

Crisis Preparation

- The case of Katrina, New Orleans

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Abstract

The purpose of this thesis is to understand the importance of crisis preparation for disaster management in New Orleans before hurricane Katrina, and why New Orleans was so badly prepared despite knowing for several years that a disaster of Katrina's magnitude was much likely to strike at this time. The study is based on secondary literature in the form of articles, web documentaries and investigative reports. The studies theoretical ground is an application of Klinke and Renn's theoretical approach to Risk Management Strategies. Terms used in the study are Disaster management, Crisis preparation and Natural Disasters. The study shows that Federal Emergency Management Agency (FEMA) has been a blockage in the process of crisis preparation. The agency has been preventing development in crisis preparation for years causing unnecessary damage to the city and the citizens of New Orleans. Why the agency has been acting this way I can only speculate about but it is an interesting subject for further research. My study also shows that a general understanding of Crisis preparation in terms of dealing with Disaster management is important and in the case of Natural Disasters it can save lives.

Key search words: Disaster management, Natural Disaster, Crisis Preparation, New Orleans, Katrina, Hurricane, Louisiana, USA, FEMA, Pam, Levees, Risk-based Strategy, Precaution-based Strategy, Discursive-based Strategy, Risk Management Strategies, Klinke & Renn

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1.0 Introduction

Natural disasters is a recurring problem in all parts of the world, some places are more at risk than others, but disasters can still appear anywhere in any shape or size. In this study I will take a closer look into disaster management mainly focusing on the term crisis preparation, I will depart from the case of Katrina, a category 5 hurricane that in late August 2005 affected large parts of southern US causing irreparable damage. Due to its geographical location, its proximity to water and large population, New Orleans was one of the most affected cities along the entire South Coast. For my thesis I've specifically chosen to focus on New Orleans, not just because of its geographical location or the damage that was caused, but because the city received an enormous amount of critique for their handling of crisis preparation and disaster management. That critic did not just come from the experts within the United States but from experts all around the world (National Geographic, 2012).

Katrina as a case is unique in the aspect that almost everything that could go wrong went wrong, everything from preparation to managing the crisis and dealing with the aftermaths of the disaster (Frontline, 2006). Local, state and federal levels of government all lacked in several aspects one of them being communication, which is crucial in a major catastrophe such as Katrina. As mentioned earlier out of the cities along the South cost New Orleans was hit the hardest, nearly 1800 lives were lost (ibid). But what I found to be one of the most compelling and interesting facts about New Orleans was not how hard Katrina hit, but how badly the city was prepared for this catastrophe that had been anticipated for years. Bearing in mind this was almost to the day four years after 9/11, at that time the United States was in a crisis preparation frenzy making sure that they as a nation were prepared for anything. Somehow the threat of an impending catastrophe did not gain much attention from neither the city officials nor from the public. Although that statement might not be entirely true because for a few years New Orleans actually had a simulation program called Pam. The purpose of Pam was to prepare city officials to be able to handle a hurricane of Katrina's magnitude. Ironically the program was shut down in the summer of 2004 by the Federal Emergency Management Agency (FEMA) due to lack of funding and not being considered relevant (Special report 2006, p 216). Another compelling fact about New Orleans that make you question how the city possible could have been so badly prepared is the fact that the city already is located below sea level, and the levees built along the coast has the sole purpose of keeping the water out of the city and keeping it from flooding on a daily basis. In this thesis I

will study the puzzle that is the crisis preparation of New Orleans and try to find out why the city was so badly prepared for this anticipated catastrophe.

1.1 Katrina the Catastrophe

Too fully understand the importance of disaster management and crisis preparation we must first learn about hurricane Katrina and the chaos and damage she brought to New Orleans. The knowledge of the damage Katrina caused will give a good insight to what kind of crisis preparation the city would have needed to manage the disaster in comparison to the preparation they actually had.

Hurricane Katrina originated over the Bahamas on August 23rd 2005 ranked as a tropical storm. On August 25th midafternoon Katrina was ranked as a category 1 hurricane able to damage smaller houses, power-lines and trees. Normally hurricanes slows down over land because they draw their energy from the warm water over sea and when they hit land there is nothing to draw from (Hurricanefacts, 2007). Instead of slowing down Katrina changed directions from Florida and continued over the Gulf Coast where she recharged to a category 2 hurricane with a highly estimated chance at becoming a category 3 hurricane within the next 24 hours. The experts had predicted that no matter where she made landfall New Orleans would be gravely affected due to the city already being located below sea level (National Geographic, 2010). On August 27th the first reports about Katrina's landfall was starting to come in and the estimated time to landfall were 30 hours away.

People east of New Orleans started evacuating their homes and moving out of the city to get out of harm's way during the day, but there were still no official evacuation order. Not until late Saturday afternoon both Louisiana and Mississippi triggered their highway emergency evacuation orders, using all available lanes for outbound traffic to transport people out of the cities (ibid). But there was neither enough time nor enough resources to get the people out of New Orleans in time. The streets were snarling up and hotels outside of the city quickly became fully booked, a lot of people could not make it out of the city and the ones who did had nowhere to go. Lunchtime Sunday 28th Katrina was ranked as a category 4 hurricane destroying everything that came in her way, only five hours later she was ranked again as a category 5 hurricane (ibid). Mayor Ray Nagin announced shortly after the forecast only 20 hours before estimated landfall a mandatory evacuation of the city, something that had never been done before (Frontline, 2006). When Katrina hit landfall in New Orleans early Monday

morning August 29th there were about 20 percent of the people still stuck in the city. The water spread and went as high as second and third storey buildings all over the city. Mayor Nagin had the day before opened up the Super-Dome Arena for a shelter as a last resort for the citizen who could not get out of the city in time. The superdome was built to withstand 200 mile/per hour wind but as Katrina swept in over the city not even the arena could hold out for the wrath of the winds. Parts of the roof was ripped loose and rain started to poor into the arena where tens of thousands refugees had sought shelter (ibid).

Afterwards FEMA reports that 1833 people were killed during Katrina which made it the deadliest hurricane since 1928 Okeechobee hurricane. 1577 were killed in Louisiana mostly in and around New Orleans (CNN, 2014). Footage from the days after Katrina shows dead bodies floating around in the water, lying on top of cars and rooftops. According to FEMA Katrina is “the single most catastrophic natural disaster in U.S. history”. The estimate damage from Katrina was 108 billion dollars which along with the most catastrophic natural disaster also makes it the costliest hurricane in U.S. history (FEMA, 2015).

Ivor Van Heerden is known as the man who predicted Katrina, at the time he was the Deputy Director of Louisiana State University Hurricane Center and since 2001 he led a team studying public health impacts of hurricanes in the city. Years before Katrina Van Heerden tried warning the government of this impending catastrophe without getting any response. In an interview done by Nova Science in July 2004 before Katrina, Van Heerden laid down a scenario much like the one that Katrina later caused. Refugees, people stuck in the city, major flooding, building damages, many dead and injured, lack of food and water these are just a few of the scenarios that Van Heerden presented. Looking back Van Heerden’s scenario was scarcely close to the real Katrina. In this interview done before Katrina struck Van Heerden praises exercise Pam where federal agencies got together with state agencies to conduct training for the potential threat of a major disaster. Van Heerden says that “hopefully there is more recognition now, especially by FEMA”. He also continues the interview by saying that there is a lot that can be done to prevent several of the major scenarios such as flooding. Restoring the wetland is one of them, Van Heerden describes the wetland as the cities outer line of defense protecting New Orleans from a water surge. Another scenario that Van Heerden describes is that the amount of water flowing into Lake Pontchartrain can be reduced which will prevent most of the major flooding that is estimated to affect the city deeply. USA is the most powerful country in the world Van Heerden continues by saying, “there were no problem to spend 40 billion dollars on the Iraq war but spending 16-20 billion dollars on

saving New Orleans could as easily be done just by being willing to put in the effort". Afterwards you can see that the total damage cost for New Orleans was as FEMA reported 108 billion dollars about five times as much money as Van Heerden estimated the preparation costs of New Orleans to have been. Van Heerden concludes the interview by saying that "unfortunately it is probably going to take a catastrophe in order to mobilize the change and preparation of the city that is so well needed" (Nova science, 2004).

After Katrina hit Nova Science did a follow up interview with Van Heerden in 2005 where he talks about how accurate his models turned out to be, the government response, faulty levees and the future. Van Heerden means that for the future Katrina can be used as a calculating example because if this were to happen in another country in the world it might even be worse than Katrina (ibid).

1.2 Problem

With a changing climate and natural disasters happening all the more often around the world, a functioning disaster management system is crucial for many cities in different countries around the globe. Not having a functioning system can lead to much more damage than necessary. In the case of Katrina there was a clear problem stated by the experts that the city was not prepared well enough. Ivor Van Heerden mentions in his second interview with Nova Science that Katrina now is used as a calculating example to prevent another catastrophe to affect New Orleans the way Katrina did. But with our climates rapid changes what is stopping future hurricanes from being more and more extreme, and our preparation system from once again being outdated and not effective enough? It is important to ask these questions even if they are uncomfortable in order to acknowledge the problems and try to find the most workable solution possible.

1.3 Purpose

The purpose of this thesis is to understand how Crisis preparation was done in New Orleans previous to hurricane Katrina. But also develop an understanding of the importance of New Orleans having a functioning disaster management system, in case of catastrophes like Katrina were to happen again.

1.4 Question

The general question for my thesis will be

- How to understand the importance of crisis preparation for disaster management?

Whilst the more specific question for my study will be

- What can explain why New Orleans was so badly prepared for Katrina?

2.0 Method

This thesis is a single case study based on secondary literature; I will use application of theory with the purpose of having the theory guiding my way through the analysis and conduct a conclusion to my question. I made the choice to only use one case in my study, the case of Katrina, New Orleans. Katrina is a unique case in many aspects as I have mentioned in the introducing chapter, Because of the uniqueness Katrina brings to this study I choose to make a case study focused on only the one case, Katrina. Single case studies such as Katrina, New Orleans can also be useful in providing information that otherwise might get lost in a comparative study (Landman 2003, p 34). A deviant country study however can be useful for theory generation (Landman 2003, p 35) although that will not be applicable in my study since I am using application of theory. I made the decision to use application of theory based on the fact that application of theory creates a good basis to build a secondary based literary study on (Teorell & Svensson 2007, p 47)

2.1 Material

I am basing my study on secondary based material such as reports, articles, web documentaries, and literature on crisis preparation and disaster management. When gathering material I have had to be very selective with the material I have chosen due to a still very infective political situation in New Orleans but also Louisiana and neighboring states. The lack of trust in the government escalated after Katrina and a lot of the material such as articles and reports are having an anti-government approach, which makes it hard to see through the ranting and determining what material are relevant and what is not. When it comes to reports and articles on New Orleans post Katrina most of them are discussing poverty and race, for my short study neither poverty nor race is something I am planning to discuss. Therefore I had to be selective with the material in order not to bring those discussions in to the paper. Despite

how careful I have been with my material and sources which claims to be independent and not have a political standpoint it is impossible to hail from. I have accepted that my sources from time to time might be biased but I have tried to select them from a point of independence and objectivity. I will not mention all of the sources I am using for my thesis but I will discuss the one that has had the most impact on my study.

A lot of the information I gathered on Katrina and the development of the catastrophe came from Frontline and National Geographic both of these sources are web documentaries conducted to explain the development of Katrina and how the government and different organization handled the catastrophe. Frontline is an American broadcasting televised company, free of any political standpoint. They have won every award in broadcast journalism and are known for reporting on controversial issues and complex stories (PBS, 2015). National Geographic is a nonprofit organization that relies on contributions from donors. They have supported scientists, research and public outreach amongst many other things for over 125 years. I feel confident in these sources despite the fact that both of them are reliant on donors. Frontline are open with the donors they are using and as far as I could tell none of them had a political origin, National Geographic did not show their donors publically but the fact that they are a nonprofit organization makes them reliable in my eyes. Another source that I have been frequently using throughout this thesis is a special report conducted by the committee of Homeland security and governmental affairs. One can argue that they would be bias due to them being a part of the government. However this report was conducted to independently investigate and analyze the case of New Orleans and Katrina with the purpose of finding out what went wrong, why and how. As I have read the report I can conclude that, that is exactly what they are doing. I therefore feel confident in using the report as one of my sources of information. Overall I feel confident in my sources, due to the political situation in the southern parts of US like I have mentioned earlier it is not possible to escape some sources being bias, even when I am aware of it.

3.0 Theory

3.1 Previous research

Finding previous research on disaster management has been tricky. A lot of the disaster management literature has their focus set on an economical aspect and a lot of the research is based around financial crisis on Wall Street. Another aspect of disaster management is that

most of the literature that is not focused on business and economy is focused on war, mostly preparation and development of warfare. Research on crisis management in the form of natural disasters has been tricky but not just because of warfare and business is dominating the field of research but because every natural disaster is unique in its own way. This uniqueness makes it hard to base solid facts on, because you cannot for sure say that what is happening is universal for all natural disasters. Research that has been done is mostly focused on the societal impact of the citizens in the affected area. Lazarus, from Florida International University, Jimerson from University of California, Santa Barbra and Brock from California State University, Sacramento developed a study in 2003 called *Responding to natural disasters: Helping children and families: Information for school crisis teams*. In this study they researched natural disasters effect on children and how to help children and families in such situations, they also looked into the possibility to prepare children in school and teaching children in areas where the disaster potential is high how to react and deal with such situations. FM global conducted a research study in 2010 called *Flirting with Natural disasters – Why companies risk it all* the study focus on why certain organizations bothers with crisis management and others do not. Even though these studies focuses on crisis preparation it is not the type of crisis preparation this study focuses on. Overall the research done within the subject of disaster management is mainly focusing on how to manage disasters once they have happened and just a few like the once I have mentioned above have chosen to focus on the preparation phase.

3.2 Defining Terms

In this thesis I wanted to talk about the term Crisis preparation but when I turned to the literature on Disaster management I found that the term Crisis preparation did not officially exist in literature as well as in the scientific language. The term that was used instead was Disaster management or in some cases Crisis management. But for me that became a problem because I wanted to focus on the preparation part. Disaster management involved the entire process, everything from preparation to handling the crisis and dealing with the aftermaths. In a case like Katrina using the term crisis management can be both useful but also have the opposite effect. It is useful in the aspect that the term covers the entire process and you can easily explain a lot of information for the reader in a short and effective way. But the term can also have the opposite effect, which is that it explains too much and you lose the ability to be specific in your language. For me this was a problem in the process, I therefore decided that I would extract the part of crisis preparation from the term crisis management and create my

own term for the study. The term Crisis preparation will in this study mean the preparing stage before disaster hits and in my case to be more specific Katrina. As for the time frame of this term preparation can mean anything from the start of preparation planning which can be years before the disaster hits or minutes away. I do not want to put a timeframe on term because that might exclude information useful for my study and therefore it might alter the result.

In my thesis I will use the term natural disaster as well, the term is most commonly used when referring to large disastrous events caused by nature. These events are known as hurricanes, tornados, wildfires, tsunamis, earthquakes etc. In my thesis the term will be used in reference to hurricanes since the case of New Orleans was caused by a hurricane. But the term is not exclusive for hurricanes since flooding for example did affect the city badly, although technically flooding was a side effect of the hurricane, However flooding in itself is seen as a natural disaster (Hurricanefacts, 2007).

3.3 Klinke and Renn's theory on Risk Management Strategies

For my thesis I will depart from Klinke and Renn's theoretical approach to Risk management strategies which consists of three different types of risk strategies:

1. Risk-based approach – including numerical thresholds (quantitative safety goals, exposure limits, standards etc).
2. Precautionary approach- Reduction activities derived from the application of the precautionary principle (exemples are ALARA – as low as responsible achievable, BACT – best available control technology, containment in time and space, or constant monitoring of potential side effects).
- 3 Discursive approach – Standards derived from discursive processes such as roundtables, deliberate rule making, meditation, or citizen panels.

Klinke and Renn says that risk analysis has become a routine procedure in assessing, evaluating and managing harm to humans and the environment and that there is a debate going on about the legitimate role of risk-analysis for regulatory decision-making (Klinke and Renn 2002, p 1072). The debate centers around five major themes *Realism versus constructivism*, *The relevance of public concerns revealed through perception studies as criteria for risk regulation*, *The appropriate handling of uncertainty in risk assessments*, *The*

legitimate role for “science based” versus “precaution based” management approaches and The optimal integration of analytical and deliberative processes.

By introducing these five themes in a more detailed way it will provide invaluable insight for risk evaluation and management. For Klinke and Renn these insights serve as heuristic tools in presentation and explanation of their own approach to risk evaluation and management Risk management strategy (RMS). For me these insights serve as analytical tools to explain how badly prepared New Orleans was for Katrina and how we can understand crisis preparation and management. I will shortly introduce these five issues below in order to understand Klinke and Renn’s RMS systems.

3.3.1 Realism versus constructivism

The first issue at hand is the difference between realists and constructivists, the realists are convinced that technical estimates of risk constitute true representation of observable hazards that can and will affect people as predicted by the calculated results regardless of the beliefs or convictions of the analysts involved. The constructivists on the other hand believe that risk assessments constitutes mental constructions that can be checked at best against standards of consistency, cohesion, and internal conventions of logical deduction (Klinke & Renn 2002, p 1073). In my case of the crisis preparation before Katrina a realist would have said that the occurrence of Katrina and the precautions that should be taken should be based on technical estimates and calculated chance of occurrence. A constructivist on the other hand would have said that the New Orleans crisis preparation before Katrina should have been based on the consistency of previous natural disasters along the south cost and logical deduction of the human mind (ibid).

3.3.2 Public concern as criteria for risk regulation

The second issue to be brought up is quite closely linked to the first. The issue concerns whether the public should be involved concerning impending threats or not. The question of inclusion has at the moment two sides, one that explicitly say that if the people and their community is affected by the potential harm or other risk-inducing activities it should be their prerogative to determine the level of risk that they judge tolerable for themselves and their community. The other side of this issue is very firm in the fact that they think you should not include the public in such decisions. They argue for that press coverage and intuitive biases may misguide the public perception. The perception of danger might be skewed though small

issues might be enhanced and larger issues forgotten due to what caught public attention which might cause more fatalities due to ignorance (Klinke & Renn 2002, p 1073). In the case of Katrina there is an interesting perspective though the emergency evacuation order did not come until the day before landfall. Should the citizens of New Orleans have had a say in how much risk they can tolerate? Or for the question I am asking should the public decide what kind of crisis precautions the city of New Orleans should have taken, or should those decisions be left for the experts to evaluate and decide?

3.3.3 The appropriate handling of uncertainty in risk assessments

The third issue centers around the handling of uncertainty and how to deal with it. Many of the experts are conflicted due to the term uncertainty not being specific enough. Several suggestions for different terms have been made such as incertitude, variability, indeterminacy, ignorance, lack of knowledge and others. Political scientist Åsa Knaggård debates in her dissertation what Swedish policymakers within climate change do with uncertainty. Knaggård says that from a rational point of view uncertainty is seen as deeply problematic for policy makers (2012, p 22). Kristie Ebi professor in global health and researcher for The Intergovernmental Panel for Climate Change (IPCC) speaks about the difference between uncertainty and confidence. She means that confidence is not the opposite too uncertainty, because there are different levels of uncertainty and confidence (Ebi 2010, p 1). Ebi mentions key findings as an important instrument, a key finding can for example be scientific data giving information about hurricanes before they might hit. Having confidence in key findings is important in order to proceed with the work that's being done, Ebi is particular in pointing out that having confidence in a key finding does not automatically mean that you have reduced the scientific uncertainty (Ebi 2010, p 2-3). However the type of uncertainty varies by the different key findings that you have. Ebi concludes her view of scientific uncertainty by saying that not having scientific uncertainty is next to impossible, and not always something to strive towards though uncertainty often keeps scientist alert and make them look even closer in to the problems they are facing (ibid). But just as uncertainty is problematic for policy makers it is equally problematic for risk analysts and risk managers, not knowing what to base their decisions on for sure. Knaggård argues that there will never be a decision made on complete certainty, that is only possible in textbook examples (2012, p 23). All decisions are including some level of uncertainty Knaggård means that in her dissertation uncertainty comes in form of lack of knowledge or diverging scientific result, as for the case of Katrina decision circling crisis management comes with uncertainty as well.

3.3.4 “Risk based” versus “precaution based” management approaches

The fourth theme of the debate focuses on how to evaluate uncertainties and transfer this problem into the domain of risk management. Most people feel moral obligations to prevent harm to human beings and the environment. Risk analysts job is to provide risk managers with necessary scientific input. Since there are more risks in the world than the world could handle at the same time priorities has to be made. A conventional solution to this problem has been risk reduction policies in proportion to the severity of the potential effects. A linear combination of magnitude of harm and probability of occurrence constitutes the most appropriate instrument for setting risk assessment (Klinke & Renn p 1074). Arguments against proportional risk assessment mainly comes from analysis of uncertainty. The risk community has been trying to sharpen their analytical tools in order to be even more accurate and respond to this challenge (ibid). An alternative approach that focuses on how to cope with uncertainties instead of spending all efforts on how to gain more knowledge has been tested. The goal with this approach is to develop better ways to co-exist with uncertainty and not be crippled by it (ibid).

You can see that risk-based method relies more on the numerical assessments of probabilities and potential damage whilst the precaution-based method relies on handling the uncertain or highly vulnerable situations (Klinke & Renn p 1075). To specify a precaution-based method is a step by step process where careful calculations are made not to step too far without enough knowledge. Environmental groups have often rallied around the precautionary method as being the best approach due to the extended collecting of knowledge before making a decision whilst the industrial and commercial groups have been fighting for the risk based approach where rather quick, rational and most likely decisions are held high (ibid).

Nassim Nicholas Taleb a professor of risk engineering and also a bestselling author of the books *Foiled by risk* and *The Black Swan*, talks about the Black Swan theory in his book. This theory is an analogy for unlikely events that rarely ever happens. Taleb says that these events are so rare that it is mathematically impossible to calculate when they will occur (Taleb 2007, p 7). Often when these events occur they are rather spectacular such as Katrina. Taleb means that there was no way of knowing when Katrina would happen only that the possibility existed just like black swans we know that they exist but we do not know where and when we might see one. One of the main reasons to why you cannot calculate to when an event such as a black swan might occur is that you can only explain it once you have seen it because it is so

rare, which makes it impossible to predict again because you have nothing to go on (Taleb 2007, p 13). Taleb also says that with more research that has been conducted Grey swans is an actual possibility which means that you can see Grey swans coming but the probability of them actually being a grey swan and not a seagull instead is highly improbable (ibid). As for Katrina a Grey swan would have meant that you could have seen when it might occur but it is highly unlikely that it actually is a grey swan because it could just as well and probably even more likely be a seagull. What Taleb means with this is that you would probably miss is due to how rare the occurrence is.

With Katrina this becomes interesting, could a proportional risk assessment have calculated the occurrence of the landfall or should it be viewed as a black swan? Also the perspective of developing better ways to co-exist with this uncertainty is interesting and brings a thought to mind of the possibility of having crisis preparation on standby.

3.3.5 The optimal integration of analytic and deliberative processes

The fifth and last debating issue focuses on the role of deliberation in risk analysis and management. Many authors have used the term deliberation as a discursive process that they believe is capable of dealing with the problems of uncertainty and ambiguity in risk management (Klinke & Renn p 1075). Equality amongst participants is one and peer review as a means for verifying understanding another. As much as many analysts support this concept it has also reached a lot of counter arguments such as economically ineffective. One of the major arguments has been that the public preferences do not match the real interest of the public. In my case this last approach doesn't really become relevant for the crisis preparation since it mostly focuses on resolving conflicts that has already occurred rather than what is about to happen.

3.4 Risk Classification

Risk classification is another stepping stone in Klinke and Renn's theory which provides the necessary link between risk assessment and evaluation. There are six different types of risk classes I won't be mentioning all of them just the ones that are relevant for my case. To find out which one of the different risk classes ones case belongs to Klinke & Renn mentions five questions that can be asked (2002, p 1084-85). These five questions are 1. Do we have some knowledge of the characteristics of the risk? 2. Does the risk exceed prespecified thresholds of one or more criteria for risk characterization? 3. Is the damage potential known and can it be

identified? 4. Does the assessed damage potential exceed the predefined thresholds for catastrophic potential? 5. Does the risks show no significantly high values on any physical criteria but may load high on the social criteria? These five questions will be a useful guide in determining which one of these different risk classification ones case belongs to.

The six different risk classifications have been illustrated by Klinke and Renn with Greek mythology. In order to identify and evaluate what kind of risk you are facing you must first classify the risk to which group it belongs, Cassandra is the Greek mythology that illustrates the classification relevant for my thesis. Klinke and Renn describe the risk classification Cassandra as the Greek mythology tells it

“Cassandra, a seeress of the Trojans, predicted correctly the perils of a Greek victory but her compatriots did not take her seriously” (Klinke & Renn 2002, p 1081).

The risk class Cassandra dwells on this paradox: the probability of occurrence as well as the extent of damage are high and relatively well known, but there is a considerable delay between the triggering event and the occurrence of damage. That leads to the situation that such risks are downplayed or ignored. This leads to situations where no one is willing to acknowledge the threat (2002, p 1081). Katrina is a shining example of the paradox that is Cassandra. Where the probability of occurrence is well known and the extent of great damage was feared yet the risk becomes both downplayed and slightly ignored. In this case the triggering event is not when the hurricane formed over open water but when scientists began to calculate its probability of occurrence.

3.5 Three risk management strategies

The ultimate goal of each strategy is to transform the unacceptable in to acceptable risks (Klinke & Renn, 2002, p 1085). By dividing the five themes into three categories and using the risk classification system, Klinke and Renn has created three types of risk management strategies that I will present separately.

3.5.1 Risk-based strategy

When using a Risk-based strategy Klinke and Renn says that risk managers should focus their efforts on reducing disaster potential. They also recommend using tools from uncertainty management in cases risks with high disaster potential (2002, p 1088). Klinke and Renn means that the tools that should be used are: Containment in time and space, development of

substitutes and negotiated rule making, decision analysis (2002, p 1087). What Klinke and Renn means with these tools is providing resilient strategies to be prepared for surprises and finding an adequate and fair balance between over- and under protection. The first of the debating issues Klinke and Renn discussed “Realism versus constructivism” belongs to this first strategy where they are focusing on reducing disaster potential. Realism and constructivism brings up two different ways to do it (see 3.3.1) but ultimately their goal is the same. The fourth issue Klinke and Renn talks about “risk based versus precaution-based” is split up in two strategies the first risk-based strategy and the second precaution-based strategy just as the title indicates. The fourth issue on a risk-based method in comparison to the precaution-based method speaks to numerical assessments and calculated answers in order to reduce the disaster potential which is a solid foundation of the Risk-based strategy.

3.5.2 Precaution-based strategy

The precaution-based strategy is often used when the risk potential is characterized with a high degree of uncertainty. Therefore Klinke and Renn means that the first course of action must be the application of precautionary measures to prevent the potential of irreversible damage (2002, p 1088). The third issue on “handling uncertainty in risk assessment” that they discuss belongs in the second strategy, the precaution-based. The high degree of uncertainty that is a large part of risk assessment is also what is characterizing the precaution-based strategy. As mentioned in the section above on Risk-based versus precaution-based there are different approaches to the two of them. In the case of the precaution-based method treading carefully while trying to determine what’s uncertain and what’s not is crucial not to overstep due to lack of knowledge. Nicholas Taleb theory on black and grey swans is very much reliant on uncertainty as a phenomenon. Taleb therefore lands with his theory within the Klinke and Renn’s precaution-based strategy.

3.5.3 Discourse-based strategy

This strategy is essential if either the potential for wide ranging damage is ignored, due to delayed effect such as climate change, or- the opposite- where harmless effects are perceived as threats. In Klinke and Renn’s risk classification system Cassandra belongs in this category. They mean that due to that the hazardous nature of the risk mainly is based on subjective perception, and the belief that the risk poses a serious threat, produces public attention and fuels public anxiety which leads to distress amongst other societal issues for the public (2002,

p 1088). According to Klinke and Renn these risks require strategies building up consciousness, building confidence, strengthening trustworthiness in regulatory bodies, and initiating collective efforts or institutions for taking responsibility (ibid). The second issue of “public concern” that Klinke and Renn discuss belongs to this third strategy, although it is quite closely linked to the first issue on Relativism and Constructivism, public concern is more of a discursive strategy though it speaks to the public attention and societal issues. The fifth and last issue on “optimal integration of analytical and deliberative processes” belongs under the discursive strategy. I will not dig deeper into it though because it is not relevant for my case and explaining it further here won’t extend the knowledge on the subject or the discursive-based strategy.

3.6 Conclusion of theory

Based on Klinke and Renn’s risk classification system I have concluded that the case of Katrina is compatible with the risk class Cassandra. Klinke and Renn place Cassandra in RMS system three, Discursive-based strategy. I thought Cassandra being placed in the third Discursive-based strategy was a little surprising, I always saw Cassandra more as a precaution-based strategy. Klinke and Renn mean that due to the hazardous nature of Cassandra and the public attention and societal issues she brings, she belongs in the discursive-based strategy. Cassandra represents Katrina which according to me could belong in risk-based strategy and precaution-based strategy as well as the discursive-based strategy where Klinke and Renn placed her. The risk-based strategy is focused on reducing disaster potential. From a perspective on crisis preparation reducing disaster potential is a tool effective in cases categorized in risk class Cassandra. Klinke and Renn says that as soon as probabilities and corresponding damage potentials are calculated risk managers following the risk-based strategy are required to set priorities according to the severity of the risk (2002, 1091). For risk class Cassandra and a perspective on crisis preparation in the case of Katrina and New Orleans, reducing disaster potential can be hard to do since most of the preventions that need to be done requires time and money like Van Heerden describes in section 1.2. But there are still a few things that can be done in order to reduce the disaster potential, in New Orleans one of those things would have been to get people out of the city sooner and remove dangerous loose objects from causing unnecessary damage. It is hard to base calculations and estimate the potential damage of occurrences like the ones Cassandra represents due to their unpredictable nature and the uncertainty surrounding them. Since the risk-based strategy is based on just that, calculations and probabilities, Klinke and Renn where right to not place

Cassandra only in this category even though there are aspects of her that belongs in the risk-based strategy as well as the others.

The precaution-based strategy is where I thought Cassandra would be, especially considering the element of uncertainty that she brings to the table. As mentioned earlier the precaution-based strategy is focused on determine the uncertainty and apply precautionary measures. In the case of New Orleans, Katrina within the classification of Cassandra speaks nothing but uncertainty. From a perspective on crisis preparation Cassandra would have benefited more in the precaution-based strategy since uncertainty and especially in the case of Katrina in many ways defines her. When it comes to the case of Katrina Talebs theory on black and grey swans becomes interesting because uncertainty is being displayed in a more direct way. His theory comes to show in many ways how unpredictable and therefore uncertain a catastrophe like Katrina is, and that a general type of crisis preparation therefore is very important, especially in a city like New Orleans. My conclusion of Klinke and Renn's theory on RMS is that I think it is hard to place Cassandra/Katrina in one specific strategy though I believe she stretches over all three of them. Because of that I have chosen as my analytical framework to not just be the Discursive-based strategy that Klinke and Renn means Cassandra belongs to, but also be my conclusion which conducts from Cassandra stretching to some part over all three of them. From theory in to the analysis I will bring Klinke and Renn's approach which consists of the three separate Risk management strategies. I will also bring my approach to the analysis where I believe that it does not only have to be on strategy Cassandra/Katrina can be stretched over all three of them.

4.0 Analysis

The case of Katrina has been one of the most discussed scenarios in American media, not just in the papers but also on television and radio. Amongst the experts the case of Katrina has been discussed since it happened in late august 2005. Still today almost ten years later Katrina comes up as a subject of discussion whenever natural disasters and Disaster management is talked about. When it comes to Crisis preparation scientist and experts are talking about three main causes having an impact on how New Orleans was prepared for Katrina. The first one is FEMA, the second one test program Pam and the third and last one is the Levees surrounding New Orleans. Since these are the top issues discussed by experts and generally seen as the main aspects of crisis preparation, I have decided to discuss them as well in my analysis. I

will present these three different matters one by one and analyze them from the analytical framework I have conducted, starting with FEMA.

4.1 FEMA

The first aspect of crisis preparation that I will analyze in my study is the FEMA. FEMA was founded 36 years ago during the Carter administration as a special branch of the government to deal and aid in catastrophic events (FEMA, 2015). As an agency they describe their purpose with these words:

“FEMA’s mission is to support our citizens and first responders to ensure that as a nation we work together to build, sustain and improve our capability to prepare for, protect against, respond to, recover from and mitigate all hazards (FEMA, 2015).”

To me this citation and the purpose they are expressing sounds good, however it makes me question if they are truly following these words as an agency. As I will present further FEMA has received an enormous amount of critique for their handling of Katrina and the preparation of New Orleans. FEMA is the agency apart from the US government that has received the most critique from not just the media, but also city officials and the people of New Orleans and Louisiana (Frontline, 2006). Up until Katrina FEMA was an appreciated agency that citizens of US trusted in (Frontline, 2006). After 9/11 FEMA received a lot of positive endorsement, for handling the crisis well (ibid). But since Katrina struck the agency has struggled, they have lost the support from the citizens of New Orleans and Louisiana, as a result of that several changes of leadership has taken place making the agency less stable (Special report 2005, p 214). FEMA’s job is to aid the American people when an expected as well as an unexpected catastrophe happens. But their job is also to prepare people and cities for possible catastrophes and to the most possible extent prevent disasters from happening. Most of the critique that the media such as newspapers and television were gunning at FEMA for was the way they handled themselves as an agency when Katrina had struck. Amongst the many things the media called them ineffective, disorganized the one that struck the hardest was when they were called “enemies of the people” (ibid). According to several studies done on the subject the media’s criticism of FEMA has caused them to lose both the public’s trust but also their support. But it is not only the people and the media that has criticized FEMA, many experts have marked their skepticism towards the agency’s handling of Katrina (Frontline, 2006).

Ultimately FEMA is still an extended government emergency branch, they are located throughout the entire US. A lot of the criticism has been focused on the fact that the precautions taken in Louisiana and specifically New Orleans was not extensive enough (National Geographic, 2012). In an independent report that The Committee of Homeland Security and Governmental Affairs conducted after Katrina FEMA was criticized hard (Special report, 2006). In the report the committee says:

“The Committee’s investigation found systemic and leadership failures, displayed in both the preparation for and response to Hurricane Katrina, at both the Department of Homeland Security (DHS) and FEMA. These failures contributed to human suffering and the loss of life. The causes of many of these failures were known long prior to Katrina and had been brought repeatedly to the attention of both DHS and FEMA leadership. Despite warnings, leadership failed to make vital changes.”(Special report 2006, p 211).

What the committee says about FEMA in this extract from the report is harsh in comparison to their criticism towards other organizations in their report, but it also gives an insight to how badly FEMA’s handling of this situation actually was. Ivor Van Heerden that is mentioned in the beginning of this study mentions two precautionary methods that could have been taken. The first one is restoring the wet land or as the locals calls it “the bayou” as an outer defense system to prevent hurricanes and flooding from reaching the mainland in full capacity (nova science, 2004). The other precautionary measure to be taken is reducing the water flow to Lake Pontchartrain which will prevent major flooding in the city of New Orleans (ibid). The independent committee recognizes in their report the same precautionary methods that Van Heerden had spoken about and means that FEMA was aware of this and failed to make the changes (Special report, 2006 p 212). In the report the committee brings up an example with hurricane Andrew that hit Florida as a category 5 hurricane in 1992 (2006, p 211). A post storm study made by the National Academy of Public Administration (NAPA) showed failure in response time which would repeat itself in Katrina. NAPA concluded that FEMA was “a patient in triage and the government must decide whether to treat it or let it die” (Special report 2006, p 212). NAPA revealed as well that FEMA needed to develop state and local emergency-management capacity far more (ibid). The critique centered towards FEMA after Katrina has shown the agency to be a blockage in the process.

When analyzing FEMA from Klinke and Renn’s perspective of risk management systems, FEMA is an agency who stretches over all three strategies. But from a perspective on crisis preparation the agency in itself is supposed to have a part in all three of the strategies. As an

agency FEMA is not just only supposed to be a part of the crisis management system or the strategies that Klinke and Renn formed but also be a leading agency in the work of crisis preparation for Louisiana and New Orleans. From the vast critique towards FEMA it is easy to see that FEMA has not been functional on any level and especially when it comes to crisis preparation. Having a functioning crisis preparation system is crucial for any city or state, but it requires leadership (special report 2006, p212). Leadership was something that at the time FEMA did not have, investigations done shows that FEMA's leadership was lacking both knowledge about emergency management and leadership qualifications (ibid). When leading an agency such as FEMA NAPA says that experience is crucial in order to make important decisions (ibid). At the time of Katrina FEMA's leadership consisted of the director Michael Brown who had very little experience in emergency management as well as agency leadership. Patrick Rhode with a position as chief of staff had no prior experience of emergency management. When learning these things about FEMA's leadership it makes me wonder if emergency management really can be conducted within an organization or an agency where the leaders have no experience or own knowledge to base their decisions on. NAPA questions FEMA's leadership and means that due to lack of leadership within the agency they are not as a leading agency within their field handling the role. This makes it harder for other organizations within the field of crisis preparation and disaster management, to reach the goal of a functioning crisis management system. FEMA's response to this critique has been directed towards the government, meaning that lack of communication with the government is what has caused most of the problems that the organization has been criticized for (Frontline, 2006). None the less FEMA has shown to be a blockage in the crisis preparation process causing New Orleans crisis preparation before Katrina to be even worse compared to what it could have been if FEMA had taking the necessary precautions. To understand the meaning of that statement Pam which I will analyze next will give a good insight to what FEMA blocking a process means.

4.2 Pam

For many years the government, city officials, scientists, planners and emergency managers have been aware of the possible threat from a major hurricane, category three or higher hitting New Orleans. It has been well known that this type of hurricane most likely will happen one day, in the late 90's early 2000 they called it the "New Orleans scenario" (Special report, 2006, p 116). Similar calculations to the ones Katrina later brought were made in this scenario like devastating flooding and the water getting stuck in the city, immobile population, local

and state government not being able to handle the situation and much needed help from federal government. In late 1998 hurricane George was a close call and the region was once again reminded of how badly prepared they were for such a major crisis. Emergency planners and local government began meetings with officials from FEMA, The Army corps of engineers, other state agencies and other parishes in the fall of 1999 (ibid). The goal with these meetings was to develop a “working plan for the search and rescue, evacuation, sheltering, provisioning, and infrastructure restoration for the greater New Orleans area.” (ibid).

Soon after the meetings had begun the group sought input from experts within the area of natural disasters and crisis management (ibid). Louisiana State University (LSU) and Hurricane prediction center were places where expert help was sought. Experts within FEMA were used when creating the “working plan” later known as the simulation program Pam. These experts were used for their vast knowledge on both hurricanes and major natural disasters but also because they knew Louisiana and New Orleans well, not just for the climate but as a city and state. Local government wished to have an extended working cooperation with FEMA but FEMA gave them the cold hand not extending any help, stalling and not granting funding which postponed the program for an entirety of five years. There is no clear answer to why FEMA acted the way they did, but for sure they became a blockage in the process (ibid). Once again FEMA is showing yet another way they are preventing precautionary measures from being taken.

URS Corporation specializing in Homeland Security was contracted to gather information and build thorough understanding of the nature of a major hurricane (ibid). LOHSEP (Louisiana Office of Homeland Security and Emergency Preparedness) was another organization with expert knowledge and a purpose of guiding them forward. After another funding issue FEMA notified the state that they had selected IEM (Innovative Emergency Management inc) as their contractor for the newest phase even after previously have given the project group the cold hand. IEMs job was to actually develop a workable plan since FEMA thought previous plans was not workable. A 120 page draft was created after a workshop with 300 participants amongst them 15 federal agencies, 20 state agencies, 13 parishes and five volunteer agencies.

In the special report conducted by the Committee of Homeland Security and Governmental Affairs they say that “Hurricane Pam was much more than just an exercise. It was a unique planning endeavor that resulted in functional plans that were considered for and actually put to use in real-life-situations before, during and after hurricane Katrina” (Special report, 2006,

p 114). From a perspective on crisis preparation, Pam seems to have been the ultimate preparation program especially for the city of New Orleans. But once again FEMA was stopping a working process preventing crisis preparation from developing further (Special report 2006, p 212). The goal of Pam was to reduce disaster potential just like the first strategy of Renn and Klinke's RMS theory risk-based theory focuses on. Preparation wise Renn and Klinke would have argued for Pam being a contribution to crisis preparation and disaster management. Mostly due to the fact that Pam was a rigorously calculated example of what most likely could happen with the purpose that stems from a risk-based strategy. To me Pam is stretching over all three of the risk management strategies. Pam brings the numerical and calculating parts from the risk-based strategy which helps estimating how to reduce disaster potential in the future, for example the results Pam showed could have been used to a bigger extent when reducing disaster potential before Katrina hit. Pam also provides an alternative to how to deal with uncertainty that the precaution-based strategy is focused on. Having the ability to deal with uncertainty in a real-life like scenario but still in a contained environment provides valuable knowledge for the future and a real-life scenario like Katrina. Dealing with uncertainty is a huge part of providing a good crisis preparation (Ebi 2010, p 2). FEMA as an agency meant to prepare the city and the citizens from all danger possible does the exact opposite in this situation, instead of embracing the possibility to create true change in the crisis preparation system they block it and stop it from evolving. From the discursive-based strategy Pam brings the societal impacts caused by the test scenario and how to deal with the public. A part of the program Pam was to learn how to deal with evacuating people from the city but also help the ones who could not get out. From a discursive-based perspective Pam was also designed to help people after the disaster, when their lives has been turned upside down, family members and loved ones that might have been lost and the fact that their homes and properties has been lost forever (Special report 2006, p 112).

Despite the program being shut down too soon and not being able to finish as it was meant too, it still had an impact and made a great difference for the crisis preparation of New Orleans (Special report 2006, p 116). Although I cannot help but wonder if FEMA had not stopped the program from continuing would it have made a bigger difference? Could the crisis preparation have been more extensive and could more lives have been saved? The committee of Homeland Security believes so, they say in their report that shutting down test program Pam was a poor decision and by keeping it running and preparing the city it could have saved many more lives (Special report 2006, p 2015). Preparation and maintenance is what brings us to the last issue discussed by the experts.

4.3 The Levees

The levees were yet another intense subject discussed by the experts. Van Heerden mentions in his second interview with Nova Science past Katrina that the levees breaking was not something that was calculated for (Nova science, 2005). The committee of Homeland Security conducts in their report that the major flooding of the city was caused due to failure of the levees and floodwalls (Special report, 2006 p 275). Reports mentioning several breaches of the levees three of them were on 17th street and London Avenue canal, this caused catastrophic flooding in the heart of New Orleans. London Avenue Canal is part of the cities drainage system and when the levees failed instead of leading the water out to Lake Pontchartrain it lead the water in the opposite direction, causing major flooding. Van Heerden says in his book *The Storm* that the failure of the levees was due to structural failure (Van Heerden 2007, p 45). Van Heerden has two theories to why the levees failed to hold up. The first one was that the foundation of the levees was not deep enough. The second theory Van Heerden brings up is the one where it might have been some design or construction problems and that the levees were weaker than they were supposed to be (2007, p 45-49). Ultimately the committee of Homeland Security says the same thing as Van Heerden in their report that the breaches of the levees mainly were caused by structural failure caused due to design or construction problems (Special report 2006, p 277). The levees failing during Katrina was a huge setback for the city of New Orleans, the flooding caused major damage and made it much harder for search and rescue teams to be mobile within the city (2006, p 278). As for crisis preparation faulty levees showed a major problem in the cities preparation for hurricane Katrina. The problems of the levees was known before Katrina and even though they weren't calculated to fail nothing were done, no check-up, no maintenance of the levees, no consulting of experts, no calculations to what should be done if they were to fail. The committee of Homeland security says that it shows irresponsible handling of the situation and has put too many lives at risk (2006, p 279). The committee concludes their report by saying that the levees was not built or maintained at a proper level above sea level. Because the level of protection the levees give is closely related to their height above sea level which ultimately affects their ability to block increased water levels driven by hurricanes, and failure to build the levees at a proper elevation diminished of protection the levees provided (special report 2006, p 280). Neglecting to maintain the levees is a failure in a perspective on crisis preparation which ultimately leads to the city of New Orleans being badly prepared and not being able to reduce the disaster potential that Klinke and Renn talks about. When you look at

the different risk management strategies The Levees stretches over all three of them just like FEMA and Pam does but what is interesting about The Levees is that based on Klinke and Renn's description of RMS The Levees are supposed to be in the first strategy, Risk-based due to the ability on reducing disaster potential by calculating where to build them to prevent most damages. But because of the faulty levees they now stretch over all three of the strategies. In the precaution-based strategy the faulty levees brings another aspect of uncertainty to deal with and in the discursive based strategy it brings an element of societal impact where the danger for the public increases drastically.

4.4 Discussion

In this study I wanted to know what could explain why New Orleans was so badly prepared for Katrina. From the material I have gathered experts pointed out several different aspects to why the crisis preparation was so bad. I chose to focus on three of them FEMA, Pam and The Levees. Throughout this study I have had several questions about crisis preparation and the case of New Orleans that I will discuss here along with the analysis of these different types of crisis preparations that were taken before Katrina. One of the first questions that I asked myself when starting to learn more about Katrina and the case of New Orleans is a question I asked earlier in this study. How could the US be so unprepared for a crisis like Katrina when the country seemingly was in crisis preparation frenzy? I cannot fully answer this question but through the material I have gathered during this study I can now discuss it from a perspective of crisis preparation. America and the American government have been devoted to creating different organizations for different specific needs. These different organizations are all focused on their specific area within crisis preparation. 9/11 was a terrorist attack and many organizations such as CIA, NSA, Homeland Security etcetera were focused on finding incoming threats and gathering intelligence. The threat of an impending catastrophe such as a natural disaster was not as high of a priority as trying to find impending terrorist threats and catching Usama Bin Ladin who later claimed responsibility for the attacks (Frontline, 2006). By keeping in mind that the threat of a natural disaster was being over-shadowed by other threats seemingly more important, you can start to see why the government was not interested in developing more resources to something that at the time seemed like a small or non-existing problem.

Of the analysis done on the different aspects of crisis preparation FEMA, Pam and The Levees shows that they all have one thing in common. They are all meant to reduce disaster

potential and prevent major crisis from affecting the city and the citizens of New Orleans. Whether they managed to do so is a matter of discussion not just for me but for the public and experts around the globe. From the material I have gathered to this study and the analysis I conducted FEMA has seemingly been a huge blockage in the process not just as an agency in itself but in almost every possible measure that has been taken in preparation of an impending disaster. My critique to FEMA is mainly focused on their relationship to the American government and the communication between the two of them because from the material I have extracted that is what seems to be the problem. FEMA is defending themselves by saying that the government is responsible whilst the government is saying that ultimately it is FEMA that has the final say in the decisions they make and therefore the government is not responsible. Both FEMA and the government are tossing the boll on who is responsible between each other without any visible progress. I think that when two organizations of their scale cannot take responsibilities for their actions you have to ask yourself the question of how progress and change be expected? And if no one is interested in taking responsibilities for their actions is there really an existing interest in developing preparation to prevent disaster? I cannot answer these questions, I can only observe from the study I have conducted that there are still many issues left to be resolved.

5.0 Conclusion

Looking back on the bigger picture and the questions I asked in the beginning of the thesis “How to understand the importance of crisis preparation for disaster management?” “What can explain why New Orleans was so badly prepared for Katrina?” Developing an understanding for the importance of crisis preparation is crucial in order to continue the work on preventing disasters from causing more damage than necessary. From the material I have used in this thesis it is overwhelmingly clear that crisis preparation saves lives (Special report 2006 p 279). Therefore it is important to understand the difference crisis preparation makes in our society and in our cities, because natural disasters is a global phenomenon and not exclusive to any country or city. As for what can explain why New Orleans was so badly prepared for Katrina, proceeding from the material used in this study it ultimately comes down to FEMA’s involvement and leading position as head of the organizations working towards better crisis preparation. My study shows that FEMA has been a blockage throughout the entire process of working for a better crisis preparation of New Orleans. Why? I can only speculate maybe due to bad leadership or bad communication with the government. In any

case my study shows that FEMA is one big reason to why New Orleans was so badly prepared for Katrina. For future research studying FEMA's role as an agency that is designed to work with crisis preparation and Disaster management but somehow is not managing it in a productive way. Continuing research on Natural disasters is also important because the environment we are living in are changing, and in the future we do not know if the weather changes and the natural disasters are getting even more extreme. Therefore continuing research to be prepared is important.

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