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Research Article

The Global Sociological Impact of Natural Disasters and Effect

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Abstract

Almost 100, 000 people lose their lives in natural disasters every year, disasters such as earthquakes, volcanos, hurricanes, floods, wildfires, and droughts. World Health Organization records more than 150 million people that are affected by disasters. The purpose of this study is to show the impact of disasters on society. Further, the objective of this study is to expose the global sociological impact of natural disasters. The study found that the impact of disasters globally is dire and claim the lives of many people. Those who lost their lives because of disasters left a huge gap in their families and society as a whole. This leaves a society with a huge gap, people that play a significant role in society are lost and this is not controllable. The researcher applied a secondary research methodology to reach conclusions on the sociological impact of natural disasters. Issues related to global natural disasters and the impact thereof were available on different platforms for the researcher to reach informed conclusions.

Keywords: *Natural disasters, social impact, global, effect, impact.*

Introduction

Since the beginning of mankind, the world has experienced various violent natural disasters which affected human lives. Currently, the death count of the ancient of these disasters has been lost, primarily because records were not kept. The classical example could be that of the Mediterranean island of Thera which is now called Santorini, Greece which had a catastrophic volcanic eruption that killed many people around 1600 B.C. however, there is no exact record of how many people lost their lives but historians can estimate the number of fatalities. Another example is the one of the Syrian City of Aleppo which began to shake in 1138 (Pyle and Elliott, 2006: 254). The city was prone to temblors but violent which was severe and killed lots of people. Because this disaster took place in ancient times, the magnitude of the quake is lost in time. The quake estimated at around 230, 000 deaths but this estimation could not be confirmed because records were not accurately kept. Numerous disasters took place in the 21st century and all those disasters are recorded. The availability of

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technology and the development globally, has made it possible to keep accurate records. It is, therefore, important to indicate the type of disasters that have taken place and the impact of those disasters on humankind (Dominey-Howes, 2004: 109). Disasters are unforeseen circumstances that are not planned for and mostly, disasters do not give people options and they attack fast. In 2004 an unexpected disaster attacked people in 14 Southern Asian and East African countries. The disaster was named Tsunami because it was an earthquake that happened in the ocean. This disaster killed more than 230,000 people and millions of people were affected. The tsunami traveled at 500 mph speed and reached the land in as little as 15 minutes after the quake hit. Because of the speed, people did not get a chance to run away or to save themselves. The disaster did not only claim many lives of people but it also caused a lot of damage which is estimated to be more than 10 billion dollars. This tsunami was recorded as the third earthquake in the world since 1900 and it killed more people than any other tsunami in recorded history (Dominey-Howes and Minos-Minopoulos, 2004: 290).

Another recorded earthquake took place at Tangshan in 1976, Tangshan is a city in China. This is an industrial city that accommodates most people from different cities, villages, and countries. At the time of the earthquake, the city had a population that is slightly more than a million. History indicates that more than 240,000 people lost their lives in this disaster (Sun, Guo, Liu, Meng, Zheng, Yuan and Zhu, 2019: 103). However, this officially recorded death toll is questionable because some scholars and experts suggest that more than 700, 000 people lost their lives. The city experienced drastic changes as most buildings collapsed and it took many years for the city to be normal. An earthquake might be seen as dominant in disasters but there are many other types of disasters globally. Cyclone for example is another disaster that has claimed the lives of many people in the world (Qian and Pedersen, 1991: 267). In 1839 Coringa Cyclone attacked the people of the Bay of Bengal and killed a lot of people. This cyclone was also accompanied by dangerous storms that contributed to people failing to save themselves. Cyclones, hurricane wind, and storms claimed the lives of more than 300,00 people. Continents and countries experience different types of disasters, Africa, for example, had experienced disasters in the form of floods and viruses. Currently, Covid-19 is a disaster that attacks all regions, continents, and countries. The number of viruses and diseases that were declared as disasters are countless. Starting from swine flu, Ebola, Malaria, HIV, TB, and many more other viruses were declared as disasters but some were later controlled by health practitioners (Tian, Zhang, Zhao, Liang, Zhang and Song, 2014: 1323).

Theoretical Perspective

Scholars, specialists in disaster in various studies such as Pelling, Özerdem and Barakat (2002: 287), indicated that disaster destroys institutions, lives, and the environment. Society is mostly affected by any natural disaster. Disasters create a situation of emergency and force people to change the way they are living. The frequency of disasters has doubled every ten years from 1996 with 96% of deaths from natural disasters. Natural disasters do not only cause death but also cause financial loss, accidents, urban fires, and social disparities. The reports of natural disasters globally have little transparency because there is no common methodology to calculate the damage caused by natural disasters. Moreover, the reports focus mainly on the loss of physical assets to human beings and nothing of the full scale of personal loss and livelihood (Butler, Stewart and Kanamori, 1979: 210).

Disasters disturb and stop the national development of countries that are affected by natural disasters. The hurricane Mitch that attacked Nicaragua in the year 2000 reversed the national gains of the development. The Hurricane forced the country to focus on fixing the damage and stop focusing on the planned programme. The damage caused by this disaster could not be properly quantified and the report was based on estimations and speculations. The reports portrayed an image that the disaster can easily be traced and the economic impact can easily be identified. The reports usually mislead society and make it difficult to find accurate information and statistics (Bradshaw, Linneker, Zúniga, McIlwaine and Willis, 2002: 244). The reports whether by government agencies, news agencies, and public institutions provide a limited report which is based on accounting for physical infrastructure and fail to incorporate national economies. There has been a discussion in the literature on the merits of different ontological approaches towards disasters and development. This supported the view of reporters on why it is necessary to only focus on the human or physical impact of disasters. There has been less or no emphasis on the impact of the disaster on the economic system and social well-being of the people. This paper argues for an effort to shift a focus from the holistic accounting methodology and include the impact of society on how people interact or live together (Russell, 1999: 322). This view is therefore intending to change the modernist tradition which placed disaster outside of the sociological impact and the societal development. The modernist tradition of disaster separated nature from society and environmental development. Throughout the paper, we refer to the sociological impact and developmental impact of disaster and also deal with the individual and household impact. Previous studies have focused on the impact of the disaster at a national or regional or sub-regional level and this study focused on the disaster at a national level. This study, therefore, draws discussion on theories of ecological vulnerability to disaster and the technological aspect of disaster prevention and response. This study presents a framework for a more holistic analysis of the sociological impact of the disaster on the entire society. This provides a discussion on how the response to disasters can address the sociological challenges that are caused by a disaster (Goenjian, Molina, Steinberg, Fairbanks, Alvarez, Goenjian and Pynoos, 2001: 789).

Few factors contribute to national disasters, there are different kinds of triggering events that coincide and overlap. Triggers include nature, earthquakes, floods, violence, war, armed conflict, technological, oil spillage, factory explosions, hazardous waste, declining social services, environmental degradation. Most disasters occur in quick succession and cause tertiary damage to a primary event. Some disasters such as droughts and some floods are slow-onset but their impact is more destructive in a long term. They affect the societal developments, investments and domestic demands are becoming higher. According to Stonich (2007: 102), the physical damage of disaster, directly and indirectly, affects the costs of production and affects the national income and expenditure. These losses have a linkage and are directly incurred in all stages of the damage caused by the disaster. The preconditions of the subsequent vulnerability result in a secondary effect that is felt throughout the recovery. This, therefore, shows that the impacts of the disaster are shaped by the size and structure of the receiving socio-economy. The economies that are poorly diversified and small are highly vulnerable to disaster shocks.

Research Methodology

Research methodology is the procedures or techniques that researchers use to identify, select, process, and analyze information about a topic. In a research paper or journal article, the methodology section allows the reader to critically evaluate a study's overall validity and reliability. The approach to be used depends on the study questions, which are then influenced by the research perspective (Noor, 2008: 1603). Unstructured or semi-structured interviews generally yield qualitative data and questionnaires produce quantitative data. Indeed, linguistic details are also converted into numbers; for example, the occurrence of such main terms may be recorded. Questionnaires may include both quantitative and qualitative data; for example, questions with multiple options generate quantitative data, and open topics generate qualitative data. Based on the availability of data that is related to the study, this study applied secondary research methodology. The secondary or desktop research was applied to collect data for this study, this was informed by the availability of data that is related to this study. Data were available on secondary sources such as newspaper articles, government gazettes, World Health Organization, and reports on global natural disasters (Singh, 2006: 06).

Results and Discussions

Internationally, disasters have been responsible for about 0.1% of massive deaths over the past decade. There has been a noticeable decline in the number of deaths caused by disasters in the past century. Disasters are dangerous and can devastate the entire country and destruct buildings and people. This has been witnessed by how Tsunami and other earthquakes have quickly shifted the lives of people and the number of people that lost their lives. Disasters can be experienced at a local level but their impact is felt globally and most people are affected. This is because of the internationalization and the interconnectedness of countries. Countries in a globalization platform mainly depend on each other through the import and export system. Countries that supply goods and services for other countries would not be able to operate normally if attacked by natural disasters (Bruins, MacGillivray, Synolakis, Benjamini, Keller, Kisch, Klügel and Van Der Plicht, 2008: 193). This is not the only impact that can be caused by natural disasters, the atmosphere, and the temperature is also affected. A practical example of this is the eruption of the volcano Tamora in Indonesia that discharged too much Sulphur into the atmosphere which affected the world's temperature and later dropped by 2 degrees. Another impact of the natural disaster that affected society is the one of Japan in 2011, the earthquake of Japan in 2011 shifted the earth's axis and shortened the length of the day (Pelling, Özerdem and Barakat, 2002: 284).

The future will have as deep an economic influence. The hurricane season of 2005 saw a record of 28 storms. Hurricane Katrina has taken the leading role in both economic and insured damages, as the costliest tropical cyclone in history yet the total economic damage in the entire season was $209 billion. The theoretically negative consequences on the countries around the world are potentially chain reactions above the headline cost. With each area in danger of natural disasters, supply chains, and retail economies increasingly around the world, comprehensive catastrophe planning to minimize the possible impact is becoming increasingly relevant for companies. However, to build emergency planning, the starting point is to consider how this can affect the company and how incidents are far from the core activities. We function in a genuinely global economy, and this reality is recalled frequently in the context of a natural catastrophe (Neumayer and Plümper, 2007: 553). The earth has seen an annual average of 260 major natural disasters in the 10 years following Hurricane Katrina

with an annual average economic damage of 211 billion dollars, insured loss of 63 billion dollars, and 76 000 deaths. In 2014, the number of deaths from hail storms in Europe to heavy winter conditions in the U.S., damage from typhoons in the Philippines to Mexico hurricanes, and floods in the United Kingdom, India, Pakistan, and Afghanistan amounted to 72%. This is just about the big catastrophes, though. There are no estimates on any of the much smaller flooding, hurricanes, earthquakes, and other local events that can generate more disturbances and losses across the world. Economic damages of US$3.6 billion have been caused by weather events since 1980, with insurers spending over US$960 billion in the same period. The effect has increased with every decade, with the first half of 2010 seeing more economic damage from weather events than the whole 2000s, thanks to a mixture of globalization, rising populations, urbanizing, and climate change (Cannon, 1994: 14).

Table 1

The world's costliest natural disasters

The economic losses caused by natural disasters.

Rank	Economic Cost (billions)	Disaster	Year	Location
1	$221.6	Tohaku Earthquake / Tsunami	2011	Japan
2	$209.2	Atlantic Hurricane Season	2005	U.S., Mexico, Caribbean, Bahamas
3	$160.8	Kobe Earthquake	1995	Japan
4	$92.5	Sichuan Earthquake	2008	China
5	$81.5	Drought	1988	The U.S.
6	$73.2	Hurricane Sandy	2012	U.S. Caribbean, Bahamas
7	$71	Northridge Earthquake	1994	The U.S.
8	$60.6	Drought	1980	The U.S.
9	$51	Irpina Earthquake	1980	Italy
10	$47	Floods	2011	Thailand

Source: Live Science, 2012.

The above table indicated the economic cost of natural disasters, location, year, and rank or level of each country. Any dollar of non-insured loss is an investment- and company growth dollar inaccessible. And, of course, the human cost is on top of that. Mortality and natural catastrophic injury will have an even greater effect on industry than on infrastructure and economic harm. To support worried people, recovery for their well-being as well as for their business can be as critical as ensuring that the insurance cover is sufficient for disaster preparation and recovery (Pine and Gupta, 2014: 04). Key events will disturb industries far past local infrastructure disruption, as supply chains and markets are hit by companies around the globe. There is not a company or customer who cannot to some degree depend on products and commodities and services from abroad and the likelihood of natural disasters ranges in any region of the planet. The earthquake and tsunami in 2011 in Tohoku and the flooding in Thailand in 2011 are excellent indicators that highlight the broader indirect economic effects of catastrophes that seem comparatively isolated disruption to particular countries. Due to the essence of the economies of the two continents, the supply chains of world technology have been severely affected by both disasters. After the Thai floods, electronic hard drives were in severe dearth and consumption rates spiked before factories could come online (Albala-Bertrand, 1993: 03). Owing to the shortage of available parts from factories in Japan, many large car producers were forced to shut down their manufacturing in European and American factories in the world economy as a result of the supply chain reaction. With this large possible effect, it is increasingly important to ensure that organizations are ready for the likely interruption.

Disaster planning should only take into consideration the immediate influence of incidents far from the center of operations on the supply chain and customers, but it should also take into account the consequences (Altay and Ramirez, 2010: 60).

The economic failure of disasters has risen astoundingly and served as a significant barrier to global growth, job creation, and support for initiatives to alleviate hunger, health, and education. Natural disasters are more than wiping outhouses; industries can be wiped out and local economies can be decimated. When large catastrophes are plausible, they also engage in discussions about changes in the environment and search for solutions to reduce potential threats and damages. These incidents could threaten the status quo and expose the value of mitigating the potential risk of exposure and vulnerability. Society has long suffered from natural disasters. They disrupt the lives of people, damaged infrastructure which can last for up to many months (Wood, Cecchet, Ramakrishnan, Shenoy, van der Merwe and Venkataramani, 2010: 09). The world economy itself is affected by both of these causes. There was an estimated worldwide economic loss of around $3 billion between 2000 and 2017 alone. And there are just the measurable losses, the true value goes even further than that figure. However certain countries are more vulnerable to some kinds of natural hazards, given the disparity between geographical areas. For example, the UK is most affected by flooding, Chile, and New Zealand by earthquakes and heatwaves and droughts in Africa and South America (Hunt and Klima, 2020: 30). Depending on the particular catastrophe, some nations are therefore more likely to struggle when various disasters require different paths to recovery. Two natural disasters have recently swept through two areas. On 14 September the Florence Hurricane came to Carolina and Virginia (Rose, 2004: 06). It caused about one million power outages and killed more than 40 people as a Category 1 hurricane. Estimated damage in Florence would be 40 billion dollars and economic growth would be lost by an extra 4 billion dollars. Typhoon Mangkhut rumbled across the Philippines, Hong Kong, and South China at the same time. It was a US-style Category 5 storm three times the impact of the Florence hurricane. In addition to the projected 16 billion to 20 billion dollars in the Philippines, Hong Kong and China's economic loss could hit $50 billion. Natural disasters, as outlined above, may place a heavy burden on the economies of governments and nations. There are unforeseen and unavoidable occurrences. But ideally, the effects and destruction of the technology may be reduced as it progresses in the immediate future (Waugh Jr, 2006: 12).

Figure 1. The illustration of the social impact of natural disasters.
Source: Jiachen Mo, 2018.

The above figure 1, illustrates the social impact of natural disasters in the society that was directly affected by a disaster. This article includes statistics over the last 20 years on the effects of natural events, human and economic worldwide. The analyzes concentrate on movements and affect patterns, and how they differ in terms of income or geographical area. Based on analyzes, findings, and actions, the discussion on the next steps required in catastrophe risk mitigation was raised. Data from 1994 to 2013 include 6 873 worldwide natural disasters that kill 1,35 million or almost 68,000 lives per year on average and impact an amount of 218 million people annually in that 20-year timeframe. The estimate is based on figures from 1994 to 2013 (Cavallo, Galiani, Noy and Pantano, 2013: 1550). The study includes some observations on catastrophe human expenses. One finding is that population growth and economic development trends are more relevant to understand the upward trend than climate change or cyclical temperature changes. Scawthorn and Porter (2019: 17) stated that not only more harms now than 50 years ago, but the possibility of a natural occurrence being a global disaster has also risen in flatlands, earthquake regions, and other high-risk areas. Earthquakes (including tsunamis), which claimed almost 750,000 lives between 1994 and 2013, destroyed more than any of the other forms of disasters. The tsunami was the worst of the earthquakes, with an average of 79 deaths per 1,000 persons, compared with 4 deaths per 1,000 for earthquakes. This makes tsunamis more deadly than land motions nearly twenty times (Douty, 1972: 585).

Between 1994 and 2013 drought affected over a billion people, or 25% of the world's population. This is even though just 5% of the disasters occurred during the time under drought. About 41 percent of the droughts were

in Africa, showing that countries with lower incomes continue to be overwhelmed by drought amid strong early warnings. Due to its scale, varying landmass, and high population densities, the United States and China reported most disasters between 1994 and 2013. Asia, with 3,3 billion inhabitants in China and India alone, has borne the brunt of disasters across the continents. However, if data is normalized for 100,000 population categories, then Eritrea and Mongolia are the world's worst afflicted nations. Haiti experienced the greatest number of victims of the 2010 earthquake, as well as in absolute terms, about its magnitude (Guttikunda, Lodoysamba, Bulgansaikhan and Dashdondog, 2013: 591). In the last 20 years, the total number of people affected has decreased from one in 23 in 1994–2003 to 39 in 2004–2013, although disasters have become increasingly prevalent. This is due in part to population increase, but also a fall in total figures. On the other hand, mortality rates rose in the same timeframe and, in 2004-2013, hit an average of over 99,700 deaths a year. This partially represents three mega disasters' huge loss of life (the 2004 Asian tsunami, Cyclone Nargis in 2008, and the 2010 Haitian earthquake). But even though these three incidents are omitted from the data, the trajectory continues upwards (Altay and Ramirez, 2010: 62).

Data research further reveals the effect of income levels on the number of deaths in tragedy. On average, in low-income countries (332 deaths) more than 3 times more people have died per tragedy than in high-income countries (105 deaths). A similar trend is apparent if countries with low and low-medium incomes correspond to those with moderate and high-medium incomes. Together, 56% of higher-income countries faced disasters, but 32% lost their lives, while 44% of disasters affected lower-income countries but 68% died. This shows that economic growth levels are significant determinants of mortality, not vulnerability to dangers. Countries that have a higher rate of the population are most affected when faced with a natural disaster (Cherniack, 2008: 134). Scientists believe that Mexico's warm Gulf made the Michael hurricane stronger than it would have otherwise. Three to five degrees Fahrenheit higher than average water temperature resulted in more evaporation and atmospheric moisture. Around the same time as hurricanes are becoming stronger and coastal floods more serious, more and more people are migrating to the coast globally, where more cities and more economic opportunities are present. More economic options mean more chance until the next catastrophe happens.

The following types of natural disasters present evidence of how natural disasters affect the sociological arrangements of society. Global temperature raises natural catastrophes. It has been noticed by the United Nations Refugee Agency that the number of natural disasters has doubled in the last 20 years4. One explanation is that between 30% and 60% of casualties of disasters have post-traumatic stress disorder 5. According to Chen, Goh, Kamiya and Lou (2019: 135), the 9.0-magnitude earthquake and tsunami that hit the world on 11 March 2011 have been a catastrophic blow to the economy of Japan. There were or were an estimated 20,000 dead and 500,000 displaced. Japan has cost 220 billion dollars. The nuclear power plant in Fukushima was destroyed. It was driven into the Pacific Ocean by radiation. Local milk and vegetables were seen to have radiation. Katrina hurricane - 160 trillion dollars to 250 trillion dollars. Hurricane Katrina's cost was measured at 125 billion dollars and 80 billion dollars in insured damages in the National Hurricane Center (Powell, Murillo, Dodge, Uhlhorn, Gamache, Cardone, Cox, Otero, Carrasco and Annane, 2010: 27). When inflation is adjusted, that's $160 billion. On August 28, 2017, in Houston, Texas, Joe Dodson is a Korean Marine vets and, after the rainwater flooding, is lifted from a flooded neighborhood by an airboat in Hurricane Harvey. The Category 4

storm that struck Texas on August 25, 2017, was Hurricane Harvey. The result was damage of $125 billion. The population has been influenced by 13 million people from Texas through Kentucky, Louisiana, and Mississippi. 88 people were killed by the tempest. The air industry is threatened by volcanic eruptions in Iceland. If aviation is slowing in Europe, it would not only be endangering travelers. Drug enterprises, high-tech time-consuming imports, luxury brands like Scotch fine whiskeys are all put on tarmacs while airports are closed down (Martinez, 2020: 517). The volcanic eruption in Iceland's Grimsvotn endangered aviation in Scottish, Irish, and French territories. The volcanic rupture of the Eyjafjallajökull volcano in 2010. Wildfire takes a hillside in Malibu, California, to the homes and industries along the Pacific Coast Highway out of reach. About 6,000 million acres of wildfires were burnt in 2018. Northern California's Camp Fire has burned out Paradise City. 85 people were killed and it was California's deadliest. The fire is the worst, too. 153,336 acres were consumed and 18,733 houses were demolished. This was the world's most expensive natural catastrophe, causing losses of $16.5 bn (Mielke, Powell, Gonzales and Mielke, 2006: 7623). The United States Forest Service invested $3.1 billion in a record sum to suppress fires in 2018. Most of the worst in history was the Mississippi River flood of 2011. It was estimated that the loss will be restored at $2-4 billion. In 1,000 years, the Dust Bowl was America's worst drought. The Midwest was devastated in the 1930s and the Great Depression worsened. The impact of the drought was exacerbated by unsustainable agricultural activities. Drought destroyed the plants that maintained the soil. Winds brought up dust clouds and placed dirt mounds on it all. Houses were sealed, cattle murdered, and children suffering from pneumonia. The wind blew dust in Washington, D.C. at its worst. In 1918, 50 million people globally died of the 1918 influenza pandemic. One in five to five million people were sick. One in four is ill in the United States. Among all, 675,000 were killed or 0.9% died. It struck the worst young men, triggering bread-winning defeat. There were already no viruses found by scientists and no diagnosis or cure was available. For days, corpses lie along the roads and in the morgues in some places, such as Philadelphia. Trade has decreased in cities such as Little Rock. Mines and factories closed because the professional workers were in short supply (Hallegatte, 2008: 780).

Conclusion

In conclusion, Sizeable foreign-currency savings, high levels of insured properties, robust social care, and diversified productivity are larger and mature economies more able to withstand and distribute the risk of impacts over space and time. There is greater space for mitigating or absorbing direct losses and therefore the risk of knock-on flow losses or indirect impacts is minimized. A seismic earthquake of 7.4 on the Richter scale for about 45 seconds reached an area of around 41 000 square kilometers in the Marmara region of Turkey, for example, on 17 August 1999. 23% of the country's population is in the region hit by the earthquake, and it is 34,7% of GNP. The State Planning Department (Devlet Planlama Teskilati, 1999) estimated that the cost is direct, between US$ 9 billion and US$13 billion (US$2 billion in industrial plants, US$ 5 billion in buildings and infrastructure) and a comparable amount of indirect losses from lost production over the long months needed by factories and industrial waste. (Devlet Planlama Teskilati, 1999) Seven months after the tragedy, however, the GNP growth decreased by 1 percent (Thompson, 2009: 09).

Haiti, with a short history of major earthquakes, has become one of the poorest in the western hemisphere and is very vulnerable to harm and loss of life. The earthquake affected up to 3 million people. The death toll figures were around; originally, the Haitian government projected deaths to be 230,000, but the number was updated by the authorities to 316,000 in January 2011. Research published in Medicine, Conflict, and Survival in 2010, estimated that about 160,000 deaths were reported, while about 100,000 were reported to have fallen in the USGS. These differences represent the difficulties even in the new age of counting deaths.

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