

Disaster Planning in Coastal Areas

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Natural disasters in coastal areas present some unique obstacles for community planners serving these areas. This paper will discuss how planners prepare for natural disasters and why this is such a prominent issue, even today. Safety of citizens should always be a number one priority for city planners, especially in coastal areas where there are unique risks that other areas might not ever experience. Since safety is such an important aspect of planning coastal areas, it only seemed appropriate to analyze this planning issue from a technical theoretical standpoint.

We chose a technical viewpoint, as safety should always be a top priority and there is no room for bias or advocacy when it comes to safety. Technical planners tend to be straightforward to the point, and that is needed in the realm of safety and disaster planning. How can planners better serve their citizens in the realm of disaster planning? That is the question that these planners should ask themselves and what we, as future planners, should address as well.

We also looked into what urban planners can do to better plan for these catastrophic events and new building techniques related to hurricane season. City planners have to build upon the foundation already provided, but what can they do moving forward to better the issues coastal cities are facing? When catastrophic damage occurs, should the city focus on immediate rebuilding, or should they take the opportunity as a clean slate for future planning for disasters? We will address the issue that natural disasters present for coastal areas, the key players involved, a technical theoretical analysis, as well as assessing the theory's ability to analyze and address the issue of disaster planning in coastal areas.

### **Planning Topic/Issue**

Why do people continue to build in disaster zones? History has shown us that natural disasters can cause catastrophic damage to communities and the infrastructure present there. Specifically, in coastal areas, citizens are at a considerably higher risk for hurricanes, tsunamis,

tropical storms, etc. Many may feel that the benefits of coastal living outweigh the chances of a natural disaster occurring. Throughout time, city planners have had to adjust and account for these storms. Public safety is always a huge concern for any public officials, as well as city planners. If there are ways for planners to implement plans that will increase the safety of their citizens, they will absolutely look into it and implement as much as they can, within reason. There are ways to plan and build in preparation of impact from catastrophic weather, and planners are constantly looking for ways to improve their design and account for any natural disasters that may occur. City planners must take a catastrophic event and look at it from a lens of opportunity. They get to ask themselves how this opportunity to rebuild has presented itself and how they can improve and avoid further damage in the future.

Natural disasters in coastal areas have a long track record. Many people can tell you at least one or two natural disasters that wiped out the foundation of an urban area in their lifetime. It's so incredibly important for planners to use the past as a template for the future. A planner understanding the past of natural disasters and how they affect coastal areas is the key to planning success in the future. Why is this a planning issue? Planners can offer input into ways that cities can be laid out and implement building codes to ensure the stability and safety of the buildings occupants.

One of the most important keys to this issue is that with a changing climate, it appears that natural disaster storms are worsening with time. According to a study conducted by Neumann, "the results suggest that the impacts of climate change in this sector could be large, especially in the second half of the 21st century as sea-level rises, temperature increases, and precipitation patterns become more extreme and affect the sustainability of long-lived infrastructure. Further, when considering sea-level rise, scenarios which incorporate dynamic ice

sheet melting yield impact model results in coastal areas that are roughly 70 to 80 % higher than results that do not incorporate dynamic ice sheet melting.” (Neumann, 2014) This leads us to believe that, while planning practices are advancing and efficient at this point, that worsening severity of storms and a rising sea-level will bring new issues into play in the future. This can present new issues for planners, as this is not something we have faced before! “To varying extents, all disasters have knock-on effects. That's part of what constitutes a disaster. But there seems to be an increase in cascading and back-to-back disasters in recent years that have left communities, at least in certain parts of the country, struggling to rebound.” (Barth, 2019) There is typically a lot of talk about how planners can look to the past in order to plan for the future, but future issues like this could lead to new obstacles.

## **Historical Origins**

### **Galveston.**

The great hurricane of Galveston is known as being one of the most catastrophic natural disasters in relation to loss of human life. The unnamed hurricane was responsible for 6,000 deaths, as well as the desolation of the city. “The storm made match sticks out of frame buildings. Even those that had been carefully constructed to withstand the wind and rain of hurricanes were not able to resist battering by bridge trestles and other debris from already collapsed structures. Even "stormproof" brick buildings fell under the onslaught. The collapsing buildings caught and held victims under water. Others were cut down by wave-tossed or wind-blown debris. The entire island was covered by a storm surge of up to 15.7 feet of water; the previous record from the 1875 storm was 8.2 feet.” (Ramos, 1998) This is important to point out, not because of the great loss of life, but because of what was done on the aftermath to prevent this from happening again.

The city of Galveston was later rebuilt, but planning precautions were taken. This is one of the first examples of city government making active planning decisions to impact the public's safety. First, they built a massive seawall to turn back storm-generated waves. Yes, this was very helpful, but what their next step was is the more remarkable aspect. They rose the entire city above sea level! Yes, they built a city on stilts and sand. Some parts of the city were raised by even 16 feet in some areas! "In addition to structures, utility lines within the dike – sewers, water and gas lines, streetcar tracks, fire hydrants and telephone and telegraph poles – had to be lifted. Fences, sidewalks and outbuildings also had to be repositioned." (Ramos, 1998) This was a major overhaul!

### **Hurricane Katrina.**

Hurricane Katrina in New Orleans, LA is known as one of the largest urban disasters in U.S. history. At the time, New Orleans was no stranger to flooding within the city. There had been precautions taken! "The system of flood protection surrounding New Orleans and its adjoining parishes prior to Hurricane Katrina evolved over a period of 280 years. The earliest drainage works sought to elevate the river's natural levees and excavate drainage canals leading towards Bayou St. John." (Rogers, 2008) There were actually concrete flood walls built in the 1990s, but some of these efforts appeared to be incomplete when Hurricane Katrina struck in 2005. It leads us to think that when we know a city is below sea level and that something like this could happen, why don't we plan for it more efficiently? Simply put, New Orleans was not prepared for something of this magnitude!

The story behind hurricane Katrina will be described later on in this text, but what I'd like to point out is the rebuilding process. New Orleans had an opportunity to rebuild their city. "Optimistically, a new New Orleans will involve improved flood safety, revitalized

neighborhoods, housing opportunities for all, and equitable treatment of all residents. Planners have an obligation to take an active role and advocate for the funding and full participation necessary to achieve these goals. The alternative would be a city that is poor, unsafe, and unequal. This is the greatest planning problem most of us have ever seen, and it warrants a correspondingly large response.” (Olshansky, 2006.) This shows that city planners have a lot to plan for and a lot to account for and have a public community to serve! Especially in coastal areas, where disasters like this are more common and take more pre-planning, after-planning, and flexibility in general.

### **The Bahamas.**

A more recent disaster in a coastal area occurred in the Bahamas. “Then, a shoddy set of building codes in different municipalities led to thousands of homes whose builders made the kinds of decisions —roofing staples instead of nails, particle board instead of wood, and leaving mobile homes completely unmoored—that might not even have passed muster inland, let alone in a peninsula intersecting the Gulf of Mexico and the Caribbean.” (Newkirk, 2017) The Bahamas incident, which will be discussed in depth later on, is an example of poor workmanship and poor construction codes not being enforced.

### **Context/Evolution**

Why does any of this matter in the world of planning? Along with all of these disasters were destruction and injuries, or even death. Planners have a role to play in planning for the safety of the public! There are so many ways to account for public safety through planning. It’s not just making homes more wind-proof that is needed. A plan, “to keep the city from sinking includes overhauling city drainage systems, adding more storm water pumps, and elevating new roads and homes. Greater feats of engineering, like building a seawall and maybe even lifting the

entire city, are also in the realm of possibility.” (Newkirk, 2017) There’s more to planning for disasters from a city planners point of view than one might have thought! With every advancement that comes along is another opportunity to advance and create an even better and safer plan of action for citizens.

As some planning interventions are mentioned, such as: seawalls, building codes, drainage systems, raising buildings and infrastructure, it brings the question to mind of why were these interventions not planned for ahead of time? What was the final straw that caused some planner somewhere to decide to plan in anticipation of a disaster occurring? For example, raising the buildings in coastal seems like common practice and is often enforced by building codes at this day in age, but at some point, in the past this was not the case. Some tools, that will later be discussed in greater depth, that planners can use to be more prepared are simple, yet effective. Planners need data to properly plan for disasters! The past is the greatest learning tool that planners have and keeping data on occurrences such as tropical storms, etc. can offer great insight later on down the line. Also, it’s important to note that while planners can do all they can to create a safe environment, that sometimes people need to simply evacuate the area. Citizens need training on what to do during a natural disaster and the community needs to be laid out in such a way that a heavy flow of traffic out of the area would not clog up and cause safety concerns for citizens. Ultimately, there are great things that planners can do to plan ahead and create safe places, but the way citizens react and how local resources react can play a large role on disaster planning.

## **Conclusion**

Ultimately, disasters in coastal areas present all types of issues for planners! Whether it be a need for rezoning, rebuilding, enforcing building codes, rethinking the infrastructure, etc...

There is a lot to think about in coastal areas. People will always be attracted to live in these areas. They're huge hubs for tourism and new developments, but as the climate changes and technology expands, the ways in which planners need to and are able to plan for natural disasters is changing as well! Public safety should always be at the forefront of a planner's mind, so taking these natural disasters into account and planning ahead of time to combat issues will should always a priority for planners in coastal areas! Planners can influence change in these coastal communities and use the past as a building block for success in the future.

### **Theoretical Framework of Technical Disaster Planning**

History is wrought with frequent "unexpected" disasters that have the ability to completely invert the regular systems of our society. Within the realm of community planning, there exists a need to prepare and plan for such events to mitigate the effects and control the aftermath as it relates to actual community. We see how over time these planning practices have come to be known under the name of Disaster Planning. Simply explained, these plans exist to give focus to those in authority when extreme events occur. When working to establish such plans, it is important to know what frame of mind a planner should address the situation from. For issues that require such variable responses depending on the issue at hand, creating a disaster plan is best done from a technical/bureaucratic perspective frame of reference. Technical planning theory has existed for years without name or a true creator as it evolved from simple processes to intricate levels of dependence that some planning creates in cities today.

As early as 1959 technical planning was understood and discussed under the name of Rational-Comprehensive planning by Charles Lindblom. His article "The Science of Muddling Through" paints a picture of the basics of this planning theory as a method of handling problems within a city. He considers it to be the "root" method as it begins from the establishment of



values and moves forward into the analysis of actual issues as a means-end approach as many technical still view situations. The test for good policy comes when you comprehensively evaluate its ability achieve the goal. Considering every relevant factor as equal in its decision process, this method opened the door to later planning theories that expand and root themselves firmly in similarly unbiased method of data collection. Coined as “Technical or Bureaucratic” planning theory, it evolved into what we now understand it to be: A neutral method of data collection, moderate political alignment, emphasis on working within the confines of an established social and political structure. Ensuring the efficient operation and functionality of cities is the name of the game for planners that ascribe to the Technical planning theory.

Early in the modern realm of planning, the different gradations of citizen were identified and used as a method of considering the progress of planning in its effectiveness and the response of citizens to such planning. Planners that exist to create responses to disaster must be aware of how much they should or should not allow citizens to be involved in the discussion and implementation of decisions. Looking at Arnstein’s Ladder as he presents it in his original paper, *The Ladder of Citizen Participation*, we see that the third level of the ladder is classified as “Informing”. He further explains that this level of citizen participation most often manifests in decisions where the citizens are given information, usually in the form of pamphlets, news media, posters or in response to questioning, but it falls as a one-way method of communication where the planner is merely providing with little true interaction. In a similar fashion the technical method of planning works well when designing disaster response because it lays out the information in a way that citizens can be informed and find the information when necessary and does not become too interactive in the sense that deliberation could slow down the actual enactment of such plans. When considering Technical Planning we must understand the different

aspects of the theory that truly contribute to its presentation as the perfect option for disaster responses. Peter Marcuse does give a wonderful illustration of how it can be broken down and analyzed in different perspectives in *The Three Historic Currents of City Planning*. Breaking down Technical planning into four categories: Scientific, Designer, Contractual, or Process planning. Scientific planning attempts to produce the most efficient version of the city and ensure its operations remain as efficient as possible on a holistic level. There is no one aspect that takes precedence over another, and as a result each issue is dealt an unprejudiced solution. The Designer planning process places the planner in an elevated level of authority to execute a “grand vision” of what they believe to be best for the city. It often can be seen aligned with Social Reform planning as it does often call for change. The difference is that Designer planners often disconnect themselves from the social concerns in favor of the development of their own imaginative concepts. Contractual planners place themselves in a subservient position, existing only to carry out the orders of those who employ them by utilizing their technical skills. Contractual planning seeks to clarify and understand that which is the vision of their client, in order to carry out the contract. It can be seen in both the private and public sector, but the key point is that the planner operates within a set of boundaries dictated early in the process. Process planning seeks to ensure that the client has thoroughly considered what the desired goal should be and attempts to use planning as a frame of problem-solving to reach those goals.

Regarding what may hold some back from fully engaging in technical planning, we see that people are called to possess a high level of information to base decisions from. Planners are also expected to remain relatively non-political and impartial as they make decisions, while utilizing a complete knowledge of the options presented to them. In a perfect situation, the planner would have the ability to make decisions with lots of time and resources with very little

influence from outside sources. We see these as the biggest criticism of Technical planning, because the world can be very unpredictable and the people in them to make mistakes. Planners won't always have the best and most complete resources available, so this can have an impact when someone is adhering to a very scientific approach of planning. It can reduce your ability to consider all aspects of the plan and how it should be implemented. Despite the potential issues, technical planning remains the best method and ideological approach for disaster relief planning as it is meant to be strict and coherent in how it deals with issues that arise unexpectedly.

We believe that regarding our planning issue it should be understood through a lens quite similar if not identical to the one provided for Process planning mixed with Scientific planning. This method of Technical planning would then arrive at conclusions not solely based on whatever design the planner desires the city to create as decided in their own mind like the Designer planning model shows. The planner would exist in an apolitical frame of mind and only exist to plan for what is in the best interest for the city officials who establishes the goals once they have been clearly decided upon. The planner would also serve as an engineer, unconcerned with anything other than ensuring the efficient operation of the city itself following the onset of a disaster. Taking care to plan with the whole system in mind, merging these two subcategories is the most appropriate method of understanding how this theoretical framework understands and processes issues. Moving forward, we now have basis to analyze the problem of Disaster Planning through the lens of Technical planning theory.

### **Theoretical Analysis of Planning Issue**

Technical theory is all about efficiency, smooth functioning, and a top-down approach as opposed to bottom-up. It can be argued that in the past, disaster planning has not efficiently prepared cities on how to respond, and smooth functioning is the last word that could describe the chaos that comes with evacuations and rebuilding. Planning for natural disasters is complicated because of the uncertainty, but Kartez and Lindell (1987) argue that “when major emergencies disrupt urban life, authorities must be prepared to offer an organized protective response: mustering special resources, informing citizens of appropriate actions, and collaborating with partners—such as the Red Cross and citizen volunteers—that are not ordinarily involved in public safety services.” They also state that some barriers to disaster preparedness among cities include no experience with disaster situations, inadequate planning, incorrect planning, and failing to learn from past experiences. If planners used a technical approach towards disaster planning, cities would feel more adequately prepared in case of a natural disaster emergency.

One of the most important tools for the technical planner is that of data. Auf der Heide explains that “knowledge based on systematically collected data from field disaster research studies might help planners avoid common disaster management pitfalls, thereby improving disaster response planning,” (2006). However, gathering that data can be quite difficult. For instance, since natural disasters are uncertain in nature, until immediately before the fact in some cases, data can only be collected after the tornado, hurricane, or other disaster has occurred. Since many have to evacuate from the community, and some even relocate afterwards, data might be skewed and can potentially miss those that were hit the hardest. There is no data which can compare before and after a disaster because they are unexpected. In addition, Auf der Heide notes that many times, people are more willing to share information immediately after a disaster

has occurred rather than later. This is partially due to the fact that peoples' memories fade the further they are removed from an event. Another problem with disaster data is that most of it has been on case studies and cannot necessarily be applied to other situations for the future more generally. Finally, Auf der Heide argues that with previous disaster research, "some of the more useful cases are dated, and there have been significant changes in public health and emergency medical systems since their publication," (2006).

According to Rajabifard et al. (2004), Spatial Data Infrastructures (SDIs) are a helpful tool in disaster management. SDI is defined as "an initiative intended to create an environment that will enable a wide variety of users to access, retrieve and disseminate spatial data and information in an easy and secure way," (Rajabifard et al., 2004). People, data, and technology (access networks, policy, standards) are the five components of SDIs. When an SDI model is created for disaster management in a community, and the appropriate information and communication technologies are used in disaster management, it is argued that mitigation, preparedness, response, and recovery will be more efficient and effective. After all, that should be the priority of disaster planning overall.

Another common theme found among disaster planning literature is the importance of it being interdisciplinary and involving various resources. For example, Auf der Heide notes that many planners have a misperception that disasters are described by the deficiency of resources. Disaster plans that only take advantage of emergency responders in the area are often ineffective. In order to be more successful, response units from adjacent areas should be mobilized. Not only this, but planners should also know how to manage those units, as Auf der Heide explains that "when more help arrives than requested or expected, [planners] may not have set up effective processes for integrating them into the response," (2006). As far as technology is concerned,

Rajabifard et al. mention that creating Spatial Data Infrastructure requires the backgrounds of several different disciplines, and numerous perspectives should be considered: conceptual, technical, socio-technical, political, institutional, and financial (2004). These factors should be looked at in the long term so that SDIs for disaster management are effective and viable.

The planner's role in disaster planning has been briefly discussed above, but it should be explained in more detail. Auf der Heide makes several suggestions for the planner in order to make disaster response more efficient. First, he talks about the importance of collaborating with response teams from not only the community but from surrounding areas, and planners need to know how to organize those groups once they arrive in the area so that recovery is more effective. Similarly, he notes that "planners may assume that the community will have substantive control over the [Emergency Medical Services] and search and rescue response to a disaster," but "because most initial search and rescue is carried out by untrained survivors, it is often not well coordinated, nor is it under the control of local authorities," (Auf der Heide, 2006). A good example of this comes from tornado recovery in Flint, Michigan in the 1950s. Groups of people who were trying to help would search for victims under piles of debris and then move on to the next pile. Then, a group behind them would search through the same pile because nobody was mindful of what the other groups were doing. It is quite obvious how this can be an inefficient process, and a more structured, organized approach to search and rescue by professional groups should be implemented. However, survivors trying to help should not be ignored, because they can speed up the process and will know more about who is missing and where they might have been last since they are from the same community and have information about locals more than response teams would. Auf der Heide suggests a training program for first

responders so they can learn how to work with survivors during search and rescue, and law enforcement personnel in particular should be involved in this training.

Training for the community to learn how to respond to natural disasters can also be helpful. High school courses, for instance, can help teach students how to appropriately give first aid, disaster care, and help with search and rescue. It has been found that many times, locals want to help in any way they can, but they just do not know how. When both authorities and the public are adequately prepared for these situations, relief is more proficient. Another suggestion Auf der Heide gives is for disaster planners to send trained personnel to hospitals instead of being on the scene so that they can help bring casualties in for treatment and also ask them questions in order to get more information on those victims that are still missing. After all, most casualties are transported to the hospital via somebody's private car, a police car, a taxi, or bus rather than by an ambulance. Once again, educating the public might be an effective way of intervening in cases like these. Survivors should know which casualties can and cannot be moved into personal vehicles and when well-trained individuals must take over. In relation to transportation, the distribution of casualties to certain hospitals should be planned out in case of a disaster. If ambulances had a radio system between multiple jurisdictions, they could communicate on which hospitals are available, which ones had to evacuate, and which ones are overflowing with casualties. Printing out maps for directions to area hospitals might also be helpful for less critical casualties who are able to travel further and get the treatment they need.

Again, since natural disasters are so uncertain, notifying hospitals about incoming casualties is often nonexistent, and if they are notified, it comes from the news or victims rather than from authorities. In the hospitals, "reliance should not be placed on staff who are not already in the facility," and therefore, "in-house staff should have full authority to activate

disaster plans and modify them as needed to meet contingencies in the situation,” (Auf der Heide, 2006). In other words, those already working should not have to rely on someone with more authority to implement a disaster plan, especially considering the fact that communication might be a problem with cellphone towers down, overloaded radio systems, and roadblocks. Planners should recognize this and make sure that the appropriate resources are already supplied in case of an emergency.

There are some limitations to technical theory when it comes to disaster planning that should be mentioned. One briefly discussed previously is that data is prioritized heavily by technical planners, but that can be challenging to obtain in a timely and accurate fashion. Related to this point is that it can be easy to just focus on numbers of casualties and forget that they are real people with real stories and families who are concerned about them. The more emotional viewpoint of natural disaster preparedness and responses can seem to be absent from a technical perspective. A social justice approach might be more appropriate when it comes to rebuilding after a natural disaster so that those most in need get the help and support necessary. It is also important for the technical planner to remember that smooth functioning can be quite hard to achieve when it comes to emergencies, and while a city can prepare as much as possible, the uncertainty that comes with natural disasters means that not everything can or will run effortlessly.

The ideal outcome of disaster planning should be preparedness. Technical planning should be applied to disaster management because it focuses on efficiency and smooth functioning. Since natural disasters are almost always unexpected, planners need to anticipate every situation, especially when it comes to recovery. Knowing how people have reacted after natural disasters in past cases is helpful in determining what can be done so that everything



moves efficiently, and mistakes or accidents are not repeated. Data can be difficult to obtain in emergency situations, but models like Spatial Data Infrastructure are helpful in keeping up-to-date information on the area that can be accessed by various groups and be used in disaster situations. Disaster planning should be interdisciplinary so that all focus areas are covered, including the technical, financial, and political aspects of natural disasters. The planner's role is that of making sure that hospitals are prepared to handle recovery and that communication is set up in a way to be effective and help response teams know where they are needed. In addition, educating first responders and the community on how to handle first aid, moving casualties, and search and rescue missions is essential so that they are prepared. Collaboration is of utmost importance when coordinating response units coming into the area, and planners need to know how to organize these various groups so that safety and efficiency are a priority.

Global warming, Climate change, are also issues that have to face cities nowadays. Also, those are the cause of Natural disasters. Cities around the world, each year have to face hurricanes, floods, earthquakes, wildfires, extreme heat. We can cite as examples, Tehran, Iran that sits on of the most dangerous fault line in the world; Los Angeles, US, sits along the San Andreas Fault, that makes this city the most earthquakes-prone place. Shanghai, China, located on the Yangtze River Delta, which makes it vulnerable to serious storms and typhoons. Kolkata, India. Jakarta, Indonesia, where the biggest issue is the lack of planning and that exacerbate the effects of natural disasters and exposes the city to continually experience floods. We have Osaka-Kobe, Japan, this place is vulnerable to storms and tsunamis. Milenia, Philippine, vulnerable to Typhoon, earthquakes, flooding. Tokyo-Yokohama, Japan, at risk for earthquakes, monsoons, floods, and tsunami.

All those cities and more are at risk because of natural disasters. The causes, the main reason for those disasters, is climate Change. Moreover, many others are in higher risk like, Port-au-Prince, Haiti, because of deforestation, which is still happening make the city more vulnerable to flood, hurricane. All of that is to say that the way we manage our cities has an important impact on Climate Change. To reduce it, either to make the worst.

It is clear now; we know that planning can be the big key to manage all of that, can be a big part of the solution. But, what is the role of urban planning in reducing the harmful consequences of a natural disaster? what the planning process looks like, what solutions or actions can be proposed to address the issue, what the role of the planner is, what the ideal outcome is/would be, and what the ethical issues are. How that can be done? We have to ask those questions is because, as Peter Calthorpe said, we find ourselves in a complex situation, at the same time we are looking for a solution for climate change, we are going to build cities for three billion people. That is a double of the actual urban environment. Moreover, it did not get not right; any other solution for climate change will not be able to save humankind. Peter Calthorpe in his various intervention for advocating for better cities, tend to respond to the question How cities can contribute to reducing significantly the CO2 footprint in our atmosphere. He summarizes that in seven principles and also gives some examples of cities that working right now on making those seven concepts a reality.

- 1- Those principles are to preserve the natural environment
- 2- To Mixt. As he states, it is not only about mixed land use, it is about mixed-income, mixed age group, etc.

- 3- Walk: A great city is a city where people can walk. He gave an example that any tourist will go in a place they cannot walk. Moreover, why all cities cannot be like that?
- 4- Bike. Biking is one kind of transportation with zero CO2 emissions. It is the most effective kind of transportation. Having more biking possibilities inside the city is a way to protect the city from natural disasters. “China is putting 6 meters of bike lands on every street.
- 5- Connect: A Routes networks that allowed any kind of routes instead of one kind.
- 6- Ride: developed high-quality transit and affordable BRT(Bus rapid transit)
- 7- Focus: Match density and Mix to transit capacity.

### **Risk prevention by controlling urbanization/city example**

As an example of a US city that understands those point, Los Angeles is a good example. The city has decided to transform itself, and now have a more transit-oriented environment. Since 2008, the city invests about 400 billion dollars in bond transit with zero dollars invested in new high ways. With that transition, LA is becoming a city of transit and walking, not a city of car.

New Orleans.

“It took an enormous natural disaster— With its toll of destroyed homes, ravaged neighbor- to push New Orleans into comprehensive planning.” .( Greeco JoAnne)

In the BNOB (Bring New Orleans Back Commission) plan, there was a commitment to historic preservation of the historic district in order to maintain the city’s character. The BNOB plan also asked for different lines of defense against future flooding. This included; regional and coastal wetland restoration, a light rail network to connect to neighboring cities and the airport,

parks in all neighborhoods, and “neutral ground” and would also function as open and park spaces. One of the main pressing goals was to create a sustainable future for the city of New Orleans.

In April 2006, Paul Lambert and Shelia Danzey headed the plan and hired a team of architects and planners to work on housing matters in the city. The planning target would be distressed neighborhoods. Another plan for New Orleans is the Unified Plan. This plan stated that the city would be rebuilt as it previously was. This includes building in low lying areas that were heavily flooded. There are three major parts that make up the Unified New Orleans Plan.

First is that it is unified, hence the name. This means that once all the planning has taken place for each neighborhood, everything will come together in one final document. Next is that it will respect the previous plans already in place (those discussed above). Lastly, government agencies are not part of this process which means it will not have to deal with as much politics.

### **Sustainable Development Project**

Many organization takes part, after Katrina, to give back the city his vitality. The Preservation Resource Center of New Orleans was one of the first groups to come out and start building homes with green infrastructure. This organization was working on building preservation a long time ago before Katrina. But after Katrina, they start to invest in a house that was affected by the hurricane. In 2008, this program enacted a campaign called “Adopt a House”. This gave community members and non-residents a chance to donate money for Katrina relief in the form of preserving historic neighborhoods. These donations were taken in order to keep the prices of the renovated houses low in order to ensure equity for returning residents.

Another project was Preserving Green that took place in the Lower Ninth Ward and was also part of the Preservation Resource Center. This project was focused on restoring blighted areas and

try to implement sustainable building techniques. The Rebuilding Together New Orleans was another sustainable development, a non-profit group. Their goals were to find displaced Katrina victims in order to get them back into their homes. One major part of the development that this group would do is creating an environmentally friendly home. Some things they did was implement energy-efficient fixtures and use reclaimed and sustainable building materials. A few years later, four to be precise, after this project began, they were the largest non-profit organization in New Orleans that targeted home renovation. One thing that makes this project so sustainable is that the reuse approaches.

### **The case of Istanbul**

“Turkey is one of the most seismic regions of the world. two thirds of the country are located in active fault zones where 70% of the population live”

Istanbul, the major historic city built on both sides of the Bosphorus Strait separating Asia from Europe and connecting the Black Sea to the Sea of Marmara, characterized as the place of diversity through the presence of people of diverse origins and a cultural plurality. and as the major economic center of the region through its control over the Bosphorus (one of the busiest shipping lanes in the world) and overland traffic between Europe and Asia, experienced an unprecedented development following the establishment of the Republic of Turkey.

The increased of his population from 689,000 inhabitants in 1927 explosion to more than 14 million inhabitants in 2012, was accompanied by a considerable spatial expansion under the effect of economic modernization through industrialization, and then economic globalization.

Istanbul's legacy of industrial facilities, transport networks, high density, and geographical features first provided the city with the conditions for the industrialization of the city of Istanbul. At the urban level, this transformation of economic and industrial policies has resulted in massive rural

exodus to Istanbul and consequently the expansion of the city in an uncontrolled and unplanned way. A new form of land use has emerged through the emergence of "gecekondu".

With the advent of globalization creating a context of competition and deregulation of the goods and capital markets, many large cities have been encouraged, and Istanbul is not the exception, to identify and value their comparative advantages, to develop proactive investments and strategic social groups. Mayors and mayors have converted to entrepreneurship.

But since 2012, with the entry into force of Law No. 6306 (adopted on May 16, 2012 by the Council of Ministers), called "Afet Yasası"("disaster law"), and its subsequent decrees, concerning the transformation of urban areas deemed at risk of natural disaster, urbanization has entered a new phase.

The "disaster law", also called the "urban renewal law" ("Kentsel dönüşüm kanunu"), constitutes the last legislative measure established within the framework of the policies of transformation of the urban spaces. The concept of "urban renewal" was used for the first time in "municipal law" No. 5393 (Belediye yasası), dating from 2005, and allowing municipalities with more than 50,000 inhabitants to develop urban transformation projects. The second important step in this regard is the entry into force of Law No. 5366 on the renovation and conservation of damaged historic and cultural property. On the basis of this law, it has been possible to initiate urban transformation projects in the protected areas of cities. In order to correct the multiple deficiencies of the previous laws and to overcome the obstacles to urban renewal projects, the authorities adopted the "Law on Amendments to Certain Laws and Decrees of Laws" (No. 5793). By this law, the powers of TOKI (Administration of Collective Housing) were expanded, the coastal areas and spaces allocated to schools and other areas of public use were subjected to the process of urban renewal. In 2010, as part of the new "municipal law" No. 5998, following the

decisions of the municipal council, municipalities can implement urban transformation and development projects, aiming at the creation of residential areas, industrial zones, commercial zones, technological parks, restoration and reconstruction of aging areas, conservation of the historical and cultural parts of the city, etc. The "law concerning the transformation of urban areas deemed to be at risk of natural disaster" (no. 6306), published in the Official Journal and entered into force on 31/05/2012, is the last step reached by the urban transformation process. Thus, almost all decision-making powers related to the transformation of cities are transferred to the Ministry of Environment and Urbanization and TOKI (Centralization of Authorities). This law led to the questioning of the "right to property" by its power to define "risk areas" and "structures at risk", and to impose public interventions to address the present risk.

In 2012, with the advent of the "disaster law", the authorities decided that the prevention of an alleged high magnitude earthquake can be interpreted as an important opportunity for the creation of planned, safe and orderly urban spaces.

Rapid urbanization compounded by inadequate urban planning, inadequate infrastructure, poor quality construction, weak governance capacities and climate change impacts are increasing cities' exposure to hazards. Urban/city planning process, or often used interchangeably, land-use planning process commonly falls under the authority of local governments or municipalities. Land-use planning can be defined as orderly disposition of land, resources, facilities and services to create convenient, equitable, healthful, efficient, and attractive environments. This is why we have to have to set up and define the place of everything, and also avoid those high risky places to natural disasters. The comprehensive plan, much as its name implies, establishes a comprehensive set of goals for a community to pursue. It is a forward-looking, at times aspirational effort that

sets the stage for other plans, regulations, policies, and programs that implement the comprehensive plan's goals.

Comprehensive plans are often used to establish a vision for future land uses, which can be used to promote a more resilient community. Directing development away from current and future areas that are vulnerable to flood impacts can promote greater community resilience. Similarly, open space acquisition plans and conservation plans can be used to target valuable natural habitats that can reduce flood and erosion risks if they are protected from development impacts.

#### **Assessment of Theory's Ability to Analyze and Address Topic/Issue**

Almost all disaster planning is done from the technical point of view. The focus of disaster planning is always measured in number of casualties and dollars of damage caused. Thus, planning for natural disasters has traditionally come from two separate approaches: recovery and mitigation. Recovery focuses on how long it takes for a community to recover (in terms of property damage and lives lost) from a natural disaster, while mitigation focuses on how to reduce the damage from potential future disasters. A third more modern approach has arisen in the past few years called resiliency planning. Resiliency planning focuses on designing communities in ways to shorten the amount of recovery time from potential disasters. This section will look at how effective each strategy has been from a technical viewpoint by examining which approach has saved the most lives and money in property damage.

Recovery was the main focus of disaster planning for most of the twentieth century in the United States. While there were some mitigation efforts in place, it was more cost effective to rebuild after a disaster than it was to put in preventative measures. People began moving to coastal areas in unprecedented numbers during the second half of the twentieth century. This led



to more development in these regions. Natural disasters got worse because of this. There was actually a decrease in the number of hurricanes that made landfall on the gulf coast from the 1950's to the 1990's but there was more damage done by the hurricanes in the 1990's due there being more people and development. Hurricane Andrew made landfall in Florida in 1992 and caused over 30 billion dollars in damage, making it one of the worst natural disasters in U.S. history at that point. Hurricane Andrew and other natural disasters of similar magnitude made planners and government agencies realize that it would be more cost effective to put mitigation strategies into place as opposed to spending tens of billions of dollars trying to recover. (Board 1999)

Mitigation is defined as “all actions that are taken before, during, and after the occurrence of a natural event that minimizes its impact”, while recovery is defined as “actions taken during and immediately after the event to reduce suffering and hasten recovery of the affected population and region.” Recovery is still an essential part of natural disaster planning, but politicians and governments began to realize that the only effective way to deal with the results of natural disasters is to incorporate mitigation strategies into it as well. There are four components to comprehensive mitigation planning and they are: “determining the location and nature of potential hazard, characterizing the population and structures (present and future) that are vulnerable to specific hazards, establishing standards that are acceptable for potential risks, and adapting mitigation strategies based on an analysis of realistic costs and benefits.”

Examples of mitigation strategies include: actively building structures out of flood plains or away from areas that are susceptible to hurricanes, earthquakes, or tsunamis, using warning systems to let locals know when there is a threat of a hazard so they have time to evacuate the

area, and strengthening buildings in order to withstand whatever disaster poses a threat to the area in which they are built. (Board 1999)

Mitigation began to emerge as the new strategy for dealing with natural disasters in the late 1990's. Several government organizations, including: Federal Emergency Management Agency (FEMA), National Science Foundation, United States Geological Survey (USGS) and National Oceanic and Atmospheric Administration (NOAA) had been funding research into mitigation strategies. The U.S. Army Corps of Engineers and Natural Resource Conservation Service had also been practicing hazard mitigation strategies in relation to flood prevention. Many private companies had also been pouring resources into mitigation strategies such as insurance organizations requiring stronger building materials in hazard prone areas. This all laid the foundation of how hazard mitigation became a successful strategy. (Board 1999)

There is perhaps no better example for the benefits and limitations of mitigation than Hurricane Katrina. The city of New Orleans, Louisiana already had some mitigation efforts in place when Hurricane Katrina made landfall in 2006. Levees had been in place in New Orleans for decades before Katrina hit in order to protect against flooding, and the warning system from the National Hurricane Center provided people with several days' notice in order to evacuate. These proved ineffective at stopping a disaster in New Orleans. Many people chose not to heed the warnings and stayed in the city, while others did not have the means to leave. The levees also proved to be inadequate for an event the size of Katrina as they failed and large portions of the city were flooded for weeks. Over 1200 people died and there was at least 70 billion dollars in property damage due to Katrina. These numbers could have been worse had the warning system not been in place. One of the reasons there was so much property damage was because only around five percent of property owners had added flood reduction measures to their

buildings before Katrina. It is important to look at why more people did not do this, and the answer is that they didn't think it would happen to them. This shows that it is difficult to put a number on the benefits of mitigation, but it is also easy to highlight that the true limitation will always be convincing people it is worth their time and money. (Kunreuther 2006)

Hurricane Sandy was another natural disaster that proved how essential mitigation is to effective hazard planning. It destroyed or badly damaged around six hundred and fifty thousand homes between New York and New Jersey and left the island of Manhattan without power, telephone and cell phone service, and subway access for over a week. Hurricane Sandy ultimately caused over 85 billion dollars in damage and killed at least 125 people. This area was another region where people thought that a disastrous hurricane would never affect them in the way that it did. Before Sandy there was almost no mitigation strategy for hurricanes or flooding in this area, but government agencies, private companies and individuals are equipping themselves and their infrastructure for the inevitability that it will happen again. They are not just doing so from a mitigation perspective, but the damage that Sandy caused has led to a new focus in preparing for natural disasters called resilience planning. (Marshall 2013)

Resilience planning combines the benefits of mitigation while also putting in preparations to reduce recovery time. Natural disasters like Katrina and Sandy have made it obvious that more than just mitigation strategies have to be taken into account in order to reduce the damage from these disasters, and that it is imperative to make the recovery period as easy as possible. The federal government approved over 60 billion dollars in funding for rebuilding New York, Connecticut, and New Jersey after Hurricane Sandy with the focus being on developing them with resilience planning strategies in mind. (Marshall 2013)

There is perhaps no place in the country that has better incorporated resilience planning than Norfolk, Virginia. Norfolk is a city that is already seeing the disastrous effects of sea level rise. It sits on low wetlands on the coast of Virginia and regularly floods during heavy rains. It is not uncommon for water to be several feet deep on downtown streets during these rains. Norfolk has experienced a fourteen-inch rise in sea level off its coast since 1930, and this is a large contributing factor to the rampant flooding. This is the largest amount of sea level rise amongst the entire east coast of the United States. This situation has forced Norfolk to innovate in ways that few other areas have when it comes to controlling flood waters. This is done through a series of infrastructure advancements, such as floodgates, seawalls, levees, and drainage systems, and funding to help residents recover when the inevitable flooding takes place. They have been so successful in these methods that a new industry has developed in Norfolk in consulting other cities on resiliency planning and dealing with sea level rise. (Barth 2018)

Resiliency planning is a form of technical planning through and through, and as such it is limited by the same factors as other forms of technical planning. Its biggest limitation is the fact that the methods it uses to prepare for the next disaster are based on the last disaster. Resilience planning cannot predict an event that could be more catastrophic than one that has already happened. Another limitation of resiliency planning, and technical planning in general, is that it does not consider social or environmental effects of natural disasters. It would be more beneficial if developers chose to rebuild further inland from coastal areas after a hurricane does immense damage to an area, but this will not happen due to the loss of economic gains this would cause. This also reinforces the fact that only the wealthy can afford to take advantage of the coastline, since reinforcement of already existing structures only increases the price it cost to enjoy this area. (Leichenko et al 2015)

Planning theory has developed three effective methods in dealing with natural disaster planning. Recovery was the standard for many decades, but as natural disasters caused more damage due to population growth and increased development in coastal regions it became clear that just focusing on recovery would not be enough. Mitigation was introduced as a method to reduce damage before natural disasters occurred. It proved to be effective when used properly but was too difficult to convince people to adapt these methods until the damage had already been done. Resiliency Planning was the natural answer to this in order to take things a step beyond just mitigation in areas that had already received significant damage. The true test of resiliency planning will be how future potential disasters affect coastal regions. These are all technical methods of planning for natural disasters and all have their own strengths and weaknesses.

### **Conclusion**

Overall, we have discussed and concluded that disaster planning is a prominent issue in the planning world, will always be an issue, and should be viewed from a technical standpoint. There is a deep history of natural disasters along the coastal region, with cause to think that storms could worsen in the future due to climate changes, etc. A technical mindset is the best approach to these issues as technical theory focuses on the best interest of the citizens, which includes safety as a priority, with efficiency as a main focus.

While there are new and developing ways in which planners can plan ahead for natural disasters, there is always going to be some cooperation from the citizens involved, especially in evacuation situations. Coastal areas need to be planned to be easily evacuated and citizens should be educated on these routes and precautions to take. Planners can use past data, outside resources, and collaboration to better plan areas for disasters.

In conclusion, disaster planning in coastal regions will always be an issue because there will always be citizens living in these regions. The economic growth in coastal areas is growing and the tourism associated with beaches brings revenue to the area. It is unrealistic to expect people to move further back from the shoreline after a natural disaster, given the economic and social climate by the coast. We explored the recovery, mitigation, and resiliency planning aspects of planning, as well. While recovery focuses on how long it will take an area to recover, mitigation focuses on how to plan ahead and reduce future damage. Resiliency planning falls into the middle and aims to shorten recovery time while also planning ahead to reduce damage and have the best outcome possible.

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