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Decision-Making While Confronted By Environmental Disaster

This analysis will explore factors that may affect protective action in regards to the individual and community decision-making process involving environmental disasters, such as hurricanes, for example. It will cover a broad analysis of different research findings, including the influence of the political theory neoliberalism, and how that reduces resources for many communities in the USA and across the globe. Additionally, the thesis will assess the influences job security, income, concerns about property, rented or owned, and traffic control issues have during mass evacuation. Furthermore, it will assess the influences these factors may have on disaster evacuation as well as recovery. It will cover an overview of the current state of the effectiveness of disaster management policy in the United States of America, including the impact disasters have on low socio-economic communities. If income/wealth is hardly sufficient to provide for an emergency evacuation, job-security is threatened, and property-damage is a very high risk, then the likelihood of evacuation will decrease, because there are too many deterrents to an individual's decision-making process.

To overview risks from Hurricanes and similar environmental disasters, there are potentially severe damages to individuals and their property. Examples include inland flooding from rainfall, damaging winds, home damage, and disruption to the power grid, portable water networks, and gas distribution systems (Henk et al., 2007). One of the most threating consequences by a hurricane is storm surge. The same study defines storm surge as "fast-rising water in which individuals and vehicles can be caught, injured, or drowned." To continue,

evacuation orders for hurricanes and heavy rains are based on predicted intensity of storm surge, "since this condition is character to pose the greatest threat to life" (Henk et al., 2007). Homeowners have an increased risk if they live near at-or-below sea levels as well as in coastal areas.

This paragraph is designed to review findings from research in the decision making process homeowners engage in during natural disasters. The body of work suggests several important issues involving organizational preparedness. For example, "studies of citizen response to flood warnings show that people do not always readily evacuate when asked to do so" (Quarantelli and Dynes, 1967; 1972). However, "successful pre-impact evacuation is a morale boost that reinforces belief that authorities are in control and people are safe" (Perry and Lindell, 1978; Lang and Lans, 1964; 1968-1975). When it comes to disaster evacuation, a relationship can be formed between evacuation planning authorities and citizens by implementing incentives to evacuate, instead of basic advisory or even mandated evacuation orders (Perry and Lindell, 1978). This "relationship," as the authors describe it, develops trust and increases the probability that threatened citizens will comply with a warning to evacuate. Evacuation results may be even more effective "if residents are aware of various evacuation routes, checkpoints, and safe locations at the time they initially receive the warning (Perry, 1979; Mileti, 1974; Mileti and Beck, 1975).

To continue on understanding themes of prevalent evacuation behavior, Mogil and Groper claim that "improved forecast warnings… may prove useless" unless the community itself prepares plans as well as people in general learning to positively perceive weather warnings (Mogil and Groper, 1977). In this case, it may not be effective to criticism the weatherman, so to speak. In general, minor damages due to environmental causes or prior storms have shown to

reduce the likelihood of evacuation for the subsequent disaster, which thus, increases the need for post impact search and rescue (Drabek, 1969). Drabek, in his research reveals the tendency that peoples' likelihood of evacuation will increase if they receive an invitation to shelter elsewhere. The author describes that evacuees first evacuate to relatives as their first choice, friends as a second choice, and shelters as their final choice.

Second, research suggests that there is a distinct connection between pre-evacuation behavior and post-evacuation behavior (Dash et al., 1997). Successful economic recovery is broadly scoped upon an effective and economically capable government involving "leadership, knowledge and a power to act" (Klinteburg, 1979; Rubin, 1985). However, Federal policy leaves most responsibility to local governments, many of which communities are not properly stocked with adequate resources to properly address the burden (Dash et al., 1997). The largest economic threat to communities directly targeted by a hurricane, such as Hurricane Andrew in the early 90's, is that due to the storm, it is possible a local economy such as Homestead and Florida City may shrink up to seven times smaller than the pre-disaster levels, measured by total sales (Dash et al., 1997). Homeowners, renters, and others who were incapable of evacuating typically ended up with drastically reduced property values, lack of shelter and resources to survive, as well as a stagnant economy. Part of the reasoning for the devastation of local economies is because of white flight from an environmental disaster. It is simple, the people that can afford to relocate and do, to avoid future disasters, will may be unlikely for an economy to completely recover from (Dash et al., 1997). For the recovery economy, this is disastrous because it leaves the existing population with higher chances for cyclical poverty and reduced ability to garner recovery resources.

Additionally, if people were not already trapped by poverty or other factors, it became much more likely that they have incapacitated mobility now. As illustrated, depreciation in institutions within poorer communities has led to large set-backs in a community's ability to function, let alone recover (Klinteburg, 1979; Rubin, 1985). Not only is there reduced tax revenue for a government to use to recover but, investment also decreases, leaving renters and homeowners to deal with their problems on their own, in many cases. In Florida City, property values dropped an average of seventy-nine percent from thirty-nine million dollars in 1992 to eight and a half million after the storm. (Dash et al., 1997). As property values drop, homeowners are stuck with their homes because they simply cannot afford such a high negative return of sale. "I wouldn't be living here if I had anywhere else to go" (Dash et al., 1997). Some extreme cases to example include severely damaged homes, some officially condemned, without services like electricity or running water, and devastated roofs. This same Florida City example from a storm in 1992 faced commercial property levels drop a third (Dash et al., 1997). Changes in economic activity include a large reduction in sales, entertainment, lodging, and repairs, which are all included in a loss of revenue for Florida City.

Third, it is clear that socio-economic factors play a huge role in the advantages and disadvantages people have relating to disaster evacuation and recovery. For example, and this has been documented, that wealthy communities can fund public projects such as levees, dams, have increased emergency medical services (EMS), and better flood insurance, which disproportionately protects wealthier communities over poorer communities from disasters (Collins, 2009; 2010). Wealthier communities not only recover faster because of these policy implementations but, some public projects such as levees or dams may have negative externalities that shift the side effects of disasters onto lower-class areas whom cannot afford

similar public expenditures (Collins, 2009; 2010). In other words, a breached levee set up to protect a wealthier town from floods, may harm the poorer town more. Disadvantages faced by lower income, ethnically diverse groups of citizens facing environmental disaster "will remain invisible" as long as researchers are focused on "statistical differences between groups, rather than pervasive social inequalities" (Holifield, 2001). Holifield speculated that the cause of the general differences of objective tragedy after disasters between groups of socio-economic class is generated by socio-economic inequalities between communities that have existed for countless generations. This must be taken into consideration while considering policy suggestions.

To further understand the integration socio-economic status has with environmental disasters and recovery, is key to understanding exactly what factors play into the decision to evacuate. For example, in area with dense agricultural and farming jobs, there are very high populations of black and Hispanic workers living nearby in traditionally single family homes. The difference however with traditional circumstances, is that these houses have each room split up room by room for tenancy (Dash et al., 1997). It has been documented by this same study that housing conditions were regularly in "chronic ill repair." To make matters worse, fifty-five percent of houses were rental units with a median income of sixteen thousand dollars. Since these are rental units, if damages occur the tenant is not responsible for fixing the home, the landlord is. Unfortunately, many of these homes do not get repaired and people have to endure living in these conditions.

"Evacuation orders were less likely to reach, less likely to be trusted by, and less likely to be followed by persons of color and lower-income residents in New Orleans than more affluent and white residents" (Bolin & Kurtz, 2018). This is to imply that there is a higher probability in lower income and/or persons of color to be distrustful of government. The Second Edition of the

Handbook of Disaster Research claims that people in poorer communities are less likely to have access to a personal vehicle and more prevalently chose not to evacuate because of reliance on local hospitals. To extent upon that, it has been reported that many people need to stay behind to care for their family and property (Brodie, et al., 2006; Elder et al., 2007). Post-recovery studies have found that mental illness is higher, in general, after a disaster such as Hurricane Katrina (Rhodes et al., 2010; Sastry and VanLandingham, 2009). "Employment and resettlement rates are significantly lower, for low-income and African American residents" (Bolin & Kurtz, 2018).

"The slower rates of return migration for non-white and low-income residents in part reflects greater housing and property damage from flood waters and delays in rebuilding flood protection structures in low-income areas," (Bolin & Kurtz, 2018) "highlighting the intersection of social processes, particularly racism and classism, which shape exposure to biophysical hazards like flooding" (Kates et al., 2006). It has been noted that recovery efforts by small, local governments within an urban economy has shown to be both a cause and an effect of continuing class and racial segregation (Logan and Molotch, 1987.) To rephrase, richer people move to where there are richer local governmental recovery resources. This has an effect on society by providing a "foundation for a cycle of poverty" that reciprocates a negative environment. This disaster evacuation study is a form of neo-segregation because it leaves poorer people with lesser public resources and allows for richer folks to congregate for better recovery resources.

In the Second Edition of the Handbook of Disaster Research, the authors associate Neoliberalism with a growth of insecure part-time careers, weakening of trade unions, and reductions of income for most of the working class population over time (Castree, 2009; Davis, 1992; Yates, 2005). According to the Handbook, this political theory in practice has large implications for the devastations wrought by disasters, especially for communities of working-

class Blacks and Hispanics (Yates, 2005). For example, since Neoliberalism leads to reduced incomes, there are less resources for less fiscally capable communities to recover from disasters on the local level. In the Yates study, thirty percent of black workers and thirty-nine percent of Hispanic workers in the nation earned poverty or below wages (Yates, 2005). According to the Bureau of Labor Statistics, this rate is twice that of whites in same or similar circumstances.

To appropriately picture what these statistics mean, "social inequities and processes of marginalization are being intensified" by neoliberal policies that constrain large quantities of people (Peets & Watts, 2004; Smith, 2008). As political elites implement "free market discipline" in many countries around the world through structural adjustment of institutions, there has since developed the largest polarization of a wealth divide since before the Great Depression (Davis, 2006; Harvey, 2010; Robbins, 2012). Included in this effect caused by neoliberal policies are declining wages, reduced social protections and services, privatization of common property resources, increased ecological disruptions, and an increase to the homeless population (Bankoff et al., 2012).

To summarize findings on decision-making processes during a disaster evacuation as a whole, there is considerable influence by family, friends, neighbors, past disaster experiences, perceived risk, perceived reliability of media's emergency information, and awareness of evacuation procedures in a specific community (Stein et al., 2010). It is remarkable that in this same study the conclusion was that communities generally share similar behaviors when confronting a disaster that calls for an evacuation. "Perceived risk and its influence on evacuation behavior is a local phenomenon more readily communicated by and among individuals who share the same geography" (Stein et al., 2010). Stein concluded with the policy suggestion that future insights into motivating citizens to evacuate, must include a message that

has been produced and advocated for on the local level. In other words, statements from public officials and notifications from television media has not been proven a more effective motivator to evacuate a population than local advocation for the matter.

To continue, "evacuation behavior of all evacuees is not determined by a common set of determinants. Evacuees from officially designated areas for evacuation respond to a different set of information cues, incentives, and risk factors than evacuees residing in areas not designated for evacuation (Peacock, Brody, and Highfield, 2004)." In other words, to attempt to address disaster management evacuation policy, one would have to address the variability of different peoples' perspectives. Another problem in relation to disaster evacuations is that a significant number of evacuees are likely to be stranded on congested roadways when the storm intensifies (Dash and Gladwin, 2007; Henk et al., 2007). A solution to overly congested roadways during evacuation may be tamed by public transit bussing. The authors do not speculate on the feasibility or efficiency of this solution but, the study shows that it will be effective as to reducing overall number of vehicles on the road (Drabek & Stephenson, 1971).

Additional findings have shown that there is a largely open audience towards the use of public transit as a solution to disaster evacuation, if further investments were made. To reiterate, factors involving the decision to evacuate include how people interpret warning messages, perceived risk, and what options one has to protect themselves and others they take on. "Knowledge about hazards, bolstered by messages about risk areas, has been found to be insufficient to motivate evacuation behavior" (Baker, 1979; Zhang, Prater, and Lindell, 2004; Arlikatti, Lindell, and Prater, 2007). Public perception on topics has been speculated to have incredible impact on its viewers. During Hurricane Katrina, there was heavy media speculation on the framing of victims of disasters to be using that as a chance to loot for individual gains.

Research claims that the truth directly contradicts with this media assertion and that looting is not found to be common (Bolin & Kurtz, 2018). Additionally, the "I have to guard myself" ideology is significantly less prevalent when public awareness, communications, planning, and solutions are being implemented in the respective community (Sorensen et al., 1985).

According to survey data from an experiment done by Sorensen, Mileti, and Bogard, evacuation uncertainty perceived by respondents were recorded and ranked, which could directly impact the decision to evacuate. The hypothesis issued in the introduction, in relation to these research findings, does not significantly prove or disprove the aforementioned factors most likely to deter the decision to evacuate from an environmental disaster. As the "number of times" an uncertainty was documented, "loss of job/other person consequences" was rated four out of thirty-five (maximum), the "cost of evacuation or economic loss" was reported five out of the thirty-five, "liability" for their property was ranked four out of thirty-five, and "feasibility of evacuation/planning" was four to five out of thirty-five (Sorensen et al., 1985). The feasibility and planning variable for Sorenson's study I matched with my highway congestion variable in my hypothesis. Just for the record, the three highest reported uncertainties in the study were in order from highest to lowest, "physical ability to communicate", "recognition of event," and "recognition of consequences/likelihood" (Sorensen, 1985). My hypothesis did not involve these three factors as being a heavily influencing deterrent to a decision to evacuate.

Lastly, one of the most successful policy solutions to organized disaster evacuation is the implementation of pre-determined evacuation zones per household (Fritz & Matthewson, 1957). Benefits of this policy proposal includes minimizing the need for larger shelters, increasing accountability of citizens, providing a choice of re-location, and offering officials and family members a better chance at locating one another much faster. For example, Australia has

developed an effective solution similar to this concept called “family message centers.” Research from this program has been documented to suggest to increase evacuation compliance and orderliness, an implemented program must involve a system to allow for evacuees to learn the location and condition of family members (Hans and Sell, 1974). State, Private, and/or Non-profit citizen-rescue and assistance forces could assist with recovery efforts to Emergency Medical Services (EMS) to provide for more effective disaster evacuations and recoveries. Thus, the probability for saving lives, reducing property damages, and for reducing costs by the next environmental disaster, will hypothetically increase.

Bibliography

1. Bogard, W., Sorensen, J. H., & Mileti, D. S. (1985). *Evacuation decision-making: Process and uncertainty*. Oak Ridge, TN: Oak Ridge National Laboratory.
2. Collins, A. E. (2010). Disaster and Development. London: Routledge 2009. 285 pp., ISBN: 978-0-415-42668-8 $39.95 (softcover) www.routledge.com. *Disaster Prevention and Management: An International Journal, 19*(4), 517-518. doi:10.1108/dpm.2010.19.4.517.6
3. Dash, N. (1994). Inequality in disaster: The case of hurricane Andrew and Florida City. *Inequality in Disaster: The Case of Hurricane Andrew and Florida City*. doi:10.25148/etd.FI14062204
4. Dow, K., & Cutter, S. (2000). Public orders and personal opinions: Household strategies for hurricane risk assessment. *Global Environmental Change Part B: Environmental Hazards, 2*(4), 143-155. doi:10.1016/s1464-2867(01)00014-6
5. Drabek, T. E. (1969). *Social processes in disaster: Family evacuation*.
6. Drabek, T. E. (2004). *The social dimensions of disaster: Instructor guide*. Emmitsburg, MD: FEMA.
7. Greene, M. R., Lindell, M. K., & Perry, R. W. (1980). *Enhancing evacuation warning compliance: Suggestions for emergency planning*. Emmitsburg, MD: National Emergency Training Center.
8. Groper, H. S., & Mogil, H. M. (1977). *NWSs severe local storm warning and disaster preparedness programs*. Emmitsburg, MD: National Emergency Training Center.
9. Mileti, D. S. (1974). *A normative causal model analysis of disaster warning response*. Boulder: University of Colorado.

10. Mileti, D. S., & Beck, E. M. (1975). *Communication in crisis: Explaining evacuation symbolically*.
11. Parida, P. K. (2010). Understanding Evacuation Behaviour in a Disaster Society: The Case of Coastal Orissa. *Sociological Bulletin, 59*(2), 179-198. doi:10.1177/0038022920100202
12. Peacock, W. G., & Gladwin, H. (1997). *Assessing the likelikhood of evacuation next time: Some preliminary findings from the FIU Hurricance Andrew Survey*. Miami, FL: Dept. of Sociology and Anthropology, Florida International University.
13. Peacock, W. G., Morrow, B. H., & Gladwin, H. (2000). *Hurricane Andrew: Ethnicity, gender, and the sociology of disasters*. Miami, FL: International Hurricane Center, Laboratory for Social and Behavioral Research, Florida International University.
14. Perry, R. W., Lindell, M. K., & Greene, M. (1980). *The implications of natural hazard evacuation warning studies for crisis relocation planning: Final report*. Washington, D.C.: The Agency.
15. Perry, R. W., Lindell, M. K., & Greene, M. (1980). *Evacuation decision-making and emergency planning*. Seattle: Battelle Human Affairs Research Centers.
16. Perry, R. W., Lindell, M. K., & Greene, M. R. (1981). *Evacuation planning in emergency management*. Lexington, MA: LexingtonBooks.
17. Quarantelli, E. L., & Dynes, R. R. (1967). *Operational problems of organizations in disasters*.
18. Rathbun, K. C. (2006). *Being prepared: Protecting your family from hurricanes, earthquakes and other disasters*.
19. Rodríguez, H., Donner, W., & Trainor, J. E. (2018). *Handbook of Disaster Research*. Cham: Springer International Publishing.

20. Stein, R. M., Duenas-Osorio, L., & Subramanian, D. (2010). *Who evacuates when hurricanes approach? The role of risk, information, and location*. Emmitsburg, MD: National Emergency Training Center.
21. Witteveen, A. B., Bramsen, I., Twisk, J. W., Huizink, A. C., Slottje, P., Smid, T., & Henk, V. (2007). *Psychological distress of rescue workers eight and one-half years after professional involvement in the Amsterdam air disaster*. Emmitsburg, MD: National Emergency Training Center.
22. Wu, S. H., Wei, M. K., & Samuelson, C. D. (2017, April 18). Perceptions, behavioral expectations, and implementation timing for response actions in a hurricane emergency. Retrieved from https://link.springer.com/article/10.1007/s11069-017-2877-4