Workshop about the GIS of Naiguatá

Interview with an older member of the cofradia of the Devils of Naiguata and an older member of the community

This is based on an *"emic"* approach, characteristic of ethno-methodology which takes into account the point of view –whether or not traditional- of the inhabitants or their interpretations and explanations of characteristics, genesis or recurrence, forecasting possibilities, and behavior considered to be the most appropriate to follow with respect to risks. This personal point of view, frequently traditional or "folkloric" is called "Common Sense Knowledge", and may have its own internal coherent complexity and profitability, and may or may not coincide with conventional "Technical-Scientific" knowledge, that is, with the external "ethical" point of view imposed by specialists with academic influence or formation.

The starting point is the idea that OPRs' familiarity with local common sense knowledge will enable them to better understand motivations and forms of response among the communities with which they interact, and gives them the aptitude to converse and even negotiate in their own terms, as well as to—as suggested by certain studies—obtain valid, empirical knowledge that is useful and exact to complement the technical-scientific information that can, therefore, be used in local risk management.

While this approach has been used for other types of research (for example, that related with health or ecological issues), it is relatively new in the country with respect to risk management, although analogous or similar approximations have been documented abroad, from the sociological, anthropological or social psychology viewpoint when initially documenting this project. Even less common seems to be the link between this type of data of a qualitative nature and the use of GIS technology.

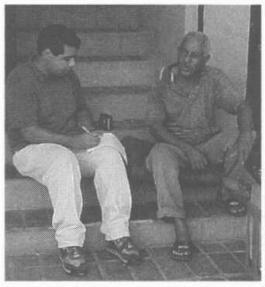
From the methodological point of view, Common Sense knowledge can be classified into three types: sensory (related with the capacity and ability to predict or perceive threats), the practical (routine, regular, frequently traditional behavior when confronting threats), and the one that includes formulas (linguistic acts and genre, frequently ritualized or that remit to ritual components, to which the power to influence the development of threats is attributed).

These variations of Common Sense knowledge also remit us to the concepts of culture, tradition, values, belief system, standards and motivation and are perhaps understandable as regards their possible origins in view of the relatively isolated and Creole nature of most of the inhabitants of Naiquatá, as well as the repeated exposure of this population to different types of threats.

In practical terms, each of these types of Common Sense knowledge, analogously to Scientific-technical knowledge, may be divided into topics that correspond to specific layers of information in the SIG and then related to variables as such or to the "Scientific Layers" that can also be visually expressed in maps or in the form of summary reports.

Given the nature of the data, beginning with the second phase of the Project, the idea is to adopt a qualitative, methodological viewpoint, with markedly ethnographic influence based one method:

Contact and research interviews applied to a non-random sample of inhabitants from different walks of life and genders, focusing on older inhabitants who have lived for many years in the town and who work in areas that presuppose the handling of important volumes of locally accumulated, empirical knowledge, since it is assumed – but will have to be verified – that this type of knowledge responds to traditions, inter-generational lines of transmission, or perhaps to the memory-appropriation of knowledge derived from having confronted such events before. Included also were local leaders, educators and members of religious fraternities (see Annex 1).



Another interview with an elderly man from the community

Data was systematized in a matrix made by the team (see below), which included the selected variables. The items that were more repeated were drawn in the map.

GIS description

As was mentioned previously, the product of this study will be a SIG in which it is hoped to combine, in addition to the specialized technical knowledge of risk, the wealth of local knowledge of the inhabitants of Naiquatá, in order to facilitate the design of more efficient strategies and practices for prevention and mitigation.

The work is being done with Mapinfo ver. 6.5 software because its functions allow quick and simple use of maps that can, in turn, be used to prepare reports and illustrations that bring to light the true meaning of the information underlying the lines and columns of data tables, contributing efficiency in decision making.

Design of the GIS

GIS will cover five (5) thematic layers described below, and efforts are being made to ensure that its design is as simple as possible in order to optimize ease of handling of the product.

Interview matrix

Tema 1: Conceptos asociados a riesgo

Entrevistado (ENT)	Riesgo	Amenaza	Peligro	Vulnerabilidad	Desastre Natural	Amenaza Natural	Amenazas en la Parroquia	Amenazas en Naiguata

Tema 2: Memoria histórica de desastres o eventos adversos

Ent	Tipo de desastre Natural (P ò CP)	Dónde	Cuándo	Víctimas	Infraestructura	Observaciones
1						

Tema 3: Susceptibilidad flujos torrenciales

Ent	Inundación	Deslaves	Flujos torrenciales	Ubicación	Frecuencia	Origen/ causa	Grado de severidad	Otra característica resaltante
1								

Tema 4: Susceptibilidad deslizamiento

Ent	Derrumbe	Deslizamiento	Ubicación	Frecuencia	Origen/causa	Grado de severidad	Otra característica resaltante
1							

Tema 5: Susceptibilidad sísmica

Ent	Sismo	Temblor	Terremoto	Ubicación	Frecuencia	Origen/causa	Grado de severidad	Otra característica resaltante
1								

Characterization

Contains fundamental aspects of the study area in order to have a clear, updated and actual view of the zone that can be handled by First Response Organizations (FRO) when preparing community risk management

Based on statistical data from 1881 to date, is subdivided into topics of health, education, housing and demographic data.

Technical–Scientific

Contains exact, conventional, technical-scientific data regarding natural threats present in the study zone.

Is a guide for community work, when preparing emergency prevention and mitigation plans

At parish level 3, natural threats are being considered:

- Susceptibility to torrential floods
- Massive movements
- Seismicity

These three (3),are based on:

- Spatial location
- Degree of severity
- Origin

Natural threat from torrential floods is being considered in the town, based on:

- Spatial location
- Degree of severity
- Probability of occurrence
- Affected surface

Historical events

This refers to all the adverse events that have occurred in the Naiguatá from 1900 to 1999, which will enable the FRO to have a historical record of the threats that have affected the zone, which is fundamental for working with the community

OPR resources

This refers to both technical data of the FRO as well as to the behavior during and after an event in the town of Naiguatá, in order to facilitate the work of the FRO in different areas. To date, the only fields in which these are available are current use, restrictions in use, and location of life lines.

Common sense

Refers to local knowledge among the people of Naiquatá, regarding technical-scientific information, either their own or traditional, adverse events that have occurred in the area, and certain aspects indicated in the layer known as FRO Resources

GIS applications

- In the Naiguatá parish,

  Determine: location, degree of severity and period when the three natural threats occurred torrential flows, massive movements, and tremors, based on information from the Simón Bolíva Venezuelan Geographic Institute (our "experts" who, in this case, synthesize technical-scientific data)

  Determine: location, degree of severity and period when the three natural threats occurred torrential flows, massive movements, and tremors (this time based on opinions of the community and local residents familiar with these issues)

- In the town,

  Identifies shelter zones, vital life lines and use restrictions for soil according to experts and the community

  Know the location of basic, public institutions (education, health), as well as other entities, stressing the coverage capacity of the different institutions or entities (in the town).

  Determine location, severity and period of occurrence with respect to the natural threat of torrential flows, as per the Simón Bolívar Venezuelan Geographic Institute.

  Determine location, severity and period of occurrence with respect to the natural threat of torrential flows, as per community opinion.

- Compare the opinion of community experts regarding the previously mentioned threats on different levels
- Become acquainted with the historical record on adverse events that have occurred in the parish (from 1900 to 1999); type of event, places affected, date occurred, number of victims and infrastructures affected.

Overall balance of project program execution

- Revision and analysis of similar GIS experiences
- Description of the most salient physical-natural and social aspects of the study area.
- Preparation of a theoretical-conceptual framework of common sense and risk
- Design of the GIS
- Implementation of a sensitivity workshop for OPRs. the purpose of the meeting was to outline Project objectives and receive feedback from these organizations in the form of information needed for interviews.
- Interviewing the different players from the community.
- Establishment of agreements with the FROs about the jeans of collecting information in the field and over time.
- Awareness building workshops at the Colegio Diego Osorio, regarding the Project and the need to manage risk on the school level.
- Request for donations of computers from different institutions.
- Preparation of a GIS user's manual.
- December 15, 2003, was the 4th anniversary of the tragic mudslides in the Vargas State which occurred in 1999. A commemorative activity was prepared with the Naiguatá Parish Board and firefighters from the Vargas State which included: presentation to the community of the results of the Project, simulation by the Naiguatá firemen of an evacuation due to fire in the Colegio Diego Osorio, and preparation by the students of a risk map of the Pueblo Arriba sector of Naiguatá.

Results of the Project

- An easy to handle SIG was designed that is adapted to the needs of the community and of the first response organizations.
- Full commitment was obtained from three of the institutions in the participating areas—Henry Iriarte, Alejandra Da Silva and Felipe Quintero—to continue with the Project, to update existing thematic layers and add new information, and to transmit this information to the area's schools and the community as a whole.
- The two directors of the San Rafael and Diego Osorio schools are impressed by the Project and want to have risk management workshops in these schools.
- Both students and teachers have been motivated to do research similar to that involved in this Project.
- Other first response institutions, such as traffic control have shown an interest in having access to the GIS and have proposed adding information from the Naiguatá Parish, such as number of victims of traffic accidents.
- The Naiguatá firefighters have seen the SIG in action and how easily it can be used to solve their technical problems, particularly everything pertaining to permits, zoning and restrictions regarding the use of space.
- Two computers will be donated in January 2004. One will be located in the Naiguatá station and the other in the central station in the office of community preparation. The donation comes from the TOTAL oil company through the nongovernmental organization Vía Tecnológica.
- Projects in schools need to be emphasized as one of the most important achievements because this is a group that is motivated to receive information and it can transmit that information not only to its peers, but also to family members.

Lessons Learned

- Common sense with respect to adverse events does not tie in actions as a set of systematically linked opinions thereby allowing them to be precisely explained. They acquire validity by resisting ongoing comparison with experience and therefore can be modified at any given moment
- Lack of systematic explanations for adverse events is a condition which adds simplicity to information to be transmitted.
- Because natural events study area do not occur frequently, people rely on the same knowledge that has been transmitted from generation to generation, and this knowledge acquired by their ancestors has not been modified
- The inhabitants have been accumulating observations about and knowledge of their geographic space, which has allowed them to handle themselves and/or to survive in that space.

This knowledge is the foundation for recommendations or actions that the community, either as a whole or individually, has been adopting with respect to the environment.

- We believe two basic conditions are needed in order to generate effective strategies for preventing or reducing natural disasters.
  - A constant exchange of information among the people (among different generations) regarding adverse events that have occurred in the area, a local early warning system and local response systems, in other words, a cultural life experience of risk
  - Greater integration among communities and organizations responsibly for preparing the community in risk management, because if the specialized organization have knowledge of the cultural life experience of risk they will be better able to understand response motivations and forms among the communities with which they interact. That is, they will have a better attitude when it comes to conversing and even negotiating with communities in the same terms. When we speak of "Terms," we are referring to the vocabulary to be used, the sites where meetings are to be held, length of training, among others.
- The community's threat priorities need to be identified. For example, in the case of Naiguatá, many of its inhabitants (those interviewed) are more concerned with the day-to-day threats of crime, unemployment, drugs, among others, than by natural threats, such as earthquakes, torrential floods and landslides. In the case of earthquakes, they believe these cannot be predicted and they must necessarily suffer the consequences. In the case of torrential floods (mudslides) the inhabitants believe these will occur every 50 years, and because the last one occurred in 1999 they don't consider this to be a problem and feel that future generations and not the current generation should worry about them. The consequences of cave-ins or landslides haven't been all that serious in the area and, therefore, the inhabitants do not assign to them the required importance. Consequently, a methodology is needed to prepare the community to face threats of Nature by using examples from daily life.

Links between poverty and disaster risk reduction in developing countries

The GIS is a planning tool this Project transverses poverty and disaster risk reduction programs, not only by scientifically identifying areas not suitable for habitation or construction, but also it gives institutions in charge of community preparedness in the area a tool to become acquainted with the beliefs and cultural experiences of risk in different areas.

With precise knowledge of the natural and anthropic risks in an area, not only from the scientific standpoint but also from that of the community itself, it will be possible to carry out projects that are both more viable and sustainable over time. Therefore, this Project helps to plan the investment to be made in an area that is more in keeping with that area's geographic situation and the vision of the community with respect to all its risks. This will help to reduce poverty levels in underdeveloped countries

The proposal was planned to obtain, more than a Geographic Information System, a tool so that any organized group for preparing community risk management can collect basic information not only in Venezuela, but in any other country by making the appropriate adaptations.

Visualization of the map makes it dynamic and the community feels the need to participate in ensuring the sustainability of the project.

The proposal will have continuity in time because the Vargas State firefighters have seen that there is a need to continue to improve and perfect the GIS–Naiguatá. This group is in the process of obtaining financing from State Government and other organizations such as Corpovargas.

On our part, because the GIS is a useful tool for the FRO we plan to replicate this experience in two communities in two other states (Monagas and Anzoategui) that have been affected by different threats of anthropic origin.

Moreover, the proposal will have continuity in time because it is linked to the "Promotion of Risk Management in Vargas State Parishes" project that SOCSAL has been developing since 2001 with financial support initially from Mercy Corps

International, and currently from CORPOVARGAS (Corporación para el Desarrollo del Estado Vargas–Corporation for the Development of Vargas State) in alliance with the firefighters from Vargas State and the Instituto de Protección Civil y Administración de Desastres de Vargas (Vargas State Institute for Civil Protection and Disaster Management).

Since the product of the research is a geographic information system it can be applied by institutions whose mission is community preparedness and risk management to any population located in marginal-urban areas of developing countries, because all the material for collecting information is in simple and practical language thereby facilitating its use and understanding by persons without expertise in the social sciences.

The components of learning in your project

Identification of areas of threat by specialized institutions and the community in general.

Awareness building and training of OPRs in handling the GIS and its advantages when it comes to planning.

Combination of two types of knowledge, scientific and common sense (formal and informal)

We would like to thank some people who help to finish this project, as: Carmen Ferris, Virginia Jimenez, Freddy Colina, Pedro Rivas, Miguel Ángel Ortega and all the team of SOCSAL and Fire Departament of Vargas.

ANNEX 1 — INTERVIEW MODEL

This is explicitly geared to key informants in the communities, both men and women and includes:

- Natural community leaders
- Social actors with different occupations (hunters, fishermen, farmers, masons, healers, fire fighters, members of communities, drivers, teachers and other professionals)
- Community promoters (inhabitants of the sectors selected in the town of Naiguatá)

Especially, but not exclusively mature people, or those with accumulated experience who –it is considered- could contribute useful information to prepare a description of the community, experiences in local organization and attention to risks, data from their own traditional wealth of knowledge relative to the topic of risks, which must be taken into account when planning social development, prevention and/or response programs.

I Identification of the interview

Date:		Time:		Duration:	
Name of interviewer:					
Context/circumstances/environment of the interview:					

II Identificatin of the person interviewed

Name:					
Place of birth:		Sex:		Age:	
Date from which the individual has resided in this locality			Places in Naiguatá where the person has lived		
Sector where the person currently lives in Naiquatá:			Address:		
TEL:			How person can be reached:		
Religion:			Occupation:		
Highest grade completed:			Role in the community:		

III TOPIC 1: Concepts associated with risk

3.1 What is your understanding of the word "risk"?

3.2 What is your understanding of the word "threat"?

3.3 What is your understanding of the word "danger"?

3.4 What is your understanding of the word "vulnerability"?

3.5 What is your understanding of the term "natural disaster"?

3.6 What is your understanding of the word "natural threat"?

3.7 Enumerate all the threats present in Naiquatá parish.

3.8 Enumerate all the threats present in the town of Naiquatá

IV TOPIC 2: Historical recollection of disasters or adverse events:

4.1 Has Naiguatá parish experienced any type of natural disaster?

4.2 What type of natural disasters have occurred?

4.3 Where? When?

4.5 Number of victims and infrastructure affected?

V TOPIC 3: Community's perception of natural threats. (COMMON SENSE)

IN THE PARISH:

Seismic susceptibility:

5.1 What is the difference between a "tremor" and an "earthquake"?

5.2 Generally speaking, would you say that there are sectors in Naiquatá parish where tremors occur more often? Yes? For example, in which sectors? (LOCATE ON MAP)

5.3 How often would you say a tremor occurs? Do they always occur with the same intensity or are there sectors of the parish where they are felt more strongly?

5.4 Have you heard of any thing or factor that might contribute to or promote tremors? What? Is this something new or have people remarked about this before? F or example, what have you heard about this among people from other eras?

5.5 Whenever there is a tremor or earthquake, have you noticed that some homes or structures such as walls, bridges etc., are more or less resistant to these movements? What have you seen or do you know about this? In your opinion which materials are "good" and withstand tremors and which are "worse" and do not? Sometimes it seems that the "people from before" knew very well how to build because there are very old buildings that are still standing, despite the passage of centuries. What do the "older" people say about this? What materials did they recommend as being the best to withstand tremors? And what type of construction "tricks" enabled them to resist more, or at least protect people from injuries or damage?

5.6 What types of signs do you recognize as occurring before a tremor? What have you heard about people who have a "kind of premonition" that something will happen? For example, in town, who is famous because he or she knew or felt that a tremor or some other threatening event was going to occur and it did? What did that person feel? What else can you add?

Susceptibility to torrential flows:

5.7 What difference is there between a "flood," a "mudslide," a "torrential flow" and a "torrential avalanche"?

5.8 Generally speaking, would you say there are sectors of Naiquatá parish where mudslides are more frequent, yes? For example, in what sectors? (LOCATE ON MAP).

5.9 How often would you say a mudslide occur? Do they always occur with the same intensity, or are there sectors of the parish where they are stronger?

5.10 Have you heard of anything or of any factor that contributes to or promotes mudslides? What? And are people just saying this now or did others say this before? For example, what have you heard about this from the people from other times?

5.11 When a mudslide occurs are some houses or structures such as walls, bridges etc., more or less resistant? What have you seen or do you know about this? In your

opinion, what materials are "good" and resistant and what materials are "bad" and not resistant? Sometimes it seems that the "people from before" knew very well how to build because there are very old buildings that are still standing, despite the passage of centuries. What do the "older" people say about this? What materials do they recommend as being more resistant to mudslides? And what type of construction "tricks" enabled them to resist more, or at least protect people from injuries or damage?

5.12 What types of signs do you recognize as occurring before a mudslide? What have you heard about people who have a "kind of premonition" that something will happen? For example, in town, who is famous because he or she knew or felt that a mudslide or some other threatening event was going to occur and it did? What did that person feel? What else can you add?

5.13 Knowledgeable people can sometimes "gauge the intensity of rain", whether there will be a lot or not, or if it will last a long time or not, but looking at the changes in the environment, as for example in the "plants" either here in town or on the mountain. They can even do this from a distance. What types of "signs" in vegetation have you heard talk about in this area? (If the person says he/she doesn't recognize any signs...) Nothing? Does the mountain always look the same or have people talked about it looking different? What kind of differences are we speaking of? And nothing can be noticed not even in the type of "plants" or "branches" or sediment, earth that comes down the river? For example, if it rains a lot and the "plants" are uprooted or loosened, what is it that you most often see "come down"?

5.14 And what about the animals? Do they behave the same way? No? For example, the insects and things like that? Are any of these indications of rain or "things" associated with rain? Yes? Of what? (If the person being interviewed is giving short answers, try some other type of animal ...)

5.15 Farmers often can distinguish between types of storms and rain and they even give them different names. Bearing in mind that Naiquatá is still "very traditional," what type of names or classes of rains have you heard about? How do they differ? Are there specific types of rains that are more closely related with landslides or "mudslides," for example?

Susceptibility to massive movements:

5.16 What difference is there between a "rock fall" and a "rock slide"?

5.17 Generally speaking, would you say there are sectors of Naiquatá parish where rock slides are more frequent? Yes? Where, for example? (INDICATE ON MAP)

5.18 Every how often would you say that a rock slide occurs? Do they always occur with the same intensity or are there sectors of the parish where these are stronger?

5.19 And can it happen "just like this, at any time," or does it seem to you that this occurrence "seems to repeat itself"? And does it happen "every once in a while" or is it "random"? If it happens "every once in a while," at what intervals is it repeated?

5.20 Have you heard of anything or of any factor that contributes to or promotes rock slides? What? And are people just saying this now or did others say this before? For example, what have you heard about this from the people from other times?

5.21 When a rock slide occurs are some houses or structures such as walls, bridges etc., more or less resistant? What have you seen or do you know about this? In your opinion, what materials are "good" and resistant and what materials are "bad" and not resistant? Sometimes it seems that the "people from before" knew very well how to build because there are very old buildings that are still standing, despite the passage of centuries. What do the

"older" people say about this? What materials do they recommend as being more resistant to mudslides? And what type of construction "tricks" enabled them to resist more, or at least protect people from injuries or damage?

5.22 What types of signs do you recognize as occurring before a rock slide? What have you heard about people who have a "kind of premonition" that something will happen? For example, in town, who is famous because he or she knew or felt that a rock slide or some other threatening event was going to occur and it did? What did that person feel? Who else?

IN THE TOWN:

Torrential flows:

5.23 In your opinion, are there sectors of the town of Naiquatá where mudslides are more frequent? Yes? For example, where? (LOCATE ON MAP)

5.24 What produces these mudslides? What have you heard about this in your community? Has this always been the case? What did the people from other eras say about this? And do the people of today continue to agree?

5 25 In your opinion, every how often does a mudslide occur? Do they always occur with the same intensity or are there sectors of town where they are more forceful?

5.26 What type of signs do you recognize as occurring before a rock slide? What have you heard about people who have a "kind of premonition" that something will happen? For example, in town, who is famous because he or she knew or felt that a rock slide or some other threatening event was going to occur and it did? What did that person feel? Who else?

5.27 As to prevention, what have you heard was done "in the old days"? What materials did they recommend as being most resistant to mudslides? And what kind of construction "tricks" allowed them to resist or at least to keep the water from injuring people and causing damage?

VI TOPIC 3: Useful information for OPRs:

6 1. During the most recent tragedy in Vargas, in '99, were you in Naiquatá (the town)? What did you do? Where did you take shelter? How did you find out about what was happening? And the people? What did they do? Where did they take shelter (Indicate on map) How did the community organize itself? How did the people act to prevent or reduce damage, loss or life and materials?

6.2 With respect to other types of threats in the town of Naiquatá, how do people find out what is happening? What do they do? Where do they take shelter? (Indicate on map) How do they organize themselves? What do they do to prevent or reduce damage, loss or life and materials?

6.3 At this time, do you consider that the Naiquatá community (the town) is prepared to confront a disaster similar to that of '99, or a similar type disaster? Yes? Why? Are there information systems of early warning systems in the zone? Are there institutions, organizations, groups in the zone that might help in case of disasters?

6 4 In your opinion, are there differences with respect to safety in different sites depending on the type of threat? Yes? For example...What have you heard about them in your community?

6.5 What areas, according to the community, might be best suited for living, business and houses in the town if pertinent measures are taken? (Indicate on map).

6.6 According to the community, what areas are best suited for living, business and houses in the town, without taking any measures? (Indicate on map)

6.7 You will have seen that after a disaster it is important to both cure bodily injuries, as well as vital to give moral and spiritual support to the people. Another way is to find strength in religion. In fact, Naiguatá is very well known in Vargas state as being a community that respects religion... When things like this occur, what do people tend to do? For example, do they pray to a specific saint? [DO NOT CONTINUE WITH THESE QUESTIONS IF THE PERSON YOU ARE INTERVIEWING IS AN EVANGELIST OR JEHOVAH'S WITNESS] To which one do they pray? What do they pray for, that is, against what kind of threat is that saint said to protect people? Who else? What do people pray for? In your family, for example, whom do you pray to? And if you make it through the danger all right, how did you or do you show your thanks? And the other saints, how did you or how do you show your appreciation? Sometimes, those most respectful are the people who belong to religious communities. Do you or any member of your family belong to one? Yes? To which? Both the priest or pastor, for example, or brothers and nuns tend to give a lot of help in disasters. They give, for example, spiritual help or attend to people in their residences or churches. That is why it is important for you to know where these places are. Where is the church or meeting place for the religious communities you frequent? What other places of this type do you know? [DO NOT CONTINUE WITH THESE QUESTIONS IF THE PERSON YOU ARE INTERVIEWING IS AN EVANGELIST OR JEHOVAH'S WITNESS] In addition to the churches, is there another place where people meet to pray to a saint and is there a family that "takes care" of that place? Where are these places located? In places such as Los Corales and in the Ermita (Hermitage) del Carmen, in La Guaira, during the '99 disaster, believers saw "certain signs or changes in the saints". Have you heard of any such thing?