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THE MASS MEDIA, POLITICAL FRAGMENTATION, AND ENVIRONMENTAL INJUSTICE IN PUERTO RICO: A CASE STUDY OF THE FLOODS IN BARRIO TORTUGO[1]

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INTRODUCTION

Experts in the field of emergency management agree that the primary source of information for the general public about natural disasters is the mass media (Fisher, 1996). It is considered that their coverage helps to raise disaster awareness among different populations simultaneously, and for that reason, it helps to develop better contingency plans. As a consequence, the information provided is perceived as directly responsible for a decrease of casualties and material losses related to natural hazards over the years. This implies the assumption that people's perception of the disaster situation, and their response to them depends heavily on the content of the media and the accuracy of the information presented, more than in other factors.

However, according to empirical research about risk perception and disaster awareness, the content provided by the media may not be serving the role of educator, as the officials in crisis management may want to believe. According to Palm (1993) the media plays only a secondary role in the development of a risk perception and disaster awareness among certain communities. This could be explained by the fact that the mass media provide standardized messages to a wide and heterogeneous audience, composed most of the times by populations with different cultural backgrounds, customs, traditions and perceptions of reality. Those standardized messages cannot appeal to the singular reality of each community, which may have different exposure to also different hazards. Even within the same cultural group individuals vary in their risk awareness depending on how long they have lived in the area, their previous personal experience with local hazard conditions (Palm, 1993), the socio-economic and political context of the community affected and the nature of the hazard. Unfortunately, those aspects are often disregarded by the literature in risk communication. As will be presented in more detail, the media content is vital in preventing human and economic losses in disaster situations, but it have to fulfill certain criteria to be effective in the creation of risk perception and disaster awareness. The warning message has to be consistent through all the diffusion channels, frequently published, and the information must have a credible source, such as scientists or government agencies. Obviously, those conditions imply good interagency coordination and communication between the offices at charge of the disaster situation and the private corporations who own the commercial media. But most importantly, the audience has to believe that the information provided is accurate and personally relevant to them, according to their own culture and perception of their local reality. However, recent content analysis has shown that the media tend to portray a very stereotypical and inaccurate picture of hazards and disaster situations, presenting disaster related myths, and information which is geographically and ideologically biased. Also, field research about natural disasters demonstrate that the coordination and the communication needed between the government agencies with the

private media, is in general terms non existent. Consequently, we can assume that the mass media is not supplying the specific and accurate information necessary to improve people's understanding of local hazards and the effective response associated to them.

In this paper, we will examine, through a case study of a rural community in Puerto Rico, why there is such a gap between what the crisis managers expect and what is really happening in the praxis. To explore this issue in a concrete example, we will look at the way in which the Puerto Rican media has influenced the development of risk perception and disaster awareness among residents of Tortugo, a Puerto Rican community that is vulnerable to floods. This community experienced a devastating flood on August of 1998 in which more than 25 families lost all of their material possessions. The relevance of this research rests on that this event was the first time that this community experienced a flood. Only 3 months after that first incident, Tortugo had flooded three other occasions, transforming a disaster scenario into an important part of the everyday life of the people of this community. This transformation of a whole community from non-vulnerable to vulnerable presents a unique opportunity to provide more knowledge about how the perception of risk is formed as a collective and individual phenomenon, and most important, which is the main goal of this research, the role that mass media played in that process.

LITERATURE REVIEW

Quarantelli, in his article "The Future is Not the Past Repeated" (1996), argues that society has now become more vulnerable to natural disasters than before due to the rapid social and technological changes of the last decades. For example, dramatic changes in lifestyles, industrialization, rapid urban growth, demographic changes, biotechnology, and the total reliance on computers and high technology are factors that increase the magnitude of natural disasters in industrialized societies. Nevertheless, there have been some technological advances that instead of increasing

social vulnerability are helping them to improve mitigation and preparedness to confront all kinds of natural hazards. He is referring to the ability to monitor natural events, changes in communication technology, the creation of a global communication system, and more importantly, the mass media.

According to Quarantelli, as well as other experts in the field of crisis management and risk communication, the mass media are significant agents in the creation of a risk perception and disaster awareness in the general global population because of their continuously increasing capacity to "quickly produce and distribute information". Thus, the media coverage of natural disaster situations is the direct cause of the creation and improvement of contingency plans in most countries because they direct and focus public attention on the issue of vulnerability against natural hazards. The dramatism with which the TV networks, newspapers, and other media portray natural disasters helps people to realize how vulnerable their society is and how necessary is to create mitigation plans. For example, the earthquake in Mexico city, according to Quarantelli, helped the industrialized countries to visualize that this type of event could easily happen in a big city and their lack of preparedness to deal with that kind of situation. This understanding of human vulnerability, at least in First World democratic countries, provokes citizens' involvement and participation in the demands for safety and preparedness from their national governments, encouraging the creation and improvement of official mitigation plans.

In this argument, the theoretic assumption is that risk awareness depends directly and exclusively on the quality and quantity of the information received by the community. Obviously, this argument is not considering important findings in the field of risk communication about the way in which the content is perceived by the audience and the unequal access and exposure to the different kinds of media among certain populations. At this moment, there is no consensus in the literature about how individuals perceive the media content and if the audience is just a passive receptor or an active interpreter in that process. For that reason, our discussion will be constructed around the idea that having access, and being exposed, to the information provided by the media about

natural disasters does not necessarily increase disaster awareness, even assuming that the media portrays disasters and natural hazards accurately.

Before presenting the most important research findings on the field of risk communication it is necessary to establish the difference between "warnings" and "coverage". For the purpose of this discussion we will define "warnings" as the alerting information provided by official sources (government, scientists, planners, etc.) to the community during the early pre-impact phase, which includes data about the possibility of the occurrence of a natural event that can be dangerous and harmful. It also presents information about preparedness and adequate behavior to prevent human and economic losses. On the other hand, "coverage" is the description of a disaster situation which occurred at the local or the international level which presents the facts related to how, when and who was affected by the natural event, the magnitude of the damage, and human and economic aspects of the recuperation process. The purpose of the "coverage" is only to describe the facts and it forms part of the daily news compilation and construction for the profit making of the medium. Using these definitions, we can classify the literature in risk communication into the two categories, studies that consider the "warnings" to measure the role of the media in the process of risk perception and disaster awareness, and the studies that consider the "coverage".

"Warnings"

According to Fisher (1996) important factors facilitate or impede the development of immediate risk perception after a warning is received. First, from the individual's perspective, if the event was unexpected and the level of emergency preparedness is low, people do not develop risk awareness. Also, Mileti and O'Brien (1992) argue that the cognitive process of the warning's reception can vary from person to person and it is influenced by demographic factors such as age, gender, education, and most important by pre-warning knowledge and previous experience with the hazard. Second, now looking at the warning itself, if the message

appears to be vague, even if it comes from an authority, the tendency to disbelief increases. Thus, for a warning message to be taken seriously, the mitigation and preparedness have to be a normal part of the community's everyday life, and the message has to be presented in a certain way.

Both, Mileti and O'Brien (1992) and Fisher (1996) agree in that the warning message has to be presented in an attractive manner, to capture the public's attention, and clear in terms of the nature of the hazard and the expected collective and individual behavior for each phase of the disaster situation. Also, the information has to be provided by an authoritative and credible source to guarantee its veracity. But most important, the information has to be consistent and frequently published through all the different channels of communication. This consistency assumes and requires good communication and coordination between the different groups and agencies in charge of the management of the disaster situation. Those criteria are designed to guarantee that the message will provide the necessary information to facilitate an effective response from the audience. However, it is clear that the individual must believe and personalize the information in order to act. And that personalization depends in great part on the accuracy of past warnings, and the frequency of the disaster agent (previous personal and collective experience, or pre-warning knowledge).

The literature on "warnings" seems to focus on the need of making the content personally relevant in order to use it as an effective agent of risk and disaster awareness. For example Risa I. Palm (1993), in a study of the attitudes towards mitigation activities, experience with disasters, and preparedness behavior of homeowners in Puerto Rico, points out that the receiver has to be attentive to the message, the issue must be a central priority, and that he/she has to accept the credibility of the argument in reference with his/her personal experience and value system. Thus, pre-impact information can only be influential if it is personalized by the audience, but that process is mediated by previous personal or cultural experience related to that kind of hazard. There is where the long-term "coverage" of natural disasters can play an important role directing the attention from the actual pre-event warning to previous hazard

experience or knowledge.

"Coverage"

The theoretic assumption that personalization of the content through recalling previous experience may enhance risk awareness in a determined situation has been suggested by empirical research on the influence of the mass media on individual's perception and response to natural disasters. For example, in a study of people's response to the aftershocks of the Loma Prieta Earthquake, Mileti and O'Brien (1992) found that previous experience with that type of hazard appeared to be one of the best predictors of protective action. Also, Turner, Niggs, and Paz (1986) studied the relationship between the believability of an earthquake prediction published by the news media in 1976 among California residents and their level of preparedness to confront that kind of natural event. They concluded that only the residents who believed that the prediction was personally relevant prepared for the predicted disaster.

These findings can be explained precisely by the differences in personal collective relevance of the content translated into previous experience or knowledge about the hazard. It is obvious that the media cannot create direct personal experience with natural hazards, but it can provide mitigation information as a normal part of its programming, not only in warning situations. However, that would require constant and direct communication between the emergency management agencies with the media. In other words, the creation of a "hazard culture" will require an strong interdependence between the government agencies dedicated to the management of disaster situations and at the same time with the private business and the media, which is not common.

Of course, there have been cases in which the media participation and its coverage of the disaster situation have been indispensable for the quick response of the community and the agencies. But those cases also reveal the lack of interagency communication and coordination, because the mutual cooperation has been a product of the circumstances and not of a premeditated plan. Due to their coverage of different angles of the

situation, and the lack of effective interagency communication, usually the emergency management officials rely on the media's information to decide the next step in their reaction to2 the situation. O'Bryan and Payne (1997) documented this in their article "Public Response to the 1997 California Floods". In that case, a network affiliated TV station in Sacramento "began almost immediate round-the-clock coverage from the onset of the disaster. They reported on the raising rivers, provided weather reports, recounted levee conditions, and provided constant coverage of the flooded area, via helicopter camera crew." In the researchers assessment of the situation the media coverage "proved invaluable to both emergency professionals and the general public" because of the lack of information provided by official sources. However, this positive participation of the media in apparent coordination with management officials seems to be the exception and not the rule. Also, as the same situation in California presents, that can be a double edge sword if the government agency and the private media are not working in real partnership. For example, in one of the towns at risk that came under mandatory evacuation, officers went door to door asking the residents to leave the area while a spokesperson for the California Department of Water Resources was interviewed on the news and "stated that there was no immediate flood danger." This incident exemplifies the necessity to coordinate the information to provide consistency in the warning messages, which is one of the major topics in communication research and one of the biggest recommendations to the emergency management officials (Fisher, 1996; Mileti and Sorensen, 1990; O'Bryan and Payne, 1997).

Thus, the creation of risk perception and disaster awareness is not directly caused by the amount of information received by the community as was stated by Quaranteli. That relationship appears to be mediated by previous experiences with the hazard or even by knowledge pre-warning, which can be provided by accurate and consistent media coverage of disaster situations. However, after reviewing the literature on the role of the mass media in the development of risk perception, risk communication and warnings, we can find two major themes. First, the focus of communication research emphasizes the quantity of the

information published and not necessarily its quality; assuming that the frequency is the only factor which affects the audience's perception of the situation disregarding the context in which the message is received. Second, the assumption that the information about hazards, disasters, preparedness and mitigation is only needed during the pre-impact phase. Most of the consulted studies emphasize the role of the media in the publication of warnings during the pre-impact phase, suggesting that the role of the mass media as agent in the risk perception development is limited only to the publication of pre-impact warnings, and also taking for granted that all disasters have clear pre-impact and impact phases. According to the presented studies, this limited intervention of the media is not helping to develop a risk perception among the community at risk because the message is not personally relevant to them. Also, disasters do not always have clear pre-impact phases. Events such as flash floods do not provide the media and the emergency managers with the necessary time to publish formal warnings. But in general terms, among communities with no previous personal or collective experience with a particular hazards and no previous knowledge about the hazard itself, the warnings are not effective. Then, the preparedness for these type of events has to be part of the daily life of the community, through residents' participation in land use, identification of hazards, and in the creation and development of mitigation plans and activities. All this combined with frequent media coverage of the mitigation activities and the vulnerability level of the community in coordination with the emergency management agencies. The objective must be to complement pre-impact warnings and preparedness with constant mitigation activities and planning (Perez-Lugo, 1998).

OBJECTIVES AND METHODS

The goal of this paper is to answer the following question: What is the role of the daily media in the development of a long-term disaster awareness in the community? To answer it, twenty interviews were

conducted in a rural community of Puerto Rico, which experienced a flash flood in August of 1998 for the first time. Nine of the interviews were conducted with members of the twenty-five most affected families of the community. These families were defined as those who suffered total or partial losses of their houses and property as determined by the Red Cross, the Municipal Civil Defense of San Juan and conversations with community residents, and who were available during daylight hours. Unfortunately, it was not possible to interview members of the remaining sixteen most affected families because at the time they were living with friends or relatives in other areas and therefore not available. The interviews were conducted between five and ten days after the flood occurred, in August 12, 1998.

The participants were asked about how aware they were about the possibility of experiencing a flood, if they received information about floods through the media or other sources before the incident, and how useful they considered the media coverage of disasters and natural events was in this particular situation. They were also invited to talk about their perceptions about the causes of the disaster and the actions that the local government took to help them in the reconstruction of the community.

Also, five emergency management officials at the local and state levels were interviewed to provide contextual information. They were asked about the response of the crisis management agencies to the situation and their perception of the media participation in the mitigation, preparedness and impact phases of disasters in Puerto Rico. They also answered questions about the official version as to the causes of the flood and how they proposed to prevent future events. Furthermore, two engineers, a journalist and the reverend of the community's Pentecostal church were interviewed to provide more information about the technical explanations for the event, the intended and actual media coverage of the situation, and the emotional condition of the community.

CASE STUDY: TORTUGO

Tortugo is an small rural community established between the municipalities of San Juan and Guaynabo, more than 3 generations ago. Located on the margins of the "Quebrada Tortugo" (Tortugo River), this community is restricted by geography (because it is surrounded by mountains), and recently imposed social limits (caused by the accelerated development of a surrounding middle-upper class suburbia of the last decade). Most of the residents are relatives or descendants of the original owner of a few acres of land. Today, mostly elderly and their grandchildren form the community. The younger-adults are working and established in the urban area of San Juan, but leave their children with their parents to avoid childcare expenses. A great majority of the Tortugo residents are homeowners, who built their houses themselves, cash and piece by piece. Only a small minority of the residents lives in rented houses, and most of them were connected in some way to the community through friendship, job, or family ties, before they moved to the barrio.

According to the present land use classification of the municipality of San Juan, Tortugo is located in the transition area between the urban center of Puerto Rico's capital city and the rural area surrounding it (*Plan de Ordenamiento de Terrenos del Municipio de San Juan*, 1998). This sector was classified as an area vulnerable to mudslides (without notifying the residents) but not to floods by the Emergency Plan for Hurricanes of the Civil Defense of San Juan (1997). But in August 11,1998 stationary rain caused the complete flooding of more than twenty-five homes in less than an hour. Eighty-two residents lost everything they had because of water and mud damage, and twenty-one more had partial losses. As a consequence of this event, according to an official press release from the Mayor's Office, San Juan declared Tortugo as a Disaster Zone activating the local government agencies for the reconstruction of the community (Official press release from the Mayor's office, August 12, 1998).

Causes of the event

The natural event that triggered the disaster in Tortugo was an intense rain (4 to 6 inches in less than an hour) localized exclusively over the rural area of San Juan. However, as in almost all types of disasters, there were different factors of social origin, which are directly responsible for the situation. Among those factors we found the lack of efficient urban planning, conflicts between the local and the state government, political issues, illegal garbage disposal in the Tortugo river, and class conflicts. As we will explain in more detail, some of those problems were manifested in an obstructed tube in the Tortugo river which could not drain the rain water from the area were the community is located, the others, in government inaction to prevent the disaster situation.
According to the Puerto Rican newspaper, *El Nuevo Dia* (August 13, 1998), the secretary of the Department of Natural Resources declared that the flood was caused directly by an obstruction in a drainage tube installed fourteen years ago in the Tortugo River during the construction of Santa Clara, a middle-upper class suburban-type community. Apparently, accumulated garbage in the river were pulled by the water stream and obstructed the drainage tube. At the same time, the tube itself could not resist the weight of an access road that was built over the river, which recently collapsed aggravating the situation. A flood manager from FEMA also attributed the event to the obstruction of the drainage tube. According to this expert, there is no other reason why Tortugo flooded the way it did. However, an engineer that was working with the Department of Natural Resources at the time that the urban development started in that area provided another explanation.
According to him, the development of that rural area was examined and approved by the Planification Board of Puerto Rico around fifteen years ago, when middle-upper class communities with controlled access, located at the margins of the city, were in high demand. However, according to the engineer, that government agency paid little or no attention to the obvious possibility of increasing the vulnerability of pre-existent rural communities to natural hazards such as floods and mudslides, due to deforestation and run-offs. Thus, when the developers of Santa Clara wanted to fill the river to construct the access road to the new community, they were only asked to install a 5 feet diameter tube to

drain the water stream with no specifications about adequate materials, responsibility for maintenance, and without considering increases in the amount of water that the river was about to receive from the surrounding areas.

The situation, given that the developers and the new residents of the zone were middle-high class, is a clear and classic example of environmental injustice. The procedure the developers followed to establish the sub-urban community of Santa Clara in Tortugo certainly agreed with the law, but it did not prevented flood problems, which only affected the pre-existent community. This was caused by various factors, all related to social and economic inequality between the two groups. First, before the construction of Santa Clara, the composition of the terrain acted as a natural draining system, which discharged the rainwater to the west. Covering the terrain with cement made it impermeable, increasing the water discharge directly to the river. Second, pluvial systems in Puerto Rico are classified into to categories: rural and urban. The design of the rural systems, as the one in Tortugo, is not as rigorous as the urban systems, lacking of the capacity to deal with an increasing amount of water. Third, the Department of Natural Resources is responsible for cleaning and maintaining the water bodies in Puerto Rico when those are in their natural state. However, this agency argues that installing the drainage tube altered the natural state of the river, and as a consequence, they are not responsible for its maintenance. Because the Planification Board did not assign the responsibility of maintaining the tube at the time of construction, no one took care of it since fourteen years ago. At the same time, because the drainage tube was installed just to comply with the law, with no consideration for giving it the adequate maintenance, the way in which the tube was installed makes it extremely difficult to clean. And fourth but more important, the deforestation of the mountains and the area surrounding Tortugo due to the development of Santa Clara, caused changes in the natural water drainage provoking the propensity for mudslides, run-offs, and the accumulation of sediments in the river.

For these reasons, at this moment Tortugo is imprisoned by the development of new residential communities like Santa Clara, while

being located in a natural depression, a chain of mountains surrounding it, a river passing through the community, and a dam-like construction which impedes the water drainage. Thus, the disaster situation in Tortugo was a direct consequence of cumulative socio-economic factors and not only of the abnormal precipitation which occurred that day. The natural event was just the trigger, which started a chain reaction.

Disaster and risk awareness among Tortugo residents.

In her study of Puerto Rican homeowners, Palm found a lack of disaster awareness and inaccurate levels of perceived risk among the general public, and even among disaster management officials (Palm, 1993). Also, according to Leave and Leave (1991), individuals at risk for flooding are neither informed about, nor very interested in being informed about, their risk. Our study tends to confirm those conclusion, but only in a partial way. According to interviews with the residents, the community was not vulnerable to floods until the construction of Santa Clara fourteen yeas ago and the installment of the drainage tube in the Tortugo River. Now, after the event, almost all the interviewees offered accurate natural and social explanations for the situation, which indicates that they were aware of the hazard. However, that does not mean that they were perceiving the risk related to it.

A couple of years ago, when one of the residents noticed that the water was not draining well even after an small rain, they realized that the tube was at least partially obstructed. Also, some residents mentioned that they started seeing big objects in the river, such as refrigerators, stoves, gas tanks, etc. According to the Sub Director of the Civil Defense of San Juan, the same residents use the river as an alternative garbage disposal mechanism due to the lack of a efficient government waste management. However, the interviewees argue that the people who throw garbage in the river are not from their community, but from surrounding areas. Presumably, the increasing population density in the area due to the urban development has lead to this illegal garbage disposal. Residents also say that same Civil Defense put some wood panels and construction materials into the river after Hurricane Hortense in 1993, in which a

house was destroyed by a tree and that agency was in charge of removing the rest of the materials.

According to the interviews, one of the residents tried to contact the authorities years ago. However, he did not receive any attention even from the Civil Defense. The Emergencies Communal Plan (1998), designed by the Civil Defense of San Juan, establishes that the community is responsible for identifying the existence of a natural hazards, evaluating their own vulnerability, and with the help of emergency management agencies to design an action plan for the occurrence of the event. That is precisely what the resident did. He called the Civil Defense for years since he discovered the problem, but according to him and his neighbors, he just received insults and bad treatment from the agency. "Every time I called," he said, "the person on the phone laughed at me saying that I was exaggerating. Even when I could see from my backyard the clog just before the tube, they said that I was just an grumpy old man. They never treated me seriously." Thus, the resident identified the existence of the natural hazard, evaluated community's vulnerability, but at the time received no help from the emergency management agency.

Consequently, some Tortugo residents knew that the tube in the Tortugo River was not draining the water properly, and that the situation could be dangerous because the houses were located right on the margins of the river, almost invading the water stream. They were also aware of the problem of illegal disposal of big objects in the river. However, none of the residents could ever make the association between those problems and the possibility of a big flood in the area. None of the residents ever thought that the water could rise about fifty feet over its normal level covering their two story houses. As one of the residents narrated: "My mom was here with my children (in the house) when the rain started. When the river started growing they stayed here because they never thought that it could grow so much and so fast. We have been living here for twenty-five years and this is the first time something like this happens. They thought that the river was going to decrease quickly as always. We have been through strong hurricanes here and this place never flooded before, even when hurricane Hortense this was not so

ugly." Another resident said that her husband "was in shock watching the river grow. He was standing at the window, just looking at the water, because he could never imagine something like this happening." The fact is that the community never experienced a flood before, and for that reason the people of Tortugo lacked of perception of risk, or at least, they did not developed a risk perception associated to that kind of hazard.

The day of the event, more than a half of the interviewees reported that they called 911 and the Civil Defense when they saw the water stream increasing so rapidly. For those who called, the experience was very similar. None of them received any attention from the authorities. As one of the residents says: "I called five times to the 911 and the first three they accused me of being joking and hung up the phone. After the fourth time, they transferred me to the Civil Defense but still it was the same. They could not believe that it was raining so bad here just because it was not raining in San Juan. Also, I am sure that they did not get here earlier after I called because they still did not believe that it was true." Another resident affirmed that "after they realized that I was not joking, the Civil Defense of San Juan started arguing that Barrio Tortugo was not their responsibility because it is located closer to Guaynabo than to San Juan. That made me very angry."

The Sub-Director denied this lack of attention and quick response from the Civil Defense. He argued that this is impossible to happen in his office implying that the interviewed residents were lying just to blame someone for their present situation. However, none of the other participants have doubts about the occurrence of those incidents. The Pastor, the engineer from the Department of Natural Resources, and the engineer in charge of the reconstruction work in Tortugo were convinced that the lack of attention and bad treatment that the residents say they received from the agency, really took place. As the reverend of the Pentecostal Church says: "It is because they are poor, nobody cares" suggesting very clearly that the socio-economic status of the community determines the attention they receive even in disaster situations.

Also, the engineer goes further in his analysis saying that from the very beginning the urban development of areas like Tortugo is a class

struggle. He says: "The Planification Board has been lenient in the approval of construction permits for this area. The developers of communities as Santa Clara have enough money to buy all the necessary permits from the Board. While the poor communities that were established here since decades ago, do not have the money or the contacts to defend themselves and their property. The power of money is incredible. Money allows people to built in inadequate places without considering the consequences. The situation in Tortugo is not an isolated case. This responds to the urbanization pattern in the whole metropolitan area of San Juan. Wealthy communities have been enclosing poor communities in the margins of the rivers, and in the most vulnerable places to floods and other kinds of hazards. And the government does not control that process."

This situation is also evidence of the lack of coordination between the government agencies. Apparently, there are no defined geographic divisions in terms of which offices are in charge of the different areas, or if they exist, Civil Defense employees seem to be unaware of them. As the sub-director of the State Civil Defense said: "There are communication problems among and between the different offices of the Civil Defense." But those problems could be explained by the configuration and organization of the agency itself and also by the political nature of its higher positions.

As the same Sub-Director explains, the Civil Defense of Puerto Rico is divided into two bodies with different responsibilities and leadership. The state Civil Defense is designed by law to coordinate the emergency management in the island but only at the level of designing public policy. This office works with federal funds. On the contrary, the local offices of the Civil Defense, located in each municipality, work with municipal funds and respond directly to the mayor. Each of these offices work separately and there is no law to impose even a minimal level of coordination between them, a situation that suggests an example of patron-client type of relationships between the local offices and the local/state governments. It also evidences a very politicized system, which impedes interagency coordination across political parties due to possible employee's loyalties to particular mayors or governors. For

example, the management positions are appointed by the mayor of each town who is the direct chief and director of the Civil Defense office. At the state level, the Director of the Civil Defense is also a political position.
All these factors make the local emergency management vulnerable to the politics of the moment and to changes in the local and the state government. Thus, these offices are reacting to the disasters situations without the necessary autonomy, and maybe without the knowledge in emergency management, instead of being efficient in the prevention and mitigation phases to their lack of interagency coordination and communication.

The media and the risk awareness among Tortugo residents.

In the literature, the role of the media in natural disasters has been divided into the four main disaster stages: mitigation, preparedness pre-impact, impact, and post-impact. In the mitigation phase, the Puerto Rican media is not a significant source of information about floods and preparedness for the community of Tortugo. According to previous content analysis of the three major Puerto Rican newspapers, floods receive almost no attention from the local media in comparison to other kinds of disasters such as hurricanes and droughts (Perez-Lugo, 1998). Among our interviewees the same phenomenon was found. Even when almost all of the visited families used the media weather reports as a reference to react to changes in the weather, all the attention is usually oriented to hurricanes and not much emphasis is placed on other kind of hazards. Ironically, in Puerto Rico the vast majority of the losses during hurricanes are consequence a of floods, but people have more fear of the power of the winds and prepare to confront the situation with that in mind only.
Only one of the interviewees recalled some floods cases presented in the news. She also remembered hearing some information about how to prepare to confront that kind of situation. But, she never paid attention to that information because it was useless; she "was not living in an area

vulnerable to floods anyway." Another resident agrees saying: "I never thought that this place was vulnerable to floods. In the years I have been living here this never happened before. So, even when I saw floods on TV before, I never imagined that the same could happen to us." The Pastor of the community church pointed out a similar argument. He said "this was a 'lagoon' (referring to the flood), that the people did not expect at all. Here in Puerto Rico floods happen all the time and the information provided is efficient and enough. The press talks a lot about how the Civil Defense and other agencies manage this type of situation. However, the people who do not live in areas vulnerable to floods, or do not know that his/her area is vulnerable, do not pay any attention to the information. People do not expect this, it is not relevant to them, so, Why bother in paying attention?"

According to the literature, one of the most important roles of the media in disaster situations is the transmission of warnings about the proximity and the magnitude of the natural event just before the impact. This may be true during events that can be predicted in some way. But, as we discussed before, the efficiency of the warnings depends on the personal relevance of the content and on the community's previous experiences with the same type of hazard. In this case, due to the lack of disaster awareness among the Tortugo population, and the "unpredictable" nature of the event (in terms of the time of occurrence) the media did not play that important role. Apparently, there were no warnings at all.

None of the interviewed residents remember hearing or seeing warnings of heavy rain for the Tortugo area that day. In fact, one of the interviewees recalls that one of the main TV channels specified that it was not going to rain that day. As a consequence, the media lost all credibility for the Tortugo residents as a warning transmitter. After the event, they lost all the trust in the media's weather reports and from now on they rely more on their personal observations. One woman says "now I look at the sky, and if it is gray that means that the rain is coming and I start shaking. But if Susan Soltero (the weather reporter of channel 11) says that it is not going to rain, I do not trust her at all. The only thing I trust now is the color of the sky".

During the impact, while the flooding was occurring, the role of the

media was very limited. As one interviewee said "the press an the TV news got here (to the community) before the Civil Defense and the Police. But the journalists were there in the street, looking at us, just watching how we were trying to get out of our houses, and they did not do anything to help. They just looked and took pictures." However, during the post-impact phase all the interviewed residents agreed that the media was an essential mediator between the government agencies and the community. As the same resident said "the attention that the media put on the incident was a determinant factor in the amount of government help that we received."

This intervention of the media was extremely important because the residents of Tortugo did not receive any disaster relief aid from FEMA. This agency argues that because the situation inTortugo was an small-scale disaster, only around twenty-five families (less than 100 people) were affected, and because the residents did not have flood insurance on their property, the community is not eligible for federal aid. But they did not have insurance because of different reasons. First, the community was not declared by FEMA as vulnerable to floods, but to mudslides. Thus, they could not purchase the flood insurance due to the lack of identified vulnerability. Second, almost all of the residencies were built, very slowly, using cash and the insurance is generally offered through lending institutions only with the purpose of guaranteeing the mortgages. However, most of the residents are low income, therefore, they probably do not qualify for a mortgage loan anyway. And at the same time, as Palm (1993) demonstrated in the case of PR, lending institutions do not emphasize the insurance most of the times because of redlining practices. But the most important reason, they did not know that flood insurance existed. All these factors also demonstrate that the case of Tortugo evidence environmental injustice and institutional discrimination.

For those reasons, they had to rely in the local government for help in the reconstruction of their community. The state government did not provide any help because it was understood that the municipality of San Juan could manage an small-scale event like that one. In those circumstances, the media played an essential role in the process of

finding economic aid and first necessity items for the affected families. The press immediately focused the public attention to the situation in Tortugo and applied pressure on the local government to make it move fast enough in finding private and public help. The residents really think that it was the media who mobilized the Red Cross, the local government and some civic organizations in their behalf. One of the residents says, "if it was not for the press, I would not get anything."
Yet another role that the media played in the Tortugo Disaster was directing public attention to the attribution of responsibilities. Thus, the media coverage revealed to the public, almost for the first time, the existence of rapid and unplanned urban development in the metropolitan area of San Juan. Until that moment the residents had complain about the construction of Santa Clara without success. As one of them put it, "it was like fighting against a monster. The developers have friends on the Planification Board and are very influent people, untouchables." But, from the beginning of the post-impact phase, the media took the side of the residents in a campaign to expose the causes of what was happening and how the causes of the disaster were completely of social origin. A TV journalist, who was in the area interviewing residents about their level of preparedness to confront future similar situations, said "disasters are not natural, these situations are caused by human factors. Covering events like this one, we contribute in creating a consciousness about human vulnerability, and more in communities with economic and geographic disadvantages."
This coverage put pressure on the Legislature to pass an official order stopping all the urban development in the area close to Tortugo. The city of San Juan had solicited that order since a few years ago but the Planification Board because of economic interests denied it. According to one engineer who is presently related to the Planification Board, there are more than eighty residential projects approved by this agency even when the environmental and social damage that this fast development has caused in the area has been demonstrated.
However, we discussed the importance of informing the audience before the pre-impact warnings to make the message effective in term of preparedness and perception of risk. That requires a direct involvement

of the media in long-term mitigation processes. Apparently, the involvement is not possible exclusively because of the profit-making nature of the private media. As the journalist pointed out "news programs have economic responsibilities too. Usually we give warnings only when the event is imminent. There is no other thing that we can do. We have to accept that news programs have economic commitments and that their main objective is to make money. Therefore, even when we understand that we have a commitment also with the public service, we cannot do it at the expense of our finances."

From the government's perspective, those economic commitments impede the coordination between the private media and the emergencies management agencies in the efficient use of the media as an agent in the development of a risk perception during mitigation processes. The Director of the Civil Defense of Puerto Rico recognizes the potential power of the media to orient and inform entire communities before, during and after a natural event. But he argues that, at least during the mitigation phase, the agency makes videos and recordings as parts of mitigation programs but they do not receive any cooperation from the commercial media because the Civil Defense has no budget to pay for advertising. The commercial media does not want to donate space and time either because that means less revenue. Also, according to the Civil Defense Director, mitigation activities are not as dramatic as the natural disaster itself, and what is not dramatic for the media does not produce money either.

Two other factors also impede the pre-impact coordination during the disaster situation because of two main reasons. First, the local media (mainly television and radio) supposedly alert the communities at risk about the proximity of a dangerous natural event through the Emergency Alert System. However, the participation in that program is voluntary and not all the stations are subscribed to it. And second, according to the Director, the worst problem that the Civil Defense can identify in relation to the media coverage of the disaster situation is that the information that they provide is not consistent with the official information provided by the agency. For example, when a hurricane is close to the island none of the newspapers, TV or radio stations publish

the official map produced by the Civil Defense. Instead, they each produce different maps with information provided by unofficial sources. For that reason, the Civil Defense has to publish and distribute the map consuming the agency's resources unnecessarily.
Also, as the Director said: "Each TV channel and radio station can offer different information, or even when they publish official data, they comment on it and offer additional predictions with no scientific or official backup most of the time. In that way, they distort the original message. For example, even when in Puerto Rico floods are major hazards, a radio disk-jockey said once that a meteorological event was approaching the island but that it was not dangerous because it was coming with rain but without strong winds." Also, in several occasions, radio stations promote outdoor activities even under storm watches exposing the lives of their employees and the general public. The agency has had serious problems with comments and actions like these, because people trust the media more than scientists and government officials, and their irresponsibility dealing with dangerous events makes the public underestimate the seriousness of the situation. Thus, the main problem with the media's participation in the management of natural disaster situation is the lack of coordination between the official agencies and the private corporations who own the communication channels.

CONCLUSIONS

One of the major findings of this research is that the influence of the mass media in the individual perception and response to natural disaster situations is mediated, and even determined by, the previous personal or collective experience of the audience with a particular kind of natural hazard. Also, this case study shows that the development of a risk and disaster awareness not only depends on the amount and the quality of the information received by the community, but on the personal relevance that the content may have for them. Thus, the usefulness of the information provided depends on the ability that the content may have to

make people recall past personal experiences or the impression the individual may have about the vulnerability of he/her's own community. At the same time, lack of previous experience with an specific natural hazard caused lack of personal relevance of the content. It does not matter how many times the news showed problems related to floods and prevention materials. Tortugo residents did not pay any attention because it was not relevant to them. However, the media can serve as a collective memory agent being consistent, frequent and specific in the material published about the most common natural hazards in PR: floods. The point is to make the hazard personally relevant to everybody using the content of the media as a substitute for past personal experience to introduce human vulnerability to floods as part of Puerto Rican's daily life. In other words, the creation of a "hazard culture" is necessary.

But to do so, the disaster management agencies and the commercial media have to agree on a coordinated public service effort, which can be expensive for both parties. The private media will have to understand the enormous responsibility that its influence on the general public implies. Also, Puerto Rico's government will have to realize the importance of the media in the long-term mitigation phase allocating more resources to the transmission of preparedness and prevention information. This case study also shows that in the management of natural disasters, the government cannot depend on the fluctuations of the market to provide pre-impact information. It has to play an aggressive role in designing mitigation campaigns in conjunction with the private sector. But before that, there are some issues of internal communication and coordination that have to be addressed. The fact that the offices of the Civil Defense work separately and individually is also impeding the agency's accurate participation in mitigation and preparedness processes. Also, the use of emergency management offices as political positions jeopardize the safety of the general public, because that practice does not guarantee that the appointed managers posses the proper training and knowledge.

In terms of the media content, the findings of this research also demonstrate that apart from giving the information to the public about what to do in which situations, the information provider has to be very

specific about the relevance of that information to each of the addressed sectors. In other words, the information has to be localized and serve the necessities of the surrounding population. But that means that the agencies in charge of the disaster mitigation plans cannot exclusively rely on the mass media as the only vehicle to transmit the information, because the standardized messages provided by the media decrease the personal relevance that the information may have to some people in particular. Contact has to be established on a one to one basis and in a routine form, and citizens participation in the creation and development of contingency plans is necessary to raise the disaster awareness in the community before the emergency occurs and to familiarize disaster managers with the communities under his/her responsibility.

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NOTES

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2 Research suggests that emergency management officials react instinctively in disaster situations instead of following written pre-established plans, if they exist at all (Fisher, 1996).

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