AMBIENTES</b>
Otros		1) 2)

**C. TIPO DE CONSTRUCCION DE LA VIVIENDA**

Numero de pisos de la vivienda

<b>1. PAREDES</b>	<b>2. CIMIENTO</b>	<b>3. PISO</b>	<b>4. TECHO</b> dos aguas: si / no	<b>5. DRENAJE</b>
Tapial    Quincha	Cemento	Tierra	Calamina	Zanja (Cunetas)
Adobe    Madera	Tapial / Adobe	Cemento	Teja	Techo Amplio / Dos Aguas
Ladrillo    Cañabrava	Piedras	Teja	Aligerado	Otro
Bloquetas    Otros	Otro	Otros	Palma	Observaciones

<b>6. ANTIGÜEDAD</b>	<b>7. MODO DE CONSTRUCCIÓN</b>	<b>8. CÓDIGO</b>	<b>9. ESTADO DE CONSTRUCCIÓN</b>
Menos de 5 años	Asistencia de Ingeniero	Siguió código nacional	Alto Deterioro
6 a 10 años	Hecho por profesionales	Alterado después	Deterioro
11 a 20 años	Hecho por ustedes mismos	No siguió o no hubo código	Sin deterioro
mas de 21 años	Observaciones	Otro (explica)	Observaciones

2. Field trip



3. Preparation of the vulnerability map

- Completion of the vulnerability forms.
- Preparation of a database.
- Preparation of the vulnerability map taking into consideration three aspects:
  - Accessibility to vehicles and transportation, telephone and radio communication.
  - Basic services in houses, such as electrical power, potable water, sewers, and construction materials of the houses (wood, thatch, tiles, and corrugated iron)
  - Capacity of local institutions (parishes, schools, municipalities, mothers' clubs, health stations, self-defence committees)
- Based on the vulnerability variables, the formula that associates these variables to a 1 to 4 value range is generated.

technical brief

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#### For example

One of the vulnerability variables is the difficult access to communities. Roads are unpaved and only four are suitable for motor vehicles, which gives those communities that only have unpaved unsuitable roads a value of 4.

Another community located in a slightly flat area and also receiving precipitation is considered at a value of 1.

#### 4. Producing the vulnerability map

##### What are risk maps used for?

- Risk maps allow the identification of the location of the risks and threats.
- They offer authorities and organisations ideas, shared with the community and experts, to make decisions and know what the existing dangers and threats are.
- All local stakeholders take part, analyse, and allow us to understand their perception of the situations.
- Maps allow registering historical events that have negatively affected the community.
- They help to prepare for emergencies.

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