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The Terrorists of Nature Around Japan

Japan is a beautiful country known for its anime, technology, rich and preserved history and structures over thousands of years. It was considered #2 out of 80 countries overall in a combination of entrepreneurship, heritage, culture, and quality of life among other things in 2019 (U.S. News, 2020). “There are currently 23 world heritage sites in Japan, 19 cultural ones and 4 natural ones” (Japan Guide, 2020). It is known for being one of the most peaceful countries in the world as it is ranked ninth place out of 163 countries in the Global Peace Index (Statistics Times, 2019). However, in all of its beauty and peace, Japan faces an imminent national security and economic stability threat. I had an opportunity to work directly with various ministries and organizations around the country and nothing can escape this ultimate truth. There are “terrorists” planning their

next attack on the country and there will be another near to or worse than ever seen before. These so-called “terrorists” are not from the likes of ISIL or Al-Quaida. These “terrorists” are camped off of Japan’s coasts, her rivers, and the top of her mountains. These terrorists are from natural disasters.

The next big disaster could strike “within the next 30 years could cause ¥1.4 quadrillion (\$12.8 trillion) in damage to the economy” (Kyodo, 2018). One must ask if Japan is prepared for not if, but “when” this terrorist will strike again. This report will examine-through research and first-hand experience-the history of Japan’s natural disasters, how disasters have crippled Japan similarly, if not worse than terrorist attacks and wars in general. Japan has a cocktail of misfortune when it comes to land and demographics that ultimately lead to a need for a “whole of government” policy development and strategy geared toward mitigation all of these threats. We will look at how demographics and policies combined will amplify the next projected disaster and finally, provide options to improve Japan’s situation to predict, respond, and fight back at these disasters.

Japan is an island country that consists of 6,852 small islands spanning from the southwest and northeast stems of its mainland (Ministry of Land, Infrastructure, Transportation and Tourism (2007). This provides for wonderful opportunities in fisheries

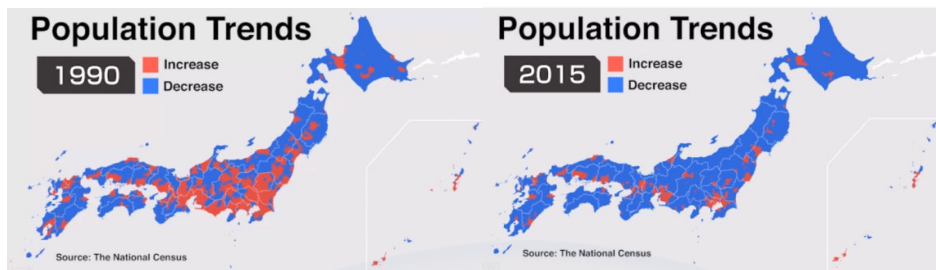
and various ports for international trade. On the other hand, there are 4 major tectonic plates: the North American Plate, Pacific Plate, Philippine Sea Plate, and Eurasian Plate grinding around and through the region. There are also two troughs and three trenches. The Nankai Trough spreads from the southeast of Kagoshima through near Fuji city- intersecting with the Sagami Trough. The Sagami trough drives straight through the middle of the country from Shizuoka Prefecture to Nigata Prefecture. Approximately 37 miles from the intersection point of the Nankai and Sagami Trough lies Mt. Fuji. Mt Fuji is an active volcano that has not erupted since, “December 16, 1707” (National Geographic, 2020). “More than 300 years, he pointed out, have elapsed since the last eruption in 1707, an eerily long silence that surpasses the previous interval of around 200 years (Osaki, 2020). This means that Fuji is over 100 years past due for an eruption. Japan’s volcanoes and surrounding plates are not its only enemies; there is also the issue water, whether it is from its coastal seas or lakes.

Japan’s urbanization and concentration of population is causing disasters to become deadlier and harder to recover from. Japan’s surrounding seas allow plenty of access to river water that has led to optimal locations for population growth and bustling cities. However, barriers to holistic habitation from the Japan lie with the fact that only 33% percent of their land is habitable (Fujimoto, 2015). Due to these restrictions, the

people appear to have no choice but to straddle coasts or live in the equivalent of bowls of habitable land surrounded by mountainous terrain. When the terrain forced the Japanese population to these areas, industries also followed suit. Osaka, Tokyo, and Hiroshima, for example have bustling ports ripe for tourism, international production, and technological corporate giants. The Tokyo metropolis alone is home to 38 million inhabitants, which is the densest population in the world (Galka, 2015). However, a continued drop in coastal sea levels is ongoing in places like Osaka, as ground water is pumped for industrialization along coastal factories.

On top of only 33% of land being habitable in Japan, Japan's slump of a working-age population has led to it being susceptible to more deadly disasters than normal due to even more urbanization. The National Institute of Population and Social Security Research estimates that Japan's population will shrink 'from 125 million' to about 106 million in 30 years" (Aizawa, 2019) due to the declining birth-rate. Employers are pooling working-aged workers from rural areas into the major cities to keep major industries afloat due to Japan's projected plummeting birth rate 15% drop. This is not the only population concern as provisional February, 2020 estimates show that 29% of Japan's population is age 65 and above (Statistics Bureau, Ministry of Internal Affairs and Communications, 2020). Three out of every ten people in Japan are at or above

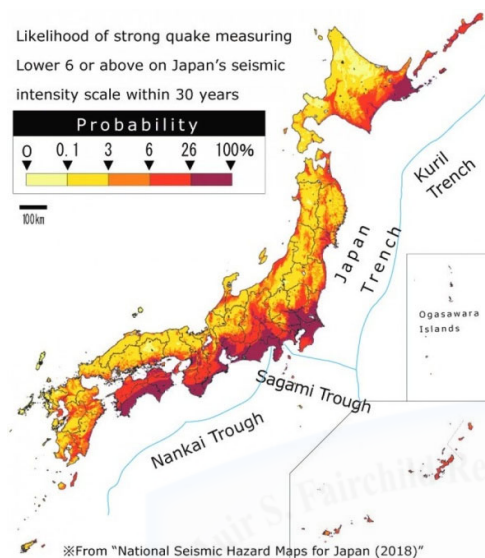
retirement age. Doubled with this, Japan's average life expectancy is second in the world to Hong Kong at about 85 years (Worldometer, 2020). It's five more than compared to the United States.



The demographics play an important role as the deadliness of a disaster can have a strong relation to the ability of the population to quickly react when alerted to impending disasters. If workforces shrink, populations are congested, and the population is unable to rescue themselves, the country has to have a strong strategy to combat this.

Luckily, Japan is no stranger to country-crippling natural disasters. In Japan's known history several major natural disaster events have occurred with the most recent catastrophe being the Higashi Nihon Dai Shinsai or Great Tohoku Earthquake. The Great Tohoku Earthquake struck the country on March 11, 2011. It was caused by a plate shift 45 miles (72 kilometers) east of Tohoku, at a depth of 15 miles (24 km) below the surface that produced a magnitude 9 earthquake (Oskin, 2017). This combination of event

culminated in approximately 120,000 buildings destroyed, 15k deaths, and damage to the Japanese economy was approximately 200 billion US equivalent dollars (Oskin, 2017).



Japan is still recovering from this disaster.

The death toll in this situation was slim compared to forecasts of if a similar magnitude earthquake was to happen in the major large cities like Tokyo or Osaka. Forecasts show the impact of the next major earthquake is expected to dwarf The Great Tohoku Earthquake with an

Note* Lower 6 is enough for people to not be able to maintain balance and damage buildings and offices.

impact liken to war. According to the Disaster Preparedness Tokyo handbook, there is a 70% chance that an earthquake will strike the Tokyo

Metropolis within 30 years (Tokyo Metropolitan Government, 2015). The worst-case projects show 23 thousand people deceased, over 1 million buildings collapsed or burned, and approximately 8 million people without homes, totaling 860 billion dollars in damage (JASDF Air Support Command Headquarters, 2019). ,

This is still not Japan's greatest fear. Also predicted to occur within the next 30 years is a Nankai Trough earthquake, which would spell catastrophe to all of Japan. As

previously mentioned, due to the scarcity of habitable land, Japan sees a majority of its people aligned along its coasts. The two major cities, Osaka and Tokyo, reside parallel to this trough and this compounds the deadliness when this tremor awakens. According to disaster prevention plans from the Air Support Command Headquarters in 2019, they project approximately 320 thousand deaths, 2 million homes destroyed, almost 10 million refugees, and 220 trillion Japanese yen or 1.9 trillion USD in damages resulting from a 9.1 magnitude earthquake and tsunami. Comparatively, 58,000 Americans died over 21 years in the Vietnam War (Spector, 2020). The COVID-19 virus took approximately six months to reach 300,000 deaths worldwide, whereas Japan's predictions are based on the impact of an earthquake and tsunami over a few days (Picheta, 2020). This is not the worst of the situation. If this feared magnitude 9 earthquake happens, the 4 impacted nuclear power plants could incur waves up to 30 high. The waves are what caused the nuclear meltdowns in Fukushima after the 2011 earthquake. The Fukushima nuclear power plants beared tsunami waves over 15 feet high but were only rated to endure 10. To make things even more severe, it is possible that such an earthquake would trigger an explosion of Mt. Fuji.

An earthquake was likely to have triggered an eruption of Mt. Fuji before. According to a report from the Japan Times, "the 1707 Hoei Eruption was likely triggered by a

magnitude 8.6 earthquake that struck south-central Japan 49 days earlier, Kamata believes there is a high likelihood that a magnitude nine Nankai Trough earthquake — should it happen in the near future as forecast by the government — would do the same” (Osaki, 2020). In Mt. Fuji’s history, it has by its own means been a threat to the country. According to an Osaka crisis response headquarters deputy director, there is not much they can do to train for a volcano. Based on forecasts of the next earthquake, 1.5 cm of ash would rain down on central Tokyo however, only 0.2 to 0.4 mm of ash would possibly result in airport shutdowns” (Jiji, 2019). An economic loss of up to ¥2.5 trillion is expected” (Osaki, 2020). This approximate 23 billion dollar estimate is if Mt. Fuji were to erupt and does not include other financial estimates from an earthquake. Due to the wind projections, they wind blow the ash westward as far as Tokyo and leave several inches of ash across farmlands, buildings, and coat exposed vehicles; to include trains. Volcanic ash is not like normal smoke. It is more like glass. It is deadly to human lungs, it does not evaporate, and it has the potential to collapse buildings.

From my research at Disaster Prevention Solutions and IHI, the company that manufactures engines for various military aircraft, and the Tactical Rescue Squadron, evacuations under ash cover will be nearly impossible. Flight and driving capabilities will continuously deteriorate until the vehicles are destroyed from the ash. Simply put; a

Nankai Trough Earthquake followed by the eruption of Fuji would be a natural disaster worse than anything any country has ever seen. It is no wonder that any of these situations could be more severe than terror attacks on Japan's society.

US Terrorism Response

The September 11, 2001 attacks on American soil and following War on Terror changed US terrorist response, policy, and countermeasures forever. The Department of Homeland Security may seem like an organization that has been around forever, but it was directly established in response to 9-11. America saw the need for tightened security and developed the Transportation Security Administration or TSA, which has become the travel standard worldwide today. Also, the Federal Emergency Management agency was placed under this umbrella to include not only support for natural disasters, but terrorism response as well. From 2001 to 2020, the US has spent approximately \$6.4 trillion on the War on Terror (Brown University, 2020) because they understood the importance of national security and the need to mitigate or eliminate this ominous threat. 7014 military and 22 US civilians have died combating terror (Brown University, 2020). This is only about 2.5% of publicly projected deaths in Japan. In other words, Japan needs to invest strongly into combating this virus and unifying as a nation if they are going to overcome

this imminent threat.

Japan's Way Ahead

There is still hope for Japan. Its cities, prefectural governments, and ministries are all preparing for the worst in an all-out response effort from all levels. Japan offers many disasters prevention centers to help educate and train citizens and foreigners of all ages against the dangers of a major earthquakes. The local fire departments host fire prevention festivals to teach firefighting and prevention techniques to the local populations. The Fire and Disaster Management Agency has adopted a culture of “Jijo Kyoujo Koujou”, which translates to Self Rescue, Local Rescue, Government Rescue. This trend emphasizes the importance of the population to be trained in self rescue and evacuation in order to rescue and evacuate other citizens in the community. After they have taken action as quickly as possible, the government will then step in to carry out the rest. The worry is that from the ever-shrinking working age population, there will not be enough emergency response forces to help all of the youth and elderly in a timely manner.

Following a major disaster, it could take at least a week for prefectural and federal response forces to organize and respond as I learned from watching exercises in Japan. I went to Osaka to see an annual exercise focused on the illustrated Nankai Trough

Earthquake scenario. The exercise showed that the prefecture has closely studied and trained on the impact of the scenario, but it seems like there is still a division of responsibility when it comes to natural disaster response and nuclear disaster response as nuclear was not included or considered in the exercise—even with nuclear disaster experts in the room. The Self Defense Force, Fire Disaster Management Agency, and Prefectural offices did not consider the eruption of Fuji a threat in any of their plans that I saw or in conversations with their disaster representatives. However, The National Police Agency did consider the eruption of Fuji a threat. Otherwise, the integration of the other ministries appeared strong.

Japan already has a model organization that bridges cooperation between the top rescue and medical personnel across their fire and police departments at Japan International Cooperation Agency (JICA). JICA is an organization that responds to disasters worldwide by training and dispatching local rescue professionals abroad within 48 hours. However, this organization does not respond to disasters within Japan. The issue with Japan's internal disaster response now is that there is no permanently stood organization that is ready to respond to a disaster anywhere in the nation. This can be seen during Japan's handling of COVID-19. Instead, they await a request from local governments to prefectures, then prefectures to the federal government before standing

up a crisis response center. JICA is a permanent operations, so they have the history of international disasters, breath of experience, logistical capacity, and annual training to develop lessons learned and improve.

When it comes to the tactical execution of prefectural crisis response centers, I visited the 2018 landslide disaster site in Kure, Japan. When I spoke with teams who directly conducted the rescue operations, they stated that their roles and responsibilities as fighter were clear, but their training, communication, equipment, and manpower differed from the Japan Self Defense Force and Police Forces. Their city and prefectural cooperation at headquarters is relatively strong, but on the ground coordination remains complex. If they had shared training and resources similar to FEMA, or Japan International Cooperation Agency, it would improve their ground level response to disasters.

Another thing to note about Japan is instead of America's all-inclusive 911 emergency call line, they use 119 for fire, ambulance and rescue while 110 is for police. Citizens can sometimes be confused during disasters that cross both lines. This also causes the potential for issues in communication when transferring calls or receiving duplicate calls or requests from victims.

The Ministry of Defense relies heavily on its Japan Ground Self Defense force for its manpower and mobility in disaster response. They have various amphibious vehicles,

some which can even function on volcanic rock. The Ministry of Defense has multiple exercises a year on disaster response. The Joint Staff planning leadership considers the US a vital asset in its disaster relief planning. They also conduct Joint Exercises like Yama-Sakura and apply lessons learned from Operation Tomodachi, the operation where US forces supported Japan in their rescue recovery operations after the Great Tohoku Earthquake.

In October of 2019, I observed a medical transport exercise hosted at Iruma Air Base by the Disaster Management Assistance Team (DMAT). Their critical care skills are superb and it was visible that the DMAT personnel across the board were veterans of emergency medical operations. They were not alone in the exercise. Japan Air Self Force's (JASDF) medical personnel participated, but they were primarily in the role of patient transport and recovery rather than actual care. However, it should be noted that a majority of the JASDF personnel were new to the force and this was their first exercise. As an Air Force Officer, we learn a lot about Self-Aid Buddy Care or SABC. This is how we learn to sustain life-threatening wounds until casualties can be transported to a hospital. This is not taught in JSDF's National Defense Academy or in JASDF's OCS. As long as I can remember, it has been in the Air Force officer curriculum and hands-on SABC has been implemented in all Air Force commissioning sources.

Nevertheless, this type of care is taught to core Japan's rescue, medical, and disaster relief personnel and expansion to all JASDF force's schools is being considered by leadership per conversations I have had with Air Staff.

Iruma Air Base is soon to become the central hospital for the JASDF when it comes to mass patient care and transportation. The intent is for any earthquake that might occur in the Kanto region, in effort to streamline mass evacuation and transport, they would push them through Iruma Air Bases'hospital. It is currently under construction and generator support for up to two months after a power outage. (REFER TO PERSONAL NOTES). In summary, there are many things Japan is doing to counteract the threat of these disasters at all levels, but there is considerably much more the country could be doing to counter these natural enemies.

Proposal

I recommend the country start by putting disaster prevention and response at the forefront of its policies and actions by creating a Ministry of Disaster Response (MDR) or Disaster Response Agency (DRA). If it were an agency, it would lie within the Ministry of Internal Affairs. Major disasters affect every single other ministry directly, so it would only make sense to have one dedicated to this function. I equate this to the justification the Air Force poses for creating a Space Force, because in this domain, all other domains

become obsolete if not emphasized enough. The creation of this ministry would mean an integrated response on all disasters in Japan from the top down and a mix of permanent, dedicated staff that could research, plan, exercise and innovate.

Manpower is easily considered when thinking of all of the other ministries that dedicate manpower specifically to disaster support. I have done fellowships with the Japan Police Agency, Fire Disaster Management Agency, The Ministry of Defense, and multiple prefectural and city offices. All of these areas dedicate manpower to the development of disaster plans, terror response, rescue operations, etc. I imagine personnel would be pooled from all of these functions to work with MDR/DRA.

I highly recommend the finances work similar to FEMA's funding. FEMA receives 18 billion dollars annually and unlike other functions, the money rolls over to the next year if unused. This makes complete sense because no one knows when the next devastating disaster will arise. It allows the country to come back with a stimulus similar to the housing market crash of 2008 if the timing aligns properly. I suggest that the activation of this agency comes at the request of prefectural governors or at the request of the prime minister, whichever comes sooner in case there are delays in communication from the disaster. Provisions will not only be for natural disasters, but terror attacks as well. With the development of MDR/DRA, there also comes a country-directed focus on

innovation and technology when it comes to disaster relief.

The number one piece of technology that is needed in Japan is earthquake predictive technology. There is technology for a response technology after an earthquake occurs, but if the world can develop the ability to accurately predict the location, severity and trajectory of an earthquake. "The average response time of the earthquake early warning system in China is 6.2 seconds now, 30 percent quicker than Japan, which is nine seconds," Wang Tun, head of the Chengdu-based Institute of Care-life, which specializes in earthquake early warnings, told the Global Times on Sunday. (Xi, 2019). Consider what the world was like before we could detect a hurricane or typhoons path and severity. The first U.S. hurricane warning occurred when the U.S. Army Signal Corps warned of a hurricane threat on Aug. 21, 1873 (Williams, 2013). They mentioned that as storms were initially projected for the US, weather forecasters were hesitant to call hurricanes, hurricanes because of the panic that it would cause the citizens (Williams, 2013). Because of this, a 1900s Category 4 hurricane caused approximately 8,000 deaths (Williams, 2013). Keep in mind, the Category 5 hurricane Katrina only caused 1,833 deaths.

This technology would be an expensive and lengthy venture, but if this country can create this capability, I can equate it to the next "Industrial Complex". This technology could be sold to all around the world and lead to multiple other innovations as effects

similar to US military-led innovations. Another technological enhancement to boost Japan's ability to respond to disasters could come through digital disaster "wargaming". As a military member, it can be hard to understand integrated military operations without being a part of and practicing the operation regularly. This is not possible when training exercises can be expensive to organize and equip. If Japan were to create command post exercises with visual simulations of various disasters and human command based responses, people could get a semi-realistic idea of death counts over time, where the weakpoints are in manpower and understand the various support functions available to them. The US war gaming program I think of is called, "Modern Air Power".

Finally, I believe Japan should be the center for disaster research and development because of its susceptibility about to every strain of disaster in the world. I recommend Japan make a large push for research and education in disaster related fields by creating disaster studies degrees, recruiting foreigners and top researchers to come to Japan to develop technologies with the promise that they have their school stipend, and post-work opportunities in Japan.

CONCLUSION

Japan is a beautiful country with rich history and culture, however it is also rich with terrorists in its seas, mountains, cities and waters. Japan's has so many natural disasters, it becomes a financial and physical barrier to the country's ability to thrive. It's demographics also present a barrier to the ability for Japan to fight against the next big events-to include the Coronavirus the world is dealing with right now.

The most serious threat that is projected to occur in the next 30 years is a Nankai Trough or Southern Japan large-scale earthquake more deadly than the Great East Earthquake by far. Approximately 320,000 deaths in a matter of weeks is something war, terrorism, and even viruses could not fathom, but this is what Japan's government officials are preparing for.

However, there are ways Japan can not only prepare, but take advantage of its difficulties. Just like the US has become the standard for worldwide military operations, Japan has the opportunity to be the standard for disaster relief and prevention. It starts with things Japan already does by developing their focus on educating their population on the severity of nature around them, and incentivizing their people to develop new ways to prevent, detect and project disasters before they happen. Japan also should reorganize their government to have a permanent office that specifically handles disasters similar to the US' Federal Emergency Management Agency. Japan's current federal structure has

no central entity to handle disasters until the time they occur and after they can confirm the severity of the event. This is unacceptable when hours passed directly equate to lives lost. Japan then can benefit from being a the model for the rest of the world to handle crises before, during and after these terrorists in nature appear.

Captain Branden J. Turnbough is a Mansfield Fellow at Air War College. During the year-long Fellowship Program, Mansfield Fellows participate in a seven-week intensive Japanese language program in Ishikawa Prefecture and ten months of placements, primarily in Japanese government agencies in Tokyo. By working side-by-side with their counterparts in Japan's ministries and agencies, National Diet, and non-governmental organizations, the Fellows will deepen their understanding of Japan's government and policymaking process.

Captain Turnbough is a 2012 graduate of the University of Houston, and entered the Air Force through the Reserve Officer Training Corps after earning his Bachelors of Arts in Media Production. He has 7 years of service. Prior to his current position, the captain served as Assistant Director of Operations for Training, Captain Turnbough led instructors of student flights of up to 16 candidates through an Officer Training School Commissioning Program for approximately 1,300 Active Duty/Reserve/Air National Guard officers annually.

EDUCATION

2012 Bachelor of Arts, in Media Production, University of Houston

2013 Logistics Readiness Officer Course, Lackland AFB, Texas

2016 Academic Instructor Course/Instructor Qualification Training, Maxwell AFB, Ala.

2017 Master of Arts in Education, Adult Education and Training, Trident University, Calif.

2018 Squadron Officer School, Maxwell AFB, Ala.

ASSIGNMENTS

1. November 2012–November 2013, Officer in Charge, Asset Management Section, Yokota Air Base, Japan
2. November 2013–September 2014, OIC, Fuels Information Service Center, Yokota AB, Japan
3. September 2014–September 2015, OIC, Plans and Integration, Yokota AB, Japan
4. September 2015–June 2016, Flight Commander, Combat Mobility Flight, Yokota AB, Japan
5. June 2016–October 2017, Flight Commander/Instructor, Maxwell AFB, Ala.
6. October 2017–May 2019, Assistant Director of Operations, Training, Maxwell AFB, Ala.
7. May 2019–June 2020, IDE Mansfield Fellow, Maxwell AFB, Ala.
8. June 2020–Present, Flight Commander, Deployment and Distribution, Kunsan AB, Korea

MAJOR AWARDS AND DECORATIONS

Air Force Commendation Medal

Air Force Achievement Medal

EFFECTIVE DATES OF PROMOTION Second Lieutenant August 3, 2012

First Lieutenant September 17, 2014

Captain September 17, 2016

OTHER ACHIEVEMENTS

2018 AETC Master Instructor Badge

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