

The Socio-Cultural Dimension of Flood Vulnerability in a Peri-urban Community in Central Mexico.

Frida N. Güiza Valverde

January 2011

Thesis submitted for the Degree of Doctor of Philosophy
School of Environmental Sciences
University of East Anglia
Norwich England

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Abstract

Disasters are triggered by natural hazards affecting population; research suggests that vulnerable communities are more prone to suffer greater impacts. Policies designed by governmental institutions to respond to these events have been mainly top-down engineering and scientific technical interventions, regardless of the social conditions in affected areas. In contrast, there is growing emphasis from international institutions such as the UN, NGO's and researchers, amongst others, on driving initiatives at the community-level to reduce the vulnerability to disasters. Nowadays is well-recognised in the literature an understanding of the social conditions contributing to vulnerability to natural hazards, as well as those providing resources for coping. This research adopts an approach based on situational analysis to mapping the local context, for that purpose qualitative research methods were employed, specifically interviews with local actors and documentary materials. The research first traces the interactions of the diverse situational elements, both social and material, that have produced and that continue intensifying a situation of vulnerability in the studied case.

A case study was conducted in a small village in Mexico which has experienced flash flooding. This thesis focuses on the significance of social and cultural differences within this village. Two distinct populations were identified inside it, an established, traditional community and an emergent community of newcomers. Differences in social identities, beliefs, knowledges and practices can be traced in the different coping strategies and understandings on the event, adopted by these two local groups.

Small scale disasters are disregarded by academic bodies, practitioners, politicians and financial bodies, putting at risk a large number of people affected by these events. The dismissal of these communities implies that they are forced to develop their own strategies for survival and access to benefits, which does not change their original condition of vulnerability.

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List of Acronyms and non-English Words

<i>Atole</i>	Corn based beverage sweet
<i>Campesino</i>	Workers of the fields, rural labourers, small freeholders, village commoners, sharecroppers or tenants
<i>Central de Abastos</i>	Wholesale warehouse market basically of vegetables, fruits and diary products
<i>Chinampa</i>	Stationary artificial island that usually measured roughly 30 by 2½ meters, although they were sometimes longer.
<i>Comunero</i>	person in ploughing community fields
<i>Granicero</i>	Mythical figure. Hail-maker
<i>Haciendas</i>	Royal land assignments in the recently discovered America to minor Spanish nobles, it included the power over every people living inside the limits of it
<i>Jara</i>	Willow-leaf Heimia. <i>Heimia salicifolia</i>
<i>Mayordomo</i>	Important indigenous religious post
<i>Mole</i>	Dish, chilli sauce
<i>Porfiriato</i>	Period in the Mexican history where a dictatorship ruled Mexico.
SA	Situational Analysis
<i>Sabritas</i>	Main producer of chips snack in the country. Close to the area there is company's factory
<i>Tamal</i>	Traditional meal, small maize cake baked wrapped in cornhusks
<i>Tepozan</i>	Butterfly tree, <i>Buddleia cordata</i>
<i>TrC</i>	Traditional Community
<i>Trueque</i>	Barter. System of product exchange
CONAGUA	Water National Commission
DN-III	Mexican army program for disaster response
EmC	Emergent Community
FEMA	Federal Emergency Management Agency
FONAHPO	National Fund for Popular Housing institution
FONDEN	National Disaster Fund
GEM	State of Mexico Government
INEGI	National Agency of Statistics, Geography and Informatics
SEDAGRO	Agricultural Development Secretary
SEDENA	National Defence Secretary(Army)
SEDESOL	Social Development Secretary
SEGOB	Secretary of Interior
SMN	National Meteorological System
ULRB	Upper Lerma River Basin
ULRBO	Upper Lerma River Basin on its Origin Side

Acknowledgements

This PhD program and research would not have been possible without the support of many people and institutions in England and in Mexico.

I want to thank to Peter Simmons and Jacquie Burgess my supervisors, as well as the School of Environmental Sciences at the University of East Anglia, for their valuable support through this PhD journey. I am indebted to many people in the small community where I did fieldwork, who provided me the opportunity to learn with them a bit of their rich life.

This research was funded by Universidad Autónoma del Estado de México and Consejo Nacional de Ciencia y Tecnología with their support I could finish the PhD program. I am grateful to specific people there that trusted me, particularly Dr. Carlos Arriaga Jordan and MsC. Guillermina Diaz Perez, *Gracias por el apoyo*. I am indebted with my friends and relatives always cheering me up. My gratitude to Carlos and Ana, I promise I won't do it again!

Chapter I

Problem Statement

1.1. Introduction

Disasters affect large populations in both developed and developing countries damaging material, social and cultural life. In general, senior officers disregard the particularities of the places where homogeneous policies are applied. Researchers have noted that vulnerability is a function of many complex factors, the role played by communities is critical to achieving the effectiveness of policies in its design and implementation.

This study aims to capture the different discourses and relationships built around flash floods in a small village in central Mexico. Social dimensions produce discourses and actions, creating a rich environment in which particular social actors are prominent. In this case, two distinct communities within one village and local governmental institutions.

The approach developed in this research, combines the latest contributions of vulnerability theory with the analytical framework of situational analysis. In relation with the theory, advances in this field confirm the need of an approach based on local knowledge as well as on the particular conditions of geographical and cultural spaces where disastrous events take place; in addition to macro-structural aspects. In this regard, this research contributes to the analysis at the meso level of one disaster arena in spatial and cultural terms, demonstrating empirically the benefits of situated studies.

The use of situational analysis in the field of disaster is original, contributing to our understanding with the tools for collection and analysis of the practices and local knowledges of the actors and non human elements within a disaster arena. The association of these findings with the analysis of macro structures allows a holistic explanation, appropriate for identifying the different world views and actions of those involved in a disaster arena.

In relation to cycle vulnerability / resilience, this research illustrate empirically that it is possible to find different spaces of resilience in areas of high vulnerability.

In this chapter, I will outline the aims and context of the study, as well as the organisation of subsequent chapters.

The role of communities in the design, implementation and success of policies has been highlighted extensively not only in disaster studies but also in other fields of research, such as health, development or technology (Wisner 2004; Cannon 2008a). The relationship between vulnerability and community is emerging as one of the most relevant theoretical trends in the face of extreme disasters and failed policies (Comfort, Wisner et al. 1999).

In 1987 the United Nations declared the 1990s the International Decade of Disasters Reduction but by the end of the decade there has not been a decline in the number of victims and cost of these types of events. Disasters like the Kobe earthquake in Japan, and recent extreme events such us Hurricane Katrina in the USA, the 2004 tsunami in Asia, and major earthquakes in China, as well as droughts in Africa and floods in Pakistan and Central America, illustrate twenty years of increasing vulnerability in the number of casualties in developed and developing countries, generating important discussions and initiatives around the world.

In recent years, different international initiatives have promoted joint efforts to lessen the harm to groups affected by disasters. Relief strategies like the United Nations International Strategy for Disaster Reduction (UNISDR, 2008) different World Bank projects and earlier initiatives such as the Hyogo Framework, promote the inclusion of communities in decision-making that is applied directly on them; this type of initiatives indirectly promote a more horizontal relation with the authorities.

Until now, decision-making in this regard has been predominately dominated by top-down scientific techniques. The shift in perspective has been driven by the steady increase in fatalities and the huge social and economic cost of disasters,

which have not been fully solved by the technical approach. It is at the community level, the meso level that actions are effective or fail in their application. The inhabitants of these communities can support such initiatives if they are considered in their design and implementation, thus lessening the impact of disasters. By understanding the processes that shape local experiences and responses, is essential to the development of engaging strategies for disaster reduction in a participatory fashion.

In this study, vulnerability is the main theory that explains the processes that lead to disaster. Before proceeding with the concept of vulnerability, however, it is important to note the growing importance in recent years, in both disaster research and policy, of the concept of resilience. Researchers on the subject have failed to agree on whether resilience is the other side of the coin with respect to vulnerability, the positive side, is a component, or is independent of vulnerability. Nevertheless, the position taken in this thesis is that it is possible to find spaces of resilience within situations of vulnerability. That is, they are not separate phenomena but a continuum in the process of vulnerability (Manyena 2006; Thomalla, Downing et al. 2006; Gaillard 2010; Miller, Osbahr et al. 2010). However, further research will have to be oriented to analyse resilient elements in the studied place.

In this regard, the communities studied in this thesis are settled in an area where the process of vulnerability has made them prone to experiencing flash floods that are more intense each time, due to constant human interventions in the landscape. For example, there has been a system of lake drainage, channelling the runoff from the mountains to provide water to Mexico City. There has also been logging and clearing the higher slopes of the mountain to gain space in which to grow in an intensive way crops such as potatoes and flowers. Crop cultivation techniques and characteristics, such as strong absorption of nutrients from the land, and soil erosion due to the steep slope, among others have had negative effects on the communities located in the lower part of the valley.

Paradoxically, economic policies are improving living standards of some peasants and villages. This is notable in the material infrastructure of towns and the livelihoods of communities farming these products, nevertheless there are environmental costs and side effects not considered when such economic development policies were designed. The topic of lake drainage will be studied at length in subsequent chapters. It should be noted however that this decision had been long delayed for technical and socio-political reasons since the early Spanish settlements in the area, during the colonial period. This practice of draining lakes was a common and expensive practice in the country during this period, the most representative is the lake on which Mexico City was set up.

The indigenous societies achieved a fair management of the water system, through channels and sluice gates; systems destroyed after the conquest. Today, continuous threatens of extreme floods in the area require constant engineering and technical interventions. The Spanish worldview in relation with water implied actions in relation to it, the idea of water as a threat to health and crops has been documented. It was considered as an obstacle for a modern and productive society because of the damages water engendered. Technical interventions that did not consider cycles and spaces of water are producing negative effects for the people living in these areas (Albores 1995; Escobar 1996; Broda 2003).

Ironically, today together with the threats of floods, the impacts of droughts are significant not only because of the lack provision of drinking water, but worsening the effect of floods because of lack of retention due to erosion on the top of the mountains.

As part of any disaster situation, different socio-cultural and ideological factors add to vulnerability of communities in different ways. The latest approaches to vulnerability advocate for a more participatory fashion in which communities participate designing policies. In this sense, a situated analysis of the problem plays an important role since it includes the different actors engaged in a disaster

to examining the production of vulnerability as well as the discourses and practices of different groups of actors, this study shows the different dyadic relationships established between salient social worlds.

For example, government officers labelled as ignorant the inhabitants of the town and tried to impose scientific-technical knowledge over local knowledges to solve the flash flood problems, but people from the traditional community opted to ignore these officers without any conflict. It was also observed how within the institutional social world there are negotiations and disagreements as well as power issues and ignorance creation between different levels of the government; the highest level creates ignorance and assumes a paternalistic role with respect to the lower levels.

The aim of this research is to analyse the role of socio-cultural relationships and practices in the production of and coping with vulnerability within a disaster arena in a small geographic community in central Mexico, through the perspective of vulnerability and situational analysis. In order to understand the processes that created and continues to create the vulnerability experienced there. Moreover it aims to understand discourses, practices, and local knowledges in relation to the flash floods influencing the way how social interfaces are created between the most salient actors.

1.2. Thesis Organisation

The structure of the thesis has three complementary sections: the theoretical frame, the methodology and the situation studied. The issue of vulnerability is discussed from the theoretical perspective in the literature review (Chapter II). Literature in relation to vulnerability suggests that the macro structural dimensions have been relevant influencing policy design for disaster risk reduction. Nevertheless, policy has been continually failing and disasters as well as casualties have been increasing. One explanation states that policy is based on the neoliberal approach as an ultimate solution to tackle marginalisation, without considering the side effects on the environment and societies because of its implementation. In the other hand critiques to vulnerability are related with its

discourses requiring significant changes in political and economic macrostructures as well as distribution of wealth, which in many cases leads to inaction on the governmental institutions. Therefore, there is not a policy design that can be applied in real terms in the short term, even if it is desirable in theoretical terms (Chambers 2006).

It has been widely studied how practices based on modernity and development discourses, have not considered communities' particularities in policy making. Advances in vulnerability theory show that in the light of experience and improvement, it would be necessary to analyse the impacts of policies designed to disaster risk reduction at the community level. Many of the times the application of homogeneous policies leads to unanticipated changes on the environment, culture or social fabric, adding to the vulnerability process. Discussions on vulnerability theory and its applicability at the macro and micro level, continue so far enriching its own conceptual and theoretical framework. In this sense the main debates are centred on the need of a more situated and participative approach at the meso level, which until recently has been considered important (Few 2003; Hilhorst 2004; Kirk 2010).

In the case of disasters, it would therefore be desirable to link decision making with the particularities of the hazard and the place. Floods are spatially defined; this has implications when it comes to specific communities affected by these events. Floods have disaster potential when they occur not merely in abstract spaces but in people's places, for instance the place-related concept of community is therefore relevant to analysing the phenomenon, using the concept of community of place.

Flash floods have been disregarded events taking place in micro regions, therefore their relevance is minimized when contrasted with major disasters. The impact of flash floods is lower with respect to major disasters in scientific, policy design, and media attention, which leads to a gap in the mentioned areas. Unfortunately, the governmental, civil and scientific spaces consider the scale of the disaster and the number of casualties influential on the feasibility of the

funding, as well as the analysis and coping of natural hazards, creating serious disadvantages to vulnerable communities (UNISDR, 2008).

Given the complex space in which disasters develop, a qualitative methodological design was considered appropriate because it integrates different actors, practices and knowledges involved, from the non human actants, to implicated actors, formal and informal institutions.

The methodological framework used is the Situational Analysis (Chapter III), it meets the requirements needed at the meso level. This methodological approach has a starting point that conceptualises the situation under study as an arena, inside this arena different perspectives, discourses and actions of actors are expressed, and diverse macro-structural dimensions. Materialise. The Situational Analysis approach apprehends in a holistic way the complex and dynamic relationships that exist within communities. Qualitative methods can capture in-depth the practices of actors in an arena of disaster.

The central chapter in this study, Chapter IV, links theory and methodology to the case study. This chapter relates the particular conditions of the case study to macro-structural elements framing the situation. In this chapter are presented the geographical, historical, economic and social dimensions, shaping the area in which the village studied is set.

The thesis then examines the salient social worlds in the flash flood arena under study: In the first instance the village and its attached communities, one traditional and one emergent (Chapter V), and then those social worlds inside governmental institutions (Chapter VI). The chapters illustrate how interfaces are created between these worlds, producing conflicts, explaining points of convergence, ways of exercising power and creating ignorance among them. In addition, these chapters identify the strategies used by communities to have access to resources and decision-making, and their particular discourses and understandings about the flood. Chapter VII discusses the findings on the interfaces between these salient social worlds, the implications of the research for

theory and practice and finally, the limitations of the research and potential areas for future research.

Chapter II

Theoretical Approaches Applied to Disasters.

2.1. Introduction

This chapter is organized around three broad themes; the first one discusses the different perspectives into disasters, the second refers to the literature concerning vulnerability, and its ability to explain a disaster phenomenon, the third discusses the literature on communities.

The first theme discusses differences between the dominant theories about disasters: risk and vulnerability. In this case, I consider that vulnerability best explains the issue of natural disasters. The next section is a review of the literature related to the cultural approach on disasters; here the relevant elements to consider are related to understanding the knowledge and practices of the different actors. The following section focuses on the explanation of disasters as social constructions, not only in the epistemological way, but also in relation with the long process of the creation of vulnerability, linked with political, economic and social factors that lead to the production of a disaster. The next section presents an analysis of the literature on vulnerability and its dimensions, all related to the macro-structural causes of it.

The next theme continues with the analysis of community. The concepts of community have been widely discussed and contested, especially the one related to geographical space. As disasters occur in a specific geographical area, for that reason a spatial perspective of community is relevant in its analysis. Community defined in a specific geographical area is relevant because it contains the morphological conditions that, together with vulnerability factors, create disasters. Further, it continues with the explanation of flash floods affecting communities. Flash floods are localised events, taking place in small communities. It is very difficult and expensive to predict them; for instance small communities affected by disasters, lack the institutional mechanisms of recovery, because of the little relevance and impact they have. The last section is oriented

to the analysis of pressures that the model of modernity has imposed on communities. It seems that community and modernity run in opposite directions. For some social approaches, the emergence of modernity means a breakdown in the values that give meaning to the community, such as solidarity, commitment, participation, trust and cooperation. Furthermore, certain policies promoted by governments and international bodies, generate negative repercussions in the foundational basis of communities.

2.2. Approaches to Disaster. Risk and Vulnerability

There are two main perspectives in relation to disaster analysis. The first is related to vulnerability and the other to risk. At the theoretical level, the differences are substantial, then, each perspective influences decision-making in diverse ways, dependent on the particular theoretical ascriptions. In general, risk is related to probability, which in many cases does not give an appropriate answer to the situation. Sarewitz et al. (2003) consider that risk-based approaches are supported by the probability of the occurrence of a disaster, not on the modification of the original causes of it, for which the context remains.

Policy-making based on risk is designed to cope with the probability of occurrence based on cost-benefit approaches, but in many cases risk reduction related to the population affected by disasters, or prone to them, is inappropriate. This is due to the fact that disasters often imply issues of wealth distribution, lack of political rights, ethnicity, gender or poverty. Consequently, researchers argue that the vulnerability approach is a matter of human rights and risk reduction is not (Sarewitz, Pielke Jr et al. 2003).

In general, the analysis of disasters has been studied from a naturalistic perspective, in which the basic principle is a high level of uncertainty and an animistic idea of uncontrollable 'natural' forces. In this perspective, solutions are of a technical nature, based on engineering knowledge, usually centred on mitigation works whose main objective is to control those forces (Alexander 1993). For example, Sorkin (1982) in his book on the economic impact of disasters, noted that in the 60-70's, technology and scientific knowledge were

developed to counter the force of nature, affecting countries with enormous losses year after year. Great investment was placed in technological development but the results were poor. In other cases, Sorkin (1982), following the scientific approach, appeals for structural changes in river channels, construction of dams, embankments, bridges and related solutions to mitigate, but not to solve, the negative impacts generated by natural hazards on communities by weak underlying conditions. These solutions are focused on hazards rather than people; this approach is still in use today, frequently guiding decision-making in relation to disasters.

In the early 80's, scholars' focus shifted from being related to technology and science, to being related to poverty and marginalization. Blaikie's influential work on the stress-release model, explains the social conditions that create vulnerability in a social system. The basic idea of the model is that disasters are located at the intersection of two opposing forces: the factors that generate vulnerability, and natural hazards. Therefore it has been stated that disasters are social constructs, not only in the epistemological fashion related to constructivism, but also in the practical aspects related to impacts on human societies, on the process that makes people prone to such disasters (Oliver-Smith and Goldman 1988; Wisner and Luce 1993).

During the 90's, research was based on the analysis and criticism of decision-making processes, as well as on coping strategies devised by governments, which in general are based on technical mitigation. Wisner (2001) stated that these decisions are generally focused on the disaster, not on the root causes, or the affected people. However, during this period, social minorities such as women, ethnic groups, the elderly and children among others gained great relevance in research and in practice.

Different factors have led to an approach based on the community's local knowledge in relation to natural hazards, such as the Hyogo conference and the Millennium Goals, as well as the failure of applied scientific and technical knowledge sustained as solution to the growing problem of disasters. The main

objective of research was the analysis of the root causes of the vulnerability process, oriented towards understanding local knowledge, with the intention of establishing a dynamic dialogue among actors in order to find common solutions (Pelling 1999; Wisner 2004).

Cultural studies concerning risk, such as those developed by Mary Douglas (1983; 1995), have been re-invigorated with fresh perspectives towards disasters and vulnerability. They analyse the psychological perspective, in which subjective impacts are considered; also the sociological point of view in relation to social organisations' myths and practices are analysed. Most of this research was conducted in remote areas, exploring indigenous agricultural communities who live in close connection with their environment (King 2000; Pelling and Uitto 2001). Research on vulnerability has extended the analysis integrating globalization and culture, combined with marginalisation and environmental degradation, has been included within the discourse of vulnerability (Oliver-Smith 2004). The need for a broader vision has involved the idea that for a complex problem, solutions are not simple. In line with political ecology, the current research on vulnerability to disasters is based on the relationships people establish with the environment, mediated by political, economic and cultural factors.

2.3. The Cultural Approach to Disasters

Culture is the element that mediates decision-making and practices among different social groups in relation to a disaster. Natural disasters can be read as social texts through their spatiality, temporality and social context. According to Oliver-Smith (2001), the relationship between nature and society is essentially cultural. He considers that the culture/nature dichotomy has its origins in the Enlightenment, in which man assumed control over nature, considering using its unlimited resources. Disasters are seen from this perspective, as being moments defying human control, to re-establish former conditions all elements of science and technology need to be employed. The intensity that describes a disaster means that all dimensions of social structure are disrupted.

Hewitt (1983) suggests that, far from reading disasters as abnormal events, they should be analysed through normal decision-making processes, related with, daily activity on the part of the people experiencing disaster. These events reveal links between material conditions and ideological structures, as well as concepts such as continuity, cooperation and conflict, power and resistance. Through the use of vulnerability as a concept, it is possible to see from outside how relations of mutuality and duality are present in a disaster situation that goes beyond individual behaviour. It also provides tools for the analysis of social dimensions around which a disaster occurs (Oliver-Smith 2001). Research on disasters has a social component, which, analysed from the sociological perspective, highlights the relation of it to the physical causes of disasters. It also analyses factors in the vulnerability process such as race, ethnicity, age, gender, and local knowledge. From the anthropological perspective, analysis of disasters includes the study of culture and local knowledge of the social groups under study.

The available literature on disasters in the of sociological and anthropological fields is basically concerned with communities and their relationship with the environment, the conditions that led to the disaster and the local knowledge about a phenomenon (Dekens 2007; Gaillard, Liamzon et al. 2007; Burningham, Fielding et al. 2008). Some studies are related to the practices and knowledge of indigenous groups in remote locations regarding disasters, by analysing their experiences and coping practices set prevention and implementation programs.

The first stage of the cultural analysis of disasters was conducted in developing countries under the influence of the theory of vulnerability. In these cases culture is recognized as the mediator between the different practices and understandings on disaster, so there are not only one, but many cultures mediating a disaster phenomenon. Culture shapes interpretation and response to disasters. It has been suggested that technical knowledge could establish a fruitful dialogue with local knowledge, together designing strategies for the different stages of a disaster. (Parker and Handmer 1998; Blaikie, Cannon et al. 2004; Thomalla and Schmuck 2004; Wisner 2004; Holcombe 2007).

In order to gather the different understandings and knowledge of the actors involved in disasters, Hilhorst (2004) suggests the 'social domains' approach. It considers shared practices and languages, and at the same time, it emphasises conflict and negotiations between the different domains. Hilhorst basically proposes three social domains: management, governance and local knowledge; the main actors in this domain are scientists, governmental officer, community residents, politicians and those affected by disasters.

Each domain has a different repertoire of experiences and a cultural background with respect to disasters. Management domain discourse is based on expert knowledge and is focused on hazard. The social domain of disaster governance is centred on decision-making and management at the governmental level (policies are designed there). Local knowledge is related to certain understandings, situated knowledge and practices of the communities in relation to disaster. According to context, local knowledge is understood in different ways: as a barrier to disaster management and governance, as a critique of modernization and the last one criticizes modernization but highlights local knowledge. This perspective seeks communities' empowerment and participation in decision-making.

As observed before, social domains are spaces of negotiation and connection, related to particular discourses, understandings and meanings. Within the social domains approach, actors constantly negotiate conditions and outcomes in the process of vulnerability, involving conflict and contradiction. Hilhorst (2004) considers this approach as a new paradigm from which to study the complex problem of vulnerability to disasters. Social domains overlap and exchange knowledge, actors belong to different domains, and have different activities and roles. Arenas are spaces where discourses, practices, values, power conditions and conflict can interact.

In general research on vulnerability analysis has been developed at the macro-structural level. Hilhorst's idea relates to practices at the meso levels. Hers is a comprehensive proposal, influenced by the actor-oriented perspective (Long

2002; Arce 2003) that allows an inclusive characterization of the phenomenon of disasters. The actor perspective informs us on how actors give meaning to experiences and emotions through representations and understandings. Hilhorst takes the idea of actors performing in social domains where clusters of values, rules and a degree of commitment are represented. In that sense, Long (2001) considers that by identifying relevant social domains, it is possible to understand the symbolic boundaries established between different actors.

In sum, Hilhorst's proposal is relevant because it is an integrated approach that addresses the macro-structural elements of vulnerability, it also focuses on the practices and performances of the actors at the meso level of the community, but by focusing only on these three social domains, other elements are lost in the analysed situation.

In that sense, the methodological proposal of Clarke (2005) on Situational Analysis as a toolbox of theory and methodology becomes relevant explaining the complex arena of disaster this methodology would be analysed in depth in the next chapter (Chapter III). Clarke distinguishes the significance of context/situadness to analyse a social phenomena. The core concept of this methodology is social worlds, which highlights the importance of the collective actors, non-human elements and commitment present in discourse and negotiation, elements missing in the social domains approach. Social worlds like social domains are clusters with duties and objectives, sharing sources and ideologies (Mark and Poltrock 2003; Eriksson and Aronsson 2004). People move in and out of different social worlds, changing activities, social contexts and reference groups, so there is interdependency amongst them. Situational analysis contributes to improving the idea of a comprehensive analysis of disasters.

2.4. The Social Construction of Disasters

The word disaster makes reference to a negative disruption of normal life by sudden events, natural or technological, that modifies everyday life. They only arise where populations are likely to be negatively affected by an event, either

human or natural (Cutter, 1996; Hewitt, 1997; Bolin and Stanford, 1998; Buckle et al., 2000; Cannon, 1994 and 2000).

A disaster is a social construct. Furedi (2007) considers that events such as disasters, are interpreted through meaning systems that are socially constructed to represent adverse circumstances. Over time, new meanings have been added around disastrous events, from being related to God's wrath, to the reactions of nature derived from the overexploitation of resources. Disaster is defined by humans, not by nature.

... while hazards are natural, disasters are not. Social systems generate unequal exposure to risk by making some people more prone to disaster than others and that these inequalities in risk and opportunity are largely a function of the power relations operating in every society (Bankoff 2003, 225).

Bankoff (2003) maintains that hegemonic discourses determine what disasters are and where they take place; frequently the unsafe underdeveloped side of the world. He also states how the western scientific discourse discredits local knowledge, to maintain its influence over knowledge and technology in the world. People from the underdeveloped world are blamed for their lack of proper scientific knowledge and preparedness.

There are at least two perspectives not mutually exclusive with regard to disasters. One maintains that the circumstances creating a disaster are random and unexpected; in essence, a disaster finds people (Pelling and Uitto 2001; Bankoff 2004). The second holds that disaster conditions are triggered by social, political and economic conditions. Frequently, poor people suffer severe damage to their livelihoods, so recovery is slow or never fully reached. This approach uses the concept of vulnerability as a centrepiece of explanation (Cannon 2000; Pelling and Uitto 2001; Wisner 2001; Blaikie, Cannon et al. 2004).

Approaches to disaster are related to dominant disciplines that provide the perspectives and schemes through which decision-making is done

... there has been a widely held belief that hazard problems and disaster impacts can be solved using ...specialized solutions: relief operations, dam building to mitigate floods, anti-seismic construction against earthquakes, and so on. But a better approach would be integrating all the structural and non-structural methods in a comprehensive program of hazard solution (Alexander 1993, 612).

During recent years, social scientists have advocated a more interdisciplinary approach, considering contributions from different social fields. Aside from regarding disasters as the result of biophysical hazardous conditions, social scientists have advocated a multidisciplinary approach in which the social sciences contribute to the understanding of disaster phenomena.

2.5. The Production of Vulnerability to Disasters

Vulnerability to disaster is a complex process. It makes people susceptible to damage according to geophysical components and social order. In general the geophysical and engineering approaches have dominated planning and disaster response, however, such policies fail in their applicability because they do not take into account particular cultural practices, political order or future impact on ecosystems and livelihoods interacting all together. Standardized decisions applied in affected communities do not solve the fundamental conditions that make a population prone to disaster (Wisner and Luce 1993; Hewitt 1995; Pelling 1999; Cannon 2000; Blaikie, Cannon et al. 2004; Bankoff, Frerks et al. 2004a).

Natural disaster analysis has grown extensively in the natural sciences and physical engineering fields; their criteria have guided decision-making in areas related to disaster mitigation and relief. Their linguistic repertoires have become dominant, setting limits to social actors in the disaster arena by defining who is a victim, what is a disaster, and perhaps more relevant outlining public policy (Hewitt 1997; Long 2001; Hilhorst 2004; Bankoff, Frerks et al. 2004a).

Social scientists took a more active role in the 90's contesting the naturalist paradigm. Blaikie suggested considering social factors in addition to geophysical ones, working with the relationship between economic and social conditions such as age, ethnicity and immigration status, as factors giving rise to vulnerability. Wisner and Luce (1993) highlighted poverty as a factor that heightens vulnerability to disasters; they suggested avoiding placing too much emphasis on natural phenomena or environmental factors, because they can mask major social problems, diverting much-needed resources away from improving the living

conditions of the affected populations. However, Chambers (1995) questioned the excessive association between structural poverty and vulnerability to disasters, stating that those responsible for planning or decision-making should not limit their action to tackle poverty because the issue could be seen as unsolvable.

In addition, the anthropological insight has given a twist to vulnerability; under this approach, local knowledge, practices and response become much more important. This perspective examines the close relationship between the environment, value systems, local knowledge, as well as everyday practices of different actors, in addition to local organisation and negotiation of locally prevalent conditions. Thus, this type of research is based on situated knowledge. An important finding through using the anthropological approach is that there is not one unique vulnerable condition, but a specific situation that is heavily influenced by the context where it develops (Oliver-Smith 1996).

Vulnerability then is the outcome of different conditions and relationships established amongst the different social actors and non-human agents involved in a specific disaster arena (Paulson, Lisa et al. 2003). People make complex cost benefit and risk estimations when choosing a place to live, the conditions that a place provides to improve their livelihoods, such as cheap transportation, access to city services or proximity to their places of work, are amongst the main factors (Cannon 2008). Disasters are shaped by a set of complex inter-related social, economic, political and cultural factors that may have different effects before and after disaster.

Community hazard vulnerability is a process that is complex, multidimensional, dynamic and in constant change. Vulnerability is not homogeneous; individuals and groups are very active trying moving away from this condition. The situational approach seeks to identify the historical, cultural, socio-economic and spatial conditions to understand how people become vulnerable in the affected communities by a disastrous event. The situational approach to vulnerability is a useful framework from which to study community relations, commitments,

values and power issues. It can also be supportive to adequate decision-making (Hilhorst 2004; Anderson-Berry and King 2005; Wisner 2008).

The latest approaches on vulnerability research suggest a more participatory and bottom-up design. People from the affected communities, together with the researcher, construct ideas on risk and disaster, and together design coping strategies. Therefore vulnerability analysis, coping solutions to hazards, and emergency response are all defined both by the researcher and by the actors (Bankoff, Frerks et al. 2004a; Davidson, Johnson et al. 2007; Tran, Shaw et al. 2009).

This research is based on the situational approach of vulnerability, a meso level perspective centred on the community level; the dimensions suggested by theory to analyse it are socio-economic, temporal, spatial and discursive. It is assumed that transferability is not applicable since it is context based.

2.5.1. The Social Dimension

For the purposes of this study, the social dimension of vulnerability is composed of three significant sub-dimensions: political, cultural and economic, which are described below. The political dimension examines the relationship between dominant models of democracy and the resultant institutionalisation. It also explores corruption and loss of civic responsibility as elements generating conditions that make a place hazardous.

Moreover, the cultural sub-dimension is important because it analyses the values, traditions and practices that explain people's responses to hazardous conditions, and their particular understanding of disasters. Finally, an analysis of livelihoods and their relationships with the two previous sub-dimensions enlightens the way assets cover basic living expenses in vulnerable conditions.

2.5.1.1. The Political Sub-dimension

Natural disasters occur in a political space. The political dimension of vulnerability explains how power is exerted in a society, explaining how decision-making, planning and implementation done in relation to community

can be physical, administrative or symbolic. This analytic component discloses vulnerability to disasters, explaining the unequal impact of these events in a society. It also explains the mechanisms of access to social benefits and policymaking, as well as deviant practices, such as corruption. The political dimension also uncovers how civic responsibility is necessary to improve local conditions. The political dimension is essential weaken or strengthen governance (Cohen and Werker 2008).

Democracy as a political paradigm is associated with the social practices and institutions that allow a population to influence major decisions and to ensure that their civil rights are protected. Fully democratic political systems have the state as guarantor of civil rights; its nature influences social policies (Dahl, Shapiro et al. 2003; O'Donnell, Cullel et al. 2004; Held 2006). Ideally, in a democratic regime the state is involved with society in the process of planning, mitigating and coping, providing the necessary resources and recognising agency. A democratic state supports communities, changing the conditions creating vulnerability, by taking into account people's local knowledge and understandings as well as including different social actors in decision-making (Pelling and Dill 2006).

Recent research has suggested that vulnerability to disasters tends to be lower when there is a relatively high level of democracy (Quiroz-Flores and Smith 2010). However, this relation has been extensively contested; criticisms include issues of governance, efficiency and the quality of democracy. Watts and Bohle (1993) emphasized how power relations and lack of rights exerted through institutional political structures, are additional factors for vulnerability. Excessive and abusive power exerted through the institutional framework makes a society more or less vulnerable. The Cuban government, largely characterized as non-democratic, is more efficient at responding to disasters than the world's pre-eminent model of democracy, the USA, especially so in the light of the failed response to flooding in New Orleans, this disaster uncovered the great inequalities in the American society (Kelman, Wisner et al. 2010).

The neoliberal influence on democratic governments is turning societies vulnerable to natural hazards. Neoliberal governments tend to abandon their protective role in disaster, leaving risk and crisis management to citizens and businesses. A common assumption in this context is that risk is greater for those less competent to manage it (Adger and Kelly 1999; Cannon 2000; Pelling and Uitto 2001; Wisner 2001; Bobo 2006).

Under conditions of an inadequate protective role from the state, research suggests that grassroots action emerges, supported by different forms of solidarity. According to this perspective, conditions like this have prompted political change, which in some cases has involved the destabilization of the authoritarian rule. In a time of crisis, the political system is under scrutiny and is often challenged by society, leading to political change (Pelling and Dill 2009).

A key concept in the case of democratic governments is access (Ribot and Peluso 2003), which implies that different social actors can all benefit from the state's resources, opportunities and social services, reached through institutional means. Access also implies the possibility to influence decision-making. Ellis (2000) argues that knowing the organisational structure, policies, standards and incentives of governmental institutions, makes it possible to understand the impact that access has on assets. Lack of access to resources and social protection makes people vulnerable to hazardous events and impacts on recovery patterns. One source of social inequity is differentiated access to benefits. Scholars analysing policy in this field, demonstrate that class prejudices on the part of dominant groups, as well as the lack of political will, can result in lower levels of protection for the poor (Oliver-Smith 1996; Cannon 2000; Pelling and Uitto 2001).

Ribot and Peluso (2003) designed a methodology to analyse how different groups, through different means, gain benefits and maintain control and access over resources, creating negative outcomes in policy. Access is defined as “the *right* to benefit from things, including objects, persons, institutions and symbols (153)”. Next to the notion of access is corruption, as illicit access, present to

varying degrees in any political system. It usually arises in the absence of institutions through which social demands should be carried out.

Corruption is conceptualised by some authors (Huntington 1968) as one way to improve the conditions of damaged communities, apparently correcting institutional inefficiencies. However, research has also found how corruption has a caustic effect in the political system and in the social fabric. It breaks the links between collective decisions and governmental institutions, undermining trust, deteriorating democratic principles of transparency, accountability, equity and justice (Warren 2004, 328). Corruption reduces public agency to an instrument of private benefit, it is an important factor in the analysis of vulnerability difficult to apprehend, so it is frequently excluded from research. As a deviant practice corruption produces benefits for those who would otherwise not have received them, generating gross inequalities of power, denying rights and benefits to communities affected by disasters (Green 2005; Gaillard, Liamzon et al. 2007).

The political machine in Latin America, particularly in Mexico has taken the name of clientelism, this political practice enhances vulnerability to disasters. The recent process of electoral competition in Mexico, implies that different political groups with different ideological affiliations have to negotiate benefits for their supporters and citizens. Clientelism implies access to public goods in exchange for legitimacy of power. The new political groups in the political arena are using these practices in a similar way to the former authoritarian government. Clientelism in contemporary Mexico has taken many faces, there is greater control over these practices by political opponents so political actors have to adopt more subtle and creative ways. Clientelism and access to benefits has a political touch, municipalities or states that are opposed to the federal government in turn, find it difficult to shift the allocation of resources, which means they have a poor performance at the local level. This is not an illegal action but a practice that puts the opponents in a disadvantaged situation (Aguilera 2011). The side effect of these political battles is the increasing vulnerability in which most disadvantaged groups are placed. It should be noted

that the analysis of clientelism in the case of Mexico is a subject that deserves an extensive analysis, nevertheless this is not the main purpose of this research.

Inside the political dimension, the concept of civic responsibility as opposed to corruption is based on responsibility and cooperation, aiming benefit of society as a whole. Civic responsibility is related to citizens' self-mobilization and participation, assuming that they have the wherewithal to take an active part in solving social issues. This form of community participation is the cornerstone of democratic societies. Democracy is enriched when citizens are engaged in decision-making, design and policy implementation. Civic responsibility gives people a sense of commitment with others, as well as self-efficacy, in addition to the feeling that their action would have an impact on what they want to change (Haddad 2006).

Loss of confidence in institutions, because of failure or corruption, contributes to the deterioration of social responsibility (Bickerstaff, Simmons et al. 2008). This encourages citizens to look for alternative ways, such as corruption, to solve their social needs or to gain benefits (Green 2005). On the other hand, Ahrens and Rudolph (2006) point towards institutional failure as the producer of bad governance, and as one of the main causes of underdevelopment and disasters. The concept of institutional failure is understood here as the lack of legitimacy, trust and effectiveness of formal institutions in relation to their performance and decision-making abilities (Meyer and Zucker 1989).

The political element of vulnerability, seen through the lens of power, facilitates the understanding of a government's agenda, of the information flow and of the dominant discourses involved in decision-making, by considering institutional or deviant practices as an additional element for disaster conditions. However, at the same time, the political element of vulnerability emphasises community participation as key in gaining access to social services and benefits, generating resilience and mitigating the effects of natural hazards.

2.5.1.2. The Cultural Sub-dimension

A second important element of the social level of vulnerability is culture. It plays an important role incorporating traditions, practices and understandings of social organisations. As previously stated, in general, policies are designed by outsiders, guided by their own particular disaster worldview, generating solutions that are often inapplicable to the cultural context of the affected people (Oliver-Smith 1996; Hilhorst 2004).

Culture is an important dimension of vulnerability; it shapes ideas about place and hazards, relating it with practices, symbols and knowledge. Culture and local knowledge could generate greater resilience, since they are based on previous experiences, and practices that channel the stress generated by disastrous events (Wisner 2008). Furthermore, risk is embedded in cultural and natural landscapes; for that reason local knowledge and experiences about the place and hazards should not be separated. There is an inextricable link between cultural diversity and the knowledge systems that emerge from historic ties to particular landscapes (Hewitt 2008).

Disasters, from the cultural perspective highlight issues that turn an event into a destructive agent of social fabric, although it might be possible to analyse people's capacities and agency. The many different ways by which collective memory is created (Eisenman, David P., et. al. 2007), as well as successful practices to mitigate hazardous events, are expressed in symbolic acts such as rites, festivals, symbols, which are socialised through songs, myths or sayings (Paine 1992; Oliver-Smith 1996; Hewitt 2008).

Institutions and norms of the social system guide the actions of people and organisations. People are intrinsically involved with society and actively enter into its constitution. The social component is related to processes, social structures and people's actions in order to cope with disasters. Disasters uncover social organisation in affected communities, as well as the levels of distribution and access to institutional power and deviant practices. Disasters lead to a basic phase of social, cultural and material needs, to the degree that essential social

functions are cut off, thereby generating disruption and stress (Parsons 1967; Dynes and Drabek 1994; Oliver-Smith 1996; Layder 2006).

The concepts of poverty which most influence policy are those of the rich, who assume that they know what poor people want and need. By emphasizing income and consumption, they neglect other aspects. Nor should vulnerability and security be given more attention than they deserve, case by case. Poor people have many criteria of well-being and deprivation. It is the outsiders who simplify them to one, two, or a few (Chambers 2006, 35).

An important area of the cultural dimension is related to formal institutions. The new institutionalism from the sociological perspective has focused on studying the various myths, symbols and ceremonies that give meaning to the existence of institutions. Although indirectly linked to the new institutionalism approach, Clarke (1999) in his study of risk planning, shows how formal governmental organisations design well-structured plans, which are more complex in terms of the uncertainty and the expectation of institutional high effectiveness. However, he found that such plans do not work in the terms for which they were set, because they are ideal models for ideal societies, far from reality.

From the perspective of new institutionalism, formal organisations are more concerned with persistence, rather than with efficiency or performance. Institutions and individual actors linked to them obtain benefits with low performance. The new institutionalism approach asserts that myths are more important than the actions that enhance productivity or efficiency, since they give direction by providing a set of values to the officers and people linked to it. This situation leads to a permanent state of institutional semi-failure but keeps the organisation alive (Meyer and Zucker 1989).

Myth is defined as the foundation that gives meaning to the existence of an organisation, it also provides models of conduct for its members (DiMaggio and Powell 1991). Therefore, many of the elements that give meaning to the existence of the institution, are deeply rooted, functioning as binding practices inside organisations (DiMaggio and Powell 1991). Internal practices reveal the myths of the institutional environment, rather than the demands of their activities.

Institutions and norms of the system guide the actions of people and organisations. People are intrinsically involved with society and actively enter into its constitution. The social component is related to processes, social structures and people's actions to cope with disasters (Parsons 1967; Dynes and Drabek 1994; Layder 2006).

Institutional efficiency is related to the myths that support its origin, goals and ideology. By studying the institutional culture, it is possible to understand the foundations of institutional responses to emergencies.

...structural elements are only loosely linked to each other and to activities, rules are often violated, decisions are often unimplemented, or if implemented have uncertain consequences, technologies are problematic efficiency, and evaluation and inspection of systems are subverted or rendered so vague as to provide little coordination (DiMaggio and Powell 1991, 47).

In the case of the institutions responsible for disaster management, their low performance is clear, because the institution disposition is to remain over time. In some cases their role is to be the civic side of disaster response, a complement to the militaristic approach. Civic disaster organisations interest is to seize resources and keep some margin of manoeuvre and influence (Brunsson 1989).

We all know that the best time to get vulnerability and risk reduction measures implemented is right after a disaster. Once the memory of a disaster diminishes, old priorities re-emerge and politicians and administrators start privileging projects that are more visible, the kind that you can inaugurate with a ceremony, a ribbon cutting that a politician can point to as a visible achievement. Risk and vulnerability reduction rarely have that kind of visibility, and their effectiveness has to wait for the next disaster to be proven, which could be years away, long after a politician has left office. And with new development initiatives, neither democracies nor authoritarian governments have a great record of ensuring that development projects do not accentuate risk and vulnerability (Kelman, Wisner et al. 2010).

Scholars, practitioners and citizens expect from decision makers a policy planning design able to generate effective results to disaster coping. Government institutions have the solutions in documents, however, issues of applicability and effectiveness of such policies go beyond the nature of the institution.

Additionally Chambers (1995) suggests that there is a great gap based on the different realities amongst professionals and the poor. The difference between the definitions and objectives of a professional top-down and the poor are the values,

career orientations and behaviours. In the case of bureaucracies and professionals, it is oriented to reinforcing the dominance of the western industrialized world, which is capital-intensive, reassuring itself constantly. The role of the plans, technologies, professions and innovations is to ensure the existence of the institution, its performance is not considered and neither are the results (Brunsson 1989). That has a negative impact in the sphere of decision-making and policy design in the field of disasters.

2.5.1.3. The Economic Sub-dimension

Within the economic dimension of vulnerability, livelihoods play an important role. Livelihoods basically comprise assets, capabilities and access to resources for living (Chambers 1995; Ellis 2000). Each of these factors is socially constructed, so livelihoods are culturally patterned (Gudeman 1986).

The economic factor is often used to explain the vulnerability of a population or group. Nevertheless, local factors add many other aspects; the standard model of income-consumption cannot explain everything by itself. Mystification and ideology on what refers to local patterns of subsistence and accumulation are related with specific rationalities (Oliver-Smith and Goldman 1988; Escobar 1998; Chambers 2006).

Livelihoods are strongly shocked when a disastrous event occurs, altering the subsistence patterns of a population. The weak structure of the poor on which living is built, implies that the impact of disasters is greater for them (Blaikie, Cannon et al. 2004). Economy as a social dimension of vulnerability refers to the analysis of limited assets and access to services or products, and an inadequate distribution of benefits in a society.

Assets should not be understood only as “things” that allow survival, adaptation and poverty alleviation. They are also the basis of an agent’s power to act and to reproduce, challenge or change the rules that govern the control, use and transformation of resources (De Haan and Zoomers 2005).

In cases of inequitable distribution of social wealth, there is an increased vulnerability to disasters, particularly among the poor. Frequently, poor people are caught in a vicious circle of lack of access to resources and protection. There

is also a tendency to relate and blame the poorest areas, those with tainted environments (Watts and Bohle 1993; Chou, Huang et al. 2004).

Extensive research in the area provides valuable insights into the diverse strategies for improving livelihoods, from those based on the exploitation of natural resources, migration, or activities based on non-natural resources (Chambers 1995; Ellis 2000).

Important factors adding to the loss of assets are environmental degradation, disasters and wars, which would drive the need of diversification of activities of the members of a community (Ellis 2000). 'The realities of poor people are local, complex, diverse and dynamic. Income, poverty, though is important, but is only one aspect of deprivation' (Chambers 1995, 173).

According to the types of assets that people have, different strategies are developed in generating livelihoods, and disaster impacts are differentiated. One element that is frequently considered essential for the proper development and establishment of economic development projects is the cultural factor. Themes such as community and festivals, duties, gift exchange, sharing and distributing food and money as well as the influence of religious institutions are seen as negative factors to development rather than as particular elements of the communities' culture to be considered when planning (Cahn 2002).

Warner (2007) suggests that people replace material assets for social assets when they are destroyed by disastrous events, so it becomes critical to maintain social relationships. The approach developed by Rural Development theorists extensively applies a participatory approach to understanding and analysing poverty. Their findings present a different perspective in relation to poverty, constructed from the poor's perspective, not the officers' one.

POVERTY CHARACTERISATION

TYPE	CONDITIONS
Proper	Lack of income and assets (resources). Assets should not be understood only as “things” that allow survival, adaptation and poverty alleviation.
Physical weakness	Under-nutrition, illness, disability, etc.
Place or social	Isolation
Marginalisation	Exclusion from access to goods and services
Vulnerability	Exposure to risk, stress, and hunger
Powerlessness	Exclusion from political, social and cultural structures and networks

Table 1. Based in Ellis (2000) Poverty Characterisation

Furthermore, research on livelihoods rarely discusses the determination of the groups to build themselves a life, motivated by the need of meeting consumption standards and economic needs. Long (2002), analysing different cases, discusses this issue, relating it with the way how individuals cope with uncertainty, take action, exploit new opportunities, and select the value systems most convenient for their situation.

This knowledge on poverty complements the vulnerability approach (Blaikie, Cannon et al. 2004), which is understood not only in the terms proposed by Chambers (1995) and Ellis (2000) as risk exposure, but as connected processes of a different order, both physical and social, which make people susceptible to suffering damage. Evaluation of poverty from governmental as well as international institutions is generally based on the way in which economic exchange is done in successful western societies. Therefore, poverty assistance programs are implemented in terms of this approach (Ellis 2000).

It is, perhaps, obvious that interpretations of measurement of poverty will depend heavily on what is measured, when it is measured (during what season), and events on who is actually doing the measuring (and for what purpose) (87).

Given this situation, some scholars suggest that rather than measuring poverty in terms of income and consumption, it is necessary to include factors such as longevity, access to health and education, and access to consumption. For the above-mentioned reasons, some scholars advocate a shift in focus in the way of measuring the wealth that is produced and distributed in the society,

disaggregating the different factors that constitute poverty, beyond marginality. Some efforts include the Genuine Progress Indicator (GPI) (Cobb, Halstead et al. 1996) and the Environmental Sustainability Index (ESI), along with others (see Hoti et al. (2007) in which the effects of ecological depletion, natural disasters, social fabric and disease factors are considered (amongst others).

In the Mexican case, the National Council for the Evaluation of Social Policies (CONEVAL for its abbreviation in Spanish) presented a new methodology that considers the accomplishment of basic social and educational human rights, access to social security, quality of housing, basic services in housing, access to food, current income per capita and the degree of social cohesion. This is a methodology constructed with a different perspective for evaluating poverty.

A controversial point of view is sustained by some scholars that considers disasters beneficial in Gross Domestic Product (GDP) growth, based on income and wealth generation to poverty evaluation (Skidmore and Toya 2002; Stromberg 2007). Since there is government spending, consumption and investment after a disaster event, the impact is reflected on GDP. This is referred to in the literature as the productivity effect (Hallegatte and Dumas 2008).

However, critics of this position maintain that GDP does not distinguish between cost-effective or wasteful, productive or destructive, sustainable or non-sustainable. GDP only adds without subtracting, by assuming that everything that happens to the market is beneficial to society regardless of wellbeing (Cobb, Halstead et al. 1996; Hales and Prescott-Allen 2002; Cuaresma, Hlouskova et al. 2008).

Forest fires, hurricanes, cancer, crime, and disease all add to the GDP because dealing with them requires exchanging money (Halles and Prescott-Allen 2002, 9).

However, repeated disaster events modify population recovery patterns, leading into chronic poverty. Disasters induce fluctuations in income, forcing households to sacrifice potential investment (Watts and Bohle 1993; Ahrens and Rudolph 2006). Therefore the system's capacity for social and natural resilience is reduced due to stress, resulting in more destructive natural phenomena such as floods or

droughts (Hales and Prescott-Allen 2002). It is not the intention of this study to discuss such indexes and methodologies, but to present alternatives to GDP (mainly based on market economy), given that the GDP's outcomes are presented as economic indicators and used on national public policies design.

In the case of disasters, such indicators influence positively on consumption, thereby increasing GDP. However, according to Hallgatte and Dumas (2008), even with the productivity effect on GDP, it is not possible to turn a disaster into a positive event; damage is often beyond reconstruction capacity, and disaster potentially leads to poverty traps. It is relevant to consider the cultural practices in terms of livelihoods in the analysis of the economic dimension of vulnerability. Disasters disrupt the availability of resources, which, as noted by De Haan and Zoomers (2005), becomes a factor for action and change on different social levels. The economic aspect goes beyond the simple measurement of income and consumption, it is also related to a value system, practices and access to resources. In this regard, it is important to understand how these phenomena were established over time and the conditions under which they were generated.

2.5.2. The Temporal Dimension

The temporal dimension of vulnerability facilitates understanding of the chronological progression of disasters and settlements. Periodisation is a useful tool for analysing a specific situation. Since it is based on history, it separates sequences and intermittent events, such as disasters or wars. Periodisation includes daily-life events and the long processes of social change (Wishart 2004).

A prominent theory describing periodisation is Braudel's (1995) idea on historical analysis. His point of view is relevant because it places on the same level the geographical area and the time dimension; in his conception, geography and time establish a society's rhythms. His instrumental methodology and problematisation is based on the design of three scales: surface disturbances, the medium-length scale, and the long-length scale.

Surface disturbances, placed in the short length (*le temp court*) are related to daily life. Daily life is affected by quick events of various kinds such as wars, festivities or disasters. The medium length (*la moyenne duree*) refers to the social history of groups, where different conjunctures change social direction; these changes are beyond the perception of external observers. Finally the long-length scale of time, is related to environmental and geographical changes, as well as to imperceptible cycles, called by Braudel 'ecological history' (Hall 1980).

This approach to history is useful for the purposes of this study because it integrates geographical and historical references. Both of them are important dimensions to consider in a disaster situation. The instrumentalisation of history in scales provides links to understanding how and when a place turns into a vulnerable community. 'Placing the genesis of disaster in a longer time frame therefore brings up issues of intergenerational equity' (Blaikie 2004, 9).

Vulnerability therefore is related to temporality and spatiality as important factors explaining disaster. The historical dimension allows identifying vulnerability origins and conditions through social, political and economic traces (Blaikie, Cannon et al. 2004). This dimension sketches the conditions that lead to the turning point of a disaster disturbance. Historical analysis of the different but entwined dimensions helps in understanding the past, present and future conditions for disaster.

The relationship between climate, topography, resource-use and culture over time represent a basis for determining the nature of disaster (Bankoff 2003). Through the historic analysis of a place, it is possible to understand dominant cultural paradigms. In this regard, Braudel's (1995) proposal is successful because it considers important the cultural, economic, political and psychological dimensions in constructing an explanation of a place. With reference to this research, his proposal brings together the elements that explain how these dimensions had affected the decision-making of groups and communities in a given time that impact later, creating disaster conditions.

2.5.3. The Spatial Dimension

Human groups modify the space conditions in which they inhabit, tailoring them to their own needs, by making use of prior knowledge. The boundaries established by each group are social conventions. Spaces are embodied with constraints and opportunities. Previous spatial knowledge as well as lived experiences are factors influencing the way how a community copes with adverse natural phenomena. The challenges vary, so do the responses (Braudel and Mayne 1995; Asfaw 2007).

The spatial dimension is important because it provides understanding vis-à-vis the range of conditions influencing hazards and their effects. Accounts based on records of past experiences of disaster or other kind of events, are helpful in understanding the patterns of spatial distribution, as well as the quality of any physical structures related to vulnerability (Uitto 1998).

Besides this dimension analyses the relationships among the political, cultural and economic reasons of certain communities living in risky or threatened areas. Chambers (2006) refers to the spatial dimension as the external factor of vulnerability. In this dynamic relationship between environment and society, the spatial conditions in which a particular group develops, as well as its local knowledge, are important tools in the design of policies and in decision-making.

To achieve a more detailed analysis of space, the concept of region has been developed. A region is an arbitrary division of space; its boundaries depend on the nature of the interest or objectives, which could be political, economic or demographic, amongst others. A region is a social construction (Wisner and Luce 1993; Pelling and Uitto 2001; Blaikie, Cannon et al. 2004; Bankoff, Frerks et al. 2004a), defined by specific configurations of class and power relations (Watts and Bohle 1993, 22); this concept appears appropriate in the medium scale of analysis.

The components of region are space and identity (Paasi 2002). The space is related to the physical, political or social system boundaries. Identity is linked to people's meanings and practices, which involve the idea of the self, faced with

the images of other social agents. In a disaster condition, previous identity and space might be distorted, because social processes are often modified. Disasters also create new spaces of solidarity, hatred, hope and fear, transforming previous landscapes; they may also generate a sense of assertiveness in the affected people by changing political identities, while destroying the physical infrastructure of the region, transforming governance and population distribution.

Nevertheless a good-quality reconstruction amplifies the short-term consequences of disasters, because although it may be time consuming, it pays off over the long-term (Philippe Le Billon 2007). However, a poor recovery process makes some people even more vulnerable to an extreme event in the future (Blaikie, Cannon et al. 2004).

The analysis of the spatial dimension of disasters is related to the social, physical and historical conditions around an event. The geographical component is a tool for decision-making, establishing interaction between the people and their surrounding environment, explaining that even when a disaster has a physical component, human activities that change spatial conditions can contribute to disaster. The analysis of this dimension can help in understanding the factors that lead to disaster occurrence in spatial terms.

2.5.4. The Discursive Dimension

Discourse is a relevant dimension because is related to decision-making. It is shaped by the diverse social constructions of vulnerability; it mediates ideologies and social ideas, turning them into situations or actions (Wetherell, Taylor et al. 2001; Wodak and Meyer 2001; Fairclough 2003). Discourses are associated with cultural principles, which are tools used by people to make judgments of an event or idea as well as taking action.

Furthermore, discourse expresses specific modes of seeing and experiencing the world, which is reflected in particular ways (Fitch 2001). In a discourse, meaning is socially constructed and dependent on the context in which it is built, it can generate action. In this sense, discourse is an important dimension in any vulnerability analysis of natural disasters; different agents express their ideas and

explain the circumstances for which the event occurred through it, directing decision-making (Wetherell, Taylor et al. 2001).

A criterion used to analyse a vulnerable condition is closely related to the analysis of the construction of ideas about certain facts, ranging from social agents or groups. Hilhorst (2004) suggests that ideas and practices in different social worlds are organized in relation to certain proximity of social agents' or groups' understandings. It is necessary to emphasize that contradiction, conflict and negotiation are present in social interaction with other worlds.

Discourses on vulnerability to disasters, and the contested 'natural' condition of these events, have a dominant ideological background (Bankoff, Frerks et al. 2004a). Actions are associated with particular discourses through which meaning is given to phenomena.

In relation to disasters discourse, Hilhorst (2004) maintains that they are characterized by different ways of experiencing and describing nature. Discourse shapes understandings, by establishing certain conditions, where those with power are allowed to make representations of an event, disempowering the others to do so (Foucault 1972).

Disaster factors and conditions are associated with particular discourses, through which meaning is given. Bankoff (2004) suggests that discourses have an ideological background, following this idea, disasters are characterised according to different ways of experiencing and understanding nature. In the same way, contemporary dominant discourses on natural disasters are related to the natural causes; in which, the uncontrollable forces of nature are beyond any human intervention, neutralizing the actions of other agents and diverting criticism away from wealth distribution, land tenancy or poverty (Hilhorst 2004).

Discourses are vectors that generate action, so it is necessary to understand and analyze their ideological foundations to understand the actors' performance. Karen O'Brien (2010) suggests that predominant discourses in the anthropogenic era are more than 'human impacts on the environment'. Dominant discourses in

this era express the issues and world views that are important and currently ruling in both the fields of environment and development.

Discourses are connected with the social and institutional practices that shape and are shaped by power relations in a society. Power then is not simply in discourse, but in the performance of a conflict, in the particular way in which agents mobilize discourses and reconnect the previously unconnected (Hajer and Versteeg 2005).

Dominant discourses on disasters are: the physical, the civil defence school, prevention and emergency management; sustainability and community involvement. Each of these approaches, as well as their discourses expresses a particular construction of natural disasters. On the construction of concepts about disasters, the different approaches establish discourses on events and situations contesting opposite discourses in a battle to impose meaning, interpretation and implementation (Long 2001; Hajer and Versteeg 2005). The physical approach explains natural hazards by the probability of occurrence, magnitude, duration, and speed (Smith 2004; McEntire 2005). Discourses on this approach present disasters as events where the human condition is subordinated to nature. In this case people are the affected victims of these conditions, far from socio-economic system conditions that allocate risk to certain social groups (Wisner 1993).

In addition, McEntire (2005) explores this paradigm and the historical conditions that lead to the mobilisation of the army in the civil defence approach when coping with emergency disasters. He found that it is related to the Cold War period. This approach has been widely used in responding to terrorist attacks as well as to natural and technological disasters. The main challenge to this model is the exclusion of civil organisations involved in planning and emergency interventions (Dynes and Drabek 1994).

Later, the paradigm shifted to focusing on prevention; different international agencies advocated this approach, but emergency managers frequently considered necessary to use the money for emergency planning operations,

instead of directing resources toward disaster mitigation, which was the purpose of the programmes (McEntire 2005).

The next emerging paradigm analysed by McEntire (2005) is sustainability. However, its limited focus on the environment has been questioned in relation to disasters, because this approach failed to anticipate and provide policy recommendations for terrorism threats. This was highlighted as a significant defect of the paradigm in light of 9/11 and ongoing attacks. Hence, linguistic repertoires (Gee 2005) silence opposed discourses in the battles of knowledge (Long 2001). Clarke (2005) observes discourses as forms of social action, where language reproduces social order and, at the same time, shapes it when people interact with society. Discourse integrates the different dimensions discussed above, figuring a linguistic corpus that leads to actions on the part of agents involved in a disaster situation. Discourse is action and its meaning is socially constructed.

2.6. The Concept of Community

The concept of community emerges, in relation with the social factors associated with disasters. Despite the elusiveness of the concept, community is frequently invoked. For some, it is the way to call for commitment, participation, trust or cooperation (Wolpert 1976); others aspire to recover the Toquevillian revelation of it (Putnam 1995). Cohen (1985) analyses the symbolic elements that give cohesion to, and differentiates, social groups. In opposition to previous definitions, the liberalist point of view considers that inside a community there are issues related to competition, inequity and detachment, issues that neglect its own existence (Brent 2004).

Nevertheless, community is present in people's discourses, making reference to place attachment, kinship and association. The experience of community to a member may be recognizable only when confronted with other communities (Cohen 1985).

Community is that entity to which one belongs, greater than kinship but more immediately than the abstraction that we call society (15)

Many different authors have tried to analyse and understand communities, searching for the elements that bind or corrode them, their constituent elements, boundaries and the characteristics that differentiate them.

The most common idea of community is an intricate fabric where people interact, and share particular understandings about support, concern or loyalty (Brint, 2001). Inside a community, multiple arenas coexist with different realities shaped by power (Long 2002). Discourses and power relations inside a community have contradictory and conflictive views which should be negotiated (Hilhorst 2004; Layder 2006). For the purposes of this research, community is defined as an aggregate of people in a geographical space, who share common activities, loyalty, common values as well as common concerns.

2.6.1. Community Typologies

There is a fine line between community and individualism. An excess of individualism is related to negative social outcomes (Durkheim 1951), such as environmental degradation, by considering individual rights over communal ones (Cairns 1998). Nevertheless, the fact is that situations like illiberalism and enforced conformism are vices present in communities. Brint (2001) states that there are two types of community: geographical and elective, based on the structure of communities; he subdivided them according to their particular characteristics.

Communities of place
Communes and collectives
Localized friendship networks
Dispersed friendship networks
Activity-based elective communities
Belief-based elective communities
Imagined communities
Virtual communities
Imagined communities or communities of belief, members are not in face-to-face contact with one another.

Table 2. Community Characterisation (Brint 2001)

In an insightful analysis about the community, Cohen (1985) questioned the unclear boundaries of geographical communities. From his point of view,

boundaries are designed, based on administrative interests without considering the internal bonds or deviances within a community. However, for analytical purposes, the administrative boundaries facilitate the study of events such as disasters, as they are spatially limited. In this research geographical and symbolic boundaries play an important role in the analysis of disasters.

2.6.2. Community Boundaries

Community boundaries can be physical, administrative or symbolic. Physical boundaries define geographical, administrative or political spaces, and allow material resources management. Boundaries are established by the community itself or extrinsically. Symbolic boundaries establish the limits where groups can move using certain codes, customs and practices. Communities have a dynamic life, their limits and relations frequently change on the inside. Boundaries appear diffused in heterogeneous communities, making their identification difficult, but when a community meets another group, boundaries are triggered.

It is much the same sentiment of distinctiveness that leads communities and ethnic groups to the reassertion of reaffirmation of their boundaries (Cohen 1985, 40).

Reassertion, self-identification and strengthening of the self are elements that shape boundaries. Boundaries become manifest because communities interact in some way or other with entities from which they are or wish to be distinguished (Cohen 1985; Brint 2001; Alexander, Edwards et al. 2007).

Disasters happen in a specific place, together with customs, value system and practices of the affected community. Complex social fabrics shape small geographical communities, therefore responses to disastrous events have different understandings and ways of coping, elaborated by the social groups within it.

2.6.3. Flash Floods in Small Geographical Communities

Scale is important in relation to disasters. Various response agencies, as well as international agencies allocate generous resources to those disasters in which a

large number of population is affected. The differentiated impacts of disasters are highly visible on a large scale.

The UNISDR Global Assessment Report 2008 suggests that it is important to consider the accumulated losses in small-scale disasters, which are repeatedly, and widely distributed due to the lack of attention, which implies that losses in small-scale disasters are greater than the large-scale disasters.

Agricultural societies obtain benefits from the materials and processes resulting from floods (OAS 1991). Floods play an important role in moving sediments and organic material to flood plains as well as in generating a series of regenerative events on aquatic and terrestrial biota. Floods are events that occur in lowlands, in alluvial areas or river mouths. Societies that develop around rivers and lakes, learn how to benefit from the cycles of these water bodies. The rainy season means an increase in river flow, which is generally related to the start of sowing season. The floodwaters of rivers drag nutrients from upland areas, which then moisten and enrich the land (OAS 1991; Lake 2007) .

Most cultures that live near water bodies have developed inventive systems of drainage and water diversion, thereby avoiding the severe impact of floodwater. In this context, local knowledge of the surrounding environmental elements has been a significant factor in developing a positive relationship with floods (Robertson and McGee 2003). Once the natural or artificial boundaries of a river, lake or bay are exceeded, flooding occurs. Floods related to inland waters are: river floods, urban floods and flash floods. River floods are related to water overflow caused by heavy rain, urban flooding is generally related to clogging in drainage systems. Severe storms in combination with soil conditions can cause flash floods (OAS 1991).

Rain is generally the main source of river and lake overflow. Meso-scale Convective Systems (MCSs) are meteorological events related with flash floods, tornados and hail.

Flash floods result from the concatenation of special meteorological and hydrological conditions. Heavy convective precipitation is not a sufficient condition for a flash flood, but it is necessary (Doswell 1996, 1).

In general, flash floods take place in mountainous zones, where strong and abundant streams of water flow downwards through narrow canyons and slopes. Flash floods drag soil, vegetation, trees, rocks and debris which, related to the strength of water currents, create a severe impact on the communities situated in the floodplains (Knapp 1989). Research on flash floods has analysed the physical and meteorological conditions that lead to the development of flash floods during the night; an important element in the design of policies for emergency and disaster prevention.

Research in the field of flash floods has found that the amount of rainwater that falls during a flash flood event is usually similar to other (non-flood) years; therefore there is no direct relationship between the amount of rainfall and flash floods. The authors point out the need for further modelling of rainfall and runoff patterns, by using radar and satellite technologies (Ruin, Creutin et al. 2008).

Evidence in this area highlights how difficult and expensive it is to track flash floods, since it is necessary to have a high degree of accuracy, real time monitoring, and expensive technology, as flash floods are not easy to predict (Das, Ashrit et al. 2006). The fact that these events take place in small geographic areas involves cost-benefit considerations in relation to financial support for research development, as well as in decision-making (Knapp 1989; Doswell III, Brooks et al. 1996; Ruin, Creutin et al. 2008).

Recently, literature on vulnerability and local knowledge has suggested the integration of local knowledge in policy-making. (Gertler and Wolfe 2004; Shanley 2006). A first attempt in the meteorological area has been undertaken in the United States with the use of storm spotters. These are human resources trained by the Federal Emergency Management (FEMA) in identifying different meteorological events by following meteorological signs; they learn to 'read' the sky. The storm-spotter's function is to send real-time information about meteorological events to local and national authorities. Such information is cross-checked with information from radars and meteorological stations (Stensrud, Xue et al. 2008). Even though storm spotters have been challenged by the imprecision

of their observations, the information they provide is relevant to prevention and emergency-response agencies, so that weather events that involve a high degree of uncertainty or inconsistency can be addressed.

In general, the focus of disaster-prevention policies emphasizes the naturalistic and environmental degradation discourse. Therefore, policy is oriented to solve those issues whilst ignoring the social, cultural and economic conditions as the main forces that induce certain groups to live in unsafe places. People in disaster-prone areas are often blamed for contributing to the generation of their own risk factor (Blaikie, Cannon et al. 2004).

To the date, there has not been much research into the geographical, physical and meteorological factors that trigger flash floods. Small villages are affected annually by these events. Local civil protection agencies do not have the resources required to cope with these emergencies, so their response capabilities are constantly exceeded.

Large-scale disasters attract the attention of various stakeholders such as the media, international aid agencies, non-governmental offices (NGOs) and officer institutions. However, when a disaster takes place in a small community that does not meet the criteria established by international agencies, these are left unattended, excluded or not considered (Cross 2001).

Total losses from small and more frequent events are as great as larger well-publicized disasters, and natural areas often 'suffer greater proportional and numerical losses than urban areas affected by the same disaster occurrence (Cross 2001, 64).

Small communities suffer from greater vulnerability to disasters due to a lack of resources of all kinds, established public policies and appropriate infrastructure. In general, most affected communities are those in the rural-urban transition with poor economic conditions, mainly occupying risky, unsafe and informal developments, which lack basic public services (Cross 2001; Pelling and Uitto 2001; Rautela 2006).

Small-scale disasters are more frequent in comparison to larger and occasional disasters in big cities. The impact on small communities is great, and recovery

and reconstruction are slow or never completed in their actual physical and social dimensions, thereby generating a progressive accumulation of vulnerability (Wisner and Luce 1993; Cannon 2000; Cross 2001; Wisner, Blaikie et al. 2004).

To summarise, small communities do not have the same influence, visibility and support as those cities affected by extreme disasters (Blaikie, Cannon et al. 2004). Their economy is weak and the institutional support is inefficient. The lack of meteorological and social knowledge, in relation to flash-flood dynamics means that mountainous regions with a large number of small communities are prone to experience them frequently.

2.7. Diverse Communities, Multiple Modernities

Although it is not the intention of this study to discuss modernity in depth, when addressing the concept of community, it appears necessary to discuss it, as this research has been conducted in a community where it is possible to recognise elements of the indigenous tradition and of industrial urban modernity.

There is a general assumption that modernity destroys community but Cohen (1985) denies this. From his point of view, it is a fallacy to consider that modernity breaks community ties; he considers that the features of community can survive industrialization and urbanisation.

Research into this area considers the possibility of finding multiple levels of modernisation in a society. There have been various forms of appropriation and adaptation of modernity values and practices in different nations, because of the interconnected nature of it (Delanty 2006). Eisenstadt (2000) suggests that it is possible to find islands of western modernity, co-existing with traditional societies.

Modernity, in the widest sense means increased rational governance in the form of bureaucracies, market orientation, individualization, and secularization (Linden 2005; Delanty 2006). The core values of modernisation, including the control of nature, human autonomy and freedom, have been frequently accompanied by technocratic practices and solutions. All of this has led to

society's subordination to science and technology, accompanied with the disempowering effect on communities' local knowledge, establishing the supremacy of those who develop highly-valued scientific knowledge.

Modernisation has been appropriated in different ways by societies, but most times has been aggressively imposed by local elites, such are the cases of Latin America, Asia and Africa (Linden 2005; Escobar 2007). It seems appropriate to say that in the case of Latin America, most of the region is modernised, but at the same time it has managed to maintain many features of its indigenous identity, which did not entirely disappear under colonisation. Colonisation was (and I would say remains) the pathway taken to institute the modernising project in the region (Larraín 2005; Linden 2005; Delanty 2006; Domingues 2006).

When discussing the project of modernity and its features in Latin America, its violent imposition on indigenous communities emerges; after centuries, modernisation has not fulfilled the promise of better economies and welfare. Urban processes have not brought benefits for the majority of the poor in these new societies. Poor people, often with an indigenous background have not benefitted from this transformation, in fact it is possible to find the replacement of rural poverty by a more modern form of urban misery (Larraín 2005; Linden 2005).

In the Latin American case, modernity has created great disparities. Even when it is possible to observe improvements in living standards and urban infrastructure, when analysed in detail, it is possible to observe the wide gaps remaining between those who have benefitted from modernization and those affected by the grossly inefficient and oppressive governments (Linden 2005; Domingues 2006).

The last 30 years, in Latin America and much of the world, have been characterized by neoliberalism as the dominant ideological and economic power, as well as by the rules imposed by funding organisations like the World Bank and the International Monetary Fund. These conditions have exacerbated the gap between the poor and the rich, which has led to further deterioration of the general conditions creating vulnerability to disasters.

Moreover, on the political side Latin American governments are constituted by kleptocratic, technocratic elites (Linden 2005). Public policy in these cases is not oriented to substantially improve the living conditions of the poor.

...poor nation-states and their citizens have little to gain and much to lose from these changes. For them, the nation-state has little power, or what power it has is predatory, and they are trapped between the impotence of the local, and the apparent omnipotence of the global (Ian 2005, 148).

Public policy in this case, is not directed to substantially improving poor people's conditions, or to engage policies that have a charitable character, which has led to great corruption at all levels and to institutional failure.

2.8. Summary

In conclusion, it can be said that natural disasters are not acts of God or misfortune. Disasters occur where there are human societies affected by them. The combination of geophysical events and social conditions make societies vulnerable to the impacts of hazardous events.

Vulnerability is a useful theoretical framework used to explain the role that different elements play in the social dimension, creating a differential impact of disasters in societies, and how these conditions have evolved. Recent theoretical approaches to vulnerability advocate a multidisciplinary approach as a means to have a complete analysis of disasters.

In relation to floods, much emphasis has been placed on the geographical aspect, so decision-making is oriented to solve these problems. Nevertheless, it is necessary to analyse the impact of floods at the community level and its internal dynamics. An important aspect of disasters is related to the size of geographical areas. Policies are designed based on cost-benefit rationality, and small areas are partially attended or not attended at all, as they do not represent a large number of people.

In the case of flash floods, to date, there has not been enough scientific research to explain many of the meteorological aspects involved. For instance, the geographical areas impacted by this type of event are evaluated in cost-benefit terms, so economic and human resources are oriented solely to assist in the most

extreme events. In this sense, much of the resilience of affected communities lies in their own resources, so their community features and its social fabric are crucial to their own recovery.

Most research in disaster areas has been carried out by using two basic perspectives: vulnerability and risk. These approaches have led to complementary theories of resilience. These theories help inform our understanding regarding the social processes behind a disaster, or the likelihood that hazards become disasters. From my point of view, vulnerability theory provides the elements that explain the reasons behind a disastrous event. In general, vulnerability theory has been used to explain conditions in developing countries; however it has been successful in explaining the effects of disasters on the multiple social groups that constitute the societies of developed countries.

The vulnerability perspective is primarily related to the social and physical components that give rise to a disaster; it is centred in society and their coping mechanisms, as well as the role played by different actors, in the construction and response to an event of this type. Much of the literature in this area is focused on the socio-economic, political and spatial side of the process, each one separately. This has allowed a comprehensive understanding of each of these aspects. The latest research in the area of disaster vulnerability has focused on understanding the local knowledge and practices of the groups affected by natural disasters, but have remained at the micro level.

An attempt to develop research at the meso level has been developed by Hilhorst (2004). She proposed the following domains: local knowledge, science and technology, and the domain of governance, all of them traversed by the dimensions suggested in the vulnerability theory. This is the first attempt to analyse in a systemic and holistic fashion how different domains interact in a disaster, setting conflict and negotiations exchange, when worldviews interact with each other.

Hilhorst's proposal was influenced by the European research into the actor-oriented approach. It included the actor's point of view to the macro-structural

approach on vulnerability, placing it at the meso level of communities. Nevertheless, the proposal, being restricted to only three social domains, lost sight of a number of factors which influenced the understandings, practices and discourses of the actors involved. It then became viable in Adele Clarke's proposal on Situational Analysis; this approach combined the material elements interacting in a disaster situation, together with the different actors and macro-structural dimensions playing in the unit of analysis of the arena in which a disaster situation was taking place.

2.8.1. Theoretical Questions for Research

Based on the previous ideas exposed, it is noted that disasters are the result of a process in which risk plus a combination of social factors, create the vulnerability to experience them. Based on Hilhorst's proposal, the dimensions that influence the process of vulnerability to disasters, as well as the three social domains that she considers for disaster analysis are included in this study. I am analysing the practices, understandings and knowledge of the actors in a disaster arena, together with the aspects that lead to decision-making. Here I am presenting the theoretical questions guiding my work in the field:

How do different social dimensions interplay in a disaster arena and what is the nature of these relationships?

How do the understandings, local knowledge and practices of the relevant actors who belong to different social worlds, contribute to the analysis of a disaster arena?

To what extent do understandings, local knowledge and practices contribute to reducing vulnerability?

Chapter III

The Situational Analysis Framework

3.1. Introduction

In the previous chapter, I reviewed the relevant literature related to disasters and vulnerability the main themes of this study. I also outlined the research questions to be addressed. In this chapter, I analyse the methodological approaches that were used to conduct the fieldwork. In this study, I used the Situational Analysis (SA) approach as a methodological framework based on Grounded Theory. The approach is useful uncovering key non-human elements and discourses, integrating the macro-structures and conditions characterising the situation under inquiry.

Qualitative research has achieved a research space by itself, the methods it offers, are based on philosophical approaches, related to how the world is understood, either realism or constructivism.

Constructivism assumes the relativism of multiple social realities, recognizes the mutual creation of knowledge by the viewer and the viewed, and aims toward interpretive understanding of subjects' meanings (Charmaz and Smith 2003, 250).

The selection of methods, is in close relationship with researcher's assumptions regarding how to address the reality, in this case, as discussed in the previous chapter, disasters are socially constructed, so the tools used in this research are oriented to grasp the variety of understandings about the floods, from the different actors who converge in a disaster arena.

In the SA framework, the situation per se becomes the unit of analysis, the case under study, the main objective is to understand the role of the different elements, actors, and dimension and their relationships (Clarke 2005, xxii). This approach allowed me to capture the actions, understandings, discourses and knowledges of the different actors within a disaster arena. It became relevant

to observe the role that material objects play in a disaster arena, which, in the case of the social domains approach suggested by Hilhorst (2004), had not previously been considered. Likewise, the SA approach apprehend the different areas of knowledge produced and consumed by those particular groups, in a given space and time.

In this chapter, I describe the different aspects of the research methodology, including design, strategies and data collection, and also how the data were analysed. I conclude this chapter by showing how I addressed the limitations associated with the design chosen for this research.

3.2. The of Situational Analysis Approach

The methodological framework used to understand vulnerability in a disaster analysis is Situational Analysis (SA). Vulnerability analysis requires a multidisciplinary, bottom-up methodological design, where different knowledges, actors and dimensions can be included in the analysis of natural disasters. The methodological structure of Situational Analysis embraces all the different knowledges, understandings, actors and non-human elements involved in influencing decision-making. Situational Analysis helps to separate and clarify the complex social processes that occur within social worlds, which are continually rebuilt throughout the course of negotiations and disputes among the actors. The methods selected, following the qualitative tradition, have given me access to the different practices and knowledges of the studied community.

In this case, my concern is on the usefulness and applicability of Situational Analysis, based on the qualitative approach (Clarke 2005). Situational Analysis has not previously been used to explore the arena of natural disasters. Since, it has its roots in health and technology studies, therefore I think it is also relevant to apply this methodology to the disaster field.

Arising from the qualitative tradition of Glasser and Strauss (1967), Situational Analysis is Clarke's (2005) proposal to re-address some basic components of Grounded Theory by integrating the post-modern perspective, including the material world as part of the interpretation and analysis.

The groundness of good traditional grounded theorizing is not only in the data per se but I would argue, most deeply in the seriousness of the analyst's commitment to representing all understandings, all knowledge (s) and action (s) of those studied as well as their own perspective (3).

Grounded Theory and Situational Analysis deconstruct the problem under study in quite different ways; Situational Analysis separates the different elements and actors present in a specific arena to later reintegrate them in a multidimensional analysis. Situational Analysis (SA) is a feasible tool for analysing floods. It provides elements to aid in the understanding of a wide range of logics, assumptions, interests and positions assumed by the actors. It also allows insights into how individual actors give unique meanings to the situations they face.

SA has been applied to understand the convergence of science and technology in the health arena. Clarke's contribution is the application of SA in providing a platform for the different discourses, interests, practices and intentions of the parties involved in arenas such as abortion, women's health, or health technology (Clarke and Montini 1993; Clarke, Shim et al. 2003; Clarke 2007).

The main elements that Situational Analysis offers could be summarized as follows:

- Offers understanding in a dynamic fashion, of the different ways in which actors interact inside a specific arena, in this case a disaster arena
- Highlights different knowledges, understanding and practices of the social worlds interacting inside the arena
- Includes non human elements playing a role in the arena and importantly shaping discourses and practices of actors in the arena under study
- Provides understanding on the different conditions creating interfaces among social worlds
- Uncovers issues of power among the different social worlds interacting
- Exposes how different dimensions (temporal, spatial or socioeconomic) play a distinctive role inside an arena

Clarke (2005) finds Foucault's power approach relevant, based on the historical tracking of given facts. She integrates power in the context of an analysed situation, in order to understand which voices are muted or amplified, instead of solely considering the power struggles. In the field of natural disasters, issues of power in decision-making and disaster response have been extensively studied in relation to women, children and individuals who are typically disempowered. Constraints on decision-making, interests and practices by government officers have also been extensively studied (Fordham 1998; Clifton and Gell 2001; Felten-Biermann 2006).

An important aspect to note is that SA methodology has been effective in disentangling the different positions of involved groups, making clear that an arena of study is composed of multiple actors, elements and different dimensions. SA has the merit of integrating the role played by the silenced voices, those who are normally hidden or not considered, as viable actors, into the analysis, thereby highlighting the issues of power that prevail in decision-making.

3.3. Situational Analysis and Social Interfaces in a Flood Arena

There are several different perspectives through which the floods phenomenon has been studied, ranging from the quantitative perspective that measures the economic and material conditions in the aftermath of a disaster; to the qualitative methodologies that, use ethnography and participant observation, to analyse the meanings and understandings of those experiencing a disaster situation. In the case of floods, different social worlds base their decision-making, influenced by their own understandings of the situation, it is possible to track each social world's power and resistance paths by following the process of decision making.

Dimensions are the elements added to this methodology, which were previously discussed in the theoretical review in relation to Hilhorst (2004) proposal. The spatial, temporal, social and discourse dimensions enrich the analytical capabilities of Situation Analysis, giving different perspectives on the outcomes, practices and rationalities of the actors involved.

Thus, the analysis of floods and the generation of vulnerability, through the tracking of the historical, geographical and social origins, play a crucial role when reconnected with the actors' discourses, making possible to understand how different dimensions and social worlds intertwine to generate vulnerability (Wisner and Luce 1993; Long 2002; Clarke 2005; Cannon 2008).

The methodological framework of SA includes different knowledges in the field of natural disasters, whether they are related to science and technology, or to those that are produced by the actors experiencing the actual event. The different ways by which the actors express and circulate this knowledge, is through discourse, which can take various forms. Clarke suggests analysing the different forms of discourse, either visual, textual or audible, drawing on Foucault's (1980) discourse analysis, and by integrating the analytics of Strauss's (1990) proposal.

In a SA of natural disasters, the event itself plays an important role, therefore studying the binary human/non-human interaction is important. The event itself determines the actions of individuals and the generation of action. Thus, floods themselves are a feature of interest because of the ways affected individuals interact with the situation and between them.

The methodological proposal of SA becomes visible in the social world maps, by discussing and capturing the complexity of the situation, different knowledges, power struggles and actors are represented. Clarke (2005) proposes three types of maps: situational, social worlds and positional maps. The first two establish interrelationship by reflecting the different elements within a situation. Social world maps reflect the conditions of collective actors and the arenas in which they establish their compromises, and the areas where they can engage in negotiations and discourses. Positional maps refer to the different positions that discourses take, all of them in relation to data. The main objective is to represent the full range of discourses and issues in order to discover diversity and contradictions.

3.3.1 Social Worlds Definition

Conventionally, social worlds have been defined as units of social action, i.e. shared commitments to certain activities (Mark and Poltrock 2003). With the intention of revitalising the Social Worlds approach, Clarke (2005) accepts the influences of the post-modern theoretical and methodological approaches, separating the social process,/action whilst including arenas, negotiations, and discourses as alternative components.

Producing discourses is a form of social action: 'Discourse is language use relative to social, political and cultural formations- it is language reflecting social order but also language shaping the social order and social individual's interaction with society [Jaworsky and Coupland 1999a: 3]' (148).

Following Glaser and Strauss, Clarke (2005) distinguishes the significance of context/situadness in analysing social phenomena. The core concept of social worlds highlights the importance of the collective actors, the non-human elements and the commitment present in discourse and negotiation. Social worlds are groups sharing commitments, resources and ideologies in order to achieve certain objectives. People move in and out of different Social Worlds, changing activities, social contexts and reference groups; there is interdependency amongst them (Mark and Poltrock 2003; Eriksson and Aronsson 2004).

Social worlds are incorporated in SA when situated knowledges are considered, as social worlds are produced by particular groups of people, historically and geographically placed, including non-human and hybrid actors (Clarke 2005).

...Structuralism shows meanings to be decentred and external to individual. Post-structuralism shows meanings to be shifting, receding, fracturing, incomplete, dispersed and deferred (Macnaughton 2005, 81).

Inside social worlds, there are points of convergence; attachment points which Clarke calls sub-worlds. Using the actor-oriented perspective, this combination of worlds is called social interfaces.

Actors and non-human elements are present in more than one social world, so the patterns of commitment, solidarity and practices change, rearrange and realign. Two or more intersecting social worlds create a new social world, so

there are infinite numbers of new worlds, for that reason Clarke (2005) suggests defining and choosing relevant stories to tell in the arena under study.

There is an element that Clarke (2005) has not included in the proposed Situational Analysis, which is related to the examination of the reasons why worlds converge or conflict. In this sense, social interfaces (Long 2001) appear as an explanatory tool delimiting social worlds.

3.3.2. Social Interfaces Definition

Social interfaces can contribute to the SA analysis framework; in this case the social worlds tend to converge, constantly creating new worlds and constellating with different arenas. In relation to this, Long's proposal enriches the Situational Analysis framework, as, through social interfaces, it is possible to study social interaction points; the areas of social divergence and the cultural interpretations of power and knowledge, which are processed or perpetuated by critical points of attachment or confrontation (Long 2001).

Furthermore Situational Analysis states that new social worlds are created when two or more overlap. However, the social interface concept highlights convergence, opposition and disagreement, but also highlights divergence within connection points. From this perspective, the objective of social interfaces is to elucidate the types and sources of social discontinuity, as well as to elucidate the links present in such situations, thus aiming to identify organisational and cultural meanings of reproduction and transformation.

Interface analysis focuses on the linkages and networks that develop between individuals or parties rather than on individual or group strategies. Continued interaction encourages the development of boundaries and shared expectations that shape the interaction of the participants so that, over time, the interface itself becomes an organized entity of interlocking relationships and intentionality (Long 2001, 69).

This methodological element seems appropriate for a deeper understanding of the social arenas since it is precisely at those points of connection in social worlds where the greatest richness lies.

The analysis of social interfaces aims to understand the discontinuities and binding sites present in such situations by identifying the organisational and cultural means of reproduction and transformation. Likewise, by locating social interfaces, it is possible to explore the elements of power and knowledge that are mediated or perpetuated on critical intersection points. Social interfaces involve a degree of common interest, but can become controversial due to the conflicting objectives of the unequal power relations within (Long 2002).

Various types of knowledge, including perceptions about oneself, other people, the context and social institutions, are important in understanding social interfaces. Knowledge is present in all social situations and is often entangled with power relations and the distribution of resources.

...'battlefields of knowledge' was chosen to convey the idea of contested arenas in which actors' understandings, interests and values are pitched against each other... that struggles over social meanings and practices take place. It is here too, where we see most clearly the emergence of various kinds of negotiated orders, accommodations, oppositions, separations and contradictions. Such battlefields arise within and across many different institutional domains and arenas of social action. (Long 2002, 42)

Power, like knowledge, is not simply possessed, accumulated and exercised. Power implies much more than hierarchies and hegemonic control. It establishes social positions and opportunities, whilst restricting access to some resources. Power is the outcome of complex struggles and negotiations through authority, status, reputation and resources, however, it is dependent on networks (Foucault and Gordon 1980; Long 2001; Clarke 2005). In a similar way to the social worlds' approach, the social interfaces' perspective considers discourse as a central element incorporating meanings, images and power.

Discourses may belong to institutions such as the state, the World Bank or the local community, but it is actors who use them, manipulate them and transform them (Long 2001, 53).

Through the recognition of social interfaces, it is possible to understand how dominant discourses are authorized, converted or confronted, thus, it helps to understand the wide range of strategies, political avenues and cultural strategies undertaken by the social actors. Discursive practices and competencies primarily develop within the circumstances of everyday social life, which become salient at

critical points of discontinuity between the actors' social worlds. It is through the lenses of social interfaces that these processes can best be captured conceptually.

3.4. Research Design

Methods for data collection were applied following the qualitative tradition, importantly the single case study was a particular entity, through which the complex relationships of the community were captured, together with the understandings and knowledge of the various actors involved in the social arena of disaster. To achieve this purpose, a semi-participant observation, a semi-structured in-depth interview and a pair of panels were conducted.

3.4.1. Field Work at The Village. The Only Case Study

A case study was considered in the research design, and a village situated at the Upper Lerma River Basin was selected to carry out an in-depth analysis and gain full understanding of this flooding site. It seems important to justify why I chose a single case study, rather than considering a comparative study. This research was designed as a case study in a peri urban area affected by flash floods, flooding is the case itself. The objective was to analyse the different roles of the actors and non human elements in the arena of disaster, their perceptions, understandings, practices and knowledges. Throughout the development of this case study, three social worlds were the most salient in this arena of study, a traditional community, an emergent community and the governmental institutions. It does not mean that other actors were not present.

Situational analysis (Clarke 2005) suggests selecting and analyzing the relevant actors in the arena under study, in order to achieve a deeper understanding of them. It was a great and challenging coincidence that two of the salient actors had a geographical reference and at the same time they were very different between them. Nevertheless the disaster as the core unit of analysis provided the elements through which the salient actors could be analyzed.

Much of the literature on case studies indicates that a single case study is exploratory research, or that it is inconclusive, as that it is not possible to create generalisations from it.

Flyvbjerg (2006), in an insightful study on case studies, details the elements, which he calls misunderstandings that have led this type of methodology to be considered a failure.

CASE STUDY MISUNDERSTANDINGS	
1	General, theoretical (context-independent) knowledge is more valuable than concrete, practical (context-dependent) knowledge.
2	One cannot generalize on the basis of an individual case; therefore, the case study cannot contribute to scientific development.
3	The case study is most useful for generating hypotheses; that is, in the first stage of the total research process, whereas other methods are more suitable for hypotheses- testing and theory building.
4	The case study contains a bias toward verification, that is, a tendency to confirm the researcher's preconceived notions.
5	It is often difficult to summarize and develop general propositions and theories on the basis of specific case studies.

Table 3: Misunderstandings on Case Study Research (Flyvbjerg 2006)

In general, the literature advocates a comparative approach towards case studies, considering that the factors mentioned above, contest the quality of case study research as well as the results that it can achieve (Yin 2008).

In this sense, Cohen (1985) notes that requiring comparisons between case studies does not have any basis, because the comparative and conceptual framework, as well as the correspondences, start with the assumption that convergence can be found, which is in the mind of the researcher, his/her own assumptions guiding what is comparable in these cases.

The objective of case studies, is to understand and grasp the complexity and deep meanings of the involved agents, expressed through the social practices and knowledge. In this sense, case studies present the in-depth points of view of those under study; thus, generalisation may include different views, on the one hand, the impossibility of generalising can be called into question, but on the other hand, single case studies can help to avoid generalisations being applied indiscriminately in all cases.

A case study is expected to catch the complexity of a single case. A single leaf, even a single toothpick has unique complexities – but rarely will we care enough to submit it to case study. We study a case when it itself is of very special interest (Stake 1999, xi).

A fundamental element of sociological research is to understand the object of study, its nature and its properties with the intention of learning and grasping its internal dynamics. Stake (1999) considers that these properties can be understood as *petites generalisations* applied to a case study.

Meanwhile, Flyverg considers that in the case of social sciences findings are in reference to the context, and therefore, in the final instance, have nothing more to offer than concrete, context-dependent knowledge, the case study is especially well-suited to produce this knowledge (Flyverg 2006, 223).

Predictive theories and universals cannot be found in the study of human affairs. Concrete, context-dependent knowledge is, therefore, more valuable than the vain search for predictive theories and universals (224).

In relation to the researcher's subjectivity and assumptions in a case study, it is important to note that the qualitative researcher, in most cases, reports how his/her personal motivations, prejudices and feelings are important factors when addressing the findings. In this sense, subjectivity is always a restraining element that the researcher is always dealing and negotiating with. In this research, subjectivity is an element clearly presented throughout all the research phases and is never overlooked or deliberately hidden.

In the field, we develop empathy or antipathy for our subjects; yet we observe and record with the cold dispassion of a physicist. It becomes necessary to live in both worlds, motivated and affected by genuine subjective feelings...that grow up in all intimate human contact, yet able to drawback sufficiently to treat ones' subject in sociological terms (Harper 1992, 151).

Case studies allow in-depth understanding of societal complexities, situations that disappear when trying to cover multiple communities with different social dimensions affecting them in different ways.

3.4.1.1 Field work at The Village. The Only Case Study

The area where this study was carried on would be called The Village from now and onwards, to conceal and protect the identity of those people who agreed to

give interviews. I selected this community after a documentary review I did in relation to floods in Mexico, particularly flash floods in peri urban communities, since this field has not been studied in depth from the social and natural sciences perspective. I did fieldwork for eight months, commuting to the village almost every day, as well as to Mexico City and to the capital of the state; doing documentary research and visiting neighbouring communities. The Village is located in an area that comprises a wide region that was formerly a lake. The upper Lerma river basin on its origin area (ULRBO). The Village has faced severe floods, the surrounding villages also often experience floods; nevertheless, the last one in 2004 covered a bigger area of it. State and local emergency services were so overwhelmed that it became necessary to apply the national emergency plan DN-III. This plan has been implemented as a response in truly extreme events such as the Tabasco floods in 2008, and the Mexico City earthquake in 1985 among other extreme disasters. The application of the DN-III in this small village, present a different perspective of how disaster emergency services operate in Mexico. The national TV news broadcast covered the last flood event in 2004, politicians and members of the local parliament donated some money, the inhabitants of the village mobilise themselves to get benefits arguing differentiated access to financial support. I gather information since the first moment I get in touch with this case.

Moreover, by making contact with the municipality to which the Village is attached, I was offered support such as escorting municipal fieldwork visits, which gave me access to the area and a better understanding of the geographical site. Officers introduced me with locals in The Village where this case is based, but also with people of surrounding towns, as well as *campesinos* farming on the mountain tops, local leaders in the valleys, and to people affected by other flooding events in the neighbouring villages.

Officers allowed me access to information that was not considered as classified, such as leaflets, annual reports to citizens and institutional magazines. The municipal officers and the delegates from the village were interested in my research, which made them accessible. During their field visits to different

locations on the banks of The Village river, they always introduced me to people who could give me information or could link me with other people. The objectives of my visit were principally to understand the social, historical, political and geographical facts that influence people's decisions when they coexist in a place, as well as to observe the different strategies in place for coping with floods. The case study, in this context, emerged as the best choice, given the amount of information that flowed from the different sources.

Next I present a fieldwork timeline; it includes the different stages of the research at that stage and throughout data analysis. The most difficult parts of the process were the starting point of introducing myself and gaining trust from people at The Village and self-confidence, as well as the transcription of the interviews.

During the first months I did documentary research in order to have a wider idea of the place, the event and the different actors involved according to the news reports. As soon as I considered I had enough information I went to the Social Development Office at the municipality. According to the collected data, this office is in charge of distributing aids for disaster relief as well as financing housing for disadvantaged people. The next step was related with the interviews and semi participant observation. At the beginning I tried to follow an interview scheme that resulted ineffective and restrictive. Panels were planned for the end of the fieldwork once people trusted me, and I had good knowledge about the situation, the particularities will be described later. The longest part of the process was the transcription and analysis of the data, because of the poor quality of the recordings and the abilities required to manage that huge amount of information.

3.5. The Researcher's Positionality

Different claims about the objectivity and reliability of qualitative research, criticise it as an inappropriate rhetorical device (Strauss and Corbin 1990; Madill, Jordan et al. 2000) Qualitative researchers sustain that both the researcher's and interviewee's subjectivity frame any interview, information and data analysis; which renders the research process dynamic The analysis of any material is part of an interpretive process, in which the ideology of the researcher is present, and so different explanations are possible (Holstein and Gubrium 1995; Henwood, Pidgeon et al. 2008). Therefore, interpretations cannot be regarded as indisputable truths, since they operate in particular areas of significance (Madill, Jordan et al. 2000).

In order to achieve reliability, it is desirable to disentangle my own position as researcher, to facilitate the reader understanding on the ideas and politics behind this research. I am a young, educated, middle-class, adult woman. I am 'white' in Mexican terms, which means that it is possible to trace foreign ancestry, and I also have a complicated name, which reinforces that view. This simple fact is

important when approaching people, because of the prevailing idea of white urban people being considered as pretentious or with patronising attitudes.

At the beginning of my fieldwork, I introduced myself as a PhD student at the University of East Anglia (UEA). For most people in the village, the UEA was a mythical place; some people even suggesting it was my own invention. They sought confirmation and evidence by questioning me about life in the UK, famous people, and by demanding pictures. Because of this, I got permission from the local university to introduce myself as one of its students.

I am a person who is critical of the authoritarian culture that is part of everyday life in Mexico. I feel there is an assumed, patronising attitude toward women and those who are regarded as inferior (either for social or economic reasons), by those with whom I had to negotiate during fieldwork. I often found these prejudices disturbing and felt disgusting and uncomfortable during my research, coming in the main from those in positions of power. Paradoxically, I noticed the same attitude in me towards the people of the village, when they were confronted by my well-educated, middle-class status I caught myself thinking about the locals as ignorant. Therefore, I had to be very wary of that, avoiding appearing to be patronising or offering undue advice.

My theoretical assumptions and prejudices framed my initial approach towards the research site. The theoretical review that I had developed in England, inferred that the most vulnerable communities were poor, illiterate squatters, abused by corrupt authorities or leaders. I had also considered that floods were central in their daily life, I was looking for people asking some researcher (Zaman and Haque 1991; Poncelet 1997; Tjora 2006; Jones 2008).

In addition, my urban, middle-class, educated mentality had made me think of the people in those communities as docile, simple and disinterested in improving their own conditions, whilst assuming that empowerment, confidence and self-organisation were the necessary tools for building strong communities; contradictions that I discovered during this process, a mixture of classism and criticism towards the system.

I found similar prejudices among government officers, and even amongst many colleagues. Some of them gave simplistic explanations, stating that poverty and ignorance are the main determinants of vulnerability, others criticised me for advocating empowerment and confidence among *that* people.

Throughout my research, however, I discovered a dynamic world within the village, with rich history and culture. The traditional community had reinforced their bonds and had resisted the onslaught of the dominant culture in creative ways, adapting everyday to global urban culture as they had done during the Spanish colonisation.

I also discovered another type of community sharing the space with the traditional community, the emergent, which has TV-influenced shaped urban aspirations, living on credit, brands and status. In general those inhabitants assume a negative attitude towards those traditional villagers who choose to maintain their traditional customs and values. Nevertheless, in regard to the authorities, the people from the emergent communities perceive themselves as disadvantaged and poor, because of their need of governmental housing support. I found this emergent community to be organised and relying on one leader; a community that, over time, could be consolidated or fragmented by its own contradictions.

However, I am trying to understand my own contradictions, and I am now personally working on them. I can now confirm that there are good reasons for using qualitative research as a tool for empowering people, and through listening to their knowledge, the academic world is nourished and enriched by their voices; the result could be a better and fairer world.

3.6. Semi-Participant Observation

Observation is part of the 'invisible work' of research (Clarke 2005).

Various authors have upheld that observations and interviews are related because in both the researcher is an observer and a participant (Tjora 2006). Considering that the participant's observation requires complete involvement in the village's activities, I developed semi-participant observation strategies, because I was not

living in the village full-time, and I was also an external spectator at some daily activities and religious festivities.

In some ways semi-participant observation was an unobtrusive approach towards the community, used to gather information about their particular understandings and practices. It provided meaningful information about the level of community involvement and the individuals' participation within it.

The aim of semi-participant observation was to gain a better understanding of the conditions and environment of the groups involved (Cooper, Lewis et al. 2004). Observation, as a research strategy, aims to gather information and data from the point of view of the people under study (Hammersley and Atkinson 2007), through close relations with communities or individuals, in their daily lives (Friedrichs and Lüdtke 1975).

Denzin (1998) suggested that observation is associated with subjectivity, which depends on the context; the social position as well as the geographical position of the observer. The salience of an observation is related to the interpretative and explicative activity of the researcher.

3.7. Semi Structured In-Depth Interview

In-depth interview is a way of collecting information; it is designed to give deep insights into the experiences, meanings, beliefs and expectations of the interviewees, and is structured around a set of topics. Interviews of this type allow the interviewer to take a more sensitive approach to relevant issues. In depth interviews disclose people's judgment, feelings and routines, key issues are disclosed in in-depth interviews. Interview in the semi-structured fashion is flexible, it promotes the explanation of the reasons underlying a problem or a practice in specific groups. Research suggests that in-depth interview should target underlying structures and causal mechanisms of social processes. However Winchester (1999) considers that for some scholars there is a need to support objectivity in order to provide an illusion of academic respectability (Kvale 1996).

Kvale (1996) suggests considering the different changes that the interview faces, bearing in mind the basic objectives. In depth interview nature, unlike other interview techniques, can gather rich and detailed data, which reflects experiences, understandings and perspectives of informants in their own social and spatial context (Kwortnik Jr 2003).

Relevant literature on the subject points out that, the interviewer and interviewee build together meanings in a dynamic fashion. The aim of the interview is to capture discourses of those involved in an arena, thus the construction of the instrument that collects information, is not objective in any case, because it is influenced by researcher's, background, however the interviewee exercises agency in the construction of knowledge about which is being inquired (Kvale 1996).

I use the term Discourse, 'with capital D' for the ways of combining and integrating language, actions, interactions, ways of thinking, believing, valuing, and using various symbols, tools and objects to enact a particular sort of socially recognizable identity (Gee 2005, 201).

Interviews disclose discourses and in depth interview is designed to capture the elements playing with language suggested by Gee (2005). Hajer and Versteeg (2005) consider that discourse reveals the role of language in different areas, as well as the actions taken. Discourse is an assemblage of ideas, concepts and categories through which meaning is given to social or physical phenomena. Discourse as stated in the previous chapter are mediated by ideologies and worldviews which guide actions. Discourses expressed by the inhabitants of The Village were successfully gathered through semi-structured in-depth interview, reaching understandings on the different ways in which people relate as well as their performed practice, their knowledge and understandings about the events under inquiry.

3.7.1. The Interviewees

Those interviewed for this study are presented below. I was introduced by a municipal officer to the first gatekeepers at the community, the following process was snow balling. Talking about the flood was not easy because the issue

brought back fears. I learned day by day how to approach the subject without being too intrusive. My lack of experience in the field did not allow me to spot relevant topics from people full of information, until I started an in-depth analysis of the data. In all cases, the names have been changed. Personal information beyond gender and approximate age were not explicitly collected; nevertheless, some data emerged during the interviews and observations. I assigned fictional names, to the people. To facilitate identification of the interviewees I put arabic numbers to members of the emergent community, capital letters to traditional community and roman numbers to other people interviewed. During account I did put the same marks in interviewees' quotations.

Emergent Community (EmC)	Traditional Community (TrC)	<i>Other</i>
<ol style="list-style-type: none"> 1. Local leader, Mr Ch. Owner of the only retail shop inside the estate 2. Mrs D* Catholic, Nurse in a public hospital 3. Mrs Mary. Catholic Divorced, recently moved there, avon and other brands sales representative 4. Family at the main Entrance* Catholic. Managers of a coffee shop in a fashion neighbouring town 5. Mrs G Catholic. Owner of a shop of building material in a neighbouring town 6. Mr L religion n/a, Physical Activity teacher at a Secondary School 7. Mrs Ranch Catholic. Lady owner of a big property next to the EmC 8. Mrs Lucy, housewife 9. Mrs R, catholic, agronomist, with a master degree, working in a rural school, against Mr. Ch 10. Mr T* catholic, the only one from the TrC, school teacher 11. Sra. Martha Catholic (Mother of 2 children) young single mother, 12. Mrs A. housewife, non Christian, with relatives in a neighbouring town, recently returned to the area 	<p>All of them Catholics</p> <ol style="list-style-type: none"> A. Delegate, women, technician in a factory B. A couple of elders, peasants, 7 children C. Don P, mayordomo, in charge of traditional dance and training to children. D. Lorry owner and his wife P retailer shop owner E. Mrs M owner of a stall in the local square, she cooks and sales traditional sweets F. Sr H (lives near the cross statute) taxi driver and peasant G. Mr J peasant and low level municipal officer H. Mr D, peasant Delegate's dad I. Mr A, elder, peasant, J. Mrs J*, elder, owner of a clothes stall in the main square K. Mr Al and his wife, owners of a fruit stall in the main square and a fruit shop in their house L. Mrs E municipal officer's grandma M. Mrs L owner of a retail shop N. Don Gap, high level officer in the municipality and peasant O. Mr S former officer in the municipality 	<ol style="list-style-type: none"> I. SEDESOL Municipality Officer, II. SEDESOL Federal Officer, III. Religious authority's son (2) IV. Urban planning practitioner V. Municipality ,Civil Protection officer VI. Municipality officer in charge of civil protection emergencies VII. State chief Officer in charge of Risk Maps design VIII. Delegate (political authority) from neighbouring town, in the middle of the catchment IX. Delegate from neighbouring town, upper side of the catchment X. Mr P, inhabitant from neighbouring town, the lowest side of the catchment area XI. 4th municipal councillor in charge of ecology, agriculture and livestock XII. Teacher from the Primary School in charge of safety XIII. Teacher 2 XIV. Municipality Chief officer of the water system XV. Chief officer in charge of meteorological stations, CONAGUA A XVI. Chief officer in charge of technical works, CONAGUA B XVII. Local Politician XVIII. Municipality officer Urban development XIX. Architect from Municipal Urban Development XX. Regional Ecology Officer XXI. Former Municipal Officer XXII. El Inge, SAGARPA officer commissioned in the municipality

*Only written notes were allowed

Table 5. List of Interviewees

3. 7. 1.1 Conducting Interviews

Many of the interviews took place at each respondent's home, or workplace whenever possible; also at food stalls, the local shop, in the street or at offices. I joined government officers during their fieldwork visits but I keep a low profile at all times. Initially, my research focused on the women in the community, I had anticipated a common bond through gender; however I found that it would take many months before that happened. In many cases, the women did not express their opinions, they waited until their husbands, fathers or brothers talked to me first, after which there was a tacit permission to speak with me. Therefore, I found it necessary to adapt to the circumstances, considering the short availability of time for the fieldwork. It is worthy of note that there are definitive gender issues in terms of vulnerability.

Most of the time I conducted the interviews alone; it was only at the beginning of my research that a friend came with me, although the participation of my companion was incidental. Many interviews were conducted in pairs and the visitors or relatives who accompanied the interviewee often enriched the content of the interviews.

In two occasions I introduced myself in an informal manner, for the interviewed it appeared uncomfortable, a stranger seeking information is not seen as a very safe or trustworthy person, unsurprisingly when considering the range of political and safety issues playing an important role in people's lives. At least three interviewees asked me not to record them; they also chose to remain anonymous and expressed that I should refrain from writing anything down during the interview. They also refused the opportunity of taking part in a further interview. In general, however, I was able to establish a good rapport with the local people, to the extent that I was invited to several personal celebrations.

All interviews were recorded by means of my mobile phone. Once permission to record had been granted, I activated the recorder. The advantage was that the mobile phone is a familiar item, so it was less intrusive for the interviewee and after a while they often forgot it was present, feeling free to discuss their

concerns and giving their views quite openly. The disadvantage was the poor recording quality, thus making transcription more difficult.

The interviews lasted about an hour; however, there are some recordings of up to three hours. In all cases, the respondents had the opportunity to ask questions or add comments. Given the limited budget, at the end of the fieldwork I bought some small token gifts to show my appreciation; simple everyday products such as tea sets, and I paid for a small traditional buffet for all the participants.

The topics addressed during interview were very general, at the very beginning I had a written list but after a while I had memorised the themes which gave me which gave me freedom to pay more attention on other relevant issues that people wanted to discuss.

Addressed Topics:

Different Dimensions of Vulnerability (presented in Chapter II)

Understanding/ Meanings/characterisation about Flash Floods

Practices for coping with Flash Floods

Ideas in relation with 'the other' and themselves

Their relation with the Institutional Organisations in relation to flooding events

Their internal organisation as a community

The role of non human elements

Actors priorities

3.8. Panels Instead of Participatory Workshop

Literature regarding vulnerability and disasters, argues, that is necessary a participatory approach, where local knowledge and practices of communities can be integrated in a policy making, likewise, this approach seeks a horizontal relationship with those in power (Wisner 2004). Having this in mind within the methods designed to gather information and in line with theory a participatory workshop was planned to include the different actors involved in the flood arena.

The aim was to elicit their views publicly, hoping it would generate a dynamic that would afford me a greater understanding of the participants in order to get some idea of how the parties involved related to each other. It was an effective way of analysing how social interfaces are created, and for observing issues of power and knowledge.

However, once in the field, the conditions changed. The Village was not homogeneous, it was basically divided into two communities in spatial and world visions: one mainly traditional (TrC) and the other emergent (EmC), both holding different perspectives but having the same common flooding problem. For the TrC community, the need to negotiate and gain sympathy from the authorities through gifts and praises was important; for the EmC community, claims of injustice, corruption and disengagement were predominant

Furthermore, the municipal officers also held divergent views, many based on politics and others concerned with their own personal self-interests. The senior-officers were unwilling to meet with village inhabitants, so a presentation was scheduled solely for municipal officers, as those officers had requested but, this was never completed.

Likewise, among officers working in emergency response and civil protection within the ranks of the operational-level there was discontent and resentment due to the limited material resources available, low wages, lack of organisation and the existence of alleged nepotism and corruption, as well as a promotion system often based on politics and friendship.

Given these conditions I decided to conduct two discussion panels, relying on the leaders to contact their neighbours. In the case of the emergent community, participation and organisation was impressive, the people became actively involved, the leader role was decisive having the community's full support. When I realised that people were showing interest in the panel, I started to make personal visits door-to-door inviting people. I also printed up a poster in which there was an extended invitation to those who I had been unable to contact personally, or who were not sympathetic to the leader.

In the traditional community, I relied on a local delegate to organize the discussion. In this case, the dynamic was quite different. Among the people I had interviewed, who had kindly agreed to spread the word about the panel, the response was poor, and only a small number of participants attended, although the delegate had gone to the square at the time of the meeting to recruit participants. Unfortunately, the people I had personally invited from the TrC community did not attend the meeting.

I also invited the municipal officers to participate in both panels. In the case of the emergent community, the civil protection operational staff was happy to attend; they made a presentation in which they distributed leaflets and gave some basic information about what to do in case of emergency. They also held a discussion with the residents about their concerns and criticisms of the response to the problem of flooding. Both sides exchanged views and frustrations; nevertheless, they achieved the establishment of common bonds that had not previously existed.

An important condition highlighted in the literature in relation to social inquiry relating in groups of people, such as focus groups is that the internal dynamics' of the group has an effect on each participant perceptions, decisions and the way how information is handled (Krueger and Casey 2009).

The panel was an improvised strategy as a result of a failed intention to conduct a participatory workshop, much of what I did, that became relevant later, was to observe and contrast how peoples' assumptions changed when confronted with the group.

3.8.1. Conducting the Panels

Initially, the main objective of the panels was to establish a common frame of reference for those directly involved; one in which all voices and points of view were heard. Given the particular characteristics of their different social worlds, and the fact that the TrC did not attend their panel in adequate numbers, these conditions were not met, so instead, I aimed to see how the flood discourses

could be clarified in a public context, what common ground the people shared, as well as the points on which there was disagreement.

I had to face the fact that the more senior officers had refused to accept the invitation to attend the panel. In the case of the traditional community, there was a total absence of government officers (apart from the local delegate), time pressures and leadership issues were the reasons given.

The panel in the case of the emergent community was much more fruitful. They were able to develop more activities and participation was enthusiastic; here, the civil protection officer was very well received.

The panel in the emergent community was conducted on one Saturday morning, a month before I returned to the UK. The timing was chosen deliberately as, by that time, I had become very well-known by the community and the people felt they could be confident in my purpose. I hired a marquee, chairs and tables, so that members could work in a comfortable environment.

The structure of the panel consisted of different stages, some of them constrained by the officers' time. Firstly, a Civil Protection officer gave a presentation, followed by a discussion. Subsequently, I too gave a short presentation, introducing a topic for discussion. Afterwards, there was a presentation of the Risk Map designed by the members of the EmC, again followed by a topical discussion, concluding with a general discussion.

The Civil Protection officer gave a general presentation, which included some materials, and offered his own experiences when dealing with the most common types of emergencies in the area. Later, he gave an account of his personal experiences during the floods in their town, again concluding with comments and questions.

My presentation basically consisted of an overview of the characteristics of the River some Google satellite photographs and pictures taken during my visit to the banks of the river; I also included some general information taken from Federal Emergency Management Agency (FEMA) on what to do in the case of

flash floods. I included this information, because, during the interviews, it became clear that, after almost five years of inhabiting in the Village, most members of the EmC had absolutely no idea about the river, further than what they could actually see from their own houses and the local motorway. The presentation was basically designed to generate relevant topical discussions between the neighbours, their experiences of what had happened in the past, how they perceived the present and the future, and what they considered could be done to improve their emergency systems.

In the beginning, the participants grouped themselves on a gender basis, as was the norm. However, after a while, I suggested it might be more productive to mix the two groups together. The now single group was split into two teams. People were very enthusiastic and were happy with the results. They designed and discussed a risk map designed by themselves, highlighting probable emergency exits as well as affected areas and the pattern followed by the water.

In the case of the TrC, the scheme changed to a presentation followed by a discussion. It took place in the municipal delegation's office. It was a challenge to organise the presentation there, given the short quorum, and it had to be cancelled on the first occasion; the second last-ditch attempt being held on the very last day before my trip back to the UK.

The timing of the presentation was not very appropriate, considering the availability of local people, taking place at 19.30 pm. The delegate from the TrC had suggested that time because she worked during the daytime in a factory and then in the evenings from 7 to 10pm; she volunteered her time to meet the needs of the village.

In this case, participation was understandably lower, although some people expressed their opinion that the information was so important to the village that it ought to be attended by the whole of the TrC. The risk map exercise was not carried out because of the time constraints; I was only able to conduct a discussion.

I video-taped both panels as much as possible, to capture the different views of the neighbours. In the EmC, I was also able to audio-record the panel, although one of the teams insisted that I turn off the recorder after half an hour of discussion.

All the recordings (from both panels) were transcribed verbatim. In some cases the recordings did not have good sound clarity, because of the poor quality of the mobile phone microphone, as discussed above in the interview section. When recording was not permitted, relying on memory, I wrote up the opinions expressed. Extensive notes were taken during both panels.

3.9. Data Analysis

I used the Situational Analysis approach to analyse my data, using qualitative methods. During the data collection phase, I listened to the recorded interviews and read through all the notes I had taken. In general, I chose to make a list of the topics to speak about during interview, so that I became very familiar with the information. This helped me to develop a critical evaluation regarding the information I was in the process of collecting.

Through this practice, I immediately noted that the theoretical basis I had been using did not contain all the theoretical explanations necessary for clarifying the enormous amount of information relevant to the interviewees, which was in stark contrast to my own seemingly naïve intention of returning constantly to the main topics that I had personally wanted to cover (as was, incidentally, suggested in the literature). I took notes on information that was not actually relevant to the case study.

After the data collection phase, I continued analysing all the information in detail. The process I used was framing, namely, limiting the general themes spoken during the conversations; jottings were relevant, in conjunction with data and questions not considered in my theoretical framework at the beginning. I used Atlas Ti, as a data administrator for the coding, discourse frames, maps and documents. In my case, this software turned out to be much more flexible and manageable than other similar programs. In order to gain analytical distance, I

used the maps as suggested by Clarke, and Grounded Theory. By using these methods, I was able to understand the symbolic elements, temporal and spatial characteristics, discourses and ideologies of the actors interacting in the flood arena. I then presented a sample of the maps, which helped me to decide which of the social worlds were the most relevant to my case study.

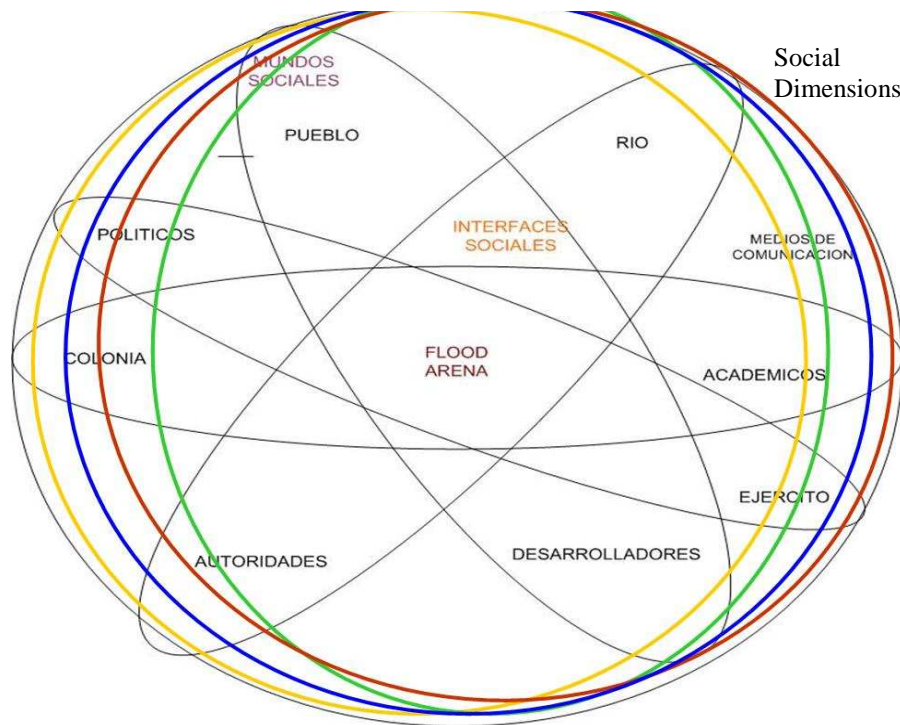


Figure 2. Sample of Situational Analysis Map

The map's design helped me to understand, clarify and make decisions about what information should be analysed in depth, in order to establish key relationships among the social worlds, actors and actants.

3.10. Summary

The methodology discussed in this chapter addresses the different elements within a disaster arena, and the dimensions and problems of interaction between major social worlds. Also in this approach, there is an interest in integrating social interfaces, in order to understand the points at which social worlds turn into areas of conflict or coincidence.

In general, SA has been undertaken through studies in the areas of health and technology, with a particular focus on women's issues (Clarke and Montini 1993; Clarke 2005; Clarke 2007). My proposal is related to natural disasters, in

particular, the consideration of the significance of the non-human elements in a disaster arena. The single case study, combined with SA and social interfaces, provides a rich analysis that allows the capturing of the interactions between the salient social worlds. Based on the methods and methodologies discussed in this section, I have analysed the data and the results are presented in Chapters 5 and 6 of this thesis.

Chapter IV

The Situation of Research. The Construction of Vulnerability in a Small Village in Central Mexico.

4.1. Introduction

The purpose of this chapter is to explain the basis on which rest the construction of vulnerability in The Village under analysis, examining the dimensions interplaying in the flood arena. Initially there will be a geographical description, describing its morphological and climatic conditions as well as the different elements that characterise the place.

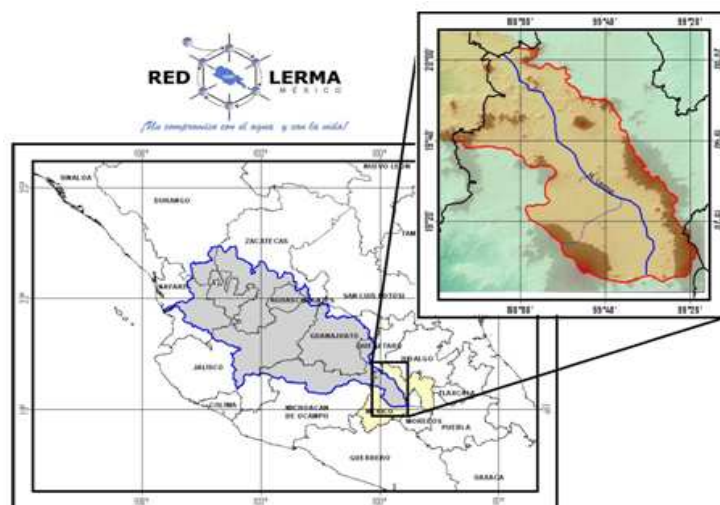
Within this space the time factor is relevant since there is no space without time (Braudel 1995). This section will describe the historical processes part of the vulnerability factors creating disasters in The Village. This analysis begins with the abrupt disruption of the social model generated with the Spanish invasion, which also established the supremacy of the western model of modernity. The modernization project based on the western paradigm, guides and influences decision making in Mexico, which in addition with latest industrialization and development project has brought major changes and effects on environmental and social conditions.

In close connection with history there are different sub-domains interplaying within the social dimension, which includes political, economic and religious. The country's political organisation involves the way in which power will be distributed and exerted. This organisation is also linked with the way how exert of power is culturally understood by elites and lay people, that understandings set the foundations for the creation of formal institutions. On the other hand, an important element of this organisation is the economic dimension; this research takes the idea of livelihoods as units in which there is a close relationship with place and culture to make use of resources.

Finally we analyze the contemporary project of modernity and the challenges imposed over communities, generating drastic changes by its application based on different cultures, mixed with extreme economic models such as neoliberalism. Culture as a mediator in each of interacting social worlds in the arena of disaster, plays a key role defining the strategies and practices of the actors involved, this conditions have a significant impact on the population studied.

4.2. The Geographical Site

The Lerma River Basin (LRB) is divided into Upper, medium and lower. The Lerma River has its origin at the centre of the country and meets the Pacific Ocean, making it one of the longest rivers in the Mexican republic. The whole Lerma Santiago River Basin has an area of 129 632 km² It is divided in upper, medium and low side (Avila-Pérez, Balcázar et al. 1999). The biggest urban, agricultural and industrial developments of the country are located along the river shores. According to data of Wester Merrey et al. (2003) the Lerma River flows through the most densely populated areas in the country, creating one of the most polluted rivers in Mexico. Environmental services and provision of resources generated in the upper Lerma river basin (ULRB) have been a source of constant overexploitation, which has had a negative impact on the environment.



Map 1. Localization of the Upper Lerma River Basin (ULRB)

Source: red Lerma web page

The Upper Basin of the Lerma River on its origin side (ULRBO) has an approximate area of 7963 km², it provides services to approximately 2.5 million inhabitants and more than 2000 industries. The central area of the country is surrounded by highlands. In the ULRBO the highest point reaches about 4,500 msn. The ULRBO is located in the central part of Mexico about 70 km from Mexico City. The main tributaries of the Lerma River on its origin side are Tejalpa Verdiguél, Santiaguito, La Gavia, Oztolotepec, Ocoyoacac, Temoaya and Sila rivers among others.

Pressures for urban growth in this area increased after the 1985 earthquake in Mexico City, which expelled people from the capital, putting enormous pressure for housing and services in the metropolitan area and surrounding areas. According to INEGI (2006) estimations, the population in the ULRBO has increased by 150%, therefore the demand for services, which has imposed a strong pressure to the environmental system of the area. Water, land and forests overexploitation is evident in the area, creating serious imbalances in the environment. Deforestation, illegal logging, unplanned housing, intensive agricultural practices have accelerated erosion and sediment loss in the steep slopes in the mountains and because of heavy rains (Albores 1995) .

Weather in the central part of Mexico is characterized by heavy summer rains, related to the annual hurricane season and dry winters with frost and low temperatures in the morning. According to data provided by CONAGUA (2010), rainfall is about 1200 to 700 mm in lower areas. The rainy season in this area is from late April to October.

Water is extracted from the ULRBO to provide drinking water to the inhabitants of the region and Mexico City, it is also used for industrial and agricultural purposes. In the latest 50's early 60's was created the Cutzamala system, after evaluating the levels of population growing in Mexico City and the increasing demand of drinking water The system building and the lakes drainage were done more or less at the same time. Basically one would support the other, because the Cutzamala system is based on extraction, channelling, piping and pumping of

national census, the Village population is about five thousand inhabitants and the main economic activities reported, in order of importance are agriculture, trade and industry (INEGI 2006). A motorway connecting Toluca the capital of the count, with the southwest of the count and indirectly with Mexico City, divides The village form from the main municipality to which it is attached.

Along the 15 kilometres of the subsidiary river shores, there are at least five communities. For centuries these communities had established a dynamic relation with the surrounding environmental elements such as rivers, lakes, woods and the meteorological conditions as heavy rains, flash floods and hails; enriching their livelihoods with all of these elements (Albores and Broda 1997; Lechuga 2001).

The river has its origins at the Nevado de Toluca volcano at 4560 MASL. The outfalls of the River reach the residues of the former Chignahuapan lake. The River is intermittent, this means that only during the rainy season it has water, its length is about 15 km, form the volcano to the outfalls of the village, but continues its course until reaching the Chignahuapan Lake. In the past The ULRBO region consisted of a wooden valley, and a system of three lakes; many communities depended on the system until its drainage in the 40's.

Even when the lakes are not there any more, its geomorphology remains and the water keep flowing through these patterns, creating conditions for frequent flooding in the inhabited areas. The indigenous peasant technology built to divert water, coping with floods and get benefit form them has been changed into improvised sewerage.

, Villanueva, L. F. A. (1996) El federalismo mexicano: funcionamiento y tareas pendientes. *Revista Mexicana de Sociología*: 3-37.



Figure 3. Valley Mountains at the ULRBO during dry season.

Source: Interviewee's Personal File

Cotler and Gutierrez (2005) report that during the period 1976-2000, soon after completed the Chignahuapan lake drainage in the ULRB, the superficial hydraulic erosion was about 27%, decreasing the infiltration capacity of the soil and reducing the water refill function.

Even when the meteorological measures taken by the CONAGUA are not accurate³ an increase on temperature rate has been registered. The Lerma River part of the system built to provide water to Mexico City, is not filling the water level requirements (Ramirez 2008).

We have a huge problem with the water. We went to check the level of water in the wells and they are far from half of its capacity. We are in trouble and in the future it would be worst you will see, we never had experienced something like this before, and we also have to fill the water quota for Mexico City. We have more than two hundred wells with low water level, hopefully soon it would rain (XV Municipal Water System Officer)

According to information provided by interviewees, in the last 10 years the intensity and the number of floods have increased, and it is possible to relate this conditions with the situation described before. Salinas (2003) reports that in 1994 because of continuous floods in the river's micro region, CONAGUA carried out research, nevertheless I could not have access to the document.

³The National Commission Water is in charge of the National Weather forecast. I had an interview with at three officers from different areas, which confirmed me that the meteorological measurements were taken in traditional stations; meaning that some peasants are in charge of them, in general the eldest, because they have the time and the disposition. The government pays a small half- year reward for this job, but some years like the 2007 there was not budget to pay, so there was not information form the stations. They also told me that if the person in charge gets sick there is a high probability that the data would not be available. There are about a hundred automatic stations in the area, not working because of lack of budget to make them work.

In order to meet the increasing demands of housing in the country, it was designed a governmental policy based on low cost massive developments, which have been promoted in different regions of the country. Housing states were built with public funds during middle 70's early 80's, but later with a new economic perspective and less social benefits, a governmental discourse based on the generation of wealth based on private funds, housing and credits were promoted (Connolly 1990).



Figure 4. Picture of Developments similar to the EmC

Source: Web Developers

There are many housing estates in the former lakes area, one of this is the emergent community (EmC). It was built with state budget to make available a fair mortgage for low income people, but is promoted and market by a private group. It was extremely flooded in 2004. That time, the flash flood was exceptional since it did not follow the normal overflowing pattern; at the shores of the river, taking by surprise the residents inhabiting in a large area not only from EmC but also from the Village.

4.2.1. An Emergent Community inside The Village

In the early 90's a civil association from The village, named Association for the Improvement of the Village got funding and authorization to build and manage a residential area for low income people form the National Fund for Popular Housing institution (FONAHPO)⁴. The financial resources to build it came from

⁴ Fonhapo is the low Income housing fund coordinated by SEDESOL. Its aim has been to meet the housing demand of low income families, operating through a subsidies system.

the federal level, the regional government and the municipality where in charge of planning, location and sales promotion of it.

Around 500 families live in two sections. The section one started to be inhabited in the middle 90's. It is mostly integrated of families previously settled in the village, looking for a property, they are newcomers. Some of them are families expelled from Mexico City after the earthquake of 1985, some of them are people who had illegally inhabited areas in the outskirts of The village. As soon as they knew about the housing facilities and the relative low cost of the houses they applied for one. In section one most of the inhabitants have some type of relationship with the people of the village, they are trying to integrate with the traditional community.

According with recounts of the locals, the second section was built quickly without considering the quality of materials. In order to level the ground in the section one, were extracted large amounts of soil from the area where the section two was built later, leaving slight hollow. Locals say that the section two of EmC was built inside a pot. Nevertheless when I requested the official opinion to the municipal officers in this respect, they always told me that the information belonged to past municipal administrations, so it was lost or disappeared.

The second section was built during the latest 90's, even when the project dated from the same time than the section one. Its population is different from the first section. They come from different locations in the country; they were looking for low cost property. Some of them came from Mexico City and have this property as investment. I observed in this section of the development different practices, people from this section can be characterized as urban, low-middle class. Their main activities are related with services in the governmental bureaucracies and factories low levels. A few travel on a daily basis to Mexico City, for others these are country houses, some get an extra income by letting the houses.

In 2003, the first houses of EmC were inhabited and apart from one family, most of them do not feel bounded to The Village. They do not participate in religious festivities, even though they have been invited. They do some shopping in the

village because some items are cheaper, especially vegetables grown in the area, but many of them prefer the bigger weekly market in the municipality centre, supermarkets and fashion malls in the capital city of the State.

Once the inhabitants of this section of EmC moved to their houses, they organized themselves in committees to make improvements and to give maintenance to the estate. They organised different committees such as clean up and gardens maintenance, building improvement, security and some parties. Through community work they planted shrubs, flowers and trees in the small spaces left as 'green areas'. They gave maintenance to the playground and revamped children's games.

With financial cooperation they bought a big iron gate, closing one of the entrances to the area, making the estate a semi private and closed space, used only by the locals and service providers. On the night of 2nd May 2004, barely a year after moving to their houses, the inhabitants of EmC were struck by a severe flooding. A flash flood from the TrC river reached 1.80 meters height.

The emergent community, took a series of actions putting pressure on the local authority aiming getting benefits, which they considered to have rights. It has been, so far six years since the last flooding in this area, the community considers that the changes promoted are enough to be protected. During this period other housing developments have been promoted in the former lake area, thousands of homes, which are also for low income populations where the mortgage is co-financed with the state. These have been seriously flooded and also affected by intense and long periods of lack of drinking water.

The initial disaster and post disaster solidarity seems to decline in the emergent community, making it evident through the untidiness that is starting to appear because of increasing lack of community work. The small green areas appear bushy, with long grass and rubbish; abandoned houses still have the spots left by the mud after the flood on its walls, along with broken windows and doors giving a derelict aspect to some streets.

There is a small group of people in the emergent community leading the organisation of it, but basically there is one person interested in keeping the sense of community in EmC. This group is organizing activities to involve the community, the years living there have enabled them to know each other in different aspects, which in some respects have had a negative effect on community building, as there are very conflicting areas like the political or the religious affiliations.

The effects of the disaster in the village were exceptional, because floods did not follow the normal pattern. However, these conditions were constructed over time in a space that has been suffered from continuous technical and engineering interventions.

4.3. The Temporal Dimension

Vulnerability to disasters is a long historical process, starting with the Spaniards arrival that brought with them the modernization project, as well as the idea that everything done by the indigenous was (and still is) useless and out of date. Later the modernization project seasoned with industrialization, urbanization and development implied new forms of intervention with negative effects for the environment and indigenous groups' culture. Their identities, based on particular ways of space usage, as well as traditional practices have been under treat for a long time.

Projects of modernisation and development have meant the over-exploitation of natural resources; city was seen as the ideal of modernity. For that reason in the middle of the XX century were implemented policies aiming the mobilisation of rural population to urban centres. It triggered a rapid concentration and growth of low skilled and poor population in the cities, putting a strong pressure on the provision of services. Large cities have been developed over time since then, one example is Mexico City, the concentration of political power, industry and services makes it a huge pole of attraction for population around the country. The cities located on the outskirts have gradually been integrated into the vast urban metropolitan area eager of services, housing and resources.

4.3.1 The Pre-Columbian Times

Indigenous groups settled in the ULRBO due to availability of large amount of natural resources. The theocratic and military structure of this highly hierarchical society was based in the establishment of training centres in different parts of the territory ruled by the Aztecs. One of these was Tenango del Valle, which was strategically situated. It was the gateway to southern territories in the region, sharing the proximity to the centre of the Aztec empire. Tenango del Valle was an important area located in a valley surrounded by woodlands, rivers and three big lakes, many of their livelihoods were related to these assets.

Cities were organised copying the same social structure than the Aztec, the social and political power was supported by priests, officers, and magistrates as well as state officers. They also had craftsmen, traders, artists and servants as well as rural community of peasants producing food for the village (Piña Chan 1975, 133).

The elite of the kingdom was built on the Tetépetl (Mountain), using terraces and platforms. The lower-class used to live downwards, dispersed near woodlands, lakes and plots, some of them used to live in small settlements of specialized activities called *calpullis*. It was not common to have towns, with people living together, in general people lived disseminated around the kingdom. The main theological and Political area was Tenango, but its influence reached the current states of Morelos, Michoacan and Guerrero, on the western side of the Mexico State (Piña-Chan 1975). In 1582, during the first stage of the colonial period, the whole population was forced to join in the lower area of the former's elite place of living, the Tetépetl, creating the village of Tenango.

A new spatial and social order was created with the Spanish rule, based on ethnicity and overexploitation. The establishment of *Haciendas*⁵ was part of these changes. Indigenous People were distributed as slave work for agricultural and mine exploitation, and for this purpose they were settled together close to the

⁵ Haciendas were royal land assignations in the recently discovered America to minor spanish nobles, it included the power over every people living inside the limits of it.

Haciendas. In order to get taxes for the crown, the whole territory was restructured, however due to indigenous population decrease and poor return from the Haciendas taxes were insufficient during the subsequent years to the conquest.

On the XVI century under new laws from the Spanish Crown, considering the poor taxes obtained and because of the negative social impact on the indigenous population, the Crown gave some especial grants to its new subjects, allowing them to own properties where they could grow their food and make use of resources. Behind these grants was the idea of a better control of the population, as well as increasing rates in the taxes generation for the Crown coming from indigenous communities. These communities were invigilated and regulated by a catholic priest, a crown officer and an indigenous authority (*cacique*) (Ouweneel 1995; Ouweneel and Hoekstra 2004)

These territories composed with indigenous people were called congregations. The legal provision of land, was about 20 to 24 hectares (Quezada 1995). Other authors talk about 70 hectares of land that sometimes included mountains for wood exploitation (Ouweneel and Hoekstra 2004). In the case of the ULRBO the exploitation of resources from the lakes were preserved for the indigenous people, allowing them fishing and hunting for self-subsistence and trade.

Inside the Congregations land was distributed among the inhabitants, it was allocated for building a house and for self-consumption agricultural activities. The Congregation also had extra land for reserve, in order to meet future population growth.

There is evidence that Tenango del Valle was an aggregated and modified town. The elite and locals were required to leave the mountain and plains to locate themselves on the plain, where the farming lands under the Spanish rule were placed (Quezada 1995, 148).

The Spanish rule created a bipolar society, made up by Spanish and indigenous peoples, giving life to a new institutional and social organisation: the Spanish world and the *Republica de Indios*. This new social and spatial organisation,

brought economic benefits to the Spanish, and also land available for distribution among them (Quezada 1995).

One interesting spatial characteristic denoting class and ethnic affiliation that still remains, at least in the centre of Mexico is the housing use of space. Congregations had an improvised and unplanned urban structure, huts were made with mud blocks, very resistant. Spanish housing centres, made houses with stone bricks, a church, a central square and stoned roads very well organised. (Connolly 1990). Nowadays is possible to observe how poor areas have a disorganised and unplanned urban structure, different from the wealthy areas that are tidy, clean and very well planned.

No significant changes happened in the environment of the region during the Spanish rule, the changes were in the social structure and the exploitation was of human and natural resources. However, in the Spanish world view, the existence of accumulated water represented harmful treats for health, there are documents from that time where this is stated, suggesting the drainage of the lakes (Albores 1995). At the end of the XVII century a formal project to drain the lakes and turn them into agricultural lands was done.

4.3.2. The Republican Era

The Independence war did not change substantially the socio-political and environmental conditions of the towns at the URLBO, many of the *haciendas* still belonged to Spanish families (Jarquín, Ortega et al. 1990). The former *Pueblos de Indios* and *Congregaciones* got the level of towns and municipalities. The new Republic was built over the same economic and social system.

Later on, during the period known as the *Porfiriato*⁶ *haciendas* experienced a renovated growth. The same Spanish elite now Mexican citizens still owned them. The new independent era, was looking for a modern and wealthy country.

⁶ Porfiriato was a period in the Mexican history where a dictatorship ruled Mexico. Porfirio Diaz was a controversial politician; peace and progress at any cost were the words of his regime. That was the time when a great economic progress was achieved as well as the modernization of national infrastructure; nevertheless there was a great economic difference amongst the population and lack of democracy that at the end took to the end his regime in the early XX century Cosío Villegas, D. (1965). Historia moderna de México: el Porfiriato. Mexico City, Hermes.

Haciendas had a feudal production structure, so to get intensive production in a capitalist way covered slavery was allowed, as well as illegal appropriation of communities land, turning some of them very productive (Montes-de-Oca-Navas 1998).

The government's objective was economic growth and modernization of the country; many areas considered strategic were updated and improved, such as energy and communications. Trains arrived to the communities settled at the ULRBO area , allowing production distribution and connecting localities.

At the end of the XIX century the economy of elites from this region, grew with the modernization policies promoted from the government. The railway introduction was an important element, giving a boost to *Haciendas*, communicating and transporting wheat, corn and other different harvest to national markets. Water from the lakes was used for irrigation, but it was still considered a treat for agriculture, when these areas were flooded. Apart from intensive usage of water for agriculture, there is no evidence of changes in the structure of the lakes during this period, but the colonial project to drain the lakes was revised at least twice (Camacho Pichardo 1998)

The illegal appropriations of indigenous communities' land, a stratified society, as well as lack of democracy were amongst others sources of the socio-political instability, which originated *La Revolucion*. One of the political requirements of the movement was land distribution for all the Mexicans and return of land from the haciendas to affected indigenous communities.

One of the interviewees told me how her grandfather was a disguised slave of one *hacienda* in the early XX century; how people living under *haciendas* rule were not able to own land or to leave the place freely, even when by then slavery was forbidden. After *la Revolucion* in 1910, some changes were possible.

Nowadays is better than before, my grandpa used to tell us how it was like working for the haciendas. On those times we didn't were entitled to own land, People were abused, it was not possible for them going to any place, they had great debts with the *Hacienda* shop. They were like slaves. It was after the Revolution that people could own land (A. Delegate)

With modernization and the industrialisation project, the environment and landscape were significantly transformed. It was during the post revolution time when the lake's transformation project went into effect. This situation would be discussed later in this chapter.

4.4. The Religious Situation

Religion involves a complex of social relations amongst different worlds and arenas. In the case of the Village, religion has a close relation with environmental and social interactions; it is also related with land tenure. In relation with environment, it has a very important role, which is seen as an integral part of the inhabitants' worldview.

In The Village as in many peasant communities, livelihoods are related with religious festivals and ceremonies. Peasants pray asking for enough rain to grow maize or other crops, for keeping their animals healthy or to thank for successful harvesting.

Religion in the Mesoamerican and Spanish world had an important role, which is an important part of the life of the inhabitants of The Village. Their practices are a fusion of indigenous and catholic religion. Indigenous religion is related with natural deities like rain, wind and soil in the form of gods that later after the conquest took the form of catholic saints.

Many of the religious festivals in The Village have a pre-Columbian disposition, carried out asking for a good harvesting or being grateful for it. They maintain practices that preserve land attachment and keep happy the volcano's lakes as water suppliers. There are some legends related with the lake that talks about mermaids (Albores 1995). Nevertheless the inhabitants of The Village do not have a clear idea about their ancient inheritance of religious practices. They do not recognise themselves in the indigenous gods.

It has been widely studied the religious syncretism amongst the original religious practices in Mesoamerica and the catholic beliefs coming from the Spanish

colonisers. Some of the main gods in the pre-Columbian times are closely related with the two seasons recognised by the peasants, rainy and dry season.

The former indigenous group ruling the area had a god related to rain, storms, thunders, flash floods clouds, falling rain, snow, hail, volcanic eruptions as well as water streams, *Tlaloc*. Caves and mountains, humid and dark places are his home. Peasants worship at him in some sacred places. It is possible to identify this ancient god in symbols and rituals performed in a catholic fashion. The festival of the Holy Cross on May 3rd set the beginning of the rainy season requesting good rain and crops is in tune with the ancient worship on Tlaloc's honour (Bonfil Batalla 1968; Coggins 1980; Albores and Broda 1997).

Bernardino de Sahagun's (1829) chronic on the conquest and life of indigenous, mentioned priests in charge of weather control, called *nahualli*, *tlaciuhqui* or *teciuhltlazqui*. Later in a more westernised fashion, they were called *graniceros*⁷ or *quizcales* (Albores and Broda 1997). One person becomes *granicero* if he survives from a thunder shock, meaning that he has been touched with the power of Tlaloc, he is getting the power read the sky, predicting rain, droughts and also he has the powers to heal certain kind of diseases related with the wind, humidity or bad energy (Bonfil Batalla 1968). He is also known as *nahual*. They were important people in the social structure, they were sky watchers day and night.

Graniceros or *tiemperos* are indigenous religious specialist, they are known with different names in different places like *nahuales* or *brujos*. They have a close relation with the shamans... *Graniceros* pretend to control weather and agricultural cycles (Broda 2003, 76).

I asked the Village inhabitants about the *granicero* or *quizcacle*, they always told me that they knew nothing about that. It has been well investigated the relation amongst the shaman, the *nahual* and the *granicero* in the literature on this area (Broda 2003). During fieldwork the people of The Village told me that the *granicero* is extinguished there, but there are some of them in neighbouring villages. Research states that hiding information to strangers are mechanism of protection of indigenous, this could be the case in The Village. Some clues give

⁷Granicero is a hail-makers

me an idea of its existence like the link that the inhabitants established amongst the figure of *nahual* and the local healer, which in the literature is related with the *granicero* as well.

In the case of storms and strong winds, the people of The Village have some prayers and symbolic practices, like stopping a storm with a knife's cut or blessing black clouds. In addition, when there is a strong period of drought some men go to a volcano lake called the Moon Lake and make a ritual asking for rain.

I will tell you about one time when rain didn't come on time. We were worried, because we had already planted our land. We joined together and then one of us went to the mountain. He had to get some water from the moon lake and come back. He had to go walking, following a path that we know very well. Then he came back with the water in a big coke bottle, we buried it in the centre of our land, we prayed and suddenly next day we had water, we were very happy. But we forgot to return the water to the lake, and we become flooded (I.Mr A)

Religious syncretism keeps some of the original practices alive and in continuous adjustment. Religion but the church, integrate local people, allocate responsibilities and have great power. The Village's inhabitants are very proud to say that they did not allow any priest to rule their church, neither to live there. They consider that this role belongs to the community and they prefer an itinerant priest. This is an interesting issue they had taken religion on their hands, they care the church by paying or doing the necessary works to maintain it. They are slightly opposed to the current religious restrictions that the current priest is trying to impose on them, part of the way how catholic church is performing nowadays, forbidding any of the indigenous practices integrated in the catholic ritual, ladies are praying everyday to remove the current priest, that makes suffering people of The Village because of the lack of respect of their uses.

4.5. The Livelihoods Situation

Livelihoods are mainly understood in this research as the way how groups or individuals meet their necessary economic and consumption requirements for living, taking advantage of resources and considering uncertainties and opportunities (Haan and Zoomers 2003).

The Village is a transitional town adjusting to a greater urbanisation pressure, nevertheless it preserves much of their traditions and rural livelihoods. It is located close to Toluca, the capital of the State of Mexico and Mexico city. The Village has been considered by the municipality where it is attached, as urban reserve, which slowly seems becoming part of the metropolitan area of the capital. These conditions have been characterised as peri-urban interface (PUI) (Allen 2003; Woods 2009).

Livelihoods (Chambers and Conway 1988) in the area are characterised by rural activities such as agriculture and livestock. During fieldwork, I could get evidence that the population income is complemented with alternative activities such as trading, factory jobs, immigration to the United States, or doing cleaning in Toluca city houses.

The main activity is agriculture, in general people has a great attachment that is more than economic, is cultural. Nevertheless it has to be complemented with other activities because of the small profitability. According with the local council data, 44.4% of the population works on agriculture, 30% on trade and 21% on industry (Orozco and Salazar 2006). One activity not reported in the official data is barter (*trueque*)⁸ that allows people to exchange a surplus among the population in a market form a nearby village.

My son is an engineer he studied in the Politecnico , he have never accepted to be mayordomo, he says that is the expenses are high, he does not want to sow our plot because he says that the maize price is very low that does not justify the work(M. Don Gap).

My husband is an agronomist and he works in Toluca. I am a teacher here in The Village, we have our plot, we sow maize and beans to make tortillas and tamales, not for trading. Even though we went to the school we cannot leave the land...(XIII. Primary school teacher interested in talking)

There is so many time since I do not sow my plot, I like it very much but I have a back injury, I also had an emergency and I had to sell one part, I only keep the plot from the community; sowing is to much work and you can see that the pay

⁸ *Trueque* is a system of product exchange in this area, is an old tradition related with pre-Columbian times but not strange to the Spanish, one day of the week people with surplus go to Santiago Tianguistenco to exchange them.

is low, the time invested does not seem any financial compensation, now I have my fruit stall in the main square and one shop in my house (K. Mr Al)

There is a small industrial corridor in progress in the area. The impact is not significant yet for population, but is gaining importance. The main economic activity is agriculture. Maize growing for self consumption is the main crop and vegetables to sell on the local market are the second one. In the last 15 years the intensive production of potatoes has been getting importance, some of the neighbouring villages in the upper side of the village river had increased its living standard, trading potato to Mexico city and other states.

- Here we basically grow potato, green beans and maize, we have water coming from the volcano

F: How much do you produce?

- We send Lorries to the Central de Abastos⁹ in Mexico City and to other places like Michoacan or Veracruz. To be honest since we sow potatoes the town has been improving, it was not like this before

F: Do you sell to Sabritas?¹⁰

- No, they buy to Sinaloa's farmers, because they say our crops have bacteria, but it does not matter because we can sell our potatoes in other places (VIII. Delegate from neighbouring town)

In The Village the main crops are maize and vegetables mainly carrots, lettuces and broccoli. A few of them supply vegetables to private traders, coming from *Central de Abastos* of Mexico City and Toluca. It is possible to find pigs, chickens, goats, ducks, lambs, donkeys, and cows in the houses. These assets are considered by the municipality as the second economic activity.

Aquatic practices remaining in the former lake area of the ULRBO are shared amongst peasants, like the implementation of small *chinamapas*¹¹ that had

⁹ Central de Abastos is a wholesale market basically of vegetables, fruits and diary products

¹⁰ Sabritas is the main producer of chips snack in the country. Close to the area there is company's factory

¹¹ Chinampa is a stationary artificial island that usually measured roughly 30 by 2½ meters, although they were sometimes longer. They were created by staking out the shallow lake bed and then fencing in the rectangle with wattle. The fenced-off area was then layered with mud, lake sediment, and decaying vegetation, eventually bringing it

changed to *planchas* (plates) after the lake drought; as well as the maintenance of *camellones* or *huertas* (aquatic gardens) which are small ponds inside the plot used to grow some medicinal, ornamental flowers and vegetables (Albores 2003).

Agriculture as a main activity has decreased, changes on the land tenure taxes and land price has increased because of housing pressures and development building, so peasants are starting to sell their lands (Maderrey and Román 2001; Orozco and Salazar 2006; Velasco-Orozco 2008).

Governmental policies oriented to boost housing have led to the construction of urban developments in the area. The municipalities in the area have a strategic position close to the capital of the state and attached to Mexico City motorway. The newcomers have more urban costumes; their jobs are usually related with the lower levels in areas of education, services or government offices. They do not identify themselves with the agricultural rites and religious festivals for that reason they do not give any economic or in specie cooperation. For the people of these new settlements credit is the common way people consume, in contrast with the people from the village that prefers to pay in cash, because most of the time they are no subject to bank credit. In the Village two salient livelihoods coexist in this small space; both have their own strategies for survival and different uses.

4.6. The Drain of the System of Lakes. Contemporary Pressures of Modernity

The lake system of the ULRBO consisted of three lakes: Chignahuapan, the San Bartolome-Otzolotepec and Lerma. Since the early period of the Spanish rule there were intentions to drain these lakes, because of an idea of spread disease coming from water, combined with distrust on the indigenous knowledge and technology about how to manage it. Water was understood by the Spanish as a threat (Camacho Pichardo 1998; Perlo and Gonzalez 2005).

above the level of the lake. Often trees such as willows were planted at the corners to secure the chinampa. Chinampas were separated by channels wide enough for a canoe to pass.

The post independent period (1810) brought the idea of modernisation of the country. In the case of the municipalities of the area, it meant the lakes drainage, to get the most of land and at the same time to finish with the communal tenure of land. Progress and private property were the aphorisms of the earlier modernisation period of the country.

At the end of the XIX century it was considered that lakes on the ULRBO were an obstacle for the agricultural development in the area, because the river channel was inadequate to carry out the big amount of water coming from the subsidiaries, generating floods, destroying crops resulting later in marshes and ponds. As a consequence of that, in 1857 the local government of the State of Mexico had the intention to drain the lakes, but as these were property of the new republican municipalities, that got annual economic benefits from the lake users, it became unfeasible. Lakes drainage justifications from the authorities were based on health and safety practices, as well as on the likelihood of economic benefits by providing new lands for agriculture (Camacho Pichardo 1998).

The hydraulic project for the ULRBO was redesigned in the late 30's of the XX century, based in the same considerations than the previous periods with the addition to provide water to the burgeoning Mexico City. This project had the objective of integrating a series of channels, aqueducts and dams diverting the rivers and streams subsidiaries of the lakes to them (Orozco and Salazar 2006).

In 1951, the first aqueducts to channel water from the Lerma River, were finished in coincidence with the creation of an industrial estate in the Lerma Toluca corridor (Cotler and Gutierrez 2005). The project aimed the construction of an aqueduct and the deviation towards system of wells and pipes to channel drinking water. Later it was completed with a massive water infrastructure system, currently including many rivers from different places, with the objective of intensive exploitation of grounded water, to provide drinking water to Mexico city named *Sistema Cutzamala* (Albores 2003; Varis, Biswas et al. 2006).

A severe drainage of the lakes system was reported when the first stage of the project was finished in 1970, on that time the Valle de Mexico Water

Commission reported the building of 230 wells and 160 aqueducts, and a daily water extraction of $14\text{m}^3/\text{second}$ (Orozco and Salazar 2006).

Contrasted reactions turned out, Albores (1995) reports the opposed views many communities had, like fears of great punishment, the extinction of local gods. And opposite to that, how for some inhabitants the lake drainage signified benefits because of land availability and access. During field work, I could confirm these opinions. Those who currently own land in the former lake do not consider that the lakes drainage are related with reduced amount of water and increased erosion and weather changes

We've got benefits from the lake drainage, because in a way we have more land for agriculture, this land is also very good for growing vegetables and it was unused because of the water (O. Mr S)

The water of the Lerma-Santiago River has been exploited in many ways. It is divided in two sections in one section it is supplier for drinking water to urban, industrial and agricultural activities; on the other section it is used as open sewerage for several municipalities and industries. It has been turned into the most polluted river in the republic.

In general and after 30 years of gradually drainage and diversion of water from the Lerma River to the Cutzamala System, as well as its conversion on a great sewerage system, there are great effects on the livelihoods and assets of the communities living at the former lakes sides. The hydrological cycle of the upper catchment river is broken, the water bodies are dry, temperature has increased and the volume of rain water is decreasing (Orozco and Salazar 2006) as well as the water coming from snow melting form the mountains, specially from the volcano also there are important effects on the health of communities that are using water form the sewerage side of the river to grow vegetables or that are flooded with this water.

4.7. Summary

Due to the complex nature of some socio technological disasters, it is possible to disguise them as natural disasters, throughout this chapter it has been presented

the various dimensions interplaying on a flood disaster arena in central Mexico. These dimensions are frequently considered in the vulnerability analysis separately, but considering the overarching nature of the situational analysis, bringing the different social worlds interplaying within the unit of analysis, is possible to have a wider understanding of the situation .

Culture mediating all this dimensions is rarely considered in the vulnerability analysis. Culture gives direction to decision making, establishing what must be regarded as valid or reliable according to each social world interplaying in a disaster arena. In the Mexican case, and especially in the case of TrC, modernization projects coming from western societies, through the conquerors and later through science and technology, have had as consequence a profound change in the social, spatial and environmental structure, when applied indiscriminately without considering any difference.

The culture that accompanied the conqueror's practices and the institution of colonialism entailed changes in the social structure of indigenous peoples. Changes came at the social level, with a cultural and ethnic separation, to then alter the indigenous geospatial patterns, by resettling communities and reintegrating them in very different ways.

The Spanish worldview justified the lakes drainage at the ULRBO, considering the pernicious effects of water in health and agriculture. From their point of view, lands covered with water could provide fertile lands for growing crops, they had the same idea with the slopes covered with woods, by clearing them those would be useful for agriculture.

The social and environmental transformation that involved the path to modernity, through imposition of development and industrialization schemes involved changes in farming methods. The central idea was, and still is, the generation of economic benefits through the application of machinery and scientific knowledge. To accomplish this project has been promoted the extensive agricultural and industrial growth as a state policy. For this reason it was necessary to increase the availability of cheap labour in the areas closer to the

factories and services, governmental policies persuading peasants to leave the fields for a better urban life were designed offering a new life by joining the modern industrial work.

City and factories, workers and urban styles were considered the progressive side of modernisation. Policies designed, were sometimes violent, but were effective some how, a rapid growth of urban centres implied strong pressures on the demand for services in the cities. It has generated an over exploitation of basic resources such as drinking water and land to meet housing needs.

In the case of the analysed village and the ULRBO, the enormous pressure coming from Mexico City due to centralisation of political institutions, industry and services has led to strong pressures on the metropolitan areas. The effect of previous environmental changes is now linked with the alteration in population rates, a huge demand for services, in which the need for drinking water is the most serious.

The lakes drainage in the ULRBO has impacted substantially the whole environment of the area, modifying communities' livelihoods. The logic that led to this idea was based on the vision of water as a threat to health and crops, but 40 years after the project, the negative impacts are highly visible. The effects of weather have been accentuated, less availability of water in the wells and water bodies have had impact not only in crops but also stressing the erosion, implying that there is a reduced provision of water for Mexico City and the metropolitan area, including the communities living in the ULRBO.

Even more, flash floods have intensified because of lack of water retention and the enormous amount of debris they are carrying with. Its impacts have been amplified on the growing population. On one side there is a lack of retention and absorption in the hills, so the water flows down with higher volume and greater force through channels. On the other hand the place where of this water should end up was a lake, that later was turned into agriculture land. Currently this is reserve area for urban growth, so the effects of flash floods now are present in residential areas, with the additional factor of an increasing housing pressure.

A great proclivity to suffering disastrous flash floods is being generated for the future inhabitants of these areas, which would be emphasized by the environmental and social conditions.

Chapter V

Flood Discourses, Practices and Symbols. Two Communities

Constellating

May 2nd, 2004, 11pm. A few drops of rain soaked the land, announcing the start of the rainy season. In the valley, sounds of traditional musical bands were heard, and cracks and lights of fireworks confused with lightning.

In the village, the youngest had gone to the local festival dance, as the elders and families stayed outside their houses celebrating one of the most important festivities of the year, the Holy Cross festival.

Early in May, the weather is warm and it feels a little bit damp. During the festival children play in the streets and go to bed late, the elder tell stories, all is joy and celebration. There is pulque (local alcoholic beverage), tamales and mole (local dishes) to celebrate. Men are responsible for lighting traditional bonfires in the streets, and a smell of burning wood and roasted corn hobs fills the atmosphere. The compadritos (godparents) are invited to join the celebration, so houses are redecorated in the city style. Microwave oven, DVD player or huge refrigerators producing ice cubes are placed in the living room.

At the edge of town, close to the toll road, there is a small housing complex, recently inhabited. The new comers are trying to sleep, but they hear the music in the distance. The cracking of the fireworks takes them by surprise.

They are service workers, retirees, young couples, office workers, teachers or nurses, single mothers or divorced women. With the exception of one family, all of them share a characteristic: they are not from the region, they desire a better life, the city commodities. They buy famous brands, live on credit and their activities and interests are more related with the city, 40 minutes away, than with the village. Today there is no party there, almost everybody has gone to bed, lulled by the telly and tired of the long week.

An hour later, the old men in the village still see the lightning illuminating the vastness of the mountain, the ladies chat covering themselves from the few rain drops. Around 12.30, pm the church bells began a strong and quick stroking, at the village some were warned, some were asleep, but at the housing complex bells were not listened, neither the message understood.

La avenida! (The flood!), cried men and youngsters running through some streets, rushing to the site of the dancing party. Quickly all became confusion. Suddenly the water with its full force slammed into the gates of houses, and tons of mud, logs, dead animals, furniture and rubbish had been swept up, giving the water a greater strength. The flood reached 2 meters in some places, it all happened in minutes, and everything disappeared within minutes.

5.1. Introduction. The flood, climbing to the roof

Around a flood arena multiple actors, understandings, non-human actors, knowledges and cultures converge (Clarke 2005). The first reactions of people are of survival, the days after are dedicated to emotional healing, as well as physical and material recovery (Morrow 1999; Becker 2009; Drury, Cocking et al. 2009). However, this is not an automatic process, this condition leads to the adoption of a series of individual and group decisions, which largely determine the aftermaths.

...most of the time, most people are with someone else. So it is groups, not individuals that actually process most disaster warnings. And, as with everything else they confront, rarely is there an immediate consensus as to what should be done, if anything. So beyond denial, there is debate. Sometimes these debates evolve into real arguments (Drabek 1999, 517).

Disasters can be unique moments that open gaps to negotiate power relations. For example, in the Mexican case, the 1985 earthquake in Mexico City has been widely analysed, as the organisation at the level of citizens and neighbourhoods was much more effective than institutional support, undermining the legitimacy of governments and elites. The response became important to the extent that a number of changes at the political level were generated after the recovery process (Douglas 1986; Tierney 2007; Pelling and Dill 2009) .

It has been stated that previous similar experiences determine the capacity of people to respond to disaster events (Drabek 1999). Mothers prioritize children safety, young people react quickly to help; in many cases men assume a peremptory attitude, and are in charge of being aware of what happens outside. Since I did not focus on gender issues I did not get enough evidence of disaster coping differences between men and women. Nevertheless, I gathered information that could give clues about them for future research (Drabek 1999; Enarson 2001; Drabek 2009).

My husband was very nervous, he was shouting, asking for his children, worried about the family. He woke the children up and told me to rush, he was mad, he didn't know what to do. I was the one who told him where to go, he was only pushing things, because he is strong (3. Mrs Mary)

Men had the same suffering that woman. In my case I yelled to my neighbour, help me to move my children up, put them below the water tank so they do not get wet, first them, the children, that was what I cared about (11. Mrs. M mother of 2 children)

Huy! Since some men did not know what to do, they got drunk and it was women who did everything, Men were expecting the worst and looked for a bottle (1. Community Leader)

For the inhabitants of both communities, the flood was an unexpected event. The previous flooding patterns changed, covering new areas, so they had no clue of what to do about it. For everybody, the most logical action was climbing to the roofs and jumping from one house to another. Some people achieved moving trucks toward the doors trying to stop the water, but this was not enough. Destruction was spread around, inside the houses. Debris and fear were the remaining effects. The neighbours began to ask what had happened, how and why.

Different actors constellated around the situation during and after the flash flood. Transient actors, like a famous TV presenter, local politicians other actors like municipal, state and federal officers; members of the local parliament, neighbouring communities, implicated actors like the army, silent actors like the insurance company, but also symbolic and material boundaries, understandings, different discourses on floods, traditions and 'the others'.

Two relevant actors were absent in the flood arena: The Red Cross and the non governmental organisations (NGOs). The Red Cross was present at the aftermath of the disaster, providing aid to some people who had been injured, however a few hours later it left the place, allowing the services of debris cleaning and collecting to do their job. Different interviewees and documents were enquired in this regard.

Unfortunately I found no record of NGOs doing work in the affected area, which is surprising, considering the large number of organizations that develop their services in other areas of Mexico such as Chiapas and Oaxaca, fashionable places I would say, that catch the attention of these actors at the national and international level.

The Map 5 presents a broad view of the social worlds and actors constellating in the arena of disaster in the studied village.

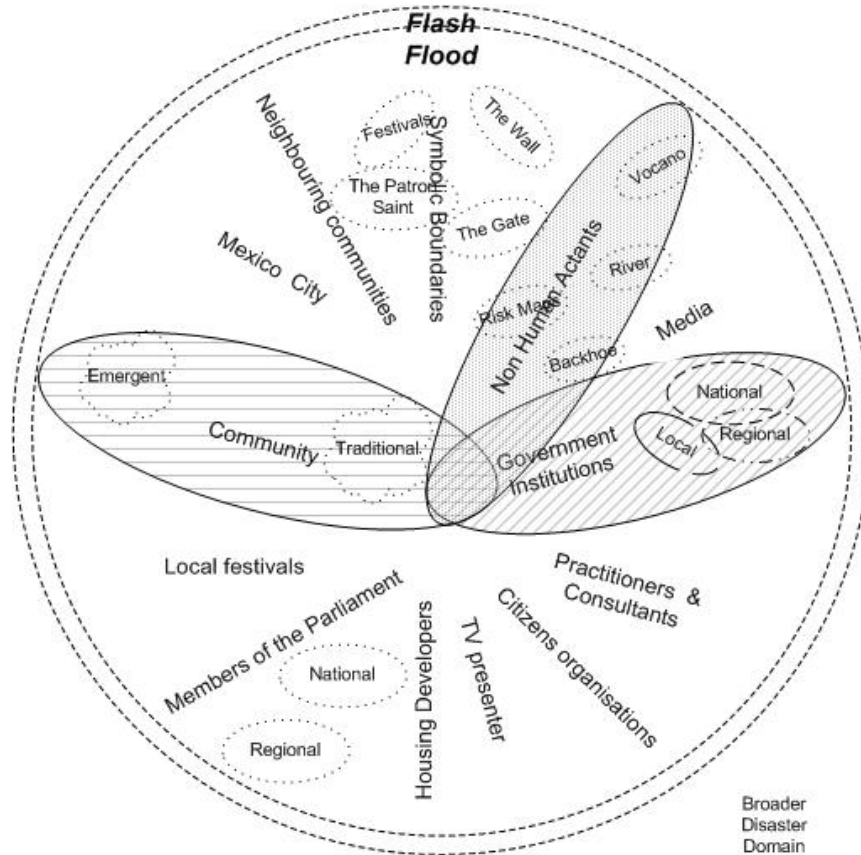


Figure 5. Situational Map of the Flash Flood Arena in the Studied Village

It can be observed that the salient actors in the disaster arena were two communities inside a geographical community, creating a social interface among them. The social world of the governmental officers was also interfacing with these communities. So many complex elements, understandings and practices were discovered within these social worlds, that a deep analysis of the other actors in the arena would require more time and resources.

This chapter analyses the relation between the two salient communities in the arena of disaster. The first section studies the established community (TrC), and the second one is related to the emergent community (EmC). Both have different ideas around the flood, influenced by their own worldviews. It is possible to observe the points of conflict, divergence and agreement creating an interface among these two social worlds.

The first section is related with the established community, it explains the symbols, festivals and relationships giving sense to their understandings on floods, as well as the practices and strategies through which they guide and construct actions. I will also explain from the point of view of the locals, the interface created by governmental policies, embodied in the use of engineering knowledge and technology. These colliding social worlds present ruptures and limits in their cultural equipment.

Festivals are an important aspect in relation to flash floods within the world view of the traditional community. These practices apart from generating social cohesion and harmony, reinstating the dynamic relationships with individuals and the community, are loaded with elements that allow the interpretation of meteorological events as part of the daily life of the inhabitants of the town, in addition to providing logistic elements for proper post-disaster organisation (Dove 2010).

At the end of this section there is a discussion on what I found a subtle opposition in relation with their suppressed practices and world views, which is called social oblivion, following the definition used by Hobart (1993).

The second section explains the newcomers' understanding on floods, their relation with the established community and the role of artefacts setting boundaries. Then is explained the way in which social interfaces are created among the traditional community and the authorities.

The communities analysed were named in this study in relation with their basic characteristic: TrC is the traditional, long established community. The newcomers settled in the housing development are the EmC, the emergent community.

5.2 Section One. The Traditional Community

In this section I will describe and analyse the different ways in which the TrC enacts its uniqueness with respect to other communities in the region and the newcomers recently settled there. On one hand, religious ceremonies take for

granted habits and modes of experiencing this uniqueness, taking the form of relationships, cooperation, authority and identity. This coincides with some scholars' findings on social practices and symbols as subtle ways to maintain claims and interpretations of the past. By concealing denied belief systems, social practices at the TrC reify people's voices, not allowing themselves to be silenced. The belief systems aim to offer people a unified response to the question of how humans should live (Swidler 1986; Norkunas 2004).

On the other hand, is possible to observe the different fashions in which the TrC's cultural tools have built successful lines of action in relation to past flooding, which have progressively become obsolete due to the severe environmental changes of the place, as well as the predominance of science and technology.

The slowness to adapt to the changing environmental externalities, as well as the commitment to not getting culturally devastated is a problematical situation for the TrC. Its worldviews are threatened by new cultural meanings, necessary for playing modernity, which require new social skills, and a drastic and costly cultural retooling (Swidler 1986).

I want to explain how through the whole domain of the TrC, questions of power and knowledge plays an active role in what Long (2002) calls battlefields of knowledge. Cultural tools and ways of action of the TrC are continually challenged and discredited by the holders of modern-scientific knowledge, governmental officers, scholars and practitioners, creating within the TrC a shared sense of ignorance, and in the eyes of outsiders and officers, apparent inaction.

5.2.1. Floods as Misfortunes

Don Gap-What kind of study are you doing?

F- I'm interested on floods and people

*Don Gap- You mean that you are interested on **desgracias** (misfortunes), you study them?*

For the inhabitants of the TrC, floods are unchangeable situations, years of experience in the place as well as the multiple times it has been flooded, have provided them a particular understanding about such events. Don Gap is a gap actor in this analysis. He is from TrC and has an active participation inside, but he is also part of the social world of the authorities, as he works for the municipal government. It seems that he is always trying to reconcile both worlds.

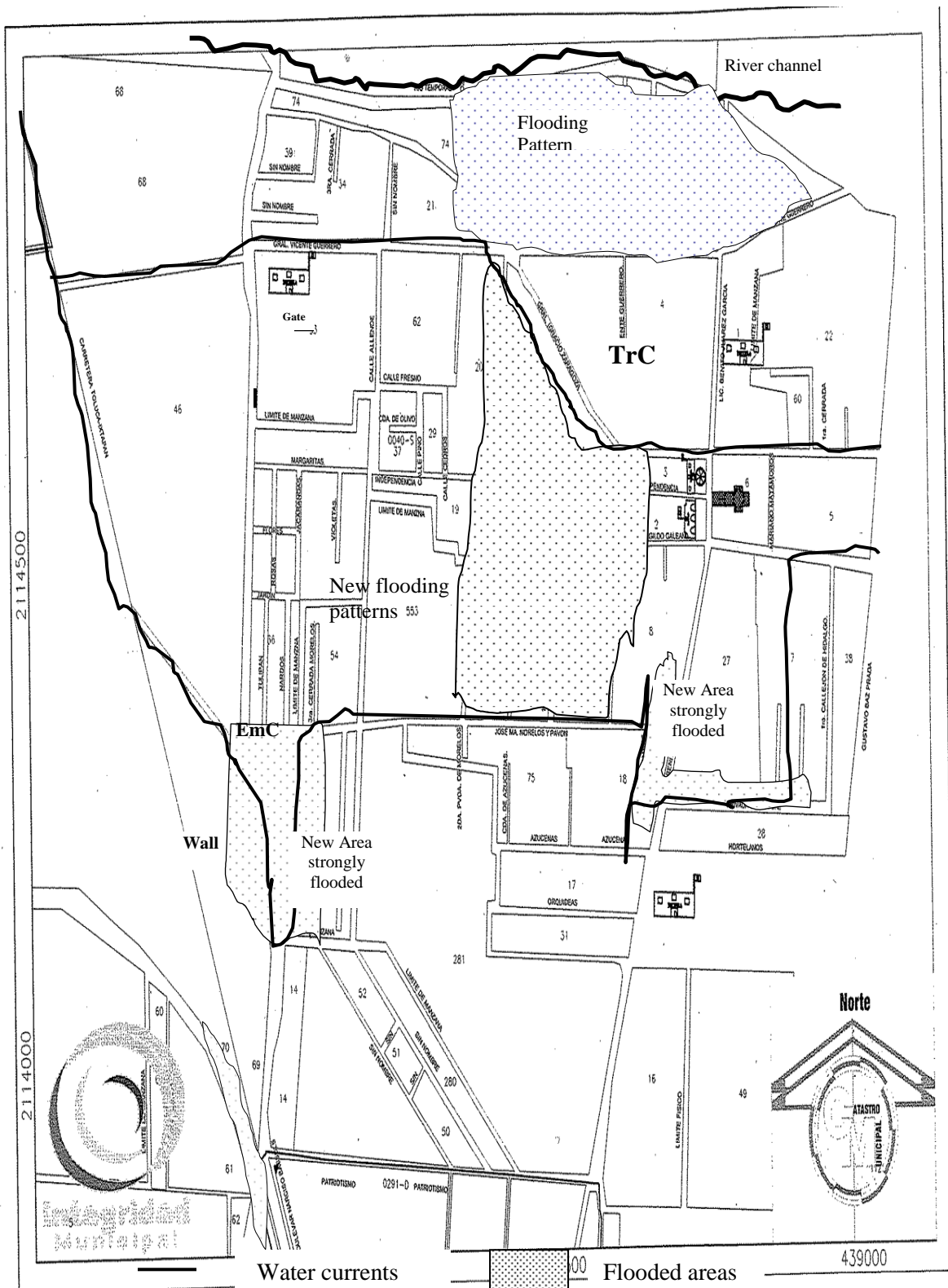
Here is normal, floods are normal, if a misfortune happens to me what can I do (Don Gap)

For the inhabitants of the TrC, floods have a random character, they are understood as misfortunes, the natural effect of living close to a river.

... It has always been like that. It is because we live near the river, it is a misfortune, we know where the channel breaks and we warn each other, there is always someone who looks over the river channel (M. Mrs L)

In general, through interviews, I perceived a fatalistic attitude from the people of the TrC, they consider that floods are the will of God testing them. This idea is joined together with their powerless feeling with respect to unpredictable natural events. This is what they call misfortunes. These ideas are not new in the literature. Some authors have done research in relation to this way of meaning searching in relation to disasters (Drabek 2009). The inhabitants of the TrC consider that neighbours of the Emergent Community (EmC) were punished with the flooding by their refusal to keep vigil over the Patron Saint figure, as never before a flood was registered in that area.

For me, it was a punishment from the Patron Saint, because they didn't allow a Holy vigil in his honour, they didn't let him get inside, and nowadays you can see them, they are happy to open the door, they offer themselves for the Holy Vigil, it was a sign that the Lord punishes (E. Mrs M)



Map 3. Map of the Communities, Flooding patterns and current streams in 2004.

Source:Locals

The idea of divine punishment is used by locals to explain the reasons for the flood in the emergent community. In relation with the impacts of the flood in an area never flooded before in the TrC, they blamed the newcomers for placing a gate on the road that connects with them. The gate became a barrier, containing debris and water that later were washed away directly to the TrC. As it will be explained later, this gate is also an important non human actant, since it has an important meaning as a symbolic boundary that the people of the TrC dislike.

The gate at the EmC was the cause of damage to us in the village, there debris, remains of animals, things, and cars got stuck, and when the water broke the gate it came with a stronger force and loads of things (D. Lorry owner and his wife P)

In addition, floods are misfortunes, they are understood as random events in which fate plays a big role, and God's will is a factor. According to what people said *a misfortune touches you, like a curse*. A fatalistic vision about disasters is mixed with environmental and geographical local knowledge of the region. These are elements added to floods understanding. In recent literature, religious beliefs are considered to explain understandings on disasters, providing insights on how religious views are closely related with practices and understandings (Gaillard and Texier 2010).

Even when these events repeat frequently, people from the TrC are not prepared, since such events are considered random. Interviewees said that in the last ten years the intensity of flash floods has increased in strength, so the previous practices are becoming out of date.

We had never seen something like that happening, ... all the houses covered, never, we had never had a *tromba* (flash flood) like that, in that side of the village, it had happened in arable land, so crops were covered, but never houses on that side (I. Mr A)

In the TrC, floods are the natural consequence of living next to a river, meteorological events imply temporary breaks of everyday life, but they do not destroy the social fabric. These events, as Hewitt (1983) states, fall within the range of risk they are willing to bear. Floods for those inhabitants of the TrC with agricultural activities have a twofold nature. The first one is that flash floods drag to the lower-side beneficial materials for land, something they call *flor de*

avenida, a type of soil full of nutrients. However, they also consider the destructive outcome of flash floods when it impacts on the village.

People also consider that the river is increasingly losing its main former role as water supplier for growing crops and as tributary of the former lake system. It only remains as a seasonal tributary to the Lerma River. The river channel is dry for most of the year, as the water is diverted in the upper side to supply a pair of fisheries and intensive potato growing. When extreme rains fall in the upper side, the impact in the lower side is frequently negative.

The problem is in the upper side, they are planting potatoes in this fashion [vertical, following the slope], also to get more land by clearing the mountain, that has made things worse for us here in the lower side (K. Mr. Al).

In the last twenty years, a government policy trying to promote a competitive agricultural activity has been encouraging potato and commercial flower monoculture, both grown in the upper side of the mountain, near federal protected areas and native woods. The people from the TrC consider that the way in which these crops are grown washes away land. The municipality has also subtly allowed the woods clearance, to leave more space for growing such crops. These are the new conditions that some of the inhabitants of the TrC consider that have turned the river a harmful element for them in the village.

A common feeling among the inhabitants of the TrC is that there is not much they can do in relation with events that happen frequently as part of the river seasons affecting them randomly. Changing environmental conditions have intensified impacts, and people do not take precautionary actions, because they consider themselves overwhelmed by these conditions.

Agricultural activities in the lower side, where the TrC is placed, are no longer basic for the livelihoods of all the inhabitants, but still have an important role in completing income, attaching them to the place, meaning freedom from the *Haciendas*, and giving them a link with ancient rituals. As explained in the earlier chapter, previous practices diverting water currents, aimed to minimise impacts by reducing the amount of running water, and at the same time benefiting crop land through artificial channels that nowadays are useless, as

water is no longer available. As a result, the impact of one strong current of water coming from the upper side means a different way of understanding and coping with flash floods.

There, near to where the petrol station is, there was a channel with clear water and women used to do the washing over there, close to a water spring, there were more channels, now they are all covered (E. Mrs. M)

Those people appropriated the channel land blocking it, filling it, and building parts of their homes over it, so when the flash flood happened the water ran following that former channel, but the houses built there did not allow water to flow downwards, so it accumulated and we were all affected. But this people had their punishment, because their houses were flooded with sewage for a long time, coming out of the houses' drains (K. Mr. Al)

...there is no science for that, who can do something against nature, it has been proved that fireworks do not work to undo harmful clouds, some say it works, neither silver nitrate spread in the sky works, there is no science (C. Don P)

The former channels for water diversion were a useful practice frequently stated by the inhabitants of the TrC used to minimize the impact of flash floods. These channels did bring benefits to their lands providing water for consumption and crops. However, with the urbanization process, intensive agriculture and the establishment of fisheries in the upper side, the channels became useless.

People from the TrC considers that flash floods are related to bad luck, and those who are affected are subject to the will of God. Moreover, in their understanding it is clear that there are factors exacerbating the impact of flash floods. But their explanation is confusing when trying to connect all the elements. They describe as influences in the multiple impacts of flash floods factors such as the lake drainage, the intensive production of potatoes, deforestation, logging and fisheries uphill. They also no longer find their traditional practices useful to minimize water impacts anymore.

Therefore, they unify all criteria observed in the idea of misfortunes, luck and the will of God; along with the idea of an uncontrollable and somewhat destructive nature.

5.2.2. Leadership

In this section, I present the way in which leadership in the TrC is performed in relation with coping practices in a post disaster condition. Inside the TrC, leadership essentially relies on two different institutional bodies: delegates (political figure) and *mayordomias* (religious figure). The political post of delegates is a step towards the religious post of *mayordomias*.

The TrC is based in its associational relations, through which the community organises its activities, circumscribes its identities and gathers resources. Delegates are the voices at the local government level, they are responsible for channelling demands from the inhabitants, they are the neighbourhood's closest political figure, and they are elected by direct vote.

In relation with the flash flood of May 2004, the general perception of residents is that delegates did not respond properly to the needs of neighbours before, during and after the disaster. People had requested better urban infrastructure, such as improved sewerage systems. During the emergency they did not carry out any activity to obtain more resources or help apart from the basic material provided by the government. After the flood, delegates were blamed for not mobilising themselves at the governmental level to gather resources and support for the victims, so they got a very discredited image into the community, which banned their possibility to become *mayordomos*. Being part of the religious organisation, has more social relevance than being part of the political authority.

We all know why they want to be in *el gobierno* (the government). Its fine, they can pinch but at least they have to do something for us (C. Don P)

There is political cynicism in the attitude of the locals of the TrC, with respect to authority, government officers and institutions. In general, people assume that if they follow the political mainstream, they will get benefits. Therefore they try to ingratiate themselves with politicians.

They [politicians] came after the flood, we organised a party with the delegates and *mayordomos*, with food and music to entertain them, we were asking for support, and they said they would send it. Someone told me that big packages of food were sent but as soon as they arrived to the place, they disappeared, and we got nothing (Mr. A)

Votes are offered in a pragmatic way through *mayordomos* and *caciques* (local chiefs), who mobilise people to support one politician or another. In that way, they get the power given by the local consensus and some benefits to the community, because they have direct access to the authority.

Apparently, they said in the TV news that the government had given 30 million pesos for recovery, false! They didn't give anything, or at least we didn't see anything (G. Mr J)

After the flood, the TrC people received some support from the municipal government, like iron or asbestos panels. The local police helped them cleaning and removing debris as well as giving basic aid, like vaccinations and sanitation.

Some organisations are more successful at gathering resources during post-disaster situations in order to negotiate financial support. Because of the damage caused to their crops by the flood, the people from the community belonging to such associations established negotiations through the leaders, the local chiefs and representatives of the regional government in rural and agricultural issues, and were successful.

About the overflowing of the... river, in Tenango del Valle municipality the leader of the local vegetable producers, did regret what happened in relation to the flash flood and the damages on crops. Nevertheless aids are flowing he said, even producers are considering to plough oats and another crops now that the emergency has receded (GEM 2004)

Specialised and powerful associations get better benefits, since they rely on the pressure they can put through their members and leaders on the authorities. In this case, farmers and vegetable producers associations were the most successful getting aids and material support, as they are better organised and have some political influence.

The internal dynamics of the TrC are organised in such a way that leadership is divided in order to win support from different sources, covering most potential areas of benefit of the community, and avoiding conflict with those in power as much as possible. Nevertheless, it seems that delegates did not have much power in the aftermath of the disaster, as they were not able to obtain benefits for their people.

It has been widely studied in the literature how affected communities, in a position of disadvantage with respect to the authority, avoid direct confrontation. There are very strong internal normative pressures not to appear to outsiders as being radical in any way (Stallings and Quarantelli 1985; Douglas 1995; Blaikie, Cannon et al. 2004).

Delegates trying to ingratiate with the upper authorities and political parties, in order to maintain their political careers, avoid any political conflict or putting excessive pressure on them. So in general, the benefits gained for the community depend on the level of sympathy the authorities have with respect to them.

This attitude is strongly supported and shared by members of the TrC. In general, during the interviews, locals were very cautious, avoiding criticism towards the authority, trying not to conflict themselves by not exposing their conflicting views, in order to avoid negative consequences. Later, when they knew they were safe, they explained this attitude to me like this:

If we don't agree with the political party ruling at the local level we don't complain, because we know that we will be in troubles. Last time the delegates were opposed to the local party, we discussed it all together, it was unnecessary to disagree, we need things, it is better to be friends with them, they didn't support the local government and we didn't receive any aid (H. Mr D)

The real benefits and support for TrC inhabitants depend on the associations to which they belong, from traders, taxi drivers, farmers or producers, apart from that, benefits are reduced to the delegates' will, and the sympathies they can get from the authority, which is generally highly committed with their political interests. In relation with the disaster, neither the politicians nor the associations provided of any sort of extra support for the people in the TrC, and people had to rely on their own resources.

For the people of the TrC, the recovery in terms of removing debris and artefacts was faster than in the EmC, given the existing social fabric. Relatives and neighbours of those affected provided food or objects, making life more bearable. Nevertheless, in relation with the EmC, economic recovery was slower at the TrC, as their working instruments disappeared with the flood, those who had

small crop plots were also affected and sales in local markets were reduced by not having products to sell.

Their segmented leadership obtained benefits for those people belonging to powerful associations like the producers. Otherwise, relatives, friends and neighbours supported the affected people in the TrC to restore normality in ways far more effective than the institutional assistance.

5.2.3. Festivals

Festivals in the area of the upper Lerma basin lakes have symbolic and identity functions. They are related with agricultural cycles, the cult of saints, the cult of the dead or the ancestors, and the cycle of life; there are festivals throughout the whole year (Albores and Broda 1997). Festivals express the blended relation of the locals' world views with the natural meteorological events.

The main festivals in the TrC are the *Candelaria* Festival on the 2nd of February, the Holy Week, The Holy Cross Day on May 2-3 and the most important one, El *Patroncito's* (patron saint) festival on July, followed by harvest celebration on the 13th of August, the festival of the dead ancestors on 1st November and December 12th, day of the Virgin of Guadalupe.

These festivities are part of a continuous cycle, in which there are elements of a festival in the next one. For example, the rosemary straws blessed on the Holy Week are used during the Holy Cross Festival on the 2nd of May, to ask for a good rainy season.

During my fieldwork I was able to participate in the festivals, from mid February to mid August. From my point of view, the most relevant festivals in the context of the TrC are the Festival of the Holy Cross and el *Patroncito's* Festival.

An important and fundamental element in the organisation of the festivals at the TrC is the *mayordomo cargos* (festival organisers), which are linked to the traditional community members. Only those who are in charge of the land of the community can get the position of *mayordomos*, and their duty is to organise and gather resources of all types for the festivals during a period of three years.

Essentially the *cargos* and festival duties are based on social exchange and reciprocity between families and friends, enforcing the social and individual links, as well as the sense of attachment to the community (Carrasco 1961; Gonzalez-Ortiz 2005; Schmidt 2006).

Even when it's an honour, we are worried, because my Dad wants to lead the *mayordomia* the next period, and the expenses are high. Imagine we have to feed at least three pigs and roast them on the *partoncito's* festival to give *tacos* (free) on that day, plus the expenses that we will have to afford for the festival's organisation. He is not going by himself, we are all together in this, and even some of the neighbours have offered support (D. Lorry owner and his wife P)

Prestige and social status is shared by organising the party through support links. Schmidt (2006) considers that the festivals are ways to integrate indigenous social structure, and simultaneously to differentiate themselves from non-indigenous social systems.

Festivals in the village are highly appreciated by the TrC, and is there where the *mayordomo's* leadership skills are tested. Apart from managing money, they must have the ability to work as leaders of a team, hire fashionable bands, get novelties for the fairground, organise the community to participate in the carnival and generally provide what is necessary for the festival to be successful.

5.2.3.1. The Holy Cross Festival

The Holy Cross festival has been widely analysed in Mexico. It is the combination of Catholic practices with the worship to Tlaloc, god of rain in the indigenous culture. In this celebration, deities of maize, earth and rain are greeted. They have taken the figure of Catholic saints, and they are pleaded as benefactors of fertility and rain (Wolf 1958; Albores and Broda 1997; Broda 2003; Gonzalez-Ortiz 2005).

In the TrC, this festival begins with a mass carried out at a place with a stone carved cross, in the old limits of the town. This cross replaced some time ago the traditional blue wooden cross. The cross is decorated for the festival with artificial and natural flowers, and whit a white cloth. During the mass, the priest prays for a good agricultural cycle and each family takes its own cross to be blessed. Blue crosses are the most popular, as the colour is related with rain

water, but nowadays there are crosses with other colours. At the end of the mass fireworks explode and *atole* and tamales distributed.



Figure 6. The Holy Cross set in one of the former entrances to the TrC. On the 2nd of May, the cross is decorated with garlands of flowers and coloured paper, and a mass is carried out.



Figure 7. Mass in honor of the Holy Cross. Each house has its own cross, traditionally painted on blue, representing water. Blue was one of the colours from Tlaloc, the god of rain in the indigenous culture

The Holy Cross festival as a whole is part of the continuous duality individual-community. This means that what happens at the macro level of the community is experienced at the micro level of families. This relationship is continuously elaborated with this kind of rituals (Albores and Broda 1997).

Families set blessed crosses on their private lands, in the centre of it, meaning the beginning of life, the beginning of creation. According to Albores (1997) this is the most sacred place, representing the centre of the world. *Compadritos* (godparents) are invited to join, later they are celebrated with a meal of *mole* and rice as well as an ancient beverage made from the agave plant called *pulque*¹², always present in festivals and ceremonies.

At the end of the day, the party continues with *lumbradas* (bonfires). *Lumbradas* are related with reading the sky, waiting for dawn. I could not get more information about this. Even Albores (1997) does not explain what the main

¹² *Pulque*, according to some research is important because its deep meaning is the Virgin's milk, all the meal served has a sacred meaning, but people is not aware of that, they just do what has been done for centuries.

purpose of the bonfires is, nevertheless, it seems to have a mystical meteorological component remainder of indigenous culture.

Each house in the village sets its own *lumbrada*, these are made on the night of May 2nd-3rd. It is lit on the street, opposite to the main entrance of the house. Family and friends gather around it. The custom amongst the inhabitants is to go from one *lumbrada* to another, sharing food with others. A black sweet beverage made of maize called *atole*, *tamales* (corn cakes wrapped in corn husks) and bread are given. This practice reiterates again the individual-community duality, in which families establish bonds of unity with themselves and with the community.

The Holy Cross festival in the TrC as a whole, is the symbolic representation of meteorological aspects, it is filled with rituals invoking beneficial supernatural forces (Albores and Broda 1997). The purpose of the rituals is to prevent adverse meteorological phenomena on the cornfields and the village, since it is carried out at the start of the rainy season, when the probability of flash floods increases.

We have to make the festival to the Holy Cross, otherwise he [Patron Saint] gets angry, and you know what happens afterwards (I. Mr A)

This festival, like all the other festivals carried out in the village, integrates indigenous and catholic religious practices, which are continuously adapted and recreated. The festival of the Holy Cross integrates the ideas people share about natural phenomena, as well as the belief systems and practices they have been inherited and transformed through time. Symbols are complex and surrounded by rituals, which in part explain the meteorological phenomena. These are part of the cultural baggage with which TrC inhabitants are equipped, and which shapes their actions.

5.2.3.2. *El patroncito's* Festival

On July the TrC has the most important festival of the year in honour of the *Patroncito*. The organisation begins a year earlier. All the inhabitants participate in it, from children to the elderly. They are organised by age, sex, occupation and

place of residence. Each group has a particular commitment, which will make the festival nice and lively.

Patron Saints are particular to each community. Saints differentiate families, groups or communities from others (Gudeman 1976). In the case of the TrC, the Patroncito provides a symbolic differentiation in spatial and religious levels. He represents and identifies only residents of the established community. Inside the TrC segmented activities are carried on to honour *El patroncito*, showing the complex internal organisation, different leaderships, and social hierarchies. As pointed out by Gudeman (1976) and Swidler (1986) any culture has a tool kit composed by world views, symbols, rituals, stories and strategies through which action is constructed.

Dove (2010) has explained how the spiritual world and worship performances are related with the everyday world. The festival in honour of the Patron Saint at the TrC reveals how devotion towards him is a source of community performance and social order.

El Patroncito's festival has several elements: traditional ceremonies, a parade with floats, and a popular dance. All the inhabitants of the TrC are involved and have specific tasks to perform. Many of the activities carried out in the village reinforce the ties among members, by the nature of the activities and throughout the celebration of the festival (Valentin 2009).

La danza de los arrieros (the dance of the peasants) is the main performance, carried out by selected people. It is an important commitment that members of the community take very seriously, starting during childhood. Being part of the dance also means that eventually, they would have the opportunity and the commitment of becoming *mayordomos*. Dancers are mainly male, even though women have started to be included. This dance is related to the peasants; life, it is a representation of the activities taken by peasants during the sowing season. It includes objects and animals used everyday, like a donkey or a bull, an *ayate* (bag for recollection), and a mattock. This dance is also related with meteorological phenomena such as rain, hail and droughts.

One important part of the performance is the provision of kitchen stuff, like tins and bowls, as well as free food, tacos of roasted pork and beef, and *pulque* for attendees. The worshiping celebrations of saints are also ways in which community wealth is socially shared (Schmidt 2006).

These days they are in a hurry, the mayordomos. They are buying dozens of crockery, they will be giving us crockery during the festival as a present; being *mayordomo* means a lot of money. On the main day there are many things needed. They are feeding pigs, because they also will have to give *tacos* of roasted pork for free to all the people and *pulque*. That is the nicest part of the festival.

The festival wasn't like this before., At the beginning there were only small carts, then one day some girls hired a big truck and made a two sides float with El Patroncito and the Guadalupe Virgin, that was the first year of that carts., Since then, single girls are in charge of organising the parade floats, nowadays you can see up to 40 floats in the parade, it is amazing! (L. Mrs. E).

The celebration is being adapted to new conditions and technologies. During my field work I watched the floats parade, with elements not original to the local culture, like dragons with movement (robots) blowing smoke through their mouths, princesses or islands of the treasure.

The festival in honour of *El Patroncito* at the TrC, represents the affirmation of themselves, their cultural background, through which they explain their relationship with the community and with the world. The festival at the macro level is reproduced in the familiar micro level, establishing a harmonious relationship between the two worlds, the individual and the community.

Some theories of modernization in relation to religious festivals consider them as reminiscences of the past, which will gradually disappear. Nevertheless, even in the midst of strong processes of social change, urbanization, globalization and standardization, religious festivities remain. Festivals have changed fitting elements of technology and global culture at the local level. Valentin (2009) considers that religious festivals provide protection and identity to rapid changes.

Festivals, as religious, cultural and social expressions do not mean a return to the past, because as noted before, festivals are improved with new technologies, such as lights, or robots in the case of floats. Festivals are a reaffirmation of identity and difference (Schmidt 2006).

5.2.4. The Role of the Patron Saint

The figure of the Patron Saint is a symbol of particular relevance in the TrC, is the centre of union of the inhabitants, because of its religious character and the significance attached to it.

At the main church in the centre of the village, there are two statues of the Patron Saint. One has the height of a person and it is dressed in a deep red robe. During the festival in his honour people approach him, touching his clothing or hair, praying and attaching petitions.

The other one is a small sculpture of about 50 cm of a knight riding a white horse. The knight wears traditional peasant clothes: a *sarape* (Wool cloak) and an *ayate* (bag used for recollection).

In strict terms both figures represent the same Saint, in terms of the locals at the TrC they are different; the big figure dressed in the traditional roman way is miraculous, but *el patroncito* is the Patron Saint of the community. He loves and looks after them, he is miraculous and they put trust and faith to him when they are in difficulty. It is a small figure, but very powerful, as they say.

The Patron Saints in communities act as defence and retarding elements, keeping the traditions. Saints connect the old with the new, and at the same time represent a parameter that drives the adaptive processes to new conditions, showing the strength of the practices (Valentin 2009)

This festival in honour of the Patron Saint reveals the great importance he has. It reveals that the devotion towards him is a source of community performance, cohesion and social order. This idea has been developed in another context by Dove (2010), who explains how the spiritual world performance is related with everyday world.

As previously discussed, *mayordomos* are a pull of persons, in charge of community lands, which are inherited through generations. Every four years members of the *mayordomias* are relieved from the obligation to organise the party together, but at least once, during four years, the *comuneros* will have to

bear the costs of the Patron Saint's festival, and minor festivals. Festivals have a collective function providing social prestige (Carrasco 1961; Schmidt 2006). Those who refuse to fulfil their role are not well regarded in the community, and many of the times are isolated. Nevertheless, given the economic crisis in recent years, some have rejected the post of *mayordomo* and also sold land of the community to non local people.



Figure 8. The Patron Saint of The Village

Locals have objected to trade land with the non locals, they consider that the land should only be sold to people from TrC living in the community, based on the fact that newcomers are not going to respect their customs and would not feel compelled to participate in the festivities in honour of the Patron Saint.

I think that land should not be sold to those who are not from here. Imagine, this land has been with us forever, they belong to el *patroncito* outsiders will not want to cooperate with the party. I have seen it, we have sold land to the island of San Juan, and they do not fulfill their obligations, they just want business (Mr A)

Swidler (1986) considers that the lines of action are related to the kind of world in which actors perform. In this regard, festivals are events that reflect and guide community members. They perform based on their cultural repertoire in relation to the world around. Both festivals and worship of saints have a cohesive and ordering role in the social system of the community, and when a negative event occurs, such as a flash flood, members of the community have the basis to explain themselves their situation, giving direction and understanding to their actions, allowing them to cope. Nevertheless, they do not have the means to improve their conditions or to avoid these events. The festival has a symbolic character related with meteorological aspects, as well as identity and differentiation, issues that have become elaborated and complex over time.

Religious festivals give meaning and coherence to the present, building references for the future, which is being built with the same set of meanings (Valentin 2009). The religious festivals and ceremonies provide stability and a sense of belonging to the members of the community against the onslaught of modernization. Festivals are ways to perform the cultural, ethnic, social and religious differences, elements against oblivion and standardisation.

5.2.5. The Backhoe came with the Engineers

After explaining the religious, social and cultural conditions related to flash floods in the TrC. I will describe and analyse the role of different economic practices related with their livelihoods. I would present the role of different non-human elements playing important roles in the disaster arena adding to vulnerability to floods.

5.2.5.1. Embroidering the River Banks. *Bordando el rio*¹³

In the rural context of the TrC the empirical knowledge of the inhabitants was more or less successful with respect to natural events, like droughts, hail storms and flash floods. Nevertheless, in the last four decades, the impact of the lake drainage, as well as the environmental outcomes created by water

¹³ Even for me the use of the word *bordar* did not make sense at the beginning, *bordar* is embroidering in the correct use of Spanish, nevertheless for the locals *bordar* means making borders to the river banks.

overexploitation, deforestation, illegal felling as well as the intensive production of food crops such as potatoes and flowers in the upper side of the mountains, has led to an increased and rapid deterioration of environmental conditions, for which local knowledge does not have effective answers.

The introduction of machinery and the irregular application of extension programs, designed by experts from the state and federal governments advising peasants on profitable crops or river management techniques to avoid floods, have meant the obsolescence of local knowledge, based on site experience. Gradual trial- failure adaptation to changing environmental conditions and commitment to not become culturally devastated, are the main problematic situations faced at the TrC.

Machines are an expression of science and technology (Clarke and Montini 1993; Clarke 2005). In the case of the TrC, machines are in the interface between the TrC and the government. Machinery and the way in which it is used is an area under discussion inside the village, because it implies power relationships, political will, ideology and the apparent idea of less physical labour. At first sight, for the inhabitants of the village the machine solved effectively and quickly what would take many days of work and fatigue for them. Actions done by the community before, to protect themselves from flash floods, are now based on machinery, but are less successful.

In the decades previous to the 70s, the impact of flash floods in the TrC was mainly in the fields. The livelihoods were predominantly agricultural, growing maize and vegetables on a small scale to supply the local market. The inhabitants also exploited the forest to make farming implements and they had aquaculture activities in the remains of the *Chignaguapan* lake.

Locals from the TrC owning land on the banks of the river had the duty to border. They used to tamp and compact the soil on the borders of the river bank, as well as remove the debris pulled by the water on its way to the lower side. They also took care of the bushes and trees on the edge. They can still recognize

different types of them, which were useful to tighten and keep the soil compacted. The banks of the river used to have vegetation.

Every neighbour used to shovel its stripe, as we used to say, with shovel and pick and we had the river perfectly controlled. If the water comes like this, we put the branches on this way, because the water comes through whirling. If the branches are on the stream direction the water will slow down and whirl. The *jaras* (*Heimia salicifolia*) shape and add volume to the banks, otherwise silt and gravel leaves everything unprotected and later erosion takes everything away.

F- Why *jara*?

Because it is abundant here, also flexible and strong. We also looked after the *tepozan* trees (butterfly trees, *Buddleia cordata*), we used to cut their biggest branches and used them in the same way I explained before with the *jaras* (*Heimia salicifolia*). We did not have machines then (B. A couple of elders)

Works usually started months before the rainy season, According to versions of the elderly, who usually participated in this kind of communal work, the responsibility of the people on that time was much greater than now. People were *bordando* their section, to avoid damage to their property, and their neighbours'. Social pressure was a strong force, which mobilized people to fulfil their obligations. In order to deal with the force of water during the rainy season, branches and stones were placed in direction to the stream.

Once the machine and the engineers were introduced, locals gradually stopped doing these works. Their commitments and sense of responsibility for the site condition started to fade, delegating everything to the machine, the operator and the authorities in turn.

Don Gap -But in that time there were machines

Couple of Elders- If there was then we got into the bad habit of relying on them. And if we take our shovel and we look what the machinery does we use our shovel as walking stick.

Machinery does everything, in the old times it wasn't like that, before, we had simple machinery as wheelbarrows. Their wheels were made on iron, then one shoved and another one pushed it, they didn't have rubber wheels. Nowadays you can see, in the middle of the mountain, they have sowed on the slopes, with that powerful machinery.

The hard and exhausting work that meant *bordar* the river for months was completed by the machine in weeks. Nevertheless, without all the engineering support, the operator is instructed to do the job only building up the land to the

sides of the river channel, implying that trees and shrubs are under enormous quantities of sand, stones and gravel, inhibiting their growth. The debris on the side of the river is not compressed, so it returns easily to the bed of the river channel by effect of gravity, wind and rain.

Over the years, the siltation coming down from the upper side has been continuously posted on the riverbanks. The accumulated amount of material is so great that today the river channel is above the ground level of the town. In two places, the authorities have built tunnels under the river channel to connect the village with the neighbouring one.

Our river is unique in the whole world because it's aerial, locals say with some pride. However, when I asked them whether the river had always been like that, and how things had changed, they replied that this is as a result of the way in which dredging works have been done.

F- Has the bank of the river been always so high?

Couple of Elders – No, in the old times it was very low, about 50 cm. Instead of the motorway bridge, there was a rail bridge, and during the drought season carts full with straw used to pass underneath the railway, in the old times we had a train going to Toluca. In the old times that was a channel river, nowadays it is a fence.

Under the rail bridge, can you imagine that? The river channel was so short, how tall do you think that a cart with straw is? More than 4 meters? but through the time the river's bed has raised its level all along its banks. The river has also suffered modifications in its course; the old one has become a local road.

Don Gap and the elders tell the story of how in the old times, when they knew that the rainy season was approaching, everybody went with the *machete* and the shovel, *bordando*, looking after each other, everybody cutting *jaras* (*Heimia salicifolia*) and *tepozanes* (*buddleia cordata*), piling them up, repairing the channel.

The social responsibility of the peasants and inhabitants of the area was greater because their knowledge was useful and appreciated. It has been discussed by Long (2001), Hilhorst (2004) and I observed it during my fieldwork, that as soon as agricultural extensionists and engineers impose solutions to problems, without knowing the situation in depth and using only science and technology as

references, provoke disempowerment and a decline in locals' confidence on their own knowledge and tools.

Latour (2005), describes how technical devices, combined with vertical government administrations have disempowered people, implying that their knowledge is wrong and out of date. In this case, technical solutions create a difference on local agency.

The critical assessments locals make on the engineers work show that they are aware of what happens in the river and in the whole region with reference to environmental issues. Nevertheless, different factors, such as the easiness that represents the work done by the machine, solving problems in the short term; the idea that local knowledge is not useful and the people's submissive attitude in order to avoid problems with the authority, are barriers to participation and to find a comprehensive solution to the complex problems faced in the area.

5.2.6. Non-Human Elements and Social Responsibility Decline

A mitigation practice suggested and promoted by authorities at different levels are dredging works. These are frequently carried out in the channels of rivers. This practice, when not complemented with other activities, progressively ends up putting river channels and banks above the level of communities, which implies that in a flash flood event, the loosen embankments of rivers collapse or break the river's walls. This practice is common in Mexico and eventually the outcomes are flooding. The next action taken by the government after repeated floods is piping rivers.

In Mexico floods doesn't know about social status, I remember, about five or six years ago a luxurious development located on a former tributary stream of the river in Tlalpan, near the Hippodrome of the Americas, they were flooded, all the residents, the river overflowed, who would you claim to? There, basically what municipalities have to do, is to place population centres above the levels of the rivers (CONAGUA Officer B).

Some years during the drought season the municipality hires a backhoe to remove all the debris that has been accumulated in the bed of the river after the rainy season. The machine hiring involves financial participation of different delegations and land commissioners from the *ejidos* settled along the river.

The municipal government leases the backhoe to the Agricultural Development Secretary (SEDAGRO), and the communities located along the banks of the river pay for the operator and fuel expenses needed. However, this does not happen every year due to the lack of budget, the use of money to solve other problems, or the proximity of local elections. These are decisive factors on hiring the machinery.

Debris removal works are remnants of what was a conservation programme of river channels in the 70's in the region. This programme was widely implemented in the Lerma basin for about 12 years (two terms of State government). The programme was carried out regularly, based on engineering and technical support along with advice from the CONAGUA, SEDAGRO and similar regional institutions.

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... In the absence of financial resources, we have allowed both the state and the municipal government to do the dredging. Unfortunately they don't do it well. Normally what we do is previously projected, we make a topographic study of the river, we identify the ponds and reinforce the embankments by giving them

the right shape. If the dredging is done by the state government, they usually throw deposited materials on the embankments and don't compact them. But when the municipal authorities do this job to their understanding, we are not so strict with these people because it's their job. We give more formality to the works, and often the materials serve us to reinforce the edges, nevertheless in most cases it is not so. If you take out gravel and sand from a river and put it on the sides, I'm sure that with the first flash flood, it is going to be washed away, but as we used to do it, we put the material on the edges very well compacted, this job is going to last many years and that's the difference (XV. CONAGUA Officer A).

Occasionally, federal or state governments develop dredging programs, sending engineers to give supervision and advice to municipalities. The municipal officers consider themselves seriously challenged by the engineers, because of their improvisation and lack of training when doing these works.

The SEDAGRO engineer used to come, because he did some works in the river channel, mmh Poor, I think that he had the heart attack because of us, what was his name? I don't remember, well we copied the way he did. Whenever he returned he was always telling us off, saying that everything was done wrong, that it was a mess. But we learnt and we did it the way we understood, and look, it is not so bad (XXII. The Inge).

The same negative considerations that authorities have about works carried out by people of the community are stated by officers at higher levels with respect to local officers.

Hobart (1993) noted that the construction of knowledge is agentic, meaning that it indicates who has the qualification to act and know. Engineers and officers at the federal level strongly challenge the work of all lower levels of government, but the lack of budget prevents them from working or assessing the technical issues.

Officers in charge of river channel maintenance point out that the lack of budget is the key element that limits their success. During the last years, river channel works with this technique were arranged in partnership with the three levels of government as well as citizens, sharing expenses. Nevertheless, it seems that the money is never enough. These ideas are developed and analysed in the next chapter, related to institutions.

The machine is controlled by the State institutions, meaning that people from the communities should have a good political or social relationship with them, in

order to have access to it. The replacement of the work of the peasants in the banks of the river by the machine meant saving a huge amount of time and effort, but it adds risky factors, such as landslides, and more importantly, it has brought together a decrease in participation and social responsibility. When I asked the locals if they would return to community work, most of them said no. They said that people have become lazy and now the machine does all the necessary work, even if it is done wrong. Nowadays nobody cares about the others as it used to be, a couple of elders told me.

It appears that social responsibility is declining in the TrC, but also in order to maintain some benefits from the officers and government in turn, people do not express their real point of view with respect to how works are performed in the channel river. They accept how things are done, nevertheless when they are to invited to participate they don't do things, they just ignore, or in Hobart (1993) terms, oblivate.

The activities in which members of the TrC participate more actively in the community are related to religious festivals, the issue of flooding is part of their life, an acceptable risk with which they have chosen to live (Douglas 2002). However, the risk of losing their traditions and culture has a significant mobilizing effect. The attitude of the locals can be seen as a form of disempowerment, but from my point of view it is obliviation in Hobart's (1993) sense.

5.2.7. Social Oblivion. Cultural Strategies for Survival

Members of the TrC do not complain or openly confront the authorities; there is a tacit acceptance, and they also voice officers' discourses. The way in which the inhabitants of the established community behave with respect to the authorities when interacting with them has been studied in other contexts and societies. It is easy to relate this attitude, nevertheless after having deeper understanding about the community I found a better explanation: social oblivion.

Hobart (1993) notes that a common attitude among members of communities under the pressure of vertical decision-making is obliviation, implying actively

ignoring those putting pressure. The author claims that it is an attitude of empowerment, in which decisions recipients actively choose to ignore the representations or judgments that others make of them. Just as the implementers of decisions assume that community members are ignorant, in the same way community members evaluate these decisions qualifying them in the same terms, so they do not consider actively their opinions or suggestions to participate. Historically the response of disempowered groups has been the apparent immobility and apathy as a way to have permanence.

Gamson (1968; 2003) considers that the apparently apathetic masses and unmotivated citizens attitude, aims to reduce the power of the system. Hobart (1993) notes that disadvantaged citizens, with respect to those who make decisions, assume their own representations and ways to deal with the imposed situations. From his point of view, this is not resistance, because this would imply the recognition of inferiority, so in order to avoid the negative consequences of disobedience or confrontation some communities actively choose to ignore. Actively ignoring involves reducing the impact of the officers' lack of knowledge and the use of power from government institutions on them.

In this case, the TrC assumed that their demands after the disaster would not be heard and they would have to solve them, with their own conditions and resources. For that purpose, this community has generated very strong ties, so needs of daily life and short term everyday life ruptures (Braudel 1995) are successfully resolved by themselves.

... authorities have been reminded again and again, during the report were recalled, we need a sewer to derive the water. They ignored us, they have completed the road works, everything...Of course when it's raining no sewer is enough, but if we had at least one sewer, water can be vented so fast, but not, well you already saw what happened there , there is nowhere the water could go., We have told the authorities every year, every year, this is what we need here, but we got nothing, this year they accepted to put a sewer here in the corner, but we are still waiting (K. Mr Al).

After the flood, neighbours from the TrC noticed how financial resources and support were first allocated to help people from the EmC. They felt ignored, but

only when they felt safe they expressed their disappointment. Nevertheless, when they interact with authorities or someone who they consider powerful , they behave with a careful and calculated conformity.

My first impression as an outsider, with a superficial glance of what was happening there, was that the TrC people are submissive, apathetic, immobile, and dependent on governmental support. I also noticed that this opinion is shared at various governmental levels.

This people do nothing to improve their conditions, they are cheating all the time to get support (I. SEDESOL officer)

They depend on us for everything (XV. CONAGUA officer A)

A more detailed observation of the situation, and also more involvement with the community, made me notice the way in which the TrC deals with prevailing conditions, policies and ideas they do not agree with. There is a non written rule inside the community, the tacit acceptance of rules and policies, followed by cautious oblivion. There are different governmental programs in relation to different aspects that people consider to affect them, from the promotion of new crops, taxation, car and mobile registrations, which in general, not only peasants but the Mexican society does not take into consideration, obviating authority requests.

One example of obliviation in relation with some policies and disaster prevention is related with the officer version that rubbish clogging sewers is the main source of floods. The local authority developed a plan to clean sewers based on citizens' participation, this strategy failed in the community because of lack of participation from citizens. One delegate tried to make people aware about climate change, putting up posters and designing a street cleaning program, she requested the participation of people, but no one attended.

When I intended to make a workshop in the TrC, the delegate considered it important and she invited locals, but just a few attended, others were gathered from around the office just to fill the place and not to embarrass the delegate because of her lack or leadership and me because of my lack of convening

power. People attending pretended and showed a contented interest, even though they were spontaneous guests.

The other side of this situation is that the traditional community has a lively organisation, rooted on their particular socio-religious organisation. For example, they have an updated database of community members. This is a detailed census that includes: place of residence, type of business and jobs, gender, number of children, civil status and migratory status. The community is also aware of who owns plots and who is in charge of the land allocated to the community.

In terms of the flooding response, they have an organisation for food and clothing distribution, as well as spaces that they improvise as shelters. At first glance, all this seems highly improvised, but the quick and effective way in which they respond to events is a good example of their organisation. I consider that it is indirectly based on their organisational structure, related to religious and civic events that they frequently have, as well as previous experiences on floods. They also have a local alarm system. *Mayordomos* in charge of church maintenance ring the bells when something unexpected happens, this is part of the duties they have with respect to the community. The ringing is very different from those calling to the mass, and it is recognized by the people as an emergency call. The people living close to the embankments are in charge of give warnings in case of knowing that a flash flood is approaching. During the last flood people told me that only the houses very close to the church could hear the bells ringing, because there was a strong noise suppressing other sounds.

Policy makers tend to work based on an idealized world, not situated and impersonal. This is a condition with which community members have learned to deal with. They know the particular nature of laws and public policies. In that sense, agency is exerted by communities (Hobart 1993).

It's impossible to get the participation of these people. Very occasionally people from some communities participate, but in exchange for something (XV.CONAGUA officer A)

In this sense Mathews (2008) noted that Mexican community members evaluate the officer knowledge and negotiate with the officers when some of their

initiatives are considered appropriate. Otherwise designed policies are not accepted but neither confronted, but simply ignored. With relation to this issue some interviewees told me about a recurrent failed programme for reforestation in the area. It is related with officers timing and even when locals know this, they do not say anything. They just attend, they even accept when the officers blame them for programme failure because of their activities. One example is given by one local talking about reforestation programmes.

The officers come every year and they bring little trees, about 5 centimetres. They invite us, they also always make a speech about deforestation; the reporters come as well. Officers say they are representatives of the federal government and they are developing a replanting programme. But it is the beginning of the drought season, and then they get the soldiers and some students to plant the trees. At the end of the season there are no trees, but they don't understand. They blame the goats and shepherds, and then they say that it is the climate change, but what they never say is that they failed in choosing the appropriate time for planting trees (H. Mr D)

Every three years there is a political change in the governmental policies and staff, little or nothing remains after three years, people of the established community are always establishing relations with the incoming government, as well as with the political parties that are beneficial to them. Relevant members of the community generally accept and vocalise expressions of government officers seeking to ingratiate themselves with the authority, in order to maintain benefits for them. Good communities will have good material and financial benefits through subsidies (Mathews 2005).

In Mexico officer assertions are rarely criticized in public (Lomnitz 1995; Nuijten 2003:133–136) but that audiences often believe that officers' public actions and declarations conceal immoral negotiations between powerful actors (Haenn 2005:162–164; Nuijten 2003:200–208). The perception that officer knowledge is a mask that conceals dangerous realities is shared by officers and their publics and is hauntingly represented on the cover of this issue well as the height of the trees is incorrect (Mathews 2008, 488).

The relationships between communities and governmental institutions are complex and intertwined, some of the local leaders become governmental officers, allowing them to have some influence in decision making (Mathews 2005).

In the studied case it can not be said that the people of the community have been able to establish favourable policies to cope with the constant and increasing effects of flooding, or with respect of the ongoing process of environmental degradation in the area. Even when they know the area and the conditions creating negative impacts, they feel unconfident of their local knowledge and far from those with knowledge, *gente de razon* (people of reason). Nevertheless, this attitude is another way to protect themselves from getting involved in issues they do not really approve. They have an opinion based on empirical and situated knowledge, which is only expressed if they do not feel threatened or compromised.

...both knowledge and ignorance ...are peculiar circumstances, often with moral connotations...the proponents of one 'system' attempt to eliminate other knowledges, to portray them (Hobart 1993, 21)

Following Gutman (1993) it is possible to say that communities accumulate experiences in relation with negative effects of opposition and resistance. The scale of opposition is related with the strengthening of coercion from the state against those who take conflicting attitudes that result in a subordinated condition and negative consequences for communities.

In this sense, social oblivion is just a way to protect people against the constant onslaught of government policies that are not beneficial to them. The inhabitants of this long established community take a pragmatic behaviour that seeks its own advantage, as well as the maintenance of their uses, basically their community which is threatened by the effects of homogenising and individualistic modernisation.

The inhabitants of the established community have found in social solidarity a way to support each other, and they strengthen it with different activities, because they know they can expect little from government institutions. After centuries of institutional neglect, their response has been oblivion. They have learned to handle emergencies with strong social ties that allow them to take appropriate action.

Listen, if I'm in the middle of the mud, with water covering my house, who do you think is gonna help me? My neighbour, so we have good relations between us, because I will rely on them in case of need (N. Don Gap).

Hobart's (1993) idea is based on the actions of communities to circumstances beyond their control. Power is exerted on them by being ascribed as ignorant. The aim of social oblivion is to minimize the effects of projects that subtly impose a westernized worldview, with a lack of understanding of particular conditions in the communities and their environment. Battlefields of knowledge (Long 2001) are present, confronting scientific-politicized knowledge against local empirical knowledge. The concept of social oblivion suggested by Hobart (1993) should be analyzed in greater depth. In the present case it appears as a defensive strategy, however the potential for social change has not been assessed.

5.3. Section Two. The Emergent Community

In this section I will describe how the newcomers established in the outskirts of the traditional community coped with the flood, how they constructed their understandings of the flood events, what conflicts and understandings they have with the Traditional Community and what are the physical symbols they created to express their uniqueness with respect the other community.

During disaster emergency new conditions arise and many decisions have to be taken, guided by surprise and improvisation (Douglas and Wildavsky 1983; Becker, Johnston et al. 2008; Drabek 2009; Drury, Cocking et al. 2009; Gaillard and Texier 2010; Schlehe 2010).

Given that is an emergent community, with a few local and cultural references, appears in a very clear way how they construct explanations about the flooding, the meaning given and strategies to solve the situation. Drabek (2009) states that the aim of these processes is getting understanding on the conditions that resulted in a disaster, followed by decisions that need to be taken at the community level.

During a certain period of time, depending on the scale of the disaster, governance, as well as chains of command are lost, creating a gap in decision making (Schneider 1992; Takeda and Helms 2007).

...people are confronted with situations and problems that lie outside the bounds of normal, everyday existence. Damaged houses, blocked roads, contaminated water supplies, and power outages all contribute to this situation. The natural and immediate reaction that most individuals experience is: "How do we deal with this?" Thus, people begin to search for appropriate standards of behaviour (Schneider 1992)

People classify their first reactions ordering information about how this situation was created. Direction towards action is related with the way how people understand the situation (Drabek 1999). After the emergency people from the EmC community experienced a situation completely new and unexpected situation, for which they did not have the tools to understand, neither relations to get resources.

5.3.1. 'El tinacazo'¹⁴, Creating Understandings on the Flood

In this section I will present the explanations the people of the community created to make sense of the flood. At the Emergent Community, people were suddenly flooded, they had only been living for one year in the development. In previous months they had a light flood of about 20 centimetres, and they thought it was related to the lack of storm sewers.

The May 2004 flood was at night and unexpected, as they did not experience any strong rain, neither any warning signs in the sky. In minutes they were flooded with a huge amount of water at high speed and with great force. They climbed to the roofs, and some people got trapped inside their own houses, because of the steel bars on their windows.

I ran through the house trying to find a way out, a few months earlier I had put in my windows protections to prevent theft, because there had been robberies in homes before. But the mud and water will not let me leave, so I grabbed my son, my wife grabbed our recently born and we sat on the bed. We expected the worst, everything happened in seconds, we reached the roof, eh! Water went inside and outside the house so fast! Thank God we were spared this time. (4.Couple at the main entrance)

People from the EmC tried to make sense (milling) of the situation with little information and knowledge about the place.

During initial meaning searching, the first and most convincing explanation for the EmC's people was of accumulated water coming to the neighbourhood through a broken wall from the neighbouring property called *el Rancho*. According to their version, a big amount of water coming from the overflowed river was accumulated there. The pressure applied by the water was so great that it broke one of the walls, flooding the area. This is called *el tinacazo* by the neighbours.

Here what happened was that a great amount of water was accumulated in the ranch, here besides us, and provoked what we call *el tinacazo*, a sudden enormous amount of accumulated water. The walls could not resist and broke one of the sides, affecting us (5. Mrs G)

¹⁴ Tinacazo: Violent water tank leaking. The people from the emergent community uses this expression with reference to the flood, they consider that the neighbour's land turned into a small reservoir and when the water broke one wall the entire neighbourhood was flooded.

The water came from other place, from the farm and the motorway. There was a return in the motorway that has been closed now, the water took that way and as we are at the main entrance of the village it affected us very much (9. Mrs. R)

The owner of *el Rancho*, a woman, attended some meetings with the people from the EmC after the flood. She blamed the estates company for the flood. From her point of view the execution of the project and building process were incorrect, affecting her property and the newcomers. However, neighbours exerted much pressure on her, to make changes in the reconstruction of the broken wall of her property. The owner, in order to avoid troubles with them, rebuilt the wall setting draining holes in the lower part of the wall, to allow water venting.

She said that during the first months neighbours made comments blaming her for the flood, and had a hostile attitude towards her. People harassed her and she became the initial scapegoat for the neighbours from the EmC. The uncertainty of the first hours after the emergency, their ignorance about the region and the inadequate response of the authorities lead the people of the EmC to find a scapegoat, in this case *el Rancho*. Nevertheless, during the recovery process, the neighbours had to join, share their points of view, experiences and opinions, changing their initial ideas about the disaster.

Different authors suggest that during a disastrous event emergent groups organise themselves because they perceive shortcomings in the institutions in charge of emergency response to the event (Stallings and Quarantelli 1985; Pescosolido 2002; Tierney 2007; Drabek 2009).

Instead, the vast majority of live rescues are carried out by community residents who are at the scene of disasters, not by officer response agencies or outside search and rescue teams. Indeed, rather than panicking and acting in otherwise unproductive ways, members of the public typically converge en masse to help when disasters strike (Tierney 2003).

The EmC process of initial understanding of the situation, found specific factors to blame, mostly the government, the estates agency and the neighbouring *Rancho*. They wanted to punish those guilty and get compensation for the damages. In the EmC, the flood event is labelled and understood as a disaster, different from the label of misfortune given by the TrC.

The idea of a big amount of water accumulated in the property next to the neighbourhood explains to them the extreme flood. Nevertheless, ideas in relation with lack of planning and corruption to place the development in a risky area started to take form during the post disaster period. These explanations gave them unity, providing consensus on the demands they considered they had to make.

One important factor was the leader, he achieved to crystallise community fears, expressing uncertainty and guiding neighbours views. He is the most authorized person by the neighbours to speak about the disaster; he voices community's understandings, feelings and concerns.

This is the result of improvisation, lack of planning and corruption of the authorities ... they told us that it's nature, God's will, but all of this has a name and a surname (1. Local leader Mr. Ch)

Some authors consider that meaning searching and understanding processes by affected people, engender social movements which under certain conditions are drivers for community cohesion (Stallings and Quarantelli 1985; Melucci 2003; Barrett, Ditzel et al. 2005; Drabek 2009). In relation to that, people from the EmC consider that one positive outcome of the flood was the emergency of a real sense of community amongst them. They acknowledge the meaningful role of the leader keeping them together and giving them direction to achieve common objectives. During the post-disaster period Mr. Ch led the community, and his suggestions to create committees with specific activities were accepted by the neighbours. This was an effective way to put pressure on the authorities for an appropriate decision making, so they got some benefits from the authorities and they also got some funding from local companies, such as Coca-Cola.

Mr. Ch united us, thanks to him we have improvements in the neighbourhood (12. Mrs A)

We are a group of foolish people, meeting to improve our social conditions, if this is what we own having it in better conditions should be our aim (1. Local Leader).

Inside the EmC, authorities and newcomers were confronted to an unknown event, from which neither of them had any previous reference. For instance, the regulatory gap was greater. Residents became organised by themselves after the

flood. Amid the mud and destruction, the cold and discomfort they discussed vital issues for the neighbourhood recovery. All these conditions were the basis for the community emergence. Tierney (2003) suggests that perceptions from outsiders in relation with communities experiencing a disaster are not confirmed when involving with it.

...myths included the notion that panic is widespread in disaster situations; the idea that disasters lead to collective demoralization and social disorganisation, which then provide a context for the emergence of anti-social behaviour, such as looting; and the assumption that, rather than carrying out their designated duties when disasters strike, emergency workers will abandon their posts in favour of saving their loved ones (Tierney 2003, 34)

In this case foundations of the community emergence were coping together and with their own means with an extreme flood and negative outcomes after disaster. The identity of the EmC is frequently reinvigorated through their struggles with the authorities. These types of threats are sources of cohesion, giving them a sense of attachment to the community. The local leader is key to understand the way in which they organised themselves, as well as the discourse they express in relation to the flood.

5.3.2. Leadership

In this section, I will address the issue of how leadership is crucial to understand social mobilisation of the community. I analysed the style of leadership that emerged after the disaster and how it brought benefits to the community. I will also explore how this leadership has changed through time.

The EmC faced a new condition, for which there were no established standards, neither previous experience. Research suggests that disasters create a vacuum of authority, and open the possibility of setting new rules (Drabek 2009). An important role in the case of the EMC was played by Mr Ch as an emerging and charismatic leader, in Weber (1968) terms, who was able to crystallize needs and anger from the neighbours, as well as gaining access to institutions to influence decisions that affected them.

...theories describe charismatic leadership in terms of the amount of leader influence over followers and the type of leader-follower relationship that

emerges. The most useful definition seems to be in terms of attributions of charisma to a leader by followers who identify strongly with the leader. This definition maintains the original meaning of charisma and provides a basis for differentiating between charismatic and transformational leadership (Yukl 1999, 294)

Newcomers lacked knowledge on the political, social and cultural conditions, and they also did not have stronger links in the region that could enable them to have straight access to resources. Therefore, the emergence of a leader had a positive effect at the neighbourhood. Pescosolido (2002) suggests that leaders are individuals who provide certainty and direction in times of ambiguity to communities or groups. He also points out those emergent leaders who have the ability to develop the most appropriate emotional response according to the needs of the group, crystallising their anxieties and engendering action from people, likewise, they manage to create shared emotions and actions.

In the face of new conditions, Mr. Ch had organisational skills filling people's needs. The vast majority of neighbours relied on Mr Ch's experience on political and workers movements. He provided neighbours clues to understand the situation, while at the same time he promoted internal organisation. Literature has established different types of leadership. The basic idea of a leader is someone seeking benefits to create suitable conditions for an organisation or community (Weber, Roth et al. 1968; Yukl 1999). Individuals carry out some practices promoting community consolidation, through calling people to participate, fostering emotional bonds or leading common actions (Borch, Forde et al. 2008). In the case studied, Mr Ch started as a charismatic leader and progressively he has moved into a community entrepreneur.

Weber (1968) argues that charismatic leaders emerge in the earlier stages of communities and do not remain stable; changes in the charismatic leadership are due to changes occurring in followers, who de-idealize the leader, as well as the need for the return to patterns of normality. Charismatic leadership is understood as 'exceptional leaders who have extraordinary effects on their followers by elevating their goals and helping them to reach their full potential' (Campbell, Ward et al. 2008, 557)

Mr Ch has assumed a role as community entrepreneur. His leadership strategy was to create a unified explanation on the reasons of floods among neighbours, which turned into organised actions demanding aid, economic support and decision making on favour of the EmC.

Public entrepreneurship is defined here as the process of creating value for citizens by bringing together unique combinations of public and/or private resources to exploit social opportunities, in return for material, purposive, or solidarity benefits (Borch, Forde et al. 2008)

The leadership of Mr. Ch played a decisive role developing the organisational capacity of the emerging community (Selsky and Smith 1994). His activities and interests went from organising committees for resources allocation, arranging distribution of aid, as well as negotiating access to decision-making at the government level. The ability to alter long established institutions and norms define social entrepreneurs as catalysts of social change (H. Dahles 2010).

As a charismatic leader and later as a community entrepreneur, the neighbours highly appreciate Mr. Ch, they recognize his ability in confronting and negotiating with the authorities, as well as involving the majority of people in the community. He has achieved access to resources to meet immediate needs in the community and access to different institutions at the federal level and private companies not frequently open.

5.3.3. The Characteristics of the Leader

In this section the aim is to explain how the characteristics of the leader have been significant in the type of community that is emerging. Mr Ch is a charismatic and emergent leader that came out to coordinate the needs of the neighbours during the post disaster period. His organisational experience was based on his previous job at a cooperative thermoelectric plant in the south of the country. He is 60 years old and is retired from his former job in the cooperative. He considers that his main influences are the political movements and the strikes in which he participated in the 70's. These movements were strongly influenced

by leftist ideology, through which he experienced the success of social organisations to get benefits (Pescosolido 2002).

Have you ever read Erich Fromm We still have the trauma of the Conquest, we're afraid of freedom, because of centuries of oppression, and we need someone with power to guide us, you are seeing this here. We have fear to rebel, fear of the authority. I come from another side of the country, there, we have the courage to rebel, there we feel owners of our own, but here the religion plays a complicity role, people spend loads of money they do not have in useless festivals, there is no reasoning (Local Leader)

Mr. Ch could attend a technological school as an outcome of the political movements in the thermoelectric, giving him a different perspective about the value of participation and social movements, which allowed him to get a qualified education. He was in the process of starting a first degree in Sociology at the University when I met him.

...people do not assume themselves as actors and authors of their own destiny, they are always ready to do it through other (Local Leader)

After the emergency, his speech was appropriate for the situation Mr. Ch's leadership, in Kieft and Nur (2002) words was directed towards action.

...we were not organised, but little by little we did it. I was in the support committee then later we organised better and I was part of the resources committee, then there was another for collection of food. To have control of what was coming, and to distribute it as equitable as possible, I was coordinating, there were other committees, and that's how we began to organise ourselves (1. Local Leader)

The community organised in committees, with specific objectives and activities, with basic posts, such as treasurers and coordinators. The community began to be in charge of their own recovery, they organised participatory decision making activities to decide the best use of resources among neighbours.

Mr.Ch reproduced at the EmC the organisational forms he learned from the cooperative where he used to work, to cope in an organised way with the critical circumstances in which the community was. His intention was to alleviate the problems that affected them, deeply mobilising the community and putting pressure all together in the authorities, guiding actions that would benefit the residents of the EmC, empowering people by showing their capacity as a united community and openly criticizing government practices that affected them in

order to mobilize the community, According to Selsky and Smith (1994) this is the normal pattern that a community entrepreneur follows in order to consolidate the ideas that glue the group.

The internal organisation in the EmC was effectively promoted by the leader; it was also independent of government, transparent and effective to give response to needs not covered by the authorities.

After five years living at the EmC, the leader is still trying to maintain unity and sense of community among neighbours. Nevertheless his charisma is fading, neighbours participate less in the renovation and tasks organised for the neighbourhood improvement. Personal interests are beginning to count more than the community (Kirk 2010).

Some residents had lost trust in Mr.Ch's, considering that behind his intentions there are politics, and that he is seeking his own benefit through leadership. Mr.Ch considers that although the neighbours have dispersed a little, for their own interest they present themselves as a strongly united group in front of the authorities, achieving benefits for all of them (Cohen 1985; Barrett, Ditzel et al. 2005). I am a foolish man Mr.Ch says, and as long as some other foolish keep working with me, I will insist.

By having Mr.Ch as a community entrepreneur, they have an important asset, mobilising and organising them as a community to get some benefits and obtain access to some decision making, at least at the municipal level.

Mr.Ch was a charismatic leader, organising action to mitigate the negative effects of flooding. Even with changes in the internal dynamics of the community he continues with his role as a community entrepreneur, with a solid commitment: to achieve community integration.

5.3.4. Symbolic Boundaries and Identity

In this section, I would address the role of symbolic boundaries, creating ties and identity in an area affected by a natural phenomenon. Boundaries set limits encapsulating communities' identity. People give and share symbolic values to

their boundaries, inside and outside of it. Boundaries establish the way in which village inhabitants want to be perceived by other communities and individuals. In the case analysed here, symbols are more complex in the traditional community, because the long period they have been settled there, have turned meanings and practices complex (Cohen 1985; Mitchell 2002)..

In the case of the emergent community boundaries are simple, of everyday life objects, like the gate that reifies social relations within the community; and the wall related to resilient practices, when people was involved on its building after the flood adding another meaning to the object.

5.3.4.1 The Gate

Setting the gate was one of the first projects that the EmC did together. The neighbourhood has two entrances, one links to a vacant lot and a gravel road and the other one to a street that links them with the TrC community. This access was closed with the gate by decision of the neighbours. The gate establishes symbolic distinctions between inhabitants of both communities the EmC and the TrC. As Mitchell (2002) recalls boundaries set identity and symbolic landscapes.

The gate was set up in the entrance that connects with the TrC community. The differentiation meaning was embodied in the artefact (Kimble and Hildreth 2005). People from the TrC felt excluded and affected, their reaction was to criticise and make fun of the newcomers because of the gate and their urban attitudes. This boundary mark became controversial for the TrC, because it challenged and limited their practices, like the integration of new members into the community life by making them participants in the many social and religious activities they carry out during the year.

The EmC residents state that they are on an island. The gate established the difference between the two communities, an artificial boundary setting limits to the TrC, which felt like a very strong disruption and rejection from the newcomers.

They put a very nice gate, [sardonically] and many little lamps on the wall, that someone came to crash and the rest were stolen (7.Mrs. ranch)

Because of our origin, it is better for us being together, *haciendo bolita* (in a group) Here we are in an island. We are not from the region and we don't have relatives so we have to deal with our own resources (1. Local Leader)

The emergence of the community is based on the creation of values and a common discourse. Physical elements and social contexts shape the members' actions and provide meanings to the community (Ruiz Ballesteros and Hernández Ramírez 2007). The gate is an element that appears so natural to set as safety issues are among the neighbours concerns, it is a protection.

The EmC is placed at the edge of town, surrounded by crop fields and vacant lots. The only connection to the TrC has been closed with the gate. During the flood the water vented through the gate bars, but much waste was held there. When the gate fell down, loads of debris were dragged to the TrC, included the gate. The municipal officers and the residents of the TrC consider that the gate was another factor for the flood and damage in the village, because it did not ease the flow of water and debris creating a reservoir.

The gate was chosen as one of the determinants of flooding by authorities, *La Comitiva* and the locals. The neighbours were blamed for setting it and generate their own damage.

This is classic in all this estates developments, for privacy or for safety they set these gates that later shut themselves up (N. Don Gap)

...we set the gate, and the people from La Directiva came and instead of being on our side, or just going along with us, they came to blame us saying that all this was our fault because of setting the gate (1. Local Leader)

In the literature the scapegoats are on the periphery of the communities but not driven completely away because their function as a focus of blame may need to be repeated (Douglas 1995, 29). In this case, the EmC is situated physically and symbolically in the periphery of the TrC, they had established symbols of difference, with their attitudes and their refusal to integrate with the other community. The gate is the main symbol of their otherness, and they are in a convenient place to become scapegoats.

5.3.4.2. The Wall

The emergent community has found a common ground through which to join together, resembling to some extent the concept of communities of practice. The EmC joined a common purpose, coping with the disaster and building safety for the future through the establishment of relationships that were transformed into specific action, giving meaning to their identity.

The wall is the element that emotionally stabilized the EmC residents, and also embodied their achievements as a community. The wall provided them with a sense of unity and identity. They placed their fears and their ability working together on it.

The things of the world have the function of stabilizing human life, and their objectivity lies in the fact that...men in their ever changing nature notwithstanding can retrieve their sameness, that is their identity... In other words, against the subjectivity of men stands the objectivity of the human man-made world rather than the sublime indifference of an untouched nature...without a world between men and nature, there is eternal movement but not objectivity (Arendt 1958, 137)

The wall was built after the flood, replacing the previously collapsed one. Some of the neighbours reckon that the wall was a form of putting their fears into something very concrete, to psychologically protect themselves. In the absence of municipal support, they did what in their logic met their needs, and the wall was their solution. In this regard, Csikszentmihalyi and Rochberg-Halton (1981) propose that material objects provide the framework for action, outlining experience and giving meaning to the selves. The wall was built with funds that the residents managed to raise through donations from Coca Cola and the regional State parliament after the flood.

The regional parliament gave us 100,000 pesos, and we got funds from other sources (1. Local Leader)

To be honest, we got the money from different sources, because we were so impoverished, but Mr. Ch organised us to get financial support and we built it together, the members of the parliament gave one part and also *la Coca*. That money was so good! (9. Mrs R.)

When neighbours speak about the wall in public, they point out that if the previous wall had been solid and resistant, it would have resisted the onslaught of water, minimizing the effects in the place.

They asked the municipality for technical advice from the municipal Urban Planning office, in which mainly dominated by engineers. The wall is 3 meters deep; it has stone foundations and a thickness of about 50 centimetres. The height of the wall from the floor is about 1.40 meters



Figure 9 Locals at the EmC. Building the wall
Source: EmC neighbour

Following Giddens (1984) on the way how people monitor everyday action, as well as the social and physical aspects of the place where they move and act, is possible to suggest that the wall is a material element of EmC people's identity, their emotional life after flooding, memory and symbol of what they as a community can achieve.

The fear that we had, we did it with a lot of fear. It is strong enough to receive the blow of water. It was ingenuity, because the stream is... I say that is useless for us to have this big wall if there is rain, water gets over here, this is psychological (Local Leader)

It is possible to track in Local Leader's discourse the idea and meaning the wall has for them. On one side is possible to read how the wall represented one way to protect themselves, since much effort was put on it to build it, but in the other side there is a clear idea that this is only a object that embodies their action against their own fears. There are contradictory thoughts with respect the wall. It

gave them back confidence in the place; having it there they can continue living in the development without fear, because they feel in the case of a similar event the wall is not going to collapse.

...what collective representation express is the way in which the group think of itself in its relation to objects which affect it (Durkheim 1972, 70).

Following Durkheim's ideas on collective representations in relation to the wall at EmC, it has a symbolic meaning in relation with the fears of neighbours. It also expresses their confidence in engineering and science to solve their situation, and also distinguishes them from other communities expressing their agency, because they have been built it through mobilisation. However, it is more an internal representation than an attempt to express their uniqueness to the communities outside.

Neighbours have conflicting ideas with respect to the wall. Some of them consider that the size of the wall is related with the size of their fear, for Mr. Ch. it is much more than they really needed. However, it is another achievement of the community, the design was done by the municipality but the construction was carried out by them. The municipality intended to charge high fees for the wall building, twice of the price they got, so they decided to make use of their workforce hiring a master mason to lead the project.

...there is an album with photos ... the government intended to charge us a million two hundred thousand pesos, we built it with two hundred thousand, we did together with the neighbours. They were five engineers, very abusive (1. Local Leader)

Locals and officers think the wall is only an object of psychological relief, because when they remember the power of water and how high it gets, they consider that it will be easily overrun by water. For the EmC people the wall is a way to protect them and they believe that anything like the last flood will happen again. They also have raised a bump of about 40 centimetres; at the entrance of the neighbourhood next to the wall, as a dike, to stop water consider that this will be a barrier. Once built, the wall was painted and the neighbours placed small lamps to illuminate the street, as there is no street lighting.



Figure 10. The Wall finished, painted and decorated. Source: EmC neighbour

Each improvement the inhabitants of EmC do in the neighbourhood is damaged, broken or stolen, they have suspicions on the people of the TrC. This is a common behaviour between both communities, they tease each other about their customs and attitudes, and both of them discredit each other's symbols of identity and difference.

5.3.5. Social Mobilization as Post-disaster Response.

There are important differences between the TrC and the EmC on how to challenge governmental decisions. Inside the EmC, solidarity among neighbours is only one part of their activities. They also mobilize in different fashions to get different kinds of material, legal or financial resources. They apply for resources from the government by challenging it, highlighting corruption. The key to social organisation and, especially, social change is the clash between those who have authority and those who do not (Gamson 1968; 2003).

In the EmC mobilization comes as an effect of the unequal distribution of benefits by different institutions. After the emergency, those who had not been supported by their relatives or connections, found a voice that expressed their disagreement supporting the local leader. The neighbours conceded him temporarily the power to represent them. The situation became even more problematic when people from the EmC found legal irregularities in their

mortgage payments and property titles. The leadership of Mr Ch turned into a catalyst for the demands of the neighbours in relation to this Gamson (1968) states that discontent is viewed as an opportunity or danger for particular subgroups. In the EmC, discontent and growing mobilization was stopped by the local authority, making a series of concessions in council taxes and mortgage payments.

The residents of the EmC gathered financial resources through mobilization. They built a retaining wall and a community stockroom with those resources, as well as other items, such as paint for street signs, trees and children games for the park. When I did fieldwork in the area, residents of the EmC community had successfully handled the conflict, so that they had succeeded in improving the conditions of the neighbourhood through financial support from external funders. They were also making some improvements to their houses.

However, the leadership of Mr Ch and the sense of community after four years of the event were weakening by different factors, such as conflicting political and religious preferences. Gamson (2003) has studied how individual interests of leaders and followers, are many times incompatible with collective interests, and there is a point when they can become irreconcilable.

Mr. Ch is *perredista* (supporter of the PRD a leftist political party), he has his own interests (9. Mrs R)

I can argue with everybody, but later I can chat with everybody as buddies (1. Local Leader)

Nevertheless, concerns about their mortgage charges and interest not paid during four years, and the accumulated debt of municipal taxes were beginning to regroup the community. The flag of the flooding was not working anymore as a glue joining the community, neither as an excuse with the authorities for not paying taxes after two municipal terms.

The neighbours of the TrC negotiated tax exemptions and benefits by challenging the authority about the illegality of the development. Besides, an insurance company carried out an evaluation of the place where the neighbourhood is located, concluding it had been built in a risky area.

The EmC had an agenda, their intention was to get tax exemption for being placed in a risky area, setting a voice (the leader) in the municipality able to speak for them, and changing the terms in the officer discourse which made them responsible for the flood for setting the gate; to be recognized as *victims*, gaining a different status and some advantages. The social organisation of the EmC found in mobilization a way to express their discontent, generating to some extent power distribution which benefited them.

5.3.6. Summary

In this chapter, were analysed the different strategies used to respond to disaster in the studied communities. Some are related to previous experiences, and some only with common sense, such as climbing up to the roofs.

The process of meaning making of floods in the village is related to local elements and past experiences. First, I will summarize section one related with the floods and the traditional community. In the TrC, understandings on floods are shaped with a fatalist attitude and a mixed idea of environmental and geographical factors influencing the increasing impact of floods in the area. The impact of a flash flood in their view is related with misfortunes and bad luck.

In relation with coping and post disaster response, the leadership is shared and segmented, which allows better negotiation of benefits with different authorities; Experience through the years has shown them that it is better to negotiate with the authority than to oppose it. Different factions inside the village compete for resources, nevertheless, there is a common rule amongst the inhabitants, not to get in trouble or very oppositional with the authorities. Their segmented leadership gets benefits for those people belonging to powerful associations, like the vegetable producers. Otherwise, relatives, friends and neighbours supported the affected people in the TrC to restore normality in ways far more effective than the institutional assistance.

Festivals and the worship of saints at the TrC have a cohesive and ordering role in the social system of the community, so when a negative event occurs, such as a flash flood, members of the community have the basis to explain themselves

their situation, giving direction and understanding to their actions and allowing them to cope. However, they know that they do not have the means to improve their conditions or to avoid these events. The festival has a symbolic character related with meteorological aspects, as well as identity and differentiation, issues that have elaborated and made it complex over the time.

Festivals as religious, cultural and social expressions do not mean a return to the past, since as noted before, festivals are improved with new technologies, and the spiritual world and worship performances are related with the everyday world. The festival in honour of the Patron Saint at the TrC reveals how devotion towards him is a source of community performance and social order.

In relation with the EmC, data suggest that it is in the process of consolidation, but there are a number of conditions influencing it daily that would impact on its future as a community. Factors such as political and religious differences as well as the presence of a community entrepreneur will probably define it.

It is interesting to note the symbolic boundaries that residents of both communities have established to differentiate themselves. In one side, the TrC has the openness to absorb newcomers, through festivals and social activities, in the other side the EmC does not want to integrate with them, refusing traditional customs they consider archaic.

Likewise, the role that different non-human actants play within the disaster arena justifies institutional practices. Those instead benefiting communities in the long term have had a negative impact, increasing the effects of natural hazards. Objects such as a backhoe doing debris removal without any integral assessment or programme, represent the supremacy of science and technology over local expertise, rejecting traditional practices of channel maintenance in the TrC, which in the end have had an impact on the social responsibility of the people.

Another interesting point to note is the different attitudes that communities have with respect to authority. The TrC does not require the authorities, from an outsider perspective it is perceived as submissive, not involved, and apparently still. Nevertheless, when analysed more closely, there is an intense activity and

organisation, which again seen from an outsider perspective could be regarded as improvised, illogic and random. The TrC uses social oblivion as a strategy to protect themselves against what they consider a real threat: the loss of their uses and traditions because of the imposition of external cultural, political and economic projects.

The EmC can be socially located in the working class or lower middle class, with some education, and a more urban culture.

The EmC is internally organised, distributing duties among community residents, and so far, they have had positive responses from the government in relation to basic issues, but not in relation with their proneness to experience again another flash flood. For them, the flood is a disaster, and focused on their leader's opinion, this disaster is the result of corruption and lack of adequate town planning.

Their response after the disaster was a mild socio-political mobilisation urging authorities to fulfil their obligations, challenging them because of their lack of will to solve the situation and their corruption. Being newcomers with minimum or no links, they took an active attitude mobilising themselves. In this way, they achieved benefits for the community. However, such political benefits that included temporary tax exemption and the mortgage payment did not resolve their condition of vulnerability to floods. The social organisation of the EmC found in the mobilization a way to express their discontent, generating to some extent power distribution, which in turn benefited them.

Chapter VI

The Institutional World of Disaster Response

6.1. Introduction

The aim of this chapter is to explain the practices, understandings and myths, performed in the social world of government institutions, based on the data collected during the fieldwork.

This chapter starts with a description of the disaster response system in Mexico, the reasons behind the creation of Civil Protection as a balance to the military, as well as the role of the community and how it developed into a self-organising system after the 1985 earthquakes. The next section studies the practices of the local disaster response institution in the studied village, where policies are put into action. Evidence shows that there is a lack of resources available to such organisations, i.e. not enough trained staff, materials or other (e.g. financial) resources, so extreme natural events can easily exceed the capabilities of these local institutions. This makes it extremely difficult for municipal officers and local people to take care of themselves and cope alone with any such events.

The following section analyses the practices that derive from scientific knowledge and related technologies. Inside this social world, planning determines the significance and use of technological instruments; planning also defines risks and legitimises actions taken by government institutions. The subsequent section analyses the institutionalized neglect of disasters, which is understood to mean that organisations supposedly charged with providing relief only ever do the minimum, either in practice sessions or in reality. The final section of this chapter refers to the creation of 'ignorance', following Hobart (1993), in the social world of government institutions.

Without being exhaustive, the theory of new institutionalism (DiMaggio and Powell 1991; March and Olsen 2006) was used to provide elements of analysis not covered by the theory of vulnerability (Wisner, Blaikie et al. 2004). Findings

explain how levels of institutional performance in disaster response have their origin in foundational myths and practices. In addition, technology and planning instruments are only used to alleviate the effects of the disaster, rather, they are used to strengthen the image of a reliable government institution. Finally, the creation of ignorance illustrates the internal dynamics of the government system. Policy design and implementation are usually done from a top-down perspective, wherein issues of power and knowledge set boundaries, imposing a uniform application to different vulnerability processes.

6.2. Disaster Response in Mexico

Disaster response before 1985 had been solved primarily by the Army. The DN-III program for disaster response (by the army) came in response to the extreme flooding that occurred in the 70's in the south of the country. Later, in the mid 80's, after the extreme earthquakes in Mexico City, demands for greater democratization and decentralization of presidential authority, as well as accusations of abuse of authority by the military opened the opportunity for the creation of a civilian organisation for disaster response.

The history of the creation of a civil institution for attending to disasters and earthquakes is significant because it outlines the nature of its identity. Mexico City is the political, commercial, administrative and cultural centre of the country, whatever happens there has repercussions affecting the entire country. The 1985 earthquakes paralysed the city and much of the administration of the country. Authority was exceeded by the disaster, and its decisions were neither quick nor efficient. This condition has been much discussed in the literature, gaps in authority in the immediate post-disaster situation are 'normal' (Drabek 1999).

Given the institutional paralysis, citizens organised themselves quickly and effectively, to save lives, remove debris, organise shelters and distribute food. Government, basically in the form of the president, mobilized the army to maintain stability and safety and to cope with the emergency, however due to the disaster's magnitude, the army capabilities were exceeded. There were thousands of victims, and their needs could not be solved by a single institution, so citizens

challenged the military authority; this did not happen peacefully, and there were some confrontations.

Improvised citizen organisations were transformed within days into formal organisations, and non-governmental organisations were created; a feature of Mexican political life that had not existed before. The army and government institutions, as well as being challenged, were discredited; this included the president. The vacuum of authority created by the magnitude of the earthquake opened the possibility for groups opposed to the government, and those with a more leftist and radical vision, to grow, all in the context of widespread dislike of the establishment (Pelling and Dill 2009). All of this was seen as a threat to the political system itself. Here, I present a short speech given by the President of the Republic in which he mentioned the creation of a civil organisation for disaster response. In the speech can be traced the values and bases giving character to these organisation.

“We will set up emergency programs to meet the needs of family housing, but also to prevent that with the excuse of fair demands people is mobilised, we encounter problems of social unrest ... the government is responsible to prevent anarchy because it is the global representative of society” (Miguel de la Madrid Hurtado 1985).

This speech is important considering the context of the authoritarian nature of the Mexican presidency. In the presidential discourse, it is possible to observe how the purposes of the new institutions are, both to meet the needs of affected families, and to satisfy the government’s concerns over anarchy. In his speech the president removed the word political groups or associations but he makes a subtle reference to them.

The creation of the Civil Protection institution then has a dual purpose, on the one hand there is the intention of creating a civil disaster response mechanism, and on the other hand it is possible to observe the intentions of political control, derived from a dislike of social organisations not under the control of the government; they are seen as a threat to stability and as a source of anarchy.

News reports from that time highlighted triggered solidarity among citizens after the earthquakes. Some authors agreed that this was the beginning of political changes from the bottom up, pushing government toward greater democratization. Citizens built new civic organisations, and some of the existing ones were modified and strengthened; thus people generated for themselves the necessary support mechanisms to cope with post-disaster conditions.

Thus, society organises itself, demanding, through government programs, cheap mortgages and provision of basic services such as drinking water and electricity, as well as land and buildings to meet the extensive housing needs.

On the 27th September, barely a week after the earthquake, took place the first demonstration of the victims; they walked to *Los Pinos* (the presidential residence). Over 30,000 people demonstrated in silence, wearing masks and helmets (symbols of the rescuers), demanding land, cheap loans, a program of reconstruction and the reallocation of drinking water and electricity. There were demonstrations every day. The government issued a decree on the expropriation of land for housing on October 11, for more than 5,000 pieces of land and buildings. However, the policy left out many affected areas and demonstrations continued (Cuevas 2005).

The nature of the Civil Protection institution in Mexico was drafted primarily with the objectives of political control as well as emergency response, in line with the President's vision. Disaster response was shaped by the experiences of the 1985 earthquakes and is considered a national security issue. Thus, Civil Protection is part of the Interior Ministry, the institution in charge of the political and administrative control of the country.

The political democratization, access to decision-making, and claims for more transparency in Mexico has been widely studied but they emanate from the citizens who were affected by the 80's earthquakes. The absence of governmental response, linked to military authority abuse in a context of a highly centralized and authoritarian presidential system, were the factors triggering society's self-organisation.

The national Civil Protection institution covers three levels of government administration to guarantee governance during a disastrous event: national, regional (state) and local (municipal). The organisation of the institution is presented in the following chart.

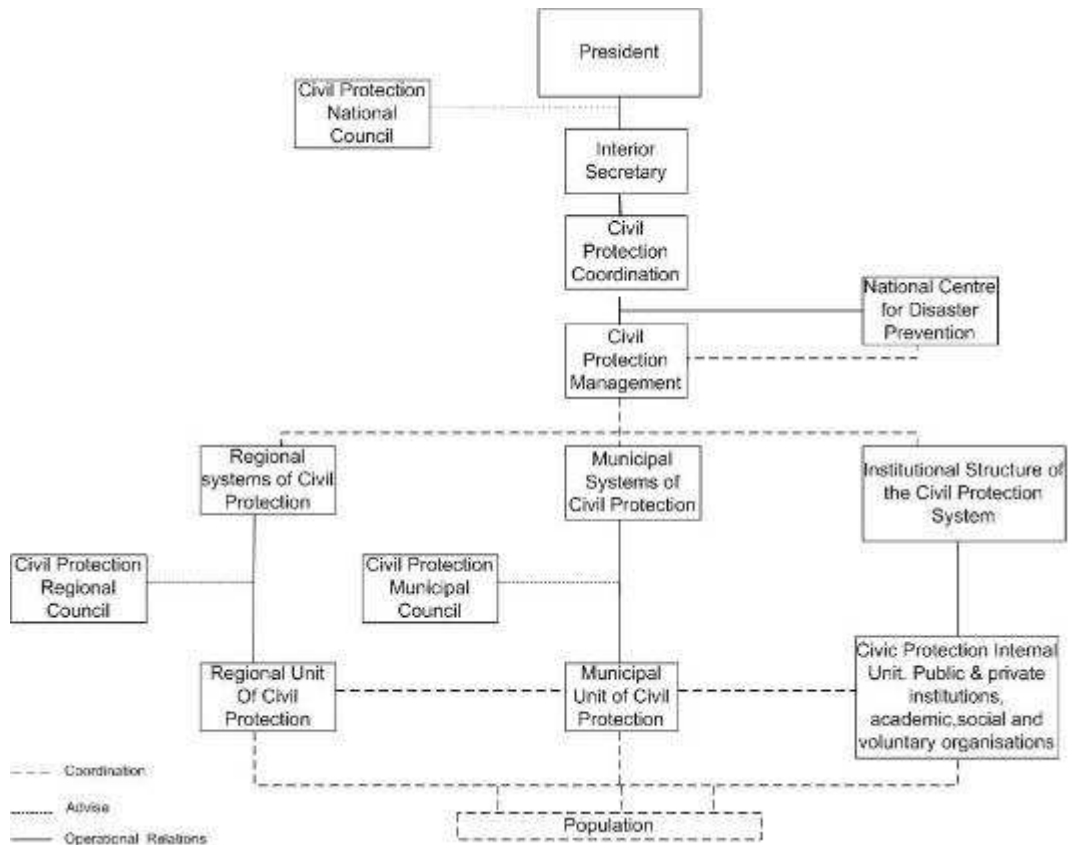


Figure 11. Flow Diagram. National Organisation of Civil Protection Institutions
Source: Civil Protection Management website

The above diagram shows the relationships between the different bodies at the federal, regional and local levels. It is possible to note that Civil Protection activities are divided between operative, advisory and coordination, which are replicated at all three levels.

A relevant issue not appearing in the diagram is related to other public organisations carrying out disaster response, in some cases with bigger resources than the institution of Civil Protection; the role of army also does not appear in

the diagram. Other government institutions working in disaster response activities are presented in the following table.

<i>Institution</i>	<i>Activity</i>
Army / Navy	Relief activity
Agriculture Secretary	Provides machinery when it comes to hydro-meteorological disasters
Health Secretary	Prevents outbreaks of infections due to debris and polluted water
Social Development Secretary	Provides vaccines and medicines Provides economic and financial resources to the affected population

Table 6. Activities and Institutions and for Disaster Response

(SEGOB 1986)

There is not a continuous coordinated work between the other institutions and Civil Protection, but there is collaboration during emergencies. These government organisations design their own prevention strategies, disaster response programs, and receive funds accordingly. Some are more powerful than Civil Protection because they have higher political rank (Secretariats), because their budgets are higher, and because their actions involve significant political benefits. For example, the Social Development Secretary has a number of programs that allocate financial resources for reconstruction, plans for low-interest mortgages aimed at better urban planning, and other social support programs, which give citizens positive impressions of the government's performance. However, federal, state and municipal authorities are aware of the lack of coordination between the powerful centre and the regions, and of the implications of this; they consider it necessary to coordinate their activities but have found that this is very difficult to achieve.

It would be great if we could coordinate, share information. But it's hard, sometimes within the same institutions, it doesn't happen (XV. CONAGUA officer A).

We have no information from other Secretaries, or municipalities. It is very difficult because of the size of the country, and because for the action needed, it would be necessary to have a lot of staff, but we don't (II. Federal SEDESOL Officer).

Apart from lack of coordination between institutions, lack of resources, staff and training were frequently spoken of by the staff within the different levels of the public administration. This is evident in the state and municipal system of Civil

Protection. In the case of municipal Civil Protection office, improvisation and multitasking activities is part of their daily work. The regional office of Civil Protection staff is hampered by too few geographers and engineers and not enough resources.

A few months before this administration started, some training on prevention began prevention. It is obvious that we do not have the necessary resources, we are two per turn and right now my associate hasn't come with me because he went to a course ... It is necessary to create a culture of civil protection in the population, because they themselves have to do all this type of work (V.Civil Protection Municipal Officer).

In general, civil institutions in charge of disaster relief lack resources and skills, and so the population at large has a negative impression of them. In the municipality, the Civil Protection offices cope with daily emergencies with basic resources, equipment and training.

F: What did the police do to help you when the flash flood receded?

Well, can you imagine this? They were just there standing, waiting, and asking: *at what time will they give us something to do, and how long are we going to have to wait here?* The police were indolent.

But not the soldiers, since they arrived, the whole day, they were working... it was 9 pm and they didn't stop. I myself went to ask the person who seemed to be in command, I asked him if I could give his men something to eat. No, he told me, at 10pm they would eat and rest. The next day they started at 6am again. Can you imagine, cleaning each house... (9. Mrs. R).

The fragmentation of disaster resources among the various Secretariats, as well as low levels of efficiency in the Civil Protection structure, is counterbalanced by a great concentration of resources in a single institution, the military. I can suggest that inefficiency of the various civil emergency response agencies produces benefits for the military, now a central actor in the disaster arena (Clarke 2005), which silently appears to solve the inadequacies of the civil institutions.

6.3. Disaster Declaration and Army Intervention

Any declaration of emergency is vertical and hierarchical; only the highest authorities within central government (municipal presidents and state governors) have the right to make such a declaration and through a certain bureaucratic

process, mobilize the army. It is established by law that if there is an imminent disaster that endangers human life, and the capacity of the state appears exceeded, the state governor (or someone nominated by him/her) can issue an emergency declaration on behalf of the president (GEM 2001).

Even though engaging the military in disaster arenas is a questionable approach, it is extensively used for disaster response by governments around the world. Existing literature in the area has consistently challenged this approach. There is agreement that coping with disasters through deploying the army is similar to wartime scenarios where the population is controlled and their role minimised to that of victims (Poncelet 1997; Wisner 2001; Gaillard 2010). More relevant is that funds and training are allocated to the military, instead of to specialized civil agencies (Tierney and Bevc 2007).

A disaster declaration leads to the application of DN-III plan, which means the intervention of the army in rescue and/or recovery. The DN-III plan has three phases: prevention, emergency response and recovery. These can be dealt with separately, according to the needs of the local authority. In the case studied, the army only performed recovery duties, not emergency response (neither were they involved in reconstruction). The army only worked for the EmC; that was the order that they received. The guiding principles for the duties of the military in Mexico with respect to disaster response are: the maintenance of national security, and the protection of the population in case of emergency (SEGOB, 2009). The army receives constant training and a great deal of financial and material resources are allocated for these priority areas (SEDENA 2010).

... working together for safety and collective concerns is the biggest benefit of the naval military manoeuvres that have a cost seven million dollars, funded by the United States, said Kernan. The commander said that this manoeuvre will allow both countries (Mexico and the USA) to get closer much faster, as well as become more effective in contingency situations, natural disasters or threats to regional security (Notimex 2009).

This news item, related to recent cooperation between the USA and Mexico in contingency situations, calls to attention how natural disasters are considered as threats to national security, at the same level as insurgent organisations and drug

trafficking; the policies designed to cope with disasters are highly influenced by the US model.

6.4. Institutional Response. *They have to learn to protect themselves.*

To assist a population of 68,689 inhabitants (INEGI 2006), the municipality has four officers in the area of civil protection. Two have responsibilities in the morning shift and two at night. Over the weekend, two officers are in charge of the municipality. According to them, emergency work generally involves road traffic accidents, severe pest infestations, and fire fighting; their administrative work is related to verifying compliance with health and safety rules in the local businesses.

Honestly, we don't work as Civil Protection; we are a municipal emergency service, now we're improving. We are always in an ambulance, because we don't have the appropriate vehicles we must have for this sort of work. ... Before the flood happened, I had never gone to a meeting, the people are not interested in keeping in touch with Civil Protection, that's how people are, everything is left to the authority (VI. Municipal Civil Protection Officer).

As described before when discussing the two communities, the response of the emergency and disaster relief services was slow; they reached the most accessible areas in about three hours but in the more distant areas aid reached them over twelve hours later.

Literature in the area suggests that this situation is typical because of the inaccessibility created by the disaster in the affected areas (King 2000). Research on the institutional sphere has revealed flaws in emergency response systems, chiefly due to lack of training and staff. The Mexican response systems are similar to those in the USA. Schneider (1992), in an analysis of such institutions in the USA, found that the federal level has more specialized and well-trained staff, and that the regional level coordinates their relief activities with the federal level; the municipal level is generally deprived of staff and training. This has implications for the application of remedial operations.

Similar circumstances were observed in the case studied. There are too few personnel trained at the municipal level, the inadequacies of the emergency services makes the emergency response slow, isolating the affected areas. In this

case, there was a cultural condition that impacted on the institutional emergency response: the civic and religious festivities of the staff. According to the officers and locals interviewed, there was lack of staff at the state level because the event happened during the early hours of a holiday weekend. As a result, the governor had to request army intervention issuing a disaster declaration.

That happened with different municipal government staff, but as far as I know, the municipal president asked for support from the regional Civil Protection, but it was weekend, and worse it was a holiday weekend, the 1st of May Labour Day, plus the 2nd of May, the Holy Cross festival, so the staff was at the minimum, that's why the governor requested the army's intervention, issuing a disaster declaration (Municipal Sedesol officer).

In the communities under research, two constables in turn gave notice of the situation to their senior commanders; for them it was immediately clear that their response capacity was being exceeded. Therefore, the local authority carried out the procedure to request support from the state level. Local government officers consider that lack of resources means that people should cope by themselves during a disaster, or wait for institutions with more resources and training to aid them.

... It is necessary to create a culture of civil protection in the population, because they themselves have to do all this type of work, they have to learn to protect themselves. When there is an emergency we come to coordinate ... but people should know these things (VI. Municipal Civil Protection officer).

Even this small village exceeded the capacity of the municipal officers; they do not have the tools, training or staff to cope. The regional level was also inefficient in their disaster response, apparently because of a lack of staff over the holiday weekend. Prevention practices were implemented, such as for earthquakes, and there were some planning and decision-making instruments, such as Risk Maps, but these were not enough because in practical terms they do not help to cope during an emergency. Municipal officers know that they are not ready to deal with extreme events, and that is why they consider that people should be responsible for their own safety.

6.5. Non-human Actants in the Institutional World of Disaster Response

In this section, the aim is to explain how the technology and instruments used by institutions in the case studied define what should be considered as risks. The Mexican government agencies oriented to disaster response and civil protection counter the citizens' claims of negligence or improvisation through acquiring technologies or building engineering projects.

Institutions invest a great deal in acquiring technologies and scientific knowledge in relation to prevention, mitigation and disaster response, which ideally should strengthen decision-making in prevention when put into practice. In the Mexican case, these instruments have been acquired, but often they are not used because of the lack of sufficiently trained personal.

The main role of these instruments (in the case of disaster prevention and response) is to identify the risks. Technology affords these institutions a good reputation, or at least the officers think so. During the interviews, the government officers, mainly from the federal and regional levels, often talked about technology, disaster management expertise and urban planning; these concepts were then used by them to explain the conditions under which it would be possible to provide better emergency response to the affected populations (as well as prevention). The Risk Maps were state-of-the-art in relation to disasters when I conducted the fieldwork. Small consultation companies, government organisations and federal funds were being allocated for the local and regional governments to generate Risk Maps.

In the municipality where I conducted the fieldwork, the officers said that the Risk Map for the area was being updated in the regional offices of Civil Protection, and that they would soon have it. The municipal government was mid-way through its three year period of Risk Map development, and the map was not ready. When I asked them for their programs relating to prevention, mitigation and response, their first response was that they had the Risk Map; they reported that they practiced earthquake and fire evacuation scenarios, which are

useful but not appropriate for the type of emergencies frequently experienced in the area.

Some theoretical approaches regard technology as tools that provide legitimacy to institutions, and at the same time they are forms of power and control, both over the staff and the population (Foucault and Gordon 1980; DiMaggio and Powell 1991; Latour 2005). This is what Clarke(2005) calls non-human actants, which also play a role in the arena of disaster.

Non-human actants structurally condition the interactions within the situation through their specific material properties and requirements and through engagements with them. Their agency is everywhere. Situational analysis explicitly takes non-human elements in the situation of inquiry into account both materially and discursively (Clarke 2005, 63).

Risk Maps in this case are non-human actants, playing a role in the arena of flooding in the community under study. These objects indirectly justify inaction and lack of resources in other areas of civil protection. The idea is that the federal institutions should have the most advanced technology possible. However, there are two problems in relation to the risk maps here: poor schooling among the municipal officers, limiting their understanding of the proper use of them (thereby thwarting effective decision-making), and non-standardised criteria in relation to the symbols on the maps. Likewise, classifications of hazardous areas change over time (for political reasons), as will be shown later in this chapter.

Technology influences user behaviour, establishing a particular relationship between user and object. Inside institutional spaces, technology creates the needs for qualified personnel. Therefore, it necessitates hierarchies and a social order within the system (Latour 2000). For example, certain professions are dominant in the area of disaster response within the institution, such as engineers and geographers, who support the appropriate application of scientific knowledge; they know how to make use of the technological gadgets designed for that purpose. The use of technological instruments, such as GPS or specialized software, in the spatial positioning of hazards guides behaviour and provides meanings to the events for those able to read them. In line with the Foucaultian

perspective, technology involves exerting power over those who do not have the knowledge to use and understand it (Foucault and Gordon 1980).

It is relevant to observe how federal officers promote the acquisition of GPS, risk maps and software at the municipal level. The acquisition of advanced technology does not automatically guarantee that policies will mitigate risks, nor does it guarantee that the staff has been adequately trained. Rather, technologies and scientific knowledge are used to show citizens that the government is doing something in relation to disasters. Devices embody security and protection.

In the following passage can be observed how officers respond when challenged in relation to knowledge about hazards and risks.

Municipal Officer - We are from the municipality of ---, and the problem that we are facing is considered one of the worst in Latin America. We need advice about it, for more comprehensive prevention.

II. SEDESOL Federal Officer A-... first, design a risk map, defining what the risks the municipality is exposed to are, and then what mitigation measures should be taken.

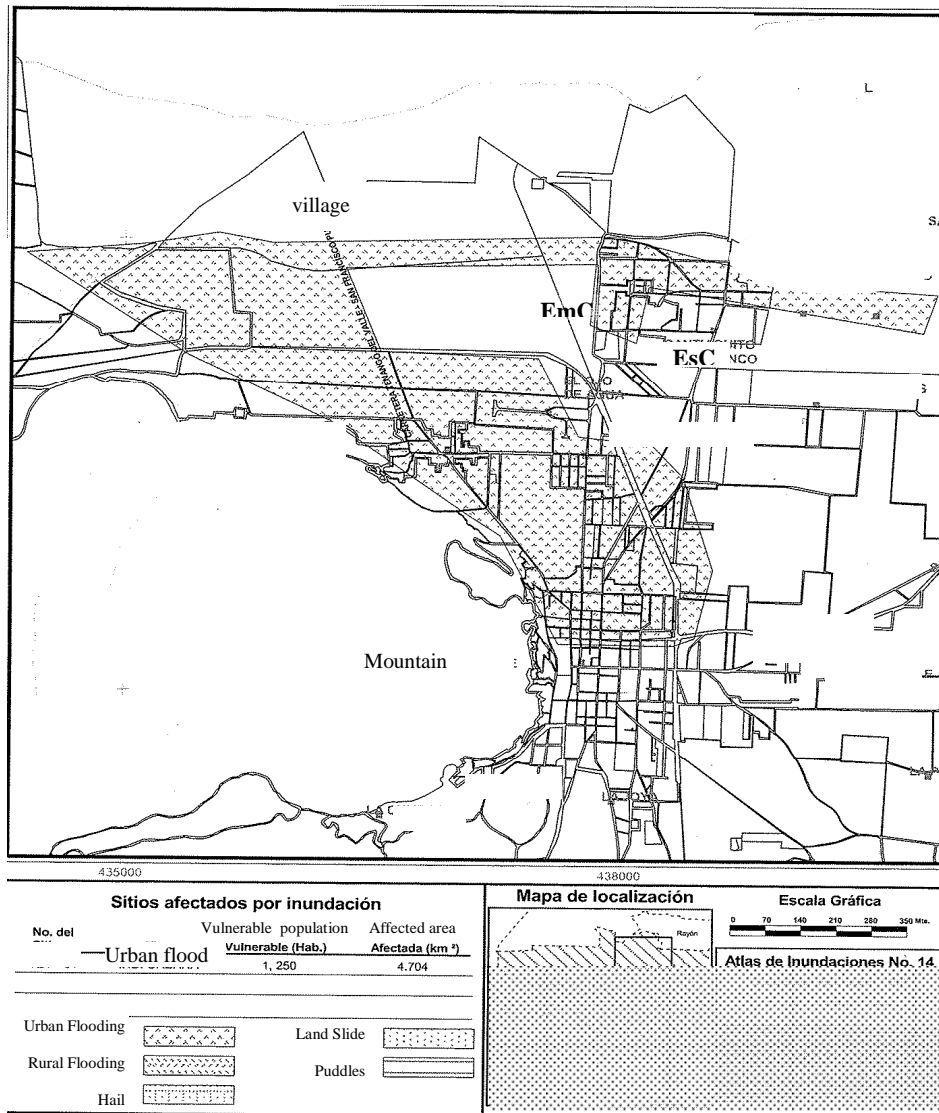
Reading this latter passage, it is possible to see the significant role given to Risk Maps by high-level federal officers, i.e. they consider that disaster technologies are more reliable than knowledge and experience in relation to the hazards that the municipal authorities can mitigate. The benefits of technology are taken for granted, and its practical usefulness is hardly questioned (Latour 2005). Risk Maps are widely promoted as important tools for mitigation and prevention, for instance, if a state or municipality does not have them, it is considered irresponsible. However, I found that Risk Maps are actually updated after disasters.

On the other hand, the Risk Maps designed by the government are called Atlas of Flooding, and officers only update the information, they do not accumulate it, therefore the information differs as the years pass. Thus, these are not maps presenting risks, these are sets of maps presenting the characteristics and features of the region, and the most recent flooding events, not risks in the area. Therefore, these maps can be seen as flood recording maps; these instruments are

not considered in the municipality where I conducted the fieldworks as a tool for decision-making.

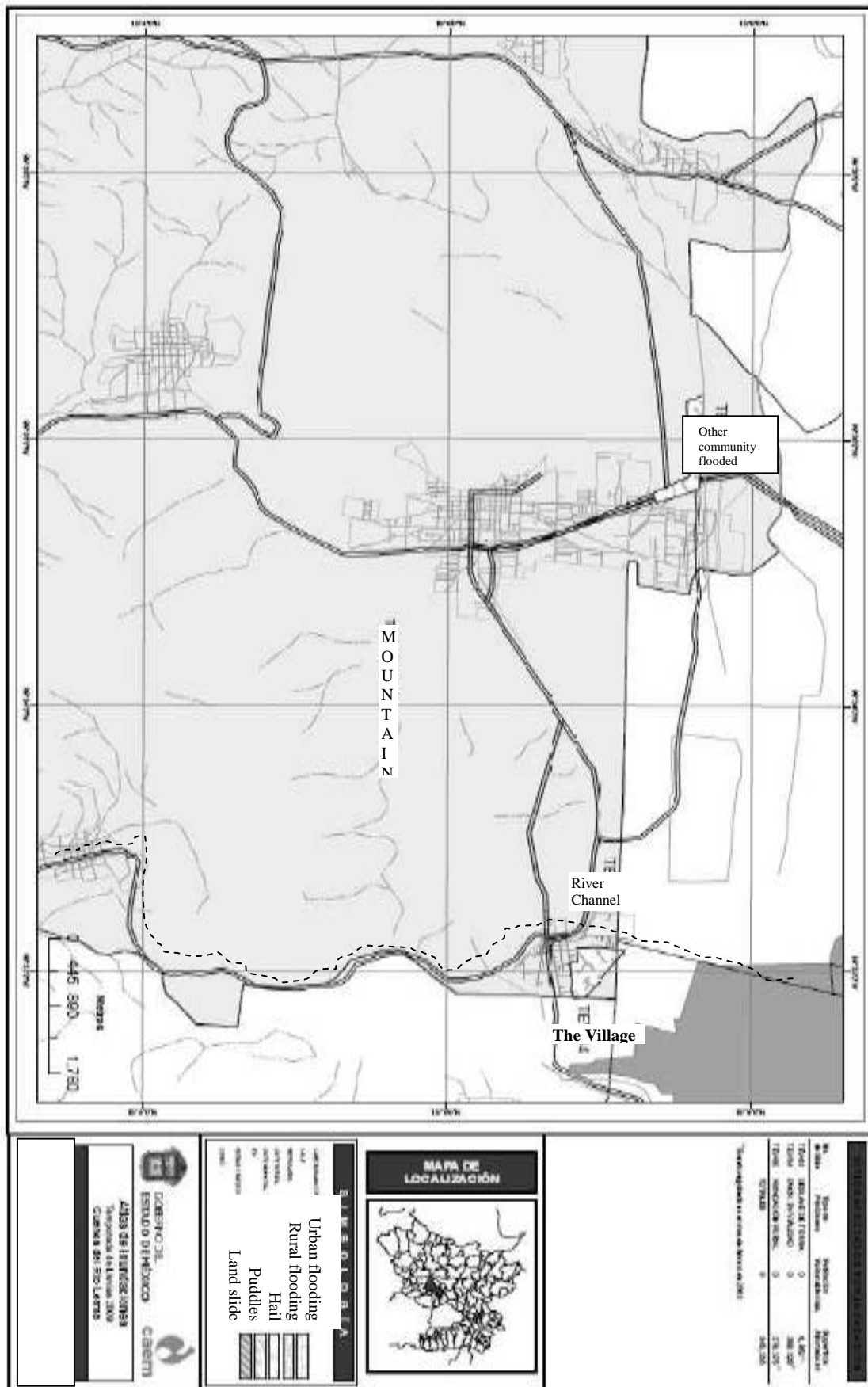
I think that we are in the same condition, I've just seen it on the risk map, because we actually have a map. I think we lack of a culture of prevention. We are extremely supportive when disaster happens but we don't know what we have to do, we don't have a plan saying we have to do this, or that. Because when it happens, you know how it happens, the path it follows. For example, we don't have a school enabled as a temporary shelter. There are places where people can go to recover, we know where they are but we do not really have a plan (N. Don Gap).

Organisations are inconsistent in defining disaster between one administrative period and the following. In the Atlas of Flooding 2007, which is presented below, the area flooded in 2004 is marked as 'urban' flooding, covering a great area, close to the mountain and the main municipality. It is not explained why the classification is urban flooding given that the areas close to the foot of the mountain are agricultural; also, there is no mark relating to the hailstorms that regularly affect the area. The flooded area was 4,704km², and they consider a vulnerable population of 1,250 inhabitants.

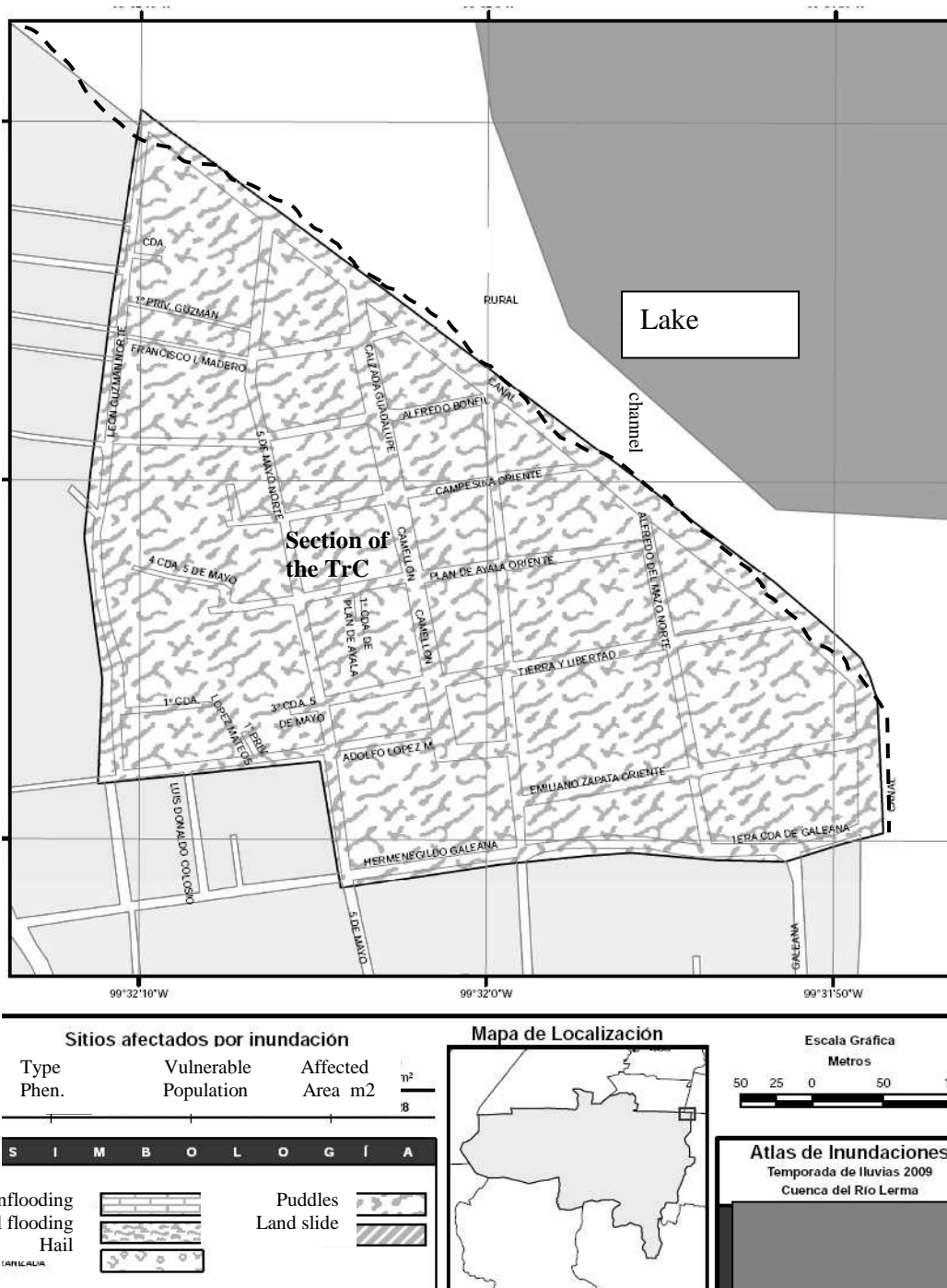


Map 4. Atlas of Flooding 2007, designed by regional Civil Protection

In 2009, the new flooding atlas (of the new administration) classifies the area as being affected by urban ‘puddles’ rather than urban flooding, but more relevant, the area covered by these puddles is smaller. Again, the classifications are not clear. According to the data on the map, there is no vulnerable population; the affected area was about 5km².



**Map 5. Atlas of Flooding 2009, designed by the Regional Water Commission
Source: Regional Water Commission (CAEM) and Civil Protection**



Map 6. Close view of the previous map, Source: CAEM

In this flooding atlas, puddles in the main road are described as an event taking place in the community, there is no population considered vulnerable, and the affected area is about 2km². Thus, the map, even when designed by experts, does not present relevant or correct data; the lake is placed very close to the community, and the river channel does not flow into the lake, as it actually does.

The Atlas of Flooding and the Civil Protection plans are updated with each new national, regional or local administration. In this case, the map does not include information from any previous maps, and the same applies for the Civil Protection plans.

I analysed the 2001-2006 Civil Protection plan; the document integrates operations to be carried out during that time. Nevertheless, I could not find any information with respect to outcomes. The following passage presents the intended actions considered in the plan.

The Special Program for Prevention and Disaster Risk Mitigation designed under the framework of the Civil Protection National Program would be implemented nationwide, in the next 6 years. It proposes 60 research projects and technological development. This program is designed to work with other agencies in an interdisciplinary way. It emphasizes preventive civil protection, as well as coordination and responsibility of social, private, academic and public bodies (SEGOB 2001).

Institutions responsible for the design and implementation of disaster response have various programs through which municipalities can seek advice and resources, nevertheless, officers do not know how to apply for funding or assistance. According to information provided by an interviewed SEDESOL officer, the budget for 2008 (during the new presidential administration) was allocated as follows:

Field	Budget (pesos)
Risk Maps	60,000,000
Research	253,000,000
Prevention Grants	370,000,000
Disaster Relief	5,302,000,000

**Table 7. Distribution of Budget for Disaster Response
Based on data provided by the SEDESOL officer interviewed, 2008**

It is evident that the greatest amount is allocated to disaster relief, followed by grants for prevention. According to the information provided by the federal officer, disaster relief refers to staff mobilization, relief actions, reconstruction and relocation if necessary. Prevention grants in relation to meteorological events are allocated for dredging, bridge-building, and engineering or technical interventions.

In the specific case of the Upper Lerma River Basin region, in which the municipality is embedded, the regional government has found it profitable in political and economic terms to allocate resources and to instigate programs for ecological recovery in the area. This satisfies citizens' concerns over the issue of ecological depletion as well as disasters. However, in real terms, it is difficult to assess the real impact of the programs and resources invested in the area because of a lack of reliable statistics and information.

According to information provided by an officer of the regional Ecology Secretariat, the government has designed a Master Plan to recover the Upper Lerma River Basin (GEM 2010c), which aims to involve all stakeholders, providing a comprehensive response to the flooding problem. Financial resources from agencies such as the World Bank and the Ministry of Finance are funding the project; the total cost (according to him) is about 8 thousand million Pesos (about 4 hundred thousand pounds Sterling). The Master Plan is basically a series of engineering works and technological solutions, the aim of which is, ideally, to reverse the problems generated by the lack of water retention in the mountain.

Also:

Among the activities planned are: the installation of a wastewater treatment plant, the construction of new channels to clean the river, the acquisition of a pumping plant to control flash floods, as well as recovery of the ecosystems to retrieve the levels of the aquifer (XX. Regional Ecology officer).

The effects of drought, changes in cropping patterns, and excessive illegal logging among many other factors, have had devastating effects in the region, making the population increasingly prone to disasters. Following the ideas of Latour (2000) and Law (2007) on technology but applied to the field of disaster, institutions link technologies and plans with practices and discourses, with each

institution performing different practices, building many versions of the same disaster. Technology embodies the institutional myths that emerge from the natural, the social and the political aspects of disaster, disempowering those groups who do not understand or have the skills to use it.

6.6. Political Costs of Decision-Making or Lack of Budget

Funding is an area of conflict inside the social world of government institutions; it is possible to observe that it is a large part of the disagreements present in the interface created within different sub-worlds of the institutional social world.

Officers at both state and local levels constantly complained about the lack of economic resources, and use this as justification for not implementing preventive measures in relation to risk areas. This argument was contested by a federal officer, highlighting the political evaluation that municipal authorities make in relation to cost-benefit impacts in applying regulations on land use, planning, building sites and materials. All of this has a negative impact on future political followers and campaign supporters, who would turn against the political party or faction promoting or applying them.

Resources are available, and should be applied in partnership, but it must be said that these actions are not politically profitable (II. SEDESOL federal officer).

However, a counter argument to this is that availability of resources is also related to municipality political affiliations. Those municipalities not related to the ruling party or group, are not taken into account, and resources, being allocated in the first instance according to political affiliations, flow more slowly to those areas (Fox and Haight 2009). Extensive documentation must be completed in order to apply for these resources. It involves a certain level of educational skills because of the specialized language required. Likewise, regulation for access to resources is not easily available, and municipal officers have to commute long distances to federal administrative offices, to access advice on how to obtain funding and resources.

From 2003 to date, ironically, instead of increasing year after year these actions went down; during 2005, by 30%, in 2006 by 26% and in 2007 by 14%. As you can see, there is no interest from local authorities (II. Sedesol Federal Officer).

In relation to this, the next passages present a conversation amongst municipal officers and the federal officer in charge of allocating funding. It is clear that the municipal officers lack knowledge in relation to programs, timing and funding; they caught the federal officer on his way through the office and asked him about the programs.

Municipal officer: ... in relation to prevention, our government wants to know how to coordinate disaster events.

II. SEDESOL Federal officer: In relation to prevention, there are three programs that can be allocated: The first is Habitat. The Secretary of the Interior has the second: the National Fund for Disaster Prevention, known as FOPREDEN. Applications should be presented during the early months of the year, but if it is demonstrated the imminence... then that is a matter of prevention. And on issues of recovery and disaster response, the INFONDEN during the national agenda for disaster prevention

Municipal officer: And what we can do to get the Risk Map?

II. SEDESOL Federal officer: To request it, you can approach any SEDESOL delegation. Your municipality is possibly considered under the Habitat program and there is resource allocation, but no longer this year. The allocation is done in the first three months of the year. At the moment we are revising the projects presented previously. During June or July, we revise projects that have not used their allocated resources, for Risk Maps, and we make a new assignation. Get close to your regional delegation, you can probably get something.

According to the SEDESOL federal officer I interviewed in 2008, much of the funding directed towards disaster prevention had never been used; the reason given was: the negative feedback received from municipalities and regional governments in relation to the political costs as a result of implementation and regulation. On the other hand, officers within the three levels frequently did reference to the financial will as an oiling mechanism in institutional operations. If resources were to flow, it would allow post-disaster mitigation works to be carried out.

If I don't have enough funding, I won't accept any more work for myself and for my staff. If senior officers offer me a promotion, but without any more funding, I prefer to reject it. It is not possible to work like that (personal communication to higher officer).

Financial will means, in officer terms, the easy flow of resources for the institution. Officers imply that behind the financial will there is political will, they do not say this overtly, but they assess their political power on the basis of

resources and funding, thereby justifying their own existence and the long-term institutional continuation.

In relation to funding, there is a combination of three conditions in the social world of institutions; on the one hand, there is the lack of funds, on the other, the restricted allocation of that funding according to political will and, finally, the political costs of implementing those programs and policies throughout the population.

6.8. Municipal Practices of Neglection

When trying to understand and analyse why institutions do not have an appropriate post-disaster response, and further, why disasters happen again and again, one word used by one interviewee from the EmC jumped into my mind: *negligencia*, meaning neglect or negligence. After studying all the documents and interviews, and having observed the behaviour of the formal institutions *in situ*, I consider it as an inherent frequent institutional practice at all levels of the system.

According to the Oxford English dictionary, neglect is related to disregard of, or indifference towards something. I later found Clarke's idea on permanent institutional failure (Clarke 1999), and in it, her theory on organisations seemed to support my idea; Institutionalism explain how institutional low performance justifies negligence, Clarke demonstrated this empirically.

This section examines the institutional practices with regard to institutional neglect. Situations such as the low performance of civil institutions in relation to effective disaster response, the process of the 'disappearance' of documents and relevant information in the municipalities during political-administrative changeovers, as well as to the continual failure to implement the programs, all add to reinforce this idea.

They have no vision, no action or goals, there is nothing. I tell you, in the coordination department, they will show us that every year they have been making an atlas of the Upper Lerma River Basin, and they're going to give us a big speech. We plant so many millions of trees over there... we did this and that, many things, including photographs. Hey! They even have a photographic atlas

of the whole area. Ah! But if we say, where is this? They will say in the mountains of Tepemajalco. If we go to the Sierra ---, to see where this conservation work is supposed to be happening, and look for the result they talk about, we won't find anything.

Any day, if you want to go, they would allow you to look at their documents, because they do not sell them or give them away as gifts, they have the document just for them. We can view them, and check them and, then going into the field to find what they say they have done, there is nothing. They haven't done anything (H. Mr D).

Every three years the administrative staff changes because of municipal elections. I have explained this situation in detail in Chapter IV, but I will also give a short review here. Every three years the municipal government staff changes, as is presented on the next page (see Figure 13). All designated councillors and the post of municipal president are decided by election, the remaining staff members being selected by the municipal president.

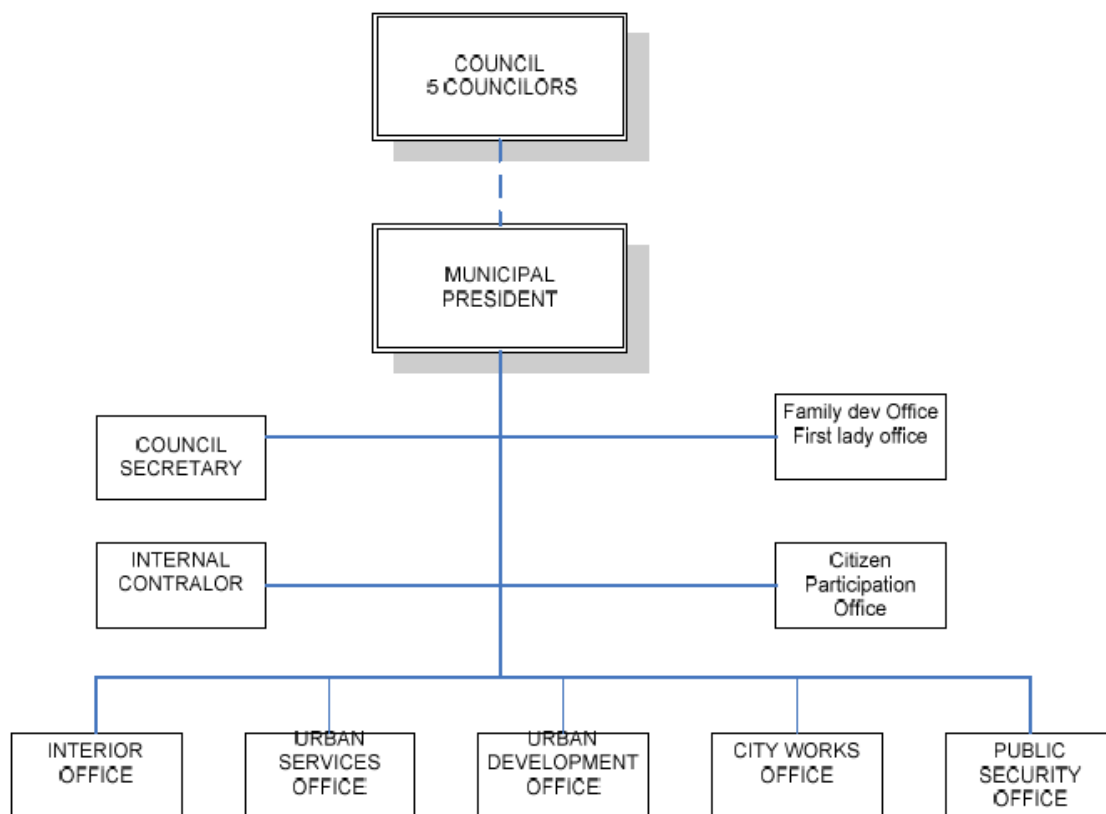


Figure 12. Flowing Diagram of the Municipal Structure

The post-election process goes together with the disappearance of sensitive documentation, some remaining files are passed on to other offices to create confusion, the staff working for the outgoing administration are replaced, new

staff members are hired and new agendas are introduced. All of this is linked to the disappearance of local institutional memory and, further, to institutional neglect.

The state government is constantly requesting information. They know that the documents and information will disappear. Thus, that information never returns to the municipalities and everything starts afresh every three years. Of course there are plans that require continuity; these are all handled directly by the state government (XXI. Former Municipal Officer).

The former municipal officer told me during our interview, that new administrations assume their positions with little equipment, staff and backup files. Even when there is an officer handover process, it is cursory, so that the new, inexperienced officers will not notice the missing documents. The lack of job security in the civil service as a stable career means the removal of all the original municipal officers, except for the servants who are supported by unions, and generally hold the lowest positions in the governmental hierarchy.

All municipal changes create similar problems throughout the whole country time and again, where the most common features are: redundancy for many municipal officers at all levels, recruitment of new personnel with unclear job role criteria, as well as material and economic plundering. It is also a recurring theme that these municipal transitions represent the cancellation of projects already implemented, whether for political or economic reasons (Gómez 2007, 17)

In the municipality, there are no remaining records of previous disasters, nothing about the use of allocated resources, nor any statistics about the number of people affected. The Atlas of Flooding is updated at the state office at the start of each new administration. It is then returned one and a half years later, in the middle of the municipal government's period. That is the only information that the new administration has regarding any disasters. During my fieldwork I went to various government offices, both state and federal, for information. In each case, I was informed that any minimum information requisition should go through the Institution for Information Access (IFAI), which had a waiting period of 2 to 4 weeks. In the case where a request for information was less

formal, the answer was that they did not know where the information was or it may have been lost.

In the case of disastrous events, like the floods analysed here, there is little evidence of them in the municipality; access to signed documents is highly controlled. Floods and other disastrous events remain solely in the officers' unreliable memory as the following conversation demonstrates.

XVI Municipal Officer-Here in the municipality there is not a ... I mean, we have no record of what has happened. When I was hired in Civil Protection, I thought there must be photos, there should be a report. There was nothing.

F: Is that related with the administration change?

XVI. Municipal Officer- Exactly, each administration takes everything away and then nothing happens, as I told one of my colleagues. A memory of this must exist, there must be something, because this place was not waterlogged. I think, it's a shame, it is a pity that they did not leave a memory of everything that Civil Protection has done, because if you have evidence you can take preventive measures.

Another practice of institutional neglect is the frequent lack of communication between organisations; departments rarely share information. This implies a justification for inadequacies, errors or failures in the execution of programs. There are many examples throughout my interviews , where officers of all ranks told me of their repeated requests for information exchange and participation.

For example, during a working visit to the areas where the municipality was supporting local families to build basic housing through SEDESOL funding, the local urban development office should have provided approval authorizing the building. In this case, that office sent an architect to supervise and conduct an evaluation, in conjunction with the office responsible for the implementation of financial resources. The architect was actually an undergraduate student in engineering, his job was to make technical observations and fill out an evaluation form. Many construction projects were proposed in the back yards of existing family houses, and in other cases on agricultural land without services; these did not follow any clear development pattern, had no services and were often on quite steep slopes.

F- How do you assess if the property is suitable for building a house?

XIX Architect - We look at physical conditions in the property, the availability for setting the appropriate foundations, property titles...

F- And what about the location of the property and services?

XIX Architect- Well, that is also considered, but in some cases properties aren't in the perimeter of the urban development reserve. Nevertheless, permits are issued if the area is considered suitable for urban development.

F- Is there any urban design that should be considered in relation to the streets and the availability of public services? I wonder how the services are going to be provided in this case?

XIX Architect- Well, the inhabitants would have to put pressure on the municipality to get the services.

This passage shows that the authorities indirectly support housing construction in unsuitable sites, exacerbating urban problems because of the anarchic growth that the authorities are supporting, adding to vulnerability.

The urban development office has characterized the area that once was a lake as a 'zone of urban growth reserve'; today, a great part of this land is still agricultural, but urbanization is creeping in. In conjunction to this, disaster coverage is decreasing on the Risk Maps. The area badly flooded in 2004 in the village is considered 'puddle prone' in the latest Atlas of Flooding, and the area of the EmC that was also flooded in 2004 has been taken out of the map altogether.

Flooding atlases do not consider any area flooded in the past because they did not happen under the current administration, or they only happened in agricultural lands, damaging only crops. For this reason, the construction of housing is not illegal in previously flooded areas. Lack of institutional memory opens the door to hazardous practices, justifying policy application based on improvised data.



Figure 13 . Leaflet marketing a new developments for middle classes in The Village area

Building companies take advantage of gaps in the law and the vacuum of authority that appears at the end of the municipal periods, generating disaster patterns by building in clearly unsafe areas. At the end of the government's term and during political campaigns, there is another vacuum of authority; many actors break the rules and disobey the law because there is no governance, according to a municipal officer interviewed.

We have noticed that in those periods house frames appear and some work is done, obviously without any permission for construction, with no documentation; finally, when the new administration has settled down, the owners ask for permission! They claim the construction has been going on for years, and that the previous government didn't do anything. And you know, they are built without any safety concerns. We still try not to allow construction in risk areas. It has been proven that... probably in 2004, they had serious problems with flooding, also in 2002 they had problems with landslides (XVIII. Urban Development Municipal Officer).

Citizens and private organisations are aware of these practices, and know of the institutional gaps, taking advantage of them. There is a silent complicity in the relationship between citizens and institutions; inadequate and inefficient performance is taken advantage of by citizens, and those institutions know it.

In the past 15 years, policies have been oriented to promoting industrial and commercial growth, which has generated serious problems in the provision of adequate services and, in particular, of land for building. Consequently, the urban development plan for the metropolitan area of Toluca Valley (where the municipality studied is located), suggests locating new settlements in risk areas (it also considers industrial development in this area). However, the document

considers that, given the high risk of flooding in large parts of the area, the building of hydraulic projects should be planned, as well as the acquisition of high-tech monitoring equipment. Thus, urban growth is planned to the east of the region, the flood-prone area, part of the former Chignahuapan Lake (GEM 2005).

6.8 Federal Practices of Institutional Neglection

The case of the National Water Commission can be used as an example of institutional neglect. The National Meteorological System (SMN) operates under the auspices of the National Water Commission (CONAGUA); the SMN provides data necessary for decision-making with respect to meteorological phenomena. CONAGUA has under its control two types of meteorological stations classified as traditional or automatic. Unfortunately, the traditional stations suffer from low levels of maintenance, and the casual workers in charge of them are poorly paid; these have a negative impact on data collection and emission, and therefore on decision-making.

In the studied area, there are stations of both types. The traditional station employs people in the local community, who receive basic training, and take measurements (once a day in the morning). These measurements are used to make daily weather forecasts and to conduct atmospheric studies over various periods of time. With the purpose of interviewing the person in charge of the traditional meteorological station, I went to the neighbouring village where it was supposed to be located. I wanted to have first-hand information about flash floods and weather patterns in relation to the last event in 2004. Unfortunately I could not find the station.

The authorities at the neighbouring village had no idea about the meteorological station, and as for name of the supposed location, no one had heard of it.

IX. Delegate: Here in the village? Er, the Water Commission you say? Do you have an address or something? The river? Because I have no knowledge, are they doing something there or are they measuring something?

F: We are studying the floods in ---

IX. Delegate: I would suggest you go there to the river, to see if anyone can help.

F: Is there an office of the --- or something?

IX. Delegate: No, with reference to water, you should go to the municipality, because here there is a group of water users, nothing more, but with regard to the river no. They have an organisation or group, but we don't. In this case we have no commission formed in relation to the river.

I went to the federal CONAGUA offices. There was a special office, similar to a waiting area in a medical centre; tickets with numbers were given by an electronic device. A uniformed lady attended me, asked the purpose of my visit and gave me some alternative times. She had a black diary, and told me there was a waiting list; I had to wait 2 days before I could get in touch with an officer. Accordingly, I returned and went into a large space divided by various improvised old desks, and a strong smell of food; a sleepy guard sent me to see *the engineer*, as he put it. This area was very different from what I had imagined, considering the plush appointments office, and I was a little disappointed.

The engineer received me nevertheless, and when I talked about the issue of the location of traditional stations, he referred me to another engineer, who told me that the traditional stations are in charge of some people hired in the village, and that caring for one is a long-term job for which only a small annual fee is paid. Some of the workers are elderly and leave relatives in charge of their meteorological station. However, in the last two years due to lack of funding, the information was not being collected, and so there was no data *yet*, as he stressed. The idea of involving grass-roots people to manage the data necessary for CONAGUA is a good idea, but lack of training, coordination and control are the most relevant aspects against such a strategy.

CONAGUA Officer A: ...in some cases the stations are some 30 or 40 years old, I understand that they were chosen open representative spaces, to capture as much data as possible ... good enough to be representative for the area. The stations were placed where there were no obstructions to wind or rain... some of the meteorological stations are located on the roofs of houses; it is not recommended but it is preferable than placing them inside the houses, where we wouldn't get very good information!

F: Are these people trained or anything? Are they taught the basics?

CONAGUA Officer A: Errr, considering the information they download ... there have been occasions where some people, because of their age or because they became ill, have passed the job on to someone they know ... we have also changed the place and they are trained.

F: Do they work Monday through Friday?

CONAGUA Officer a: For the money, we tell them not; every single day at 6am, they should take the measurements, Saturday, Sunday, holidays, daily. But in those areas where there is a payment and elderly people are in charge, they usually leave the job to their grandchildren.

The data generated by the traditional stations feed the databases of the national meteorological system. Although the data is supposed to be for decision-making and research, most of the time they are unreliable because of the poor performance of the traditional stations. In an effort to make the data more reliable, the government acquired automatic meteorological stations, which take continuous measurements throughout the day, generating a continuous flow of information, via satellite, to a central database at the SMN.

Unfortunately, the CONAGUA officer confirmed that the automatic stations too were not working because they were in a process of adaptation. He also mentioned that the software necessary was becoming obsolete. Furthermore, according to him, there was the possibility of returning the stations to the supplier because SMN was unable to fully utilize them due to staff shortages.

It is possible that involving the local population in the running of the traditional stations is an appropriate and positive means of involving communities; running them is a skill and a source of extra income, but institutional neglect is evident in the lack of follow-up training and resources, which is causing the information collection system to fail. Moreover, technology does not solve problems when there is no staff. Technology in this case, is used to demonstrate that the institution is good at its job, but in reality this technology becomes obsolete with time, and it has never been properly used.

The municipal institutions have management and political functions. At the administrative level, municipalities are responsible for the provision of services and for the execution of policies. In the Mexican case, public policies are generally designed at the centre but a municipality is responsible for its population, and in this sense it has more political weight. However, a predominantly urban municipality, with factories and a wide services

infrastructure, has relatively more political weight than a rural small town with only basic productive activities (Gómez 2007).

Robles de Benito et al. (2008) suggest that local municipal dependence on both the state and the federation in terms of policy design results in a mismatch between the level of human resources needed to carry out those policies and the actual needs on the ground; this makes it difficult to make decisions based on context-specific experience. Likewise, the authors note how task expansion is not easily accepted by municipal officers; on the other hand, federal officers do not easily accept the expansion or delegation of federal programs by the municipalities as they consider this a loss of political power and control.

Citizens and private organisations are aware of institutional practices and timings, and exploit them in their favour. The ongoing development of plans and programs in a top-down manner makes it difficult for politicians at the centre to reflect the interests and needs of the citizens. Further, economic development and industrial and infrastructural expansion are accompanied by a lack of adequate human resources to implement them. However,

We should not think in terms of political parties, we must first remember that we are human beings, we are *mexiquenses*, people of the State of Mexico and people from the region, and so support and solidarity should flow from this, no matter where it comes from, even if it's necessary to acknowledge and thank the authorities that have granted benefits (XVII. Local politician).

Many social programs with a social approach are provided as gifts from the powerful, who seek political returns, and it is possible to note this in the above passage. The funding that is granted to solve disaster conditions comes from federal funds but is presented as generosity on the part of the politicians.

The above situations vis-à-vis the institutions have described and illustrated how the workings of the political system create structural vulnerability (Lavell 2000). Decision-making is justified by the authorities as being legal, even in the case of building houses in flood-prone areas. This does not mean that the institutional and legal frameworks are adequate. On the contrary, all the conditions for increased vulnerability are being created by poor governance, which will affect present and future inhabitants of the whole former-lake area.

6.9. Institutional Construction of Ignorance

Ignorance is not a simple antithesis of knowledge: it is a state which people attribute to others and is laden with moral judgment. (Mark Hobart)

The aim of this section is to analyse the power battles inside the social world of formal institutions, where ignorance is constructed. Its analysis is relevant since this practice is related to decision-making and the strategies that are applied to cope with disasters. The concept includes cultural, social, situational and experiential factors. Knowledge is at the same time creative and destructive when intending to destroy other knowledges, concepts and understandings, and in that way ignorance is created over other groups.

The social sub-worlds in the social world of governmental institutions are the federal, state and municipal levels; within these sub-worlds, there are battles between those who have the technical and academic abilities, experience, and empiric knowledge. Each sub-world has its own codes of conduct and symbols, and their interests often collide. During interviews, a frequent theme was the constant patronizing attitude that officers from the state and federal levels had towards the municipal staff. Highlighting their lack of education, the higher officers implied an intellectual inability to cope with emergency conditions, which was then used as an excuse to establish tight controls over both resources and people.

During the fieldwork, I noticed that within the municipal institution, officers established hierarchies according to their educational level and academic background. Thus, an engineer is not seen in the same way as a lawyer.

In the municipality, technical and structural modifications have been made to the system of lakes and rivers of the Upper Lerma River Basin, having negative impacts on the local ecosystems and on the culture of the communities settled in the area. These technical solutions were considered as the ultimate solution to development, but they were imposed through state-level policies over local rationalities, and ended in failure and negative consequences for the locals (Hobart 1993).

Now, to solve the problems created by earlier decisions, new programs have been established, which again have a strong technological and engineering component. These works are instigated primarily by the state and federal officers. The man in charge of advising and carrying out one of these programs (the dredging and maintenance of a river channel in the Municipality) is an agricultural engineer or *El Inge* as he prefers to be called. He is very proud of his title, and of his experience in the area, but feels a little embarrassed when reference is made to his humble agricultural background.

We have a regional consultant, but he never comes here. He just appears when there's money from the municipality, and as I am the most experienced, and I know everything about the area, all my colleagues ask me when there is something to be done XXII. *El Inge*

Certainly, *El Inge*, even though his background is in agriculture, has empirical experience, since he has done much work with the federal civil engineers that occasionally come to maintain the river channels of the area. He has been in his job as an agricultural technical advisor at the municipality for at least six years, that is, across two municipal periods; because he is commissioned by SEDAGRO, his removal or replacement depends on the federal, not the state or municipal level.

Though *El Inge* is not originally from the municipality, he knows its problems very well. He has accumulated several archives containing relevant information on the area, but he considers them to be personal information.

This is all the information I have gathered. They have tried to steal it and that's why I always keep it with me. They don't give me credit. I do the work and someone else takes the credit. And that's not fair! (*El Inge*)

From his point of view, the main factors causing floods are deforestation, grazing and lack of works in the river channels. He considers that the poorly informed practices of the peasant farmers are the cause of soil erosion. He criticizes the techniques they use to grow potatoes, as well as rotational grazing, and destroying programmed reforestation (promoted by the government and other institutions). Both of these latter activities are carried out within the boundary of a national park, at 2,800 meters above sea level. Legally, it should not be

possible to do any of these activities but they have been quietly ignored by the government at all levels, otherwise there would be the need to generate development alternatives to strengthen the livelihoods of peasant farmers. While I was conducting my fieldwork, a government program was promoting the intensive cultivation of canola for oil production, but local farmers were unwilling to switch from their maize crops, vegetables and flowers to a crop not yet proven profitable. *El Inge* said that the reason was ignorance and even a desire to remain poor.

In relation to mitigation works for floods, government institutions are designing policies for which the basic practices are: channel dredging, raising bridges, and building retaining walls. I encountered a local delegate who was seeking the favour of local voters prior to the upcoming elections. He was following an old program developed in the late 70's early 80's, related to the basin's management, and was dredging channels, digging ditches, and doing some reforestation. He said that he had learned all of these by watching how local and federal engineers did them; also, *El Inge* occasionally gave him advice.

This is not rocket science! We can do it. In fact nobody is paying me for doing this; I'm doing it for my neighbours, and because it is necessary, but you know it's very hard, this is loads of work for one person guiding and one backhoe driver, and anyway I've done very much of it on my own. Last week we dug these retention ditches, and today they are full of water and gravel. When are we ever going to finish? (VIII. Delegate)

In general, wherever there are rivers, the government policy to avoid floods and flash-flooding is to dredge the channels. However, this is a case of ignorance creation. Municipal officers agree with this type of work because of the visibility of the backhoe doing works along the river channel but the municipal officers are strongly criticized nevertheless because there are no other types of mitigation in evidence. The works suggested by the government are merely dredging the river channels, and some basic infrastructure works. The table below is part of the Atlas of Flooding 2009; it presents the mitigation works necessary in the channels, such as dredging and building gabions in the area of the river. These works are suggested for the year after the publication of the flooding atlas.

Actions and works done in 2009	
Operations and services to infrastructure	New infrastructure
Preventive actions were done: cleaning and dredging 4,460m of channel, and 105m of drains Evaluation of affected area by technical staff. Dredging and reinforcement of channel walls in the north east (action to be executed in 2010)	Gabion building in the river channel (action to be executed in 2010)

Table 8. Actions and works done in a flooding area

Atlas of Flooding 2009

Officers from CONAGUA consider that basic works require high budgets. However, from their perspective, the techniques used by the municipalities, and even by the state, have not been done technically well.

There are two ways to do this, given the lack of resources; we have allowed the state government to do the dredging, unfortunately they do not do it well. Normally, we do some analysis beforehand in relation to the river; we assess the ditches and then the reinforcement of the levees is done properly. In the case of dredging carried out by the State, they normally put the gravel down without compacting it, creating another problem (XVI. CONAGUA officer B).

In general, the federal officers consider that they do these kinds of technical works better than their municipal counterparts; they make negative assessments of the municipality's dredging works, and they consider the low educational background of the municipal officers limits their ability to do technical work to a satisfactory level.

The municipal authorities work following what they understand, but we are not very strict with them because they are doing the best they can. What we do is give some formality to their work. Also, their materials often come as debris from the mountain, and so they use this gravel and debris to reinforce the channel walls... their work is going to be washed away in the next flash flood, but if we do it will much last longer, that's the difference (XVI. CONAGUA officer B).

The municipal officers are aware of the negative perceptions that higher officers have about them, considering them ignorant. *El Inge* emphasized the constant conflicts between the municipal officers in charge of the river works and the engineer coming from a federal institution (supposedly to evaluate and give advice). However, the municipal officers make jokes about the federal officers'

patronizing attitude. The next fragment has been presented before, and it clearly explains the power and battles of knowledge, where one knowledge is trying to establish itself as dominant, by destroying any opposed knowledge.

The SEDAGRO engineer used to come because he did some works in the river channel, mmm, poor. I think that he had the heart attack because of us, ha ha, what was his name? I don't remember, well we copied the way he did because he used to come very sporadically but whenever he came he was always telling us off, saying that everything had been done wrong, and that it was a mess. But we learnt and we did it how we understood, and as you can see, it is not so bad (XXII. *El Inge*, municipal officer).

For the federal officer, neither *El Inge* nor the municipal officers had the knowledge required to properly conduct the necessary works in the river. The creation of ignorance between the different government institutions implies the imposition of superior perspectives from higher levels. The municipal officers' knowledge, in a semi-urban setting, is based on experience; they do not have Bachelor degrees and so they lack the jargon and cultural tools necessary to negotiate with the federal engineers on a basis of equality.

Thus, there is no real dialogue between the different levels of government officers. There is a continuous creation of ignorance from the higher levels to the lower ones. The situated experience of the municipal officers is not considered valid from the upper-level officers' perspective. Given the lack of resources and programs for disaster management, the municipal officers utilize improvisation to support their technical knowledge, but those same municipal officers also disregard local knowledge, creating the same ignorance over the farmers' knowledge.

6.10 Summary

In the Mexican case, the institution of Civil Protection was created in response to demands made by the citizens after the devastating earthquakes in Mexico City in 1985. It is based on emergency disaster response, but is not much involved in disaster prevention. The Civil Protection institution, as a governmental organisation, was the government's response to the army's excessive use of force

when trying to impose order and manage the disaster situation. The government at that time was criticized for lack of effective response.

On the one hand, it is possible to observe a democratic decision, but on the other hand, it is possible to say that the government justifies its activities related to disaster response even though its performance is generally poor; however, it cannot be blamed for lack of interest vis-à-vis the citizens' needs. Civil Protection is a government organisation that operates on the national, regional and local levels.

In the particular case of the studied community (a small village), the capacities of municipal officers were exceeded; they did not have the tools, training or staff to cope adequately. The regional level was also inefficient in their disaster response. The practices of prevention implemented, such as earthquake drills and technology acquisition (for example Risk Maps) are insufficient because, in practical terms, they do not help during an actual flooding emergency event. The non-human actants in this particular field of disaster link institutions, technologies and plans through practices and discourses.

Each actor in the institutional social world has different practices, creating many versions of the same disaster. Municipal officers assess their own work as emergency response, but these are actually small, easy, daily emergencies. In case of an extreme event, the opinion of the local officers is that people should be responsible for their own safety.

Among the different levels of government, there is a constant creation of ignorance and the imposition of knowledge; this implies that all knowledge or experience in the lower governmental levels is not valid. Municipal government officers have situated knowledge, however, the vertical implementation of technical decisions disempowers those municipal officers.

Lack of economic resources is always used by municipal and regional officers as a good reason for not implementing preventive measures. This argument is contested by federal officers, highlighting the political cost-benefit evaluation that municipal authorities perform, in which the application of regulations and laws has a negative effect on the

interests of future voters and campaign supporters, which would be against the political party or faction implementing them.

Governmental decisions as well as negligence create vulnerability. Decision-making is always seen as legitimate, even in the case of building houses in flood-prone areas, although the decisions are often based on inadequate data, such as the incomplete the Risk Map or meteorological data. Is interesting to note the term Atlas of Flooding is used instead of Risk Map; the word atlas only designates the places where floods happen, not the actual risks (this term does not seem unintentional in its selection). It is now possible to observe the creation of the conditions that will increase the level of vulnerability of the present and future inhabitants of the whole former-lake area.

Chapter VII

Conclusions

7.1. Introduction

This research has examined the multiple relationships, understandings and practices established between different actors and social worlds in a disaster arena. The cultural, political and environmental aspects are the most important dimensions in the context of this research. The study was conducted in a post-disaster situation and it was possible to observe how different social worlds constellate thereby creating interfaces. Additionally, through the Situational Analysis framework, it was possible to observe how everyday actions play a relevant role when disaster strikes.

Small scale disasters are disregarded by academic bodies, practitioners, politicians and financial bodies, putting at risk a large number of people affected by these events. The dismissal of these communities implies that they are forced to develop their own strategies for survival and access to benefits, which does not change their original conditions of vulnerability.

A relevant result at the theoretical and methodological levels, in this research, is the value of the situated analysis that recognises the unique conditions characterising these events in the micro areas, re-evaluating the different strategies taken by these populations to cope with disasters. This approach makes visible the nature of the interactions between different actors in a particular disaster arena.

I used a qualitative approach to analyse the meso level of the community, which was supplemented with Situational Analysis as a theoretical and methodological framework. Situational Analysis (Clarke 2005) allowed me to observe and analyse the many different interactions, conflicts and negotiations that arise in a disaster arena between the various actors. Throughout this chapter, the research questions are answered whilst conclusions are built.

Vulnerability was the theoretical framework used, which allowed me to explain the different macro-structural conditions (political, economic, social, historical, spatial) that influence the formation of a disaster arena. The study design and the implementation of the methodological framework provided many contributions, both theoretical and methodological. In this chapter, I will primarily analyse the theoretical implications of this study, with reference to other previous studies similarly conducted in the area of disaster vulnerability from a cultural perspective. I will then discuss the implications that the different discourses have had in relation to decision-making in each social world, and how this has impacted on the success or failure of government policy design. Finally, I will discuss the feasibility of, and limitations on, the research design and methodology as well as potential areas for future study.

7.2. Theoretical Contributions. The Socio-Cultural Dimension of Vulnerability

The findings described in the previous chapters are relevant contributions to the existing literature covering the socio-cultural dimension of vulnerability to disasters. This area has, to date, rarely been integrated into the macro-structural analysis of disasters and in the decision-making process. In this section, I will discuss the specific contributions to the theory obtained through this study. Firstly, I will explain the contributions in relation to the socio-cultural dimension of vulnerability to disasters. Secondly, I will review the meso level of vulnerability analysis, and its relevance in decision-making, particularly in light of the fact that, at this level, public policies have highly visible outcomes.

As discussed in the theoretical chapter, disasters have been studied from two perspectives: risk and vulnerability. The first approach is based on the probability of occurrence, the second on macro-structural conditions influencing a disaster situation (Blaikie, Cannon et al. 2004). Recently, a significant body of research has shown interest in the meso level of communities, as that is where public policy is seen to be relevant.

The main approach influencing the community perspective is the development school of thought, in this case, the actor-oriented approach (Long 2002). It is dependent on situatedness for explaining the conditions and factors involved in the interaction of the actors in the disaster arena, as well as defining practices and understandings.

In the last few years, international organisations have recognized that both socio-cultural and environmental conditions are having an increasing impact on disasters in both the developed and the developing world, and have become aware of the failure of the established public policies. It is therefore necessary to consider the local community as the level where policies are directly implemented, and where success or failure is experienced (UNISDR, 2008). New approaches advocate for the integration of local knowledge, practices and understandings in the decision-making process when dealing with the people affected by disasters.

The findings in this study suggest that decisions, both at institutional and community levels, are influenced by the interface created among the cultural, political and environmental dimensions. Inside the disaster arena different actors evaluate the situations of vulnerability and hazards in relation to their own understandings, practices and knowledge.

Hilhorst (2004) developed a perspective that analyses the meso level in order to explain the convergence of three social dimensions of disaster: governance, local knowledge and science and technology. This approach, oriented to analyse the community level, explains how the most relevant social domains surrounding a phenomenon can establish negotiations, create conflict, and help to understand a disaster situation; for those reasons this perspective is relevant. The findings in this study are consistent with Hilhorst's proposal in relation to the salient social worlds (called domains by Hilhorst) in a disaster situation. However, each social world is heterogeneous; thus, within each of these worlds, groups and actors with different interests and understandings coexist. This is an element that is not considered, or at least not satisfactorily answered, by Hillhorst's approach.

Several actors with different interests and understandings coexist within the same social world; an analysis of the points of internal conflict and other relevant domains has not been considered in Hilhorst's proposal. In that sense, the application of Situational Analysis as a methodological framework, and the use of the actor-oriented approach (Long 2002), supplements these deficiencies in Hilhorst's model. In addition, Situational Analysis captures the various interactions among the actors, social worlds and non-human elements related in a disaster arena. Moreover, the actor perspective, developed by Long (2002), adds to the field of Situational Analysis, explaining points of conflict, convergence and disagreement in the constellations of social worlds and non-human actors within a disaster arena.

From Clarke's (2005) perspective, interactions among the social worlds lead to the creation of sub-worlds; from the actor-oriented perspective (Long 2002), such interactions create interfaces, where conflict, negotiation or convergence can be explored. In this sense the two approaches work well together, highlighting the elements that make sense in a disaster arena.

The outcomes of the decision-making processes are established by different understandings, perspectives and practices of the salient social worlds, when related to disasters. One important outcome of this research is the idea that the nature of those interactions among the different social worlds is socio-cultural. These findings add to the body of knowledge through the analysis of the various socio-cultural elements inherent to the actors, influencing the implementation and success of policy inside the different social worlds. It is relevant also the inclusion of the role of the non-human elements defining practices and understandings among those affected at the meso level.

Community is central to the local knowledge approach. The geographical perspective of the community has been highly contested, as it has been considered a limited analytical unit restrained to a particular space. However, given the spatiality of natural disasters, the geographical focus is highly relevant in this case. Disasters are located spatially and communities establish the

material and symbolic boundaries that determine the responses in relation to an emergency inside this space.

The vulnerability theory is still relevant in explaining the structural conditions through which a society becomes prone to disasters; this research supports the perspective based on the role of social conditions contributing to disasters.

The socio-cultural dimension of vulnerability is expressed through the different discourses, practices and understandings of the actors involved. In general, disaster-response approaches are based on economic indicators, with the relationship between poverty and marginalization guiding the design and implementation of policies. The data suggests that whether in making short-, medium- or long-term policy, it is vital to consider the future impacts of these decisions, not only in economic but also in environmental, social and cultural terms.

Policy design, based solely on macro-structural elements, means that the particularities of individual communities are overlooked. In the case of the community, the analysed results show that it is necessary to design policies in which there is genuine participation of those communities who are at risk, a decision-making process that would take into account each situation's unique elements. A situated approach would have a beneficial impact on any community affected by extreme events.

7.3. The Social Interfaces of the Communities, and Governmental Institutions in The Village

The findings from this study are comprehensive and, even though there are elements that are widely applicable, the results are context-specific, based on the results of the study conducted in a geographical community located in central Mexico.

Flash floods are micro events that occur frequently in the studied area, and different human interventions have increased the impact of these events over time. The most salient social worlds that created interfaces in the arena of flash

floods within the town were: two types of community, (one traditional [TrC] and one emergent [EmC]), and government institutions.

One interesting finding in this regard is related to the interface of communities and institutions in relation with urbanization.

The world view of the salient social worlds in this arena of disaster, is related with distinctive decision making. In the case analyzed here, communities have less access to decision-making, they are subject to the application of public policies that are best suited to the institutional world. In relation with urbanisation pressures in the area, these decisions are creating spaces for communities' vulnerability.

Urbanization in an area prone to floods because of previous decisions and interventions in the environment is endorsed by the authority. This activity is legal since the risk assessment tools are not designed to prevent, but to register disastrous events annually. The lack of a reliable system of rainfall monitoring as well as the internal dynamics of the institutional world in relation with changes in the administrative body, based on the disappearance of relevant documents, are adding to the institutional creation of vulnerability.

Modernisation is a prevailing discourse in the governmental actions, an idea behind urban development and country industrialization. Nature control through human intervention and technology is at the back of the lakes system draining, which was justified on the need of land for cultivation, increased productivity and more recently of space for urban growth.

The communities from the area and the newcomers have established their own dynamic relationships, however the increasing effects of environmental issues released by public policies, have put them into a hazardscape (Mustafa, 2005), within which they negotiate in a different way with the officers and governmental institutions. The traditional community is obliterating, and the emerging community is mobilizing politically.

7.3.1. The Communities

In the studied village, the various decisions that have been taken in development and industrialization have significantly impacted on the environmental, cultural and social dimensions. During the last 60 years, decision-making in the region of the Upper Lerma River Basin has included lake drainage for providing water to farmlands and urban areas, as well as for drinking water to Mexico City. The introduction of alternative crops expecting higher returns, intensive forest exploitation, and felling woods to extend agricultural land in unsuitable areas, have had serious implications on both the environmental and on the cultural aspects of the whole region. Livelihoods based on the exploitation of aquatic products and a range of cultural expressions and practices of the affected communities have been threatened by these ‘new conditions’ in the area.

The intense urban growth, without adequate planning strategies, is another source of pressure on such communities. The clash of world views between the traditional inhabitants and newcomers has generated cultural pressures on both parties. This is the first point of discrepancy in the interface of the community under study; the clear definition of the two communities, one semi-rural, the other more urbanized, who hold opposing views in relation to the analysed event.

Actions taken in the affected village are designed outside the local context; these are decisions based on national interests rather than on local needs. With respect to the local situation, I found that there are different discourses in relation to flash floods.

The inhabitants of the traditional community (TrC) expressed that the threat relating to the loss of their customs, practices and world view, is more significant to them than an event with which they have learnt to cope for hundreds of years. For the TrC, this is considered a misfortune, nothing more.

On the other hand is the view of the newcomers, who have no personal experience of flash floods, are without any local roots, and do not have any interest in the traditional community. To them, flash floods are disasters. This demonstrates their completely different attitudes and actions regarding the event.

For the TrC, the intensity of natural events has increased; however, the event itself is not unknown. They hold a clear view that the worsening conditions are due to mistaken decisions taken at the institutional level, such as the lake drainage, the indiscriminate technical interventions to cope with the effects of the previous decisions and the partial results in the short term, improvising simple responses to complex conditions.

However, there is a high degree of uncertainty on who will be most affected by the impact of the phenomenon; this is considered through a fatalist point of view, since in these areas there are people who remain unaffected. Therefore, this situation is not a priority for the TrC, and even when they have gained a little access to negotiations with the municipal authorities, they do not put pressure on them in this regard. It is remarkable to observe that during the emergency stage of disaster they make indirect use of their organisations for festivals, coordinating activities, shelter, and food and aid distribution.

The TrC is a highly resilient community, very effective in restoring the previous conditions through community support, which is reinforced with each of the events taking place, whether religious or civic.

The TrC has faced many challenges throughout history, from the Spanish conquest to the more recent challenges of contemporary modernity, from which they have taken elements for redefining and adding to their own culture. Social oblivion is a strategy they have adopted, in order to actively ignore the externally-made decisions with which they do not agree, avoiding conflict and punishment from those with power.

With respect to interaction with government institutions, the TrC has accumulated many experiences of the negative effects of opposition and resistance. They consider that strong opposition always leads to the strengthening of the coercion from the state, against those who take conflicting attitudes, which in the end will leave them in an even more subordinated condition. In that sense the traditional community has chosen social oblivion as a way to protect

themselves against constant government intervention with policies that are not beneficial to them.

In the long term, small communities suffer the most from the negative effects of poor decision-making. The inhabitants of this long-established community have adopted a pragmatic mode of behaviour, which seeks its own advantage, maintaining their world view and their community; even when they are strongly threatened by the homogenising effects of modernisation.

The inhabitants of the traditional community have found a way to support each other through social solidarity. They strengthen their bonds through various activities, as they feel they can expect little help from government institutions. Through centuries of neglect, they have experienced disempowerment, therefore, they have learnt to handle this through constructing strong social ties that allow them to take appropriate action.

The TrC has a segmented leadership; the sectors best organised and most powerful gained the most benefits from the government, for example, the horticultural sector. However, the sectors that gained little benefit blame lack of commitment on the part of their delegates; the inhabitants of the traditional community then impose social punishments on their delegates, by not allowing them the opportunity to apply for the more sought-after community posts.

This conditions described before do not mean that the community is successful in every case, or that their customs are left untouched, but it does mean that the community inhabitants are active, they organise themselves without challenging the authorities, they do not completely follow established cultural models, and they actively seek to maintain their identity and world views.

With regard to the emergent community (EmC) and flash floods, the findings of this study show that their strategy of social mobilisation is linked to their success on post-disaster recovery. Their urban and social backgrounds, as well as having a leader experienced in political movements, has given them access to both government and private resources as well as bringing them to the attention of the

media. The response of this community is very similar to the response that was generated in Mexico City after the earthquakes of 1985.

The emergent community has imposed more horizontal relations with municipal authorities that are many of the times disliked by officers; however, in regard to the federal authorities, access is still difficult, which means that they have little power for real negotiation.

Their discourses on floods are in line with the dominant naturalist discourse, where disasters are moments when nature is an uncontrollable force, and the event is labelled as a disaster. It is interesting to note that they consider themselves as active agents, taking responsibility for their own conditions and actions. They trust in science and technology to solve the flooding conditions. Moreover, they consider that construction of a residential area in an area of risk, in this case a flood plain, is associated with corruption and lack of proper planning within the three levels of government. However, as most of them do not have other housing options, they consider that technical and engineering interventions can increase the safety of their properties and families.

Although the EmC was supported with economic and material resources from different public and private institutions, their lack of experience in flash floods, and their lack of knowledge of the region, implied that they carried out only the minimum technical structural changes required. Nevertheless, considering the volume and level that the floodwater reached last time, in the case of a further flood event, these modifications would not be enough to cope. However, these changes provide them with some psychological security.

Both communities have established different types of interfaces with the authorities. On the one hand, the EmC has chosen social and political mobilisation; by organising themselves into committees, each with different activities for the community members, and by putting pressure and challenging the authorities in order to gain benefits. The emergent community has reunited behind their leader, but it is unclear what may happen in the future as his

charisma and the returning sense of 'normality' among the inhabitants of the EmC, have made them somewhat complacent with their conditions.

The interface created between the EmC and the TrC functions through the different understandings and perspectives that both communities have of themselves. Despite the multiple efforts and strategies of the TrC, it has failed to integrate the newcomers; they still consider the newcomers to hold arrogant attitudes. The refusal of the members of the EmC to participate in the traditional local festivals has served to increase the divide between the two communities. Furthermore, the TrC has often ridiculed the improvements that the EmC has made to its infrastructure and, on some occasions, has even resorted to vandalism and destruction of the changes they have made to their property.

The EmC has established very clear boundaries for the TrC, limiting the areas of interaction between them. They are not interested in joining together with the TrC. People from the EmC consider that people from the TrC are superstitious and ignorant, encouraged by the church. Their festivals are described as unnecessary expenses and they make fun of their traditional dances and uses. Unsurprisingly, in regard to the floods, there has not been a joint effort between these two communities.

According to the findings, the authorities have not changed their practices in relation to the municipal system of Civil Protection. A relevant aspect observed during this study is that social movements have failed to change disaster-prone conditions, neither upgrading equipment nor training the staff in charge, but in spite of this, they have still managed to cope in the post-disaster situation. However, the conditions that create vulnerability remain.

One interesting finding with regard to the two communities is that both have been successful in terms of coping with disasters; they have proved themselves to be resilient, and they recovered by themselves through using different strategies. Nevertheless, they are established in an area of growing vulnerability, created by unsatisfactory decision-making and urbanisation pressures, which focus

primarily on the establishment of a modern society based on the industrialized model, not on the needs of the local communities.

7.3.2. The Institutions

Former institutional discourses on water as a harmful element to both human health and crops, has led to technical intervention into the environmental systems in many parts of the country, not only in the upper Lerma River basin. Mexico City is an example of these changes, demonstrating that the impact on subsequent generations has been negative.

During the last 15 years, a national housing policy has been introduced; triggered by the economy and the demands of growth pressures in Mexico City and its huge metropolitan area, which already covers several states. This has led to a building outbreak in areas totally unsuitable for urban development.

The literature states that, to change the process of vulnerability, it is necessary to change the economic model and the policies that have created such conditions. As these assertions are difficult to achieve in the real world, government organisations have been created to respond to the negative effects of disasters.

As previously discussed, in the Mexican case, the origin of the institutions of disaster response was the state's answer to the abuses committed by the army during and after the earthquakes of 1985, and to the citizens' calls to hold civil institutions responsible, in order to prevent and respond to future disasters.

Research has shown that a large budget has been allocated for the acquisition of technologies and machinery to justify the existence of those civil institutions responsible for disaster response. Equally, many other institutions have grasped opportunities to jump on the bandwagon, procuring budgets by opening departments to deal with disaster response. This situation causes the dispersion and dilution of both resources and response.

The civil institutions in place to respond to disasters, such as Civil Protection, have shown poor performance, as their training is inadequate and their budget is often very segmented; the military response is then presented as a more effective

institution. The major difference between the civil and military institutions is in budget allocation; in the military, the budget, skills and training are all combined within one institution, thereby making it very effective. However, the army, when involved in a disaster arena, tends to be a silent actor.

In any country, the army is generally the government's last resort when responding to extreme, large-scale events, as demonstrated in such cases as Hurricane Katrina, the tsunami in Thailand or the recent floods in Portugal, France and Pakistan. However, even in small Mexican towns where only a few people are affected, a disaster usually leads to the mobilization of the army because of the poor material conditions and the lack of skills training within the various levels of the civilian disaster response teams.

Public institutions oriented to disaster response acquire advanced technology, thus preventing claims of negligence or improvisation. However, there is a lack of trained personnel for the implementation and use of these technologies, which is combined with the loss of institutional memory (the lack of any available records on previous disasters). Therefore, these institutions are ill-equipped for satisfactory decision-making. As can be seen in the Atlas of Flooding (see Chapter VI), there are serious inconsistencies in the recording of susceptibility; areas that in some years are considered susceptible to urban flooding, in the following Atlas of Flooding are only evaluated as prone to water-logging, an assessment that has been used to justify building development in those areas.

This study found that another important element in the discourse concerning social disasters in the institutional world is the lack of funding. Everything is justified in this way, but within the same institutional world there are challenges to this discourse, showing conflicts between different levels. The funding is allocated at federal level but policies are implemented at state level, particularly at the municipal level; therefore, federal officers contest both the discourse of the lack of funding at other levels and the discourse emanating from other secretaries not supported with budgets, highlighting the political costs that imply implementation of policies and regulation; the institutions applying it can suffer

from negative assessments from citizens resulting in failed political career of the officers in the future.

Likewise, within the social world of government institutions, there is a continual deliberate creation of ignorance, according to Hobart (1993), which is related to issues of both power and knowledge; federal officers assume and are assumed to be the most competent and qualified within government organisations. It is considered by inferior levels that they have more experience and insight in disasters. Instead, municipal officers, who are at the lowest level, are considered unskilled, even though they are the officers closest to the communities. Federal officers often have a patronising attitude and disregard the experience of municipal officers.

In relation to the information available for policy design, it is possible to observe that, in the case of atmospheric measurements, there is no reliability; reasons such as lack of training, monitoring and low staff wages are among the reasons given, and the automated atmospheric stations were not even working when I did my fieldwork. Therefore, decisions made at the highest level, are based on erroneous information from those databases, which simply means that all results are equally incorrect.

To conclude this section, I observed a complicated picture of meaningful dialogue between the salient social worlds in the arena of flash floods. The significant lack of trust in government institutions that exists in local communities, concerning erroneous decision-making, combined with their assumptions of corruption, is clearly a huge obstacle to the possibility of any transparent dialogue amongst the parties. The traditional community chooses oblivion and denial as protection mechanisms, the emergent community preferring political mobilisation.

There are points of encounter among salient worlds, the institutional discourse bases its action within the field of science and technology, whilst ignoring local knowledge, as does the emergent community. Their idea about flash-flooding is also strongly in agreement with the opinion of the emergent community, that of

sudden unexpected events, emergencies and misfortune having uncertainty as their background.

The socio-cultural dimension of vulnerability highlights the construction of practices and discourses of actors and social worlds involved in a disaster arena, each with their own particular perspectives and interests. This research shows that in this specific context, it would be difficult to establish a dialogue between such salient social worlds in the situation analysed each social world is responding to, and limited by, their own interests and world views.

7.4. Implications for Policy

In the short term, social mobilization and organisation generates resources and benefits for the communities. Strong leadership, essential in the early stages of post-disaster response, may later shift to a model of community entrepreneurship in small communities, with a horizontal distribution of authority and activities that enable community-building and benefits.

Local knowledge of communities is an important element; it helps to bring into context the design and implementation of public policies related to disasters.

The municipal areas of disaster response are the most important ones; therefore the most highly trained staff and up-to-date resources need to be made available, in order to deal with the specific range of risks and hazards located in the area. At the municipal level communities have closer ties with the authorities; thus, this is the field where convergence is possible.

Instruments for decision-making, such as Risk Maps, should be continually updated, showing disaster events in a cumulative manner. The current way in which results are updated, and the loss of any previous evidence or records, has led to serious errors of judgement and, hence, to erroneous decision-making, and puts the local population at risk.

The municipal staff has situated experience, both at institutional and local level, which may be useful in giving an adequate response in cases of disaster. The

staff could be trained in the interpretation of Risk Maps and in the use of technologies, which would assist them in making appropriate decisions.

Event drills would be more effective if situated, responding to those particular events that happen in those affected municipalities or communities.

The area where the lake used to be is now prone to flooding as there is an entire geospatial setting influencing it. In addition, the specific environmental conditions in that area are affected by anthropogenic interventions, which magnify the effects of any natural events. For that reason, it is clearly not an area suitable for housing or development.

Policy-makers need to consider evaluating and integrating these specific situations, incorporating them into the context of each policy's application, particularly the socio-cultural aspects and the impacts of such hazards on vulnerable local communities.

7.5. Limitations of Research

Due to design limitations, the findings of this study should be examined with care. I will begin by analysing the limitations of the Situational Analysis framework.

The nature of Situational Analysis, in making relevant understandings, knowledges and practices, is clearly focused on the socio-cultural dimension of the phenomenon under study, so other dimensions are not analysed in depth.

In order to analyse the disaster arena, different social worlds, actors and interacting elements, I had to set limits, as proposed by Clarke, to study the most relevant of those worlds. I was not able to analyse the constellations of all the actors for reasons of time, as it would have been necessary for me to remain longer in the community and establish deeper contact with them. The table below presents the most basic discourses, actions and knowledges of the salient social worlds in the disaster arena analysed

Social world	Discourse	Actions	Knowledge
EmC	Disaster	Social mobilisation	Science and common sense
TrC	Misfortune	Social oblivion	Tradition, local knowledge
Institutions	Emergency/Disaster	Institutional neglect	Science, technical intervention

**Table 9 : Discourses on Floods
Simplified Table**

Nevertheless, if more time and resources were available, other actors in the disaster arena would be worth including., I identified the following ones: housing developers, national media, groups of scholars analysing the impact of the Lerma river drain, international agencies funding projects for the Lerma River basin (although not for the studied Village), neighbouring communities, non human elements such as the motorway, the volcano, and the land; as well as transient actors including a charity ran by a famous TV news presenter.

This is the first stage of analysis, the most central to the research, around which most salient actors and social worlds are grouped. This stage provided the most relevant and interesting information in the arena of disaster.

Based on the literature, knowledge of the area, and the huge amount of information that informants provided me with, I feel confident that even if the relevant interfaces were just two communities, the non-human elements, and the institutions, these interfaces and social worlds capture the central cultural elements within the arena of flooding. As a point of clarification, and not as a limitation, it is important to note that there were other communities within the geographical area studied; there were other worlds and other social actors also interacting in the arena of disaster. Nevertheless, it demonstrates the large amount of information collected in a thesis project.

In order to interview people without having any relationship with the community in the first instance, I went to government institutions; this may appear to bias the selection of the interviewees. For this reason, once I had met the first interviewees, I set a separation from the government and it was through those

people and their networks of friends and family that I was able to meet more people. It was always necessary to be formally introduced to the interviewees, twice I tried to introduce myself to some people but I did not achieve the same level of confidence, as I had not been introduced to them by a trusted third party.

This study has a limited transferability because of various conditions. The first is related to its context-specific nature; this work is located and limited to a specific geographical area in central Mexico. The chosen place was appropriate for flood analysis because it is a small village often affected by flash floods, with increasing impacts. Moreover, the community had settled on the shores of the former lake and, additionally, it is a long-established community.

Another limitation with respect to the social world of the institutions, was that the interviews were conducted with members of different government organisations; the regional (State) level being the most difficult to interview, as access to officers was very limited and there was a great deal of information control. However, it was different in the federal and municipal cases, where officers gave me the opportunity to interview them but they had very few documents to rely on. Consequently, I found most of the documents in libraries, newspapers and online.

It is assumed that no data can be entirely objective, nevertheless, looking for a less-biased report I attempted to confirm the information I received through examples, actual incidents or personal experiences, as in some statements these could appear to be solely personal judgments. Since this work is based on Situational Analysis, I contrasted the different accounts of the multiple actors to find any common ground. This I did by cross-checking with available documents and journal reports. The results of this research relate to the area studied, therefore the findings and conclusions cannot be widely generalized.

7.6. Avenues for Research

This study is focused on one community affected by flash floods, so many questions remain unanswered in relation to other communities living along the river and on the shores and artificial islands of the former lake, which have also

experienced increasing frequency of flash floods, raising questions of how to respond to these events as opposed to the community studied here.

These questions include: How do the traditional communities associate with recently established communities in those areas? What impacts are these new communities experiencing? Can they consolidate as communities over time?

A further question is related to other actors present in the flooding arena in those other communities, who are not present in this study, but who are in a similar situation: What other local knowledges do those neighbouring communities have that could be useful in mitigating the effects of flash floods? Likewise, with regard to the interfaces in those neighbouring communities, it would be relevant to know if the interfaces there, are the same as those found in this study.

Additionally, with regard to the institutions, it would be worth knowing whether other municipalities and civil protection authorities share the same discourses about their own role in a disaster arena as the case studied here.

And further:

Are there different flooding response plans implemented in other municipalities?

How do other municipalities manage their own urban policies?

Is there continual housing development in the former lakeside area?

How do other municipalities and organisations gain access to benefits and government support?

What is being made of existing technologies with regard to disasters such as hazard mapping and GPS?

The idea of community participation in conducting atmospheric measurements is appropriate. However, it would be interesting to know how this information could be shared with local and regional levels leading to participative decision-making.

Other research avenues are related to climate change and its global impact on the local environment. In this context, an interesting aspect for consideration would

be the induced changes in the environment and climate, and the impact on the communities in the area under study.

A further point to consider is related to the notion of resilience. It would be most interesting to study the strategies of resilience in the community studied, and what, if any, institutional policies have been designed to enhance resilience instead of vulnerability.

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