Journal of Political Sciences & Public Affairs
ISSN: 2332-0761

Mark, J Pol Sci Pub Aff 2017, 5:2
DOI: 10.4172/2332-0761.1000264

Mini Review Open Access

Environmental Disruption: Push/Pull Factors, Human Migration, and Homeland Security

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Received date: May 25, 2017; **Accepted date:** May 31, 2017; **Published date:** June 06, 2017

"Climate change, in some regions, has aggravated conflict over scarce land, and could well trigger large-scale migration in the decades ahead. And rising sea levels put at risk the very survival of all small island states. These and other implications for peace and security have implications for the United Nations itself"[1]*. Ban Ki-moon - Former Secretary General of the United Nations.*

Introduction

Scenes of massive human populations have become frequent in recent times with those fleeing oppressive governments, civil wars, and atrocities against civilians from dictators. As overwhelming as these migrations have become to many destination states and countries, it is forecast that these will be minute to what might take place in the next fifty years due to climate change events. Environmental changes and disruptions affect human populations across the globe. Natural disasters, man-made catastrophes, and changes in weather patterns can dictate where and how one lives, or, in many cases, where one must migrate to sustain life. Lasting conditions such as drought, continual storms that lead to flooding alter the landscape and the ability for those living in these regions to sustain livelihood. Many areas of the world rely on agriculture and with changing environmental events, it becomes necessary for many to migrate to other regions, internal and international, to support their families. With these moves comes competition for, many times, already scares resources and culture differences that put a strain on local and state governments to maintain homeostasis. The cultural differences and increased human populations per square mile may create conflict that can affect homeland security efforts as well.

Environmental events that result in human population movement are not always involuntary. There are many pull factors that result in persons migrating from one region to another. Reduced opportunities for work and food in their homeland or region may cause large numbers of a population to move to areas where it is easier to maintain life. It is easy to understand political or internal coercive migration as a push factor but one must be aware of the drastic changes to a person or family's life that will result in uprooting or leaving family members behind to make a change one feels is the better choice for survival. As Kniveton et al. stated, "people and society are not and never will be affected by climate change; rather their lives and livelihoods are impacted by manifestations of the climate system, such as a lack of rain or a heat wave"[2]. The climate has been changing for millions of years. It is not the changing climate itself that causes human migration but the impact the change of climate has on environmental and social events.

Long term issues that will affect numerous areas of the globe are rising sea levels due to ice melt and erosion caused by rapid encroachment along coastal regions. Many before uninhabited areas along the coast have been occupied over the past century or more and rising sea levels will cause much of this to become uninhabitable. An example of this will be presented in the next section using Hurricane Katrina in 2005 in New Orleans as a case study on how a city that is largely built at or below sea level and protected by man-man structures can result in a major disaster when severe storms alter the landscape. To make matters worse, the coastal communities and hurricane vulnerable areas of the U.S. include over 80 percent of all counties that have a population the live in persistent poverty (more than 20 percent) over the last three decades[3]. These socioeconomically challenged areas have fewer formal pre-post catastrophic event evacuation plans thus resulting in residents moving to other parts of the country to survive.

Scientists warn that the potential for extreme weather conditions will increase as well as the intensity of such as the climate begins to change. This poses a threat to homeland security agencies as they manage all aspects of the critical infrastructure and how this can affect energy resources. As was seen during Katrina, branches of the military will be forced to respond to both the disaster site as well as evacuee target locations as local officials will be overwhelmed by the human migration. The military may be used to provide security for human populations as well as provide security to food and water resources. This becomes an important aspect of national security as roads, airports, bridges, and other vital parts of the infrastructure become compromised post-natural or man-made disaster. The vulnerability to security threats both domestic and international makes nations less protected during these events. Additionally, energy resources in the Gulf of Mexico drive much of the economy and provide fuel and oil for electrical grids, water plants, and other vital parts of the infrastructure. Should environmental changes increase in frequency and intensity as warned, the disruption of these energy sources handcuffs rescue and aid efforts on all fronts.

This article will include a brief history of hurricane Katrina and how it devastated New Orleans and other parts of the Gulf Coast. More importantly, the catastrophe will be discussed by applying the exogenous shock thesis, showing how the event led to complete governmental breakdown. Used frequently in economics to explain sudden downturns and the effects of natural disasters and their havoc on social and economic entities, exogenous shock will be examined from a homeland security aspect insofar as disaster pre-planning and post-reaction to the environmental changing event. The significant

[1] Ban Ki-moon, "Maintenance on International Peace" https://www.un.org/sg/en/formersg/ban.shtml 2011.

[2] Kniveton D, Schmidt-Verkerk K, Smith C, Black R (2008) "Climate Change and Migration: Improving Methodologies to Estimate Flows", IOM Migration Research Series 33. Geneva: IOM.

[3] American Security Project. 2014.

negative effects of exogenous shock from disasters create conditions to which administrations have little foresight or control. It is hypothesized that administration and management of homeland security agencies are weakened by exogenous shocks that affect their infrastructure due to the rapidly digressing conditions during and after natural and man-made disasters. This breakdown affected local evacuees and those who were forced to migrate to other regions of the country alike.

Exogenous Shock

This paper is using exogenous shock as a foundation to explain how and why things go awry in the aftermath of catastrophic events. With this, an explanation as to exactly what exogenous shock is and how can it be applied to homeland security agencies defaults and natural disasters. Although developed originally as an explanation to economic pitfalls in the aftermath of crisis, exogenous shock thesis can be used to explain how these agencies may be caught off guard when sudden hazards come their way.

Varangis et al. include that there is "no consistent definition of shocks" to a system. Reasoning to this is that what defines an exogenous shock to a city, state or nation is a matter of how the shock affects the entity[4]. They explain that "shocks may be defined as a significant change in the value of a variable from its underlying trend"[5]. To make this thought clearer, shocks are those things that defile the norm in extreme situations. This is not the same as an ongoing condition to which the agency or entity has time to prepare. Shocks are instances of extreme volatility,[6] "a deviation from a normal, expected, trend that is unanticipated or exogenous, resulting in significant negative effects or impact"[7,8,9].

It is thought that the term exogenous shock came from the writings of Martin Pawley in the early 1970's. He included that "the great energy crisis began on 6 October 1973… It is what economists came to call an 'exogenous shock' to all the economies of the Western World"[10]. Peter Heather used the term in his book when describing the fall of the Roman Empire when he argues that the Roman Empire collapsed suddenly but did not decline in a gradual manner... the Empire collapsed due to the exogenous shock of the barbarian invasions[11].

Boettke explains the how exogenous shocks affected the governmental system in Russia in his book[12]. He posits that "a large policy change preceded by an exogenous shock could move the system in the desired direction…and this exogenous shock in the form of an ideological revolution, a natural disaster, or an economic collapse can precipitate the regime change necessary for reform…then when an exogenous shock displaces the dominant group, changes can be made to the basic structural rules for governing a society"[13].

To reiterate, exogenous shocks are when an event has a significant negative impact on a system that is beyond the control of the agency or government entity[14,15]. While discussed in respect the economic and marketing literature, exogenous shock has been neglected in criminal justice writings. Patch included that exogenous shocks hit the system "like a hammer" and everyone is affected at the same time from the source[16]. This differs, per Patch, from endogenous shocks that are in place before the exogenous shock occurred[17]. Exogenous shocks in "life circumstances such as personal or natural disasters could sever a person's connections to family, jobs, or community" and have been shown to lead to future criminal activity[18].

Hurricane Katrina – Changing History

August 29, 2005, the southeastern portion of the United States prepared for one of the worst hurricanes to ever make landfall[19]. New Orleans has feared a major storm for some time due to aging pumping systems. Moreover, the levee system was in questioned as to whether it would keep more than a Category 2 hurricane at bay. On August 30, 2005, those fears culminated with levee breeches that filled up to 80% of the city with as much as 20' of water[20].

With cell phone towers, power lines, and land line communications destroyed across much of the middle Gulf coast, the flooding posed a more serious threat as citizens, police, firefighters, and all who lived in a large portion of New Orleans became prisoners of the swelling floodwaters[21,22]. With this, all government agencies afforded security

4 Varangis, Panos, Sona Varma, Angeloque dePlaa, and Vikram Nehru. Exogenous Shocks in Low Income Countries: Economic Policy Issues and the Role of the International Community. A paper prepared for the World Bank 2004.

5 Ibid

6 Ibid

7 Ibid

8 IMF 2006. The exogenous shocks facility (ESF). "International Monetary Fund", August, 2006.

9 Patch K (2004) Physics model predicts book sales. TRN, The Latest Technology Research News.

10 Pawley, Martin. The Strange Death of an Architectural Criticism: Martin Pawley Collected Writings. Black Dog Publishing, 2007.

11 Heather, Peter. The Fall of the Roman Empire. Macmillan 2005.

12 Boettke, Peter. Why Perestroika Failed. Routhledge 2005.

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14 Brudney JL, Hebert FT (1987) State agencies and their environments: Examining the influence of importnat external actors. The Journal of Politics, 49(1): 186-206.

15 IMF 2006. The exogenous shocks facility (ESF). "International Monetary Fund", August, 2006.

16 Patch, K. Physics model predicts book sales. TRN, The Latest Technology Research News, December 15-22, 2004.

17 Ibid

18 Ibid

19 Knabb RD, Rhome JR, Brown DP "Tropical cyclone report: Hurricane Katrina: August 2005". National Hurricane Center. Retrieved 2/15/2007 from http://www.nhc.noaa.gov/pdf/TCR-AL122005_Katrina.pdf (2005; Updated 2006).

20 Smith MR, Rojek J (2006) Law enforcement lessons learned from Hurricane Katrina. Department of Criminal Justice, College of Arts and Sciences, University of South Carolina.

and emergency management became inundated with crises. Many of the emergency calls went unanswered as emergency personnel could not get to callers or handle the situations due to lack of personnel, equipment, and facilities[23]. The police and emergency workers became as ensnared as the city.

The mass evacuation before the storm turned into chaos as thousands of people who refused to leave or had no way to leave became stranded[24] in attics, on roof tops, and wherever they could find refuge above the water line[25]. The Louisiana Superdome swelled with those fleeing the floodwater and later became a sweltering crime habitation[26]. With 25,000 plus persons confined in the Superdome with no electricity, running water, or air conditioning, reports of rape, robbery, and other violent crimes were prevalent[27]. Criminal justice organizations faced the daunting task of operating under extreme circumstances with field and communications equipment that were inadequate even before the storm hit New Orleans.

The evacuation of many districts in New Orleans was imperative as essential amenities became scarce and people were dying with each hour than went by. With tens of thousands of those displaced from their homes, the decision was made to move the displaced persons to other areas of the U.S. The 200,000 people that arrived in Texas had few belongings and little money or food to survive. Houston alone took in more than 150,000 evacuees[28]. These evacuees had few belongings as most of what was possessed was lost in the flood waters. Jobs, housing, and financial stability were needed to survive[29].

Hurricane Katrina was noted to have caused the largest human displacement in the history of the United States[30]. In a seemingly ever-changing climate over the past few decades, environmental disasters have resulted in more populations being forced to migrate as each year passes. With these migrations comes differing backgrounds, cultures, mores, and values that increasingly alter the way governments must prepare for the influx of population as they affect natural and civil resources. As a large portion of the world's population live or vacation near coastal regions, large populations become more vulnerable to harmful experiences when disaster strikes are sure to increase.

Vulnerability

One thing that must be considered is that one does not have to live in a poverty-stricken area to be more vulnerable to events that may lead to human migration. One does not predicate the other but one must be factored with the other as resources to leave an area before catastrophic events happen are significant. There are also many other factors that come into play when examining push or pull factors of migration. Residents of New Orleans were vulnerable long before Katrina due to aging and failed pumps that were put in place to protect the city. Lower socioeconomic population exposure to the flooding resulting from the levee breaks was pronounced as a large part of the city that flooded included housing districts that were typically lower-income families. Blaikie et al. included that natural hazards only result in a disaster when they meet patters of vulnerability[31]. The citizens of New Orleans were exposed to a natural hazard from decades as they depended on man-made levees and pumps to prevent a disaster. The inability to cope with the hazard created a disaster that forced the movement of several hundred thousand people[32] [1].

Push factors that also make human populations vulnerable are that availability of income sources and how one is perceived socially in a society. Social disasters occur when a society becomes vulnerable due to long-term social failure or neglect of infrastructures that could result in emergency relief and post-disaster planning leaving few exposed to the hazards of the event. Social failures leave groups of people exposed to environmental changes and their vulnerability depends on the resources and coping mechanism capacities[33]. It is important to note that migration, whether voluntary or involuntary, is highly correlated with reducing the vulnerable characteristics of a society.

Migration

When one examines human migration, it seems simple at first glance. The group is either fleeing something or someone or moving towards a better way of life with assumed more opportunities. Ernest Ravenstein wrote the Laws of Migration and attributed migration to two processes[34] [2]. Push factors were in place to drive one to another region due to social or environmental hazards while looking for a more positive way of life. Pull factors are simply factors that attract one to another place for the same reasons mentioned above. Pull factors are not always economic as most assume. Lee, who furthered Ravenstein's work, included that push factors were generally economically motivated but could be hindered by terrain, distance, age, class, gender, education and family ties[35]. Some migration models refute that

21 Caputo M, Ovalle D, Bolstad E, Merzer M. "Hurricane Katrina pummels gulf coast". The Miami Herald, August 30, 2005.
22 Maggi, L. "Lack of communication during Katrina proved crippling". Times-Picayune, September 15, 2005.
23 Farber, D. "This isn't representative of our department:" Lessons from hurricane Katrina for police disaster response planning". Willoughby Anderson: Disasters & the Law, April 28, 2006.
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25 McCown, A. "Criminal justice issues and response times of disaster". Presented at the After the Crisis: Healing from Trauma after Disasters Expert Panel Meeting. National Gains Center 2006.
26 Caputo M, Ovalle D, Bolstad E, Merzer M. "Hurricane Katrina pummels gulf coast". The Miami Herald, August 30, 2005.
27 Fimrite, P. "On New Orleans' dark streets, patrols assume the worst. Martial law and poor communication lead to tense situation for one reporter. San Francisco Chronicle, September 9, 2005.
28 Hughes, P.R. "State sheds light on plight of evacuees". Houston Chronicle August 10, 2006.
29 Ibid
30 Ibid
31 Blaikie P, Cannon T, Davis I, Wisner B. At Risk: Natural hazards, people's vulnerability, and disasters. London: Routledge, 1994.
32 McLeman R, Smit B (2006) "Migration as an adaptation to climate change" Climatic Change 76(1-2): 31-53.
33 Ibid
34 Ravenstein EG (1885) "The Laws of Migration". Journal of the Royal Statistical Society XLVIII: 167-227.
35 Lee ES (1966) "A Theory of Migration" Demography 3(1): 47-57.

migration occurs largely on economic grounds as, in some cases, the wages at the target location were similar to what was available in their current setting and the migration slowed or stopped even when higher wages were available in destination regions[36]. The movement of a population is, of course, regulated by states and international borders thus becoming the major influence on how, when, and why migration takes place. These causes or restrictions are more likely to cause migration to increase or decrease with environmental factors rarely the main reason for people to move. It is generally a combination of social, political, and environmental issues that initiate migratory actions.

In recent times, migrations to larger cities has been increasing leading to more concentrated populations thus adding to the risk of cultural conflicts, natural hazards, and more scarce resources[37]. This is particularly evident in developing countries increasing the strain on civil and security personnel. As many large cities are geographically located along waterways or coastlines, the increase in immigrant populations only expands the risk of hazards and future disasters displacing many of the immigrant population once again. But not all environmental events or disasters are hurricanes, tornadoes, or floods. In large industrial urban areas, pollution, industrial accidents or alterations to the landscape through buildings, dams, or industrial plants can force migration. If a dam is build and several miles of previously occupied river bottom is flooded, the number of displaced persons would be great if near an urban area. Also, politically motivated disasters such as terrorism, war, or dictatorships can completely change the social landscape and induce migration. Although some of these events were not intended to cause relocation, the results of these acts often lead to displacing a population either temporarily or permanently depending on the lasting effects of the event.

Many of these environmental events are not exogenous shocks to a region or entity. The gradual process of environmental erosions takes place over many years or decades. In turn, terrorist activities, natural disasters such as violent storms and flooding, earthquakes and eruptions come without much notice thus shocking the system resulting in, many times, chaotic situations. With these rapid changes in one's environment, it is necessary for multiple humanitarian agencies to aid in temporary or permanent relocation whereas climate changes tend to be a much slower process leading to policy development and plans to avert the situations where possible. Migration must have an event or series of events to activate. Rarely does one single environmental incident cause the movement of a population. Many factors come in to play when examining why a group of people or move forcefully or on their own. Decaying social and economic factors or political oppression along with a shocking event can induce displacement. It is this process of change that can be correlated with human population movement or displacement.

The events that affect international migration and internal migration are similar but factors become more significant in international migration. Hugo reports that most people who migrate internally and leave an area due to an environmental event stay closer to home so they can return when order is restored[38] [3]. He also included that it is becoming easier to migrate internationally due to more countries cooperating through migration treaties and social networks set up to assist in resettlement of migrants in end-point countries[39]. Additionally, with increased global business, trade, academic institutional reciprocation, and agreements between like-minded nations, international migration will become more easily accomplished and accepted. Also, per Hugo, as countries recognize the reduction in coastal land due to rising sea levels, the pressure to assist, where possible, by way making migration accessible, becomes more evident[40]. As social networks bring crisis events to the forefront in short order, the willingness of global support is paramount to developing target destinations when adversity occurs.

Conclusion

Climate change is threat that brings many aspects with it. The costs of climate change can be seen around the world with harsher weather patterns, more violent storms, torrential rainfall causing widespread flooding, and the list goes on. As the globe fights back, human populations will continue to migrate to safety, better living conditions, and a perceived easier way of life. The average number of natural disasters across the world has increased from 100 in 1975 to over 400 in 2007[41]. No region is immune to these shocking events that displace hundreds of thousands of persons each year. As cultures and people migrate, threats to national security become imminent. Heavy burdens are put on homeland security agencies, states, and countries on all corners of the earth. As numerous places are already under pressure to provide enough food and shelter for their own citizens due to continual long-term drought, additional people can push marginal states to the brink allowing security threats to flourish. Add the potential for an exogenous shocking event such as a terrorist attack, typhoon or a large hurricane, and massive global immigration could ensue.

Climate change and migration can also affect human health as more people are living close together with warmer temperatures affecting air quality and allowing outbreaks of once-limited diseases such as Malaria. These diseases can get into the food and water supply leading to widespread illness or death. With air quality declining each year and warm winters allowing mosquitoes and other insects to thrive, health concerns across the world are a reality.

How environmental change affects migration should be at the forefront of international governments and a strategic plan to account for potential human displacement put in place. Regions that are especially susceptible to disasters and catastrophic events should create policies and pre-post disaster planning not only during the event but what to do in the case of large migrations of humans looking for safety or livelihood. Countries and agencies working together to create collaborative plans will allow for solid policies to be better prepared when hazardous conditions or disaster strikes. It is not a matter of if but only a matter of when. As the environment continues to change,

36 Massey DS, Arango J, Hugo G, Kouaouchi A, Pellegrino A, Taylor JE. World in Motion. Understanding International Migration at the End of the Millennium. Oxford: Oxford University Press 1998.

37 Ibid

38 Hugo G (1996) "Environmental Concerns and International Migration" International Migration Review 30(1): 105-131.

39 Ibid

40 Ibid

41 EM-DAT, OFDA/CRED International Data Base, http://www.emdat.be/ 2007.

the influence it has on migration will demand proactive efforts by everyone to be prepared.

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This article was originally published in a special issue, entitled: **"CSpecial Homeland Security Issue",** Edited by Anthony N. Celso