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ENGL 1304

11 April 2019

### Changing Climate and Houstonian Attitudes on Flooding

Within the Houston community there have been many hurricanes and tropical storms that have hurt our citizens in the past. This changing climate and the most recent hurricane being Harvey which cost Houston a great amount of property damage and some of our citizens right now are still struggling with the aftermaths of the natural disaster. It is difficult not to look back and ask what we could have done to reduce the damage caused by the hurricane or to prevent it. It is apparent that the county has thought about this since I have seen trucks carrying dirt and working on ditches near my neighborhood for months. The community has attempted to fix this problem in the future by removing waste in the many ditches near my house and they have actually carved up truck loads of dirt to have them transported elsewhere to make room for more flood water the next time a hurricane arrives. Rather than just making more room for rainfall, I wondered if there were other methods to prevent flooding or damage caused by flooding. From asking this question, I found that there were ideas to reduce precipitation, slowing down the runoff of water, and forestation. I will discuss three proposed solutions to the changing climate which will involve reducing precipitation, slowing runoff, and forestation.

The topic of discussion should be focused on the attitudes of the people and the culture of the people which decides how we react to future problem because we already have plenty of solutions to choose from. In his article, "Flood Prevention", J.C. Oakes examines the three

methods to prevent and reduce flood damage caused by hurricanes, the author formats his article in a way to eliminate potential solutions until he reaches the best solution. The author does so by explaining to the reader the potential methods in which cities can reduce precipitation, but quickly concludes that to attempt to control rainfall via by controlling the weather was not practical and moved onto slowing down or retardation of runoff water. It is explained that by merely slowing down the rate of which water travels may help with drainage problems, but that in developed areas with little natural landscaping, this would be a problem because it is very difficult to slow water flow on concrete and manmade structures as it is better to have natural landscaping to make this area practical. To apply this idea to Houston is difficult as the area is very industrialized and would be difficult to implement this mode of prevention. Thus, the author narrows down his suggestions to his final potential solution, which he explains for the remainder and he majority of the journal, which is to increase the capacity of drainage systems within the area. The author then strongly advocates that if these channels were maintained properly, there would have been instances where states would not suffer damage from flood. Because the author wrote the journal in such a way, I agree that these methods would help the prevention of flooding, but I believe a solution to the flooding problem is not something we are in search of because we are capable of implementing these solutions. We shouldn't be asking "how do we fix this" or "what solutions are there to prevent flood damage". The real problem and question that we need to ask is "why aren't we doing anything about it?". It is not right that these solutions presented have been solutions implemented by other countries, proposed by past generations living in Houston, but we have not implemented these in our local community.

We have so much potential to reduce the damage done from previous floods, but we don't act on it until it is too late. The notion that the flooding problem is within our grasp, yet we

choose not to reach for it is supported by Climate institution's article which states that "40 percent of the flooding can be attributed to Houston's drainage issues"( New Flood Prevention Strategies). This is alarming as "officials [have] reported that 4.5 billion dollars would be spent on the recovery in [Houston]"( New Flood Prevention Strategies). It can be inferred that if this amount of flooding could've been prevented, then Houston would not have lost approximately 1.8 billion dollars of damage could have been prevented. Although drainage issues are a large percentage of the damage caused by flooding, there are other modes of which we can acknowledge to prevent further damage such as the climate change. According to a study by MIT, "the chance of rainfall such as those occurring in the Hurricane Harvey event rose up to 18 percent after 2000" (New Flood Prevention Strategies) . Their research has led the institution to believe that it is caused by increased greenhouse gas emissions throughout the years. Focusing on this aspect, it appears that the trend will not plateau or decrease, but instead is most likely to increase over the years. This is alarming as there are populations of the Houston community and other communities that do not believe in global warming and will continue to contribute to increased greenhouse gasses due to lack of knowledge on the issue.

Solutions are being brought up by many professionals, but whether the people decide to implement them is up to the attitudes of the people. The article, New Flood Prevention Strategies, relies on the experiment that Kerry Emmanuel, a professor of meteorology, conducted in 2018 in Houston. In this experiment, Emmanuel performed computer modeled simulations to explain the connection between climate change and the increased rainfall that will be a problem in Houston's future. Emmanuel suggested that it is best to rebuild houses and to widen bayous in Texas to prepare for the next disaster. The problem with this method is that by building houses on higher ground, the amount of land required for that house to be built higher up will displace

water onto houses built on lower ground potentially causes more damage to older estates.

Because of this potential problem, it is still unclear as to what can be done in terms of reconstruction of houses. This is also a problem as these plan will be very expensive and to be done on a large scale is not practical. However, I believe the solution is not to be found in this aspect of the problem. Currently, drainage systems are being remodeled, cleaned, and expanded to reduce further flood damage in the future. This is especially true in Harris County as I've seen ditches a minute away from my house being dug up, cleared of debris, and expanded for months. I still believe that this solution is not enough to fix all of our flooding problems because this is only a temporary fix since climate change will eventually cause more and more rainfall in our area.

Overall, the solution to our flooding problems is not something we need to invest our time and energy into figuring out, but it should be the attitudes of the people and the community who should be pushing for their government officials to take care of public drainage systems and flood prevention. It is only fair that if the government taxes the property of the people, that they should also make sure they do their best in preventing damage to those properties by keeping public systems paid by the taxes of the citizens working properly. In the end it is up to the government which implements these solutions to maintain the drainage systems months before heavy rainfall rather than months after the damage has been done. This behavior is common in humans as we tend to ignore problems until it has become difficult or impossible such as the increased greenhouse effects that have no immediate affect on the populations. This preventative method of thinking should be applied to all problems rather than waiting for the problem to cause damage before we decide to act on it. The county doesn't send people to check and clear these

drainage systems for years. However, when they are vital in the prevention of damage, they are not in shape to function as they are expected to lead to unnecessary damage to our community.

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