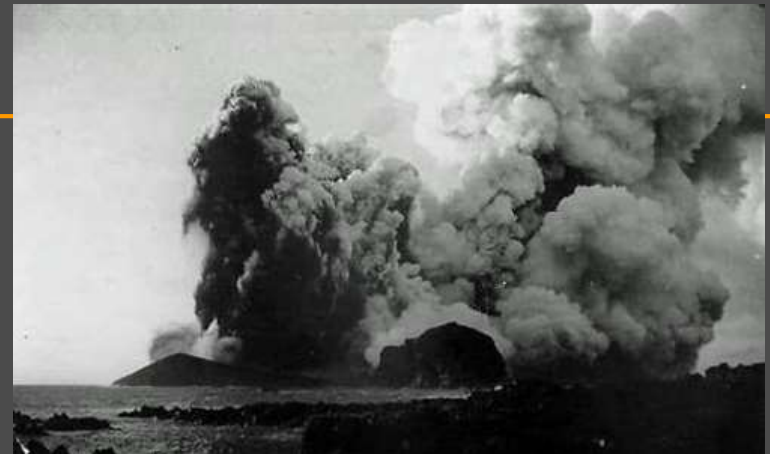


Seismic and volcanic risk in the Azores: reasons to stay in endangered places.

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Risk Analysis: the Science and the Art
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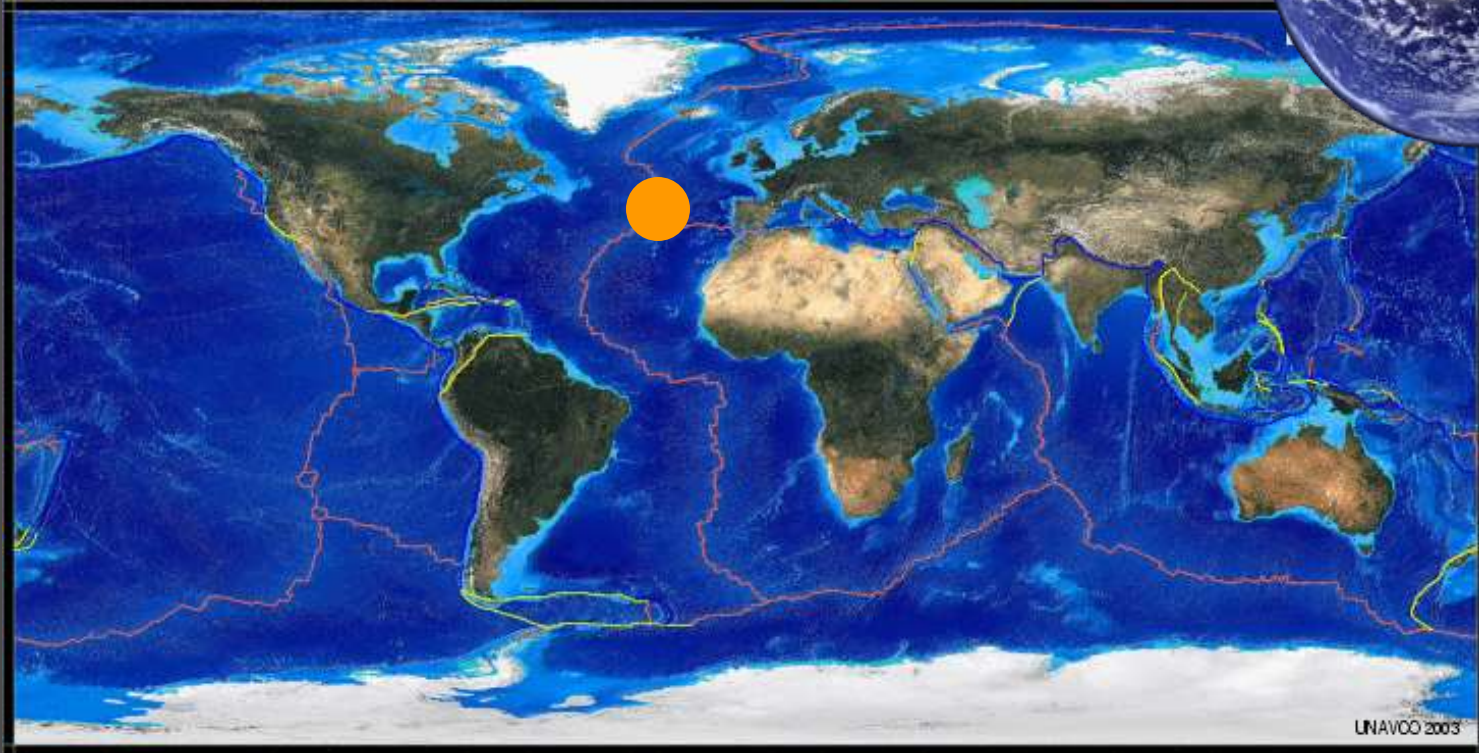


Overview

- The *Topoi Metus Study*
 - geographical & theoretical background goals
 - methods and phases
 - data and findings
- The construction of an instrument sensitive to the “voice” of lay people



GEODINAMISM OF THE AZORES



The Azores are nine islands, located over a triple junction of three large tectonic plates: the North American Plate, the Eurasian Plate and the African Plate.



Volcanic Eruptions ■

Earthquakes ■

Events with the most serious impacts throughout history.



Earthquakes & Volcanic Eruptions

Earthquakes & Volcanic Eruptions



1957-1958 - Capelinhos Eruption,
Faial island



1980- Earthquake - Terceira,
S. Jorge, Graciosa



1998- Earthquake - Faial, Pico
e São Jorge

- A submarine eruption 1 Km away from the Faial island was active for over a year. To help the victims, United States created specific legislation, and a emigration flow started to take place.
- Mass destruction, 71 deaths, over 400 wounded and 15 000 homeless.
- Mass destruction in many villages in Faial, big landslides on the coastal areas, 8 deaths and over 400 wounded and 1700 homeless.

Recent events in the memory of Azoreans

What is the *scenario* of knowledge on seismic and volcanic risks in the islands?

- Lack of information regarding the social dimension of situations – how people perceive and deal with situations
 - ↓
 - ↓
 - ↓
 - ↓
 - ↓
- Management of risks has not taken into consideration the analysis of the **social and cultural factors** which frame people's perceived risks, their **perceptions**, and their **behaviour** in those risk situations

Research on risk perception and risk communication in the University of the

Azores

since 2006 ...

a multidisciplinary team began to develop:

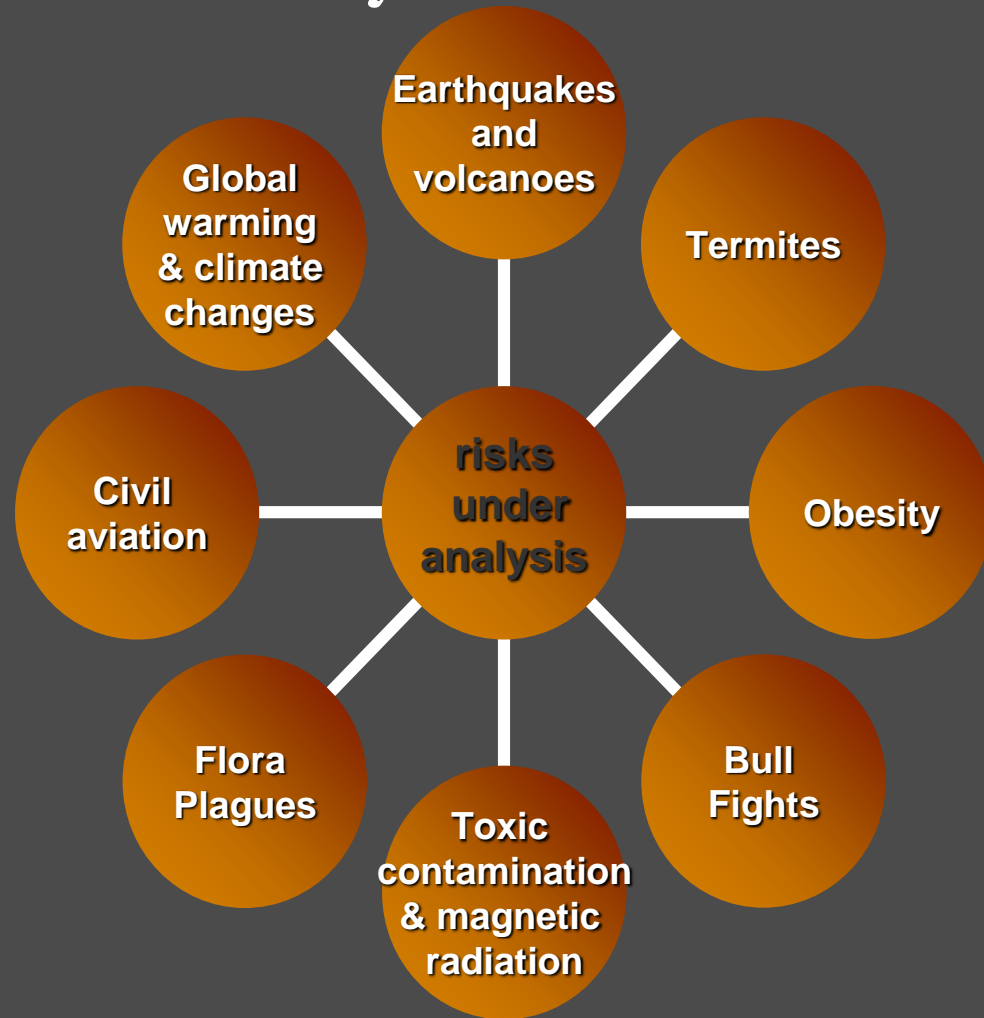
■ Research:

Funded Projects:

- Termipar (DRCT)
- Africa Annes (FCT)
- Topoi Metus (DRCT)

7 Masters' Thesis

■ Masters' degree Program in Environmental Education



The team aims to

- Contribute to bring researchers, decision-makers, the media, and citizens closer in the management of risk situations
 - ... creating knowledge on the social dimension of risk situations;
 - ... creating communication devices to support decision and action regarding the mitigation of risk sources and/or consequences (videos, web, video games, cartoons, flyers, etc)

GOALS

- ◆ To explore personal narratives of natural disaster situations;
- ◆ To construct and validate an instrument to characterize risk perception,

1. sensitive to

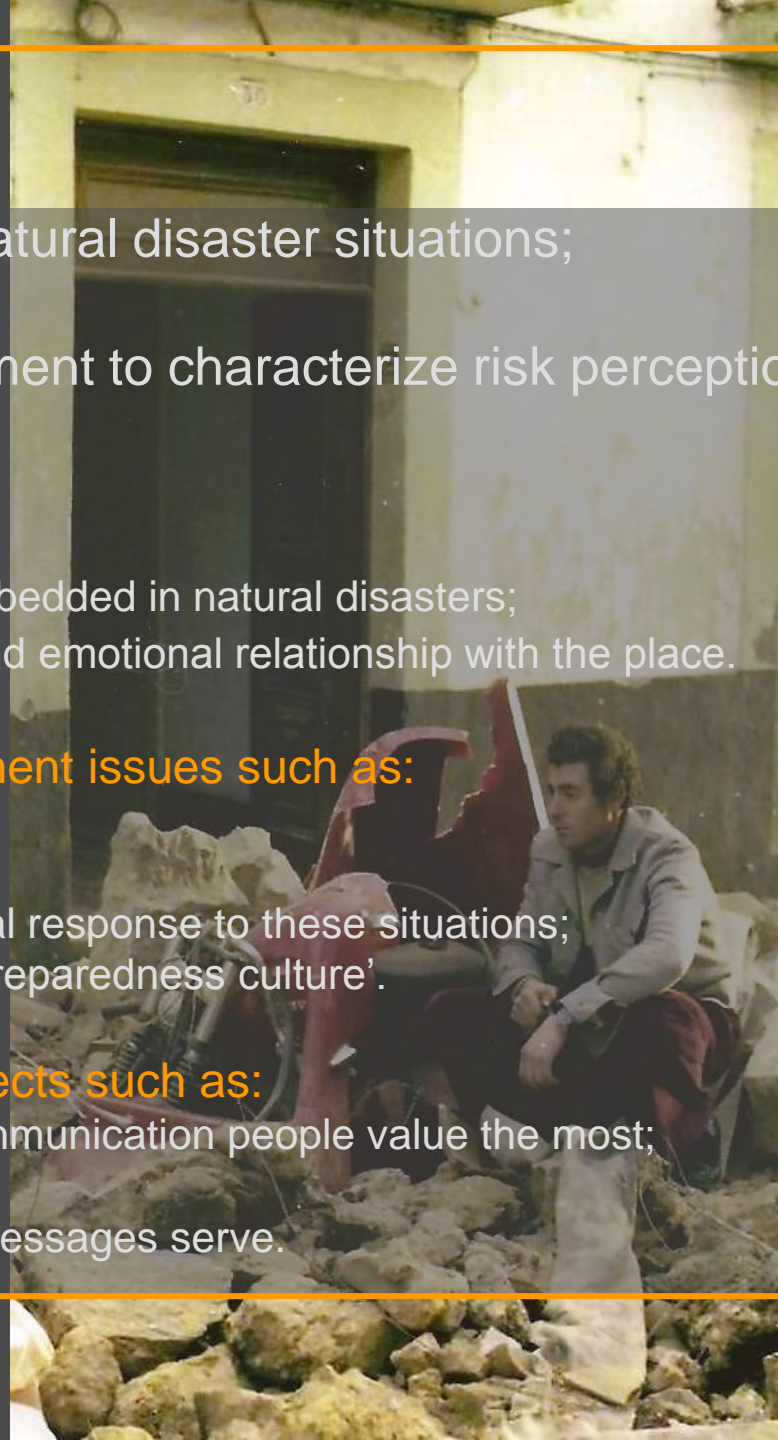
- the Azorean context;
- the mysticism historically embedded in natural disasters;
- the people's identification and emotional relationship with the place.

2. to characterize risk management issues such as:

- Lack of information;
- Risk behaviours;
- Public evaluation of the social response to these situations;
- People's commitment to a 'preparedness culture'.

3. to clarify communication aspects such as:

- Strategies and means of communication people value the most;
- Public trust;
- What functions should risk messages serve.



METHODS AND PHASES

■ Phase 1- Exploratory study

■ Participants – 30

- 5 islands: S. Miguel, S. Maria, Terceira, Faial, Flores;
- 3 age groups: 16-25 (N=10); 26-55(N=10); +56(N=10);
- gender groups: ♀ (N=15); ♂ (N=15);

■ Data production:

- An Semi-structured Interview – ave. duration 60 minutes
- Individual
- Category system - 6 dimensions / 14 sub-dimensions

■ Phase 2- Construction and validation of the questionnaire

■ Construction and facial validation

■ Distribution and psychometric study of the questionnaire

CONCEPTUAL DIMENSIONS

- Risk characterization

ex: *What causes earthquakes/volcanoes in the Azores?*

- Risk profile evaluation

ex: *Have all the islands been equally affected by those natural events?*

- Systems' vulnerability evaluation

ex: *Who has been more affected by earthquakes/volcanoes? Has anyone benefited with those events?*

- Risk management (before, during, and after the crisis)

ex: *What should people do to prepare themselves for earthquakes/volcanoes?*

- Trust – in information processes; in risk management processes

ex: *How much do you trust the entities involved in crisis management?
How much do you trust in the crisis information that is given to citizens?*

PRELIMINARY DATA ANALYSIS:

Risk characterization

	Earthquake	Volcanoes
Descriptions	Diverse sensorial; emotional; physical; cognitive;	Simplistic spectacular events
Emotions associated	Fear	
Evidence (warnings):	weather (quiet, muffled, warm, 'deaf'); animal behaviour	

Risk profile evaluation

- Differences in exposure to seismic/volcanic risk across the islands are not reported
- Earthquakes are the most serious natural hazard in the Azores;
- Other significant hazards: tornados, climate change, global warming, floods, land sliding, termite plague... (volcanoes not mentioned);

Events of reference associated to their own life

Preliminary data analysis: *Systems' vulnerability*

- Who was more negatively affected?
 - the most socially disadvantaged: aged and psychologically vulnerable persons;
 - the owners of vulnerable houses;
- Major losses:
 - Lives
 - Material - houses and property
 - Patrimony
 - Psychological/emotional
- Who benefited with earthquakes?
 - Nobody
 - Construction companies; people who get improvements in their property; people who get a new house; the most disadvantaged to the most well-off, official and non-official intermediaries; the Government.
 - Everybody

Preliminary data analysis: Risk management

- What impressed/'touched' interviewees the most?

Solidarity among people

Interpersonal conflicts resolution

- What is done by authorities/entities (e.g. Government, Civil Protection, experts, schools)?



Before a crisis, to prepare citizens: **Nothing**;



During and **after** a crisis: Ok; The Government does its share; things work because **people help each other** (TER/FAI);

- What is done by the person him/herself?



A sense of not needing more information to be better prepared, to become more resilient to crisis and crisis impacts



There is not a 'culture of precaution'

Preliminary data analysis: Place attachment



Strong attachment to the living place

- Social - Emotional Reasons:
 - birth place;
 - life history;
 - interpersonal relationships;
 - beauty;
- Material/Quality of Life Reasons:
 - owning a house;
 - having facilities near the house;
 - knowing the place;

THE CONSTRUCTION OF AN INSTRUMENT SENSITIVE TO THE “VOICE” OF LAY PEOPLE

- Instead of exploring the correlation of risk perception with public response and adjustment to a particular hazard event, we wished to understand the **reasons underlying judgments** concerning risks and to uncover the various rationales beneath them;
- Those rationales are of considerable interest to planners and policy makers - the **public perception of risk is driving policy** as much as technological and scientific risk assessments.

Principles underlying the construction of the Questionnaire

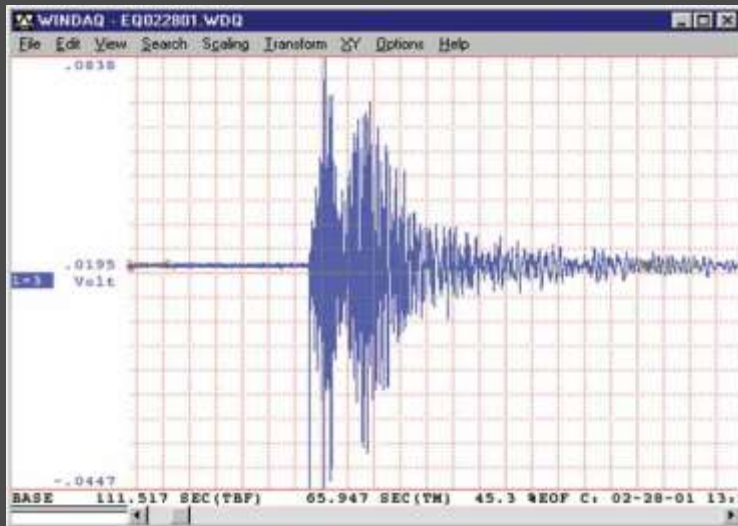
Sensitivity to the respondents' rational

- Empirical model of item construction **vs** conceptual or patchwork;
- Diversification of answer formats with a prevalence of closed-ended multiple-choice questions, with answers close to the positions expressed in the interviews **vs** ordinal scales which only measure the direction and intensity of respondents' opinions;
- Rationales are found through exploratory multivariate analysis rather than the individual analysis of items.

Saturation of the universe of representations/attributions/opinions of respondents (diversity)

- Inclusion of all the perspectives found rather than only those representing regularities;
- opportunity to produce alternative forms of answering the question;

Preliminary data analysis: Public Trust



People do trust others...

... official and non official entities, regarding:

- Risk/crisis communication
- Risk/crisis management

EXAMPLE of a prototype item in a scale

topic: Public Trust - crisis management

- In an earthquake situation, how much do you trust the following entities to deal with the crisis?

Please use a scale from 1 to 10, 1 would mean that you do not trust at all and 10 would mean that you trust completely.

	do not trust at all								trust completely	
	1	2	3	4	5	6	7	8	9	10
Regional Government										
Local Government										
Civil Protection										
Fireman										
Military Forces										
Health System										
Scientists										

only measure direction and intensity of opinions

EXAMPLE of an item in our questionnaire (version A)

topic: Public Trust - crisis management

1. Do you trust authorities/entities during an earthquake crisis?

- a. Yes, I do basically trust people;
- b. Yes, particularly the fireman, because they have knowledge on these matters;
- c. Yes, they want to do their best;
- d. Yes, they have already proved to be able to manage appropriately similar situations;
- e. Yes, If there is a disaster the different entities – military, Government – joint themselves and come to rescue and help;
- f. Yes, they have the responsibility and the obligation to help their citizens.
- g. I want to believe them, but I am not sure to believe the truth;
- h. I basically do not trust them, but I may change my mind if someone fair and honorable tells me otherwise.
- i. No, most of the time they do not know about what they are talking about when they talk on TV or on the radio.
- k) No, we cannot trust anybody anymore.
- l) No, in those situations the authorities, specially the political parties, have an opportunistic attitude.
- m) No, they do not really care to help people.
- n) None of these alternatives corresponds to my perspective, which is : _____

multiple-choice options
close to opinions expressed
in the interviews

opportunity to alternative
forms of answering

EXAMPLE of an item in our questionnaire (version B)

topic: Public Trust - crisis management

Do you trust authorities during an earthquake crisis?

Completely Disagree

1	2	3	4	5
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Agree Completely

Now, from the following A to G answers, please choose the one that best expresses your opinion.

- a. Yes, I do basically trust people;
- b. Yes, particularly the fireman, because they have knowledge on the situation;
- c. Yes, they want to do their best;
- d. Yes, they have already proved to be able to manage a crisis;
- e. Yes, If there is a disaster the different entities – military, firemen, police, etc. - joint themselves and come to rescue and help;
- f. Yes, they have the responsibility and the obligation to act in the best interest of citizens.

- g. I want to believe them, but I am not sure to what extent they tell us the truth;
- h. I basically do not trust them, but I may change my mind if it is someone fair and honorable

- i. No, most of the time they do not know about what they are talking about when they talk on TV or on the radio.
- o. No, we cannot trust anybody anymore.
- u. No, in those situations the authorities, specially the political parties, have an opportunistic attitude.
- m. No, hey do not really care to help people.

- a. I don't understand it.
- b. None of these alternatives corresponds to my perspective, which is : _____

measure direction and intensity of opinions

and the rationales underlying them

THANK YOU!



Pico

A volcano that stands 2,351 meters (7,713 ft)
high on the island of the same name

The highest place of Portugal

Volcanic Status: Active

(photo by Eduardo Tereso)