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The Forgotten Narratives of Fukushima

ヒューマンエラーとリスク社会における人々の回復の軌跡:

忘却された福島のナラティブ

A dissertation submitted in partial satisfaction

of the requirements for the degree of

Doctor of Philosophy in Urban Planning

by

Yoh Kawano

2020

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2020

ABSTRACT OF THE DISSERTATION

Human Error and Human Healing in a Risk Society:

The Forgotten Narratives of Fukushima

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Doctor of Philosophy in Urban Planning

University of California, Los Angeles, 2020

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Every year, on March 11, the nation remembers the tragedy that happened in 2011. For one day, the media is engulfed with stories of survival, heroism, tragedy, lost loved ones, parents still searching for their children's remains, evacuees seeking compensation. But on any other day of the year, these stories are forgotten, only to resurface again a year later. But while stories of grievances over a natural disaster persist, a different type of disaster has a different type of narrative. Human error—design flaws, regulatory failures and improper

hazard analyses— was largely to blame for the calamity that beset Fukushima's coastal communities a day after the tsunami had ravaged its towns. Just when a community had awoken from the worst possible nightmare of their lives, an even more unimaginable accident was transpiring: the nuclear power plant in their neighborhood had just exploded, resulting in the immediate evacuation of their shattered homes. Why was a nuclear power plant built in their backyard? And had its presence over the years outweighed the terrible consequences it had now created?

When I first met Tokyo Electric Power Company (TEPCO) Vice President Yoshiyuki Ishizaki on December 15, 2014, he articulated the great strides his power company had made since the harrowing days of the March 11th, 2011 catastrophe. He spoke candidly on how the antinuclear federal administration—led by the Prime Minister at the time, Naoto Kan—had stormed into his office demanding explanations, eager to put the blame squarely on the owners of the nuclear plant. He hinted on the federal government's desire to disassociate themselves and absolve responsibility from any damage caused by the multiple explosions at the power plant. This relationship between Japan's political factions, the general public, and the nuclear industry has a long history of contestation since nuclear energy was first introduced in the 1950's. It was supposed to be a way, or rather *the* way out of the imprint of devastation left from the ashes of the Second World War. And yet, how can the only country in the world to be subjected to the horrors of the nuclear bomb pave a future that depends on an energy source derived from the very weapon that annihilated its cities? This dissertation is an exploration of the narratives that are born through human error. I examine how marginalized populations perceive risk and investigate the various

factors that have contributed to Japan's embrace of nuclear energy.

毎年 3 月 11 日になると、国民は 2011 年に起きた災害のことを思い出す。この日ばかりはメディアも惨事で生き残った人々のこと、様々な武勇伝や悲劇、亡くなった人たちのこと、我が子の遺骨を今も探し続けている親のことや、補償を求める避難者たちのことを伝える。しかしこの日が終わると一年後のこの日までまた忘却の彼方へと消え去っていく。自然災害には悲嘆はつきものだが、それは災害の種類によっても形態が異なる。津波が町を襲った翌日に福島の沿岸地域で起きた大惨事は、設計ミスや規制の不在、不適正な危険分析などのヒューマンエラーによるものである。津波という最悪の悪夢から目覚めた翌日に、町の人々は更に想像を絶するような災害を経験した。原子力発電所が爆発し、町民は緊急に避難することを強いられたのである。そもそもなぜ原子力発電所が町のすぐ近くにあったのか。そして長年に渡りそこに存在してきた利益は、今回のような最悪なリスクを上回るものであったのだろうか。

私が 2014 年 12 月 15 日に当時の東京電力(TEPCO)の副社長であった石崎芳行氏に初めて会った時、石崎氏は 2011 年 3 月 11 日に起きた大惨事から東京電力がいかに躍進してきたかを語った。石崎氏は、当時の菅直人首相率いる反原発政権が事故時に東京電力本社へ乗り込み、説明を求め責任を押し付けたことをざっくばらんに話してくれた。石崎氏は、当時の政府が爆発による被害のいかなる責任をも回避しようとしていたことを仄かした。この日本国内の政治派閥、国民、そして原子力産業の論争の関係性は、原子力が初めて日本へ入ってきた 1950 年代より長く続くものである。原子力の導入は第二次世界大戦後に国が再度立ち上がるための手段でもあった。しかし、世界で唯

一原子爆弾の脅威に晒され町を破壊されたことのある国が、その未来を同じ原子力に託すことができるのであろうか。この論文はヒューマンエラーによって生まれたナラティブに焦点を当てたものである。周縁化された人々がいかにリスクを捉え、また日本の原子力依存に加担する様々な要素を考察する。

The dissertation of Yoh Kawano is approved.

Karen Umemoto

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University of California, Los Angeles

2020

To Fukushima

In loving memory of Leo "El Profe" Estrada and Mayor Tamotsu Baba

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Acknowledgments

A PhD is not possible without the support of many. My interest in disaster ethnography began with a simple phone call from Muli Amri, who invited me to Indonesia to visit Banda Aceh in 2005. There, we witnessed the humility of the human race in the face of catastrophe. In 2011, Yugo Shobugawa, a medical doctor from Niigata University, took me to the East Coast of Japan, a coastal area that had just been ravaged by an earthquake and tsunami. Herein begins my journey into Fukushima with a group of volunteer scientists and medical doctors from Niigata University driven by altruistic purposes: Makoto Naito, Jun Goto, Yoshihiro Amaya, Yoshinori Katsuragi, Shigeru Hirayama, Hagiko Aoki, Yuka Iwasa, Tomoko Saitoh, Mayumi Nishikata, and the entire Team BISHAMON and Team SASADANGO.

In beautiful Hamadori, the coastal region of Fukushima, I met countless individuals with hearts of gold. First and foremost, my *Okamisan*, Tomoko Kobayashi, the spirited owner of Futabaya Ryokan, where many a summer I spent as my hub to conduct my research. I thank many others who welcomed me with open arms, including her husband Take-san, Noriko Takahashi, Junichi Iwasaki, Kajuto Sugita, Yumie Keller, Koichi and Sachiko Nemoto, Noritomo "Gūji" Nishiyama, Sachiko Bamba, Masami Yoshizawa, Satoshi Shirato, Yuichi Suzuki, Jun Hori. A special thanks to Chihiro Sato, who finally succumbed to my persistent calls for participating in my research, providing the much-needed youthful voice to this research; Sueko Shimokobe, who showed me what life is like in a shelter, and always welcomed me with a genuine smile; and to nappo whose beautiful voice has rejuvenated so

many people who have suffered. I thank the two city mayors, Katsunobu Sakurai and the late Tamotsu Baba, who graciously offered their time to talk to me and share their thoughts on place and the anguish they felt leading a city after a disaster. I express much gratitude and respect to TEPCO's former Vice President, Yoshiyuki Ishizaki for guiding me around the nuclear power plant, for an unlikely friendship, and for always making the time to meet me.

I thank the University of California, Los Angeles, for providing me with a purpose in life for the last 25 years. The Technology Sandbox, my sanctuary and its crew from past and present are like family to me: Lisa Snyder, Albert Kochaphum, Hannah Gustafson, Francesca Albrezzi, Dan Chen, Kana Kudo, Francesca Piazzoni, James Walker, Grant Young, Bruce McCrimmon. My humanities friends for being sources of tremendous inspiration: Zoe Borovsky, Andy Rutkowski, Joy Guey, Anthony Caldwell, David Shepard, Ashley Sanders Garcia, Nobuko Toyosawa, Takako Hashimoto. Rene Tajima Pena and Kristy Guevarra-Flanagan for teaching me the secrets of documentary film-making. Silvia Gonzales, Yiwen Xavier Kuai, JaeHyeon Park, Sarah Soakai, Brenda Tully for endless conversation in the PhD dungeon. Bo Liu, for being the best PhD office-mate one could ask for and Andy Schouten for our Drake escapades. Other friendships that have guided me through the years: Hiro Iseki, Bill Pitkin, Hiromi Mizuno, and the FitSoccer group. Arfakhashad Munaim for venturing inside the Evacuation Zone with me, as well as enjoying the hot springs of Fukushima. Robert Bernstein, Eugene Sor, Salvador Santa Ana, Jeffrey Moseley for being better friends than words can ever describe.

The UCLA faculty who have been my mentors, inspirations, parent figures, and friends: Anastasia Loukaitou-Sideris, Leo Estrada (long rest in peace), Abel Valenzuela, all three of you have been there for me since the day I stepped into the Urban Planning Department, oh way back in 1995. Todd Presner, Dana Cuff, Karen Umemoto, Steve Commins, and Katsuya Hirano for exposing me to new academic worlds. And Mariko Tamanoi, for guiding not one, but two Kawano PhD's.

I thank my three boys, Rio, Rui, Ren for their boundless energy and for just being themselves, and my wife Marika for holding down the fort throughout this journey. My love is endless for all of you. To my brother Carl I say "take it easy," and to my sister Kaede, the gratitude is immeasurable for all the love and support you have provided throughout this journey. And finally, all this would not be possible without my Okaasan and Otoosan whose endless belief, love and support made this a reality.

But really, this one's for you Otoosan.

Vita

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SELECTED PRESENTATIONS

October 10, 2019 Crossing Borders: Past and Future of Japanese Studies in the Global Age, Prague, Czech Republic (invited)

October 20, 2018 Midwest Conference on Asian Affairs (MCAA), Minnesota [invited]

March 24, 2018 Association for Asian Studies (AAS), Washington DC (invited)

December 15, 2017 Tokyo Electric Power Company (TEPCO), Tokyo, Japan (invited)

June 15, 2017 Symposium on Ecology and Japan, UC Irvine (invited)

January 24, 2013 Opportunities and Challenges of Participatory Digital Archives, Harvard University, Boston

October 22, 2012 IEEE Global Humanitarian Technology Conference

June 28, 2011TEDx UCLA, Minding, Mining, Mending, Mapping "Can Twitter Save Lives?"

Chapter 1

Introduction

Despite being one of the most resilient countries in the world, Japan suffered immeasurable catastrophic damage from the triple disaster—a magnitude 9.0 earthquake, 12-story high tsunami waves, and a nuclear meltdown—of 2011. Eight years after this tragic event, much of the nation has decided to move on, turning their backs and eager to forget the nuclear calamity that befell large parts of Fukushima. Those affected by the nuclear catastrophe, including more than 150,000 residents who were forced to evacuate, continue to live in exile. This dissertation is an exploration of the narratives that are born through human error. I examine how marginalized populations perceive risk before and after an anthropogenic accident and ask the following four questions:

- How can theories of risk help us understand the way risk is perceived in marginalized communities? (Chapter 2)
- How do various research methodologies facilitate our understanding of how human-caused accidents affect specific communities? (Chapter 3)
- What is the relationship between the history of nuclear development in Japan—its post-war adoption, its connection to popular culture, the rise of anti-nuclear movements, and the prevalence of safety myths—and the situation that led to the Fukushima accident? (Chapter 4)
- How do oral histories from those impacted by the Fukushima accident inform perceptions of risk, trauma, and displacement? (Chapter 5)

The concept of risk is explored through a case study that revolves around nuclear Japan. I expand on a wide spectrum of multi perspectival oral histories that span more than seven years of in-depth ethnographic fieldwork, and utilize participatory cinema as a way to draw a comprehensive narrative that reveals deep sentiments about spaces of disaster and abandonment. The situation that allowed the Fukushima accident to happen where it happened, is not a matter of chance. The historical and political backdrop that led Fukushima to play host to multiple nuclear reactors is a strategic directive by the *genshiryokumura*, or the "nuclear village," a term commonly used in Japan to refer to the "institutional and individual pro-nuclear advocates who comprise the utilities, nuclear vendors, bureaucracy, Diet (Japan's parliament), financial sector, media and academia (Kingston, 2012)." The narratives of those affected by the ongoing crisis in Fukushima stand in sharp contrast with the narratives promoted by the *genshiryokumura*. To understand contesting voices, this dissertation follows a group of people whose lives have forever been disrupted by the disaster: a nuclear power plant executive, a priest, a travel inn owner, a farmer, the mayor of a local town, an 86-year-old evacuee, a 19-year-old evacuee to name a few. It is through the lived experiences and oral histories of survivors that the repercussions of the troubled nuclear industry are humanized, and an understanding of human-made disaster spaces is unveiled. Such knowledge can offer valuable insights into the recovery process, elucidate the impact of prolonged trauma, and bring forth the narratives of survival and reconciliation, exposing the issues needed to set new policy agendas, and educating the global community on the hidden perils and consequences of human-made disasters.

A Global Problem

The narratives of vulnerable populations around the world have commonalities. Displacement can be triggered by multiple factors. Some may be naturally caused disasters such as floods and wildfires, while others may be engendered by human error, and others still may be a combination of both. Trauma inflicted upon vulnerable populations has an added value of anguish when human error is responsible. Worldwide, examples of such incidents are prevalent, from Chernobyl, Bhopal, Three Mile Island, and Fukushima. In Japan, human error caused hazards, such as the Minamata Disease and the Fukushima incident, have left a lasting legacy of trauma that leaves its imprints for generations. Residents in the affected area will continue to have grave concerns over the health effects of radiation exposure, displacement, the dissolution of families, disruption of their lives and lifestyles and the contamination of vast areas of the environment (Kurokawa, 2012).

To come to terms with the widespread abandonment of the numerous municipalities that surround the nuclear power plant, I investigate the various theoretical frameworks that have defined city planning, specifically looking at theories that help elucidate the factors that have led to the situation in Fukushima. Industrialism and neoliberal governance have contributed to the concept of "nuclear colonies" or for that matter, situations where rural communities all over the world are utilized for both their labor force and their space for the sake of capital gain. Historical and theoretical inquiries are made to reveal how central authorities coupled with industrial leaders decisively chose to consolidate high risk industries at the periphery, isolating and unloading the burden of potential hazards onto "second class citizens."

The Fukushima Conundrum

When I first set foot in the evacuation zone in the summer of 2012, I was asked to hold a white device with gauges and measurements unknown to me at the time. I was but a few miles away from the Daiichi Fukushima Nuclear Power Plant (F1 from hereon), the epicenter of the world's worst nuclear disaster since Chernobyl. What I did recognize were the audible and visual cues: the high-pitched beeping noises and the oscillating needle moving from left to right, eventually hitting the right edge (30 micro Sieverts/hour). The digital screen displayed the words **OVER**, signaling that whatever invisible matter it was monitoring had exceeded the capacity of the device. I was struck by the thought, how could something so dangerous not be visible to the human eye? How could such a landscape, seemingly devoid of any elements of risk, suddenly be subjected to such abandonment? And why have we, as human beings pursuing a more desirable livelihood, instead subjected ourselves to such a tragedy? What was noticeably missing in this specter was any signs of humanity. I was in the midst of an otherwise tranquil Japanese countryside, a vast expanse of mountains, rivers, rice paddies, shrines, and traditional homes that quaintly dotted the oceanside. This is one of three major regions in Fukushima called “Hamadori,” *hama* meaning “coast,” and *dori* meaning “path.” It is in this coastal zone that the Tokyo Electric Power Company (TEPCO from hereon) decided to build F1 in 1970, one of more than 50 reactors that would, in its zenith, provide more than 30% of the nation's electricity (Kinefuchi, 2015, p. 448). TEPCO’s own evaluation revealed a countryside eager to assume the mantra as home of “Nuclear Power: Energy for a bright future,” as a welcoming sign in Naraha, the village where F1 is situated, proudly asserts. Naraha, the “chosen” village, was

now the symbol to this new vision that would deliver the hopes of prosperity back to Japan. Situated more than 200km from Tokyo, Naraha's location is strategically important from the national perspective: it is not too close, nor is it too far from Tokyo. And so, just four years after Japan stunned the world by hosting the 1966 Olympic games, its foray towards nuclear dependency began.

Two years after the accident, Japan's Prime Minister Abe assured the world that "the situation in Fukushima is under control." This proclamation was part of Abe's acceptance speech for Tokyo's selection as the hosts for the 2020 Olympics (Field, 2016). "Fukushima has never done, and will never do any damage to Tokyo." But at what cost? Is Tokyo's safety worth the disrupted lives of 150,000 people, many who were forced to evacuate their hometowns indefinitely (Storper & Walker, 1989, p. 30)? Abe's statement is a fitting metaphor to the engines of capitalism that decentralize high risk industrial machines, spreading them out to peripheral communities like those in Fukushima, penetrating their lands, their mountains, their rivers, their oceanfront, and their way of life. Tokyo, the mecca of Japanese pop culture, embodies that "central place," a model that stipulates that "small towns provide basic items for the immediately surrounding populace, while big cities capture those functions with large market areas (Storper & Walker, 1989, p. 30)." Abe's message is on one hand, an assertion that the situation in Fukushima is under control, and that it will never do damage to Tokyo. The certainty with which he declares Tokyo's safety comes from a strategically planned mode of energy production that harks back to the 1960's, when commercialized nuclear energy was first introduced. My inquiry into Fukushima's abandoned spaces, however, proves such claims to be erroneous. I expose the

continued human trauma that persists in the region, and the ongoing reality that the situation at the Fukushima nuclear power plant is far from resolved, with melted nuclear fuel rods still not under control.

Today, a visit inside the stricken nuclear facility paints a troubling dystopian picture: more than 6,000 contract workers—in full body suits and gas masks—are fervently at work, struggling to mitigate the damage caused by the meltdown. Dispatching robots and creating mega ice-walls are but a few of the latest futile attempts to eradicate the situation, succeeding only in deepening the scars that continue to haunt the region. Now, the exposed risk of commercialized nuclear power plants is safely tucked away in the countryside.

The strategic distribution into peripheral communities was done so with exactly this current situation in mind: in times of crisis, Tokyo would be safe. But what of those who live in these so-called "peripheral" communities? These Fukushima evacuees, all 150,000 of them, are victims of the consequences created by the nuclear accident at TEPCO's Fukushima Daiichi Nuclear Power Plant. What triggered the tragedy was a natural disaster, but what transpired was caused by 1) human ambition to commodify nuclear power as a source of energy consumption for the masses, and 2) human underestimation of the ravaging forces of nature, in this case, a tsunami triggered by a massive earthquake that inundated the critical backup power supply. In short, this was caused by human error.

While the human error in the context of the Fukushima nuclear disaster can be explained through a series of technical documents, the narratives of those affected by the causes of nuclear radiation find no technical rationalization. To give an example, technology can map the amount of radiation that is spread over a region, but how does one

explain the spiritual bond a farmer has over these radiated lands? This dissertation is not about the accident per se, but it is about participating, listening, filming, engaging, and sharing. It is experiential. Many narratives and voices from different camps are brought together, intertwined with arguments on the validity of visual ethnography, interrogations on the history of the proliferation of nuclear technology, movements on both the pro and anti-nuclear sentiments, and theories of urban planning, geography, risk, and social learning. In the next chapter, "Theoretical Context and Literature Review," two frameworks of analysis are debated. The Cycle of Risk illustrates how our dependency on risky endeavors has created a process that cycles from knowledge, to action, disruption, assessment, and back to knowledge. The Fortune of Places describes how peripheral places are being exploited for the benefit of the metropolis. Risk Theory and Social Learning each look at different theoretical models that help explain why humans pursue science and technological solutions, despite the known risks that have been the cause of catastrophic accidents worldwide. Chapter 3 details the research methods of "spatial ethnography" and "thick mapping," introduced as frameworks that guide the speculative examination of displacement and abandoned spaces. My fieldwork inside Fukushima is introduced as a five-part agenda: transect survey, sensor-based data, photography, interviews, and film. This section discusses perspectives on the history, theory, and debates about visual ethnography, and how it eventually steers the direction for this research. Chapter 4, "Nuclear Japan," takes us back in history to discover the genesis of nuclear technology, from its use as a weapon for mass destruction, to its transformation as the "peaceful atom" in post-war Japan. The anti-nuclear movement has its roots in an unlikely source: the Suginami

Housewives in the 1960s to the post-Fukushima protests that saw millions take to the streets of Tokyo to protest the restart of nuclear power plants across the nation. Chapter 5, "The Narratives of Fukushima," shifts the focus to personal communities, putting relevance to the local and community aspects for understanding the ways in which history and transformative events shape people's experiences. This is done through an ethnographic agglomeration of the events as narrated by those affected by the Fukushima disasters. Finally, Chapter 6, "Healing in a risk society," looks towards a new normal, *atarashii futsuu,* as communities ponder a future that includes the aftereffects of the radiation fallout, the presence of a nuclear power plant being decommissioned in their backyard, and the abandonment that has forever disrupted past social interactions. It connects the narratives of Fukushima to the various theoretical, methodological, and historical frameworks discussed in previous chapters, and outlines a set of recommendations for future scenarios that embody similar frameworks.

Chapter 2

Theories of Risk

Theoretical Frameworks

Marginalized communities around the world are consistently exploited for the sake of a larger, often centrally mandated, societal needs. The risk associated with the production of such needs is thus exported to communities that are vulnerable to the lure of monetary infusion and the promise of an upgrade in their quality of life. In order to answer the question on how risk is imposed—either fairly or unfairly—onto these communities, I focus on the literature and arguments around various aspects that revolve around the theories of risk in the following sections:

- *The Cycle of Risk* looks at the cyclical nature of technologically based risk endeavors.
- *The Fortune of Places* describes how peripheral places are exploited for the sake of capital gain.
- *Risk Theory* is evaluated through four prominent themes that recur through their discourse: uncertainty, safety, trust, and perception.
- *Social learning* looks at how action must overcome resistance and defines a paradigm shift as a fundamental change in the basic concepts and experimental practices of a scientific discipline.

A Cycle of Risk

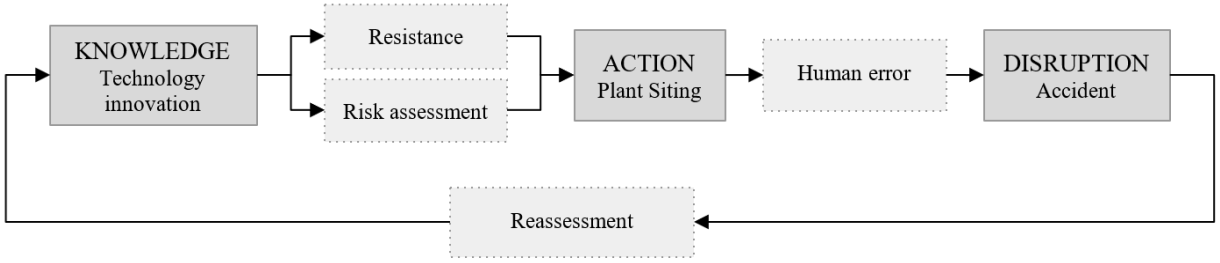

Figure I: The cycle of risk

Knowledge leads to action, action is met by resistance, resistance is successfully overcome, action is taken, errors lead to disruption, knowledge is reassessed, normative is restored, and a new cycle of action leads to a new start (Figure 1). Friedmann mentions "double loop learning" as an approach to change an actor's theory of reality. He expands on how difficult this transformation in thinking can be, given one's predilection to established positions, lifelong work experiences, and educational foundations. I find this framework to be true in my own investigations on the way the nuclear industry has evolved. What Friedmann refers to as "philosophical foundations" is true amongst the members of the nuclear elite in Japan. My qualitative investigation, conducted through a series of longitudinal interviews over the past 5 years, confirms Friedmann's argument. Actors in the nuclear industry are "eager to acknowledge error; they have far too much at stake, money and reputation being the more obvious interests (Friedmann, 1987, p. 217)." Nuclear leaders in Japan, specifically those from Tokyo Electric Power Company (owners of the crippled Fukushima Daiichi Nuclear Plant) are all too eager to accept responsibility for the tragedy that has befallen the communities that surround the power plant. Many have lived through,

and continue their quest to rekindle relationships with local residents, and yet, when probed on their retrospective thoughts on the validity of nuclear power's continuing influence in these communities, they are adamant on their belief that science and technology will prevail and provide a sustainable energy source for the country. In the words of Friedmann, a commitment to an ideology is abandoned "only when their unworkability is clearly demonstrated, when the calamity of failure is already imminent. Even then, as a last desperate gesture, actors may be tempted to ask whether the impending disaster might not be otherwise explained, and instead of seeking fault with their own practice, search for scapegoats in the environment instead (Friedmann, 1987, p. 218)." Case in point, an interview with TEPCO's vice president reveals the utilities deep desire to prolong its support for nuclear energy.

> "Our accident has caused tremendous suffering. We have torn communities apart and taken the way of life from the people. But even so, we must face the reality that Japan has a huge shortage in oil and natural resources. We need energy for us to sustain and support the Japanese people. If I think about the choices we have to generate energy I don't think it is a good idea to abandon the peaceful use of nuclear energy right now."
>
> Yoshiyuki Ishizaki, TEPCO Vice President (Interviewed on April 1, 2017)

Terry Moore's theory of public goods, and his notion of "externalities," the dichotomy between "positive" and "negative" occurrences, is symptomatic of the repeated corporate encroachment on vulnerable populations. The example posted by Moore describes situations where a given community may benefit from the infringement of a particular industry (positive externalities), only to be subjected to the negative consequences due to overzealous practices (negative externalities). Specifically, Moore brings up

situations where factories take advantage of a "public good," such as public land or water bodies, and use these as a free resource to advance their agendas (Moore, 2007). To this regard, Friedmann's following words on human "irrationality" ring true: "Even in the face of mounting problems, we will tend to fight for what we have as well as for our beliefs (Friedmann, 1987, p. 218)." I conclude with the argument that a paradigm shift in nuclear science has yet to materialize despite the various crises it has faced. Thomas Kuhn (1986) argues that crisis is the precursor to a paradigm shift. The crises that have emerged from the faults in nuclear science have done little to diffuse a global enthusiasm for its production, and the ever-present threat of nuclear warfare continues to be used as barter for global supremacy (Kuhn, 1996).

Here too, there is a cycle of risk, where risk is introduced as a benefit for society, safety is promised, accidents occur, new risks are born, assessments are made, and risk is re-introduced with newly defined boundaries, awaiting the next unforeseen accident. To find a fitting framework to describe the situation in Fukushima, I found no better fit than the theoretical discussions around the Risk Society, by prominent sociologists Ulrich Beck and Anthony Giddens. Historically, they perceive the era that begins with the industrial era—induced by humanity's pursuit of social advancement through science and technology—as a transitional period where we are no longer governed by fate, but rather one where we promote our *own* fate. In order to survive in contemporary society, it is imperative to understand the nature of risk, how it is governed, enforced and imposed, and how we as individuals negotiate with it.

The Risk Society is a theoretical framework that informs our society that is largely dictated by our own advancements in science and technology. Humanity has allowed itself to chart its own future by relying on its own technological advancements, no longer controlled by the natural state of the world. Within this risk society, the creation of nuclear weapons, and subsequently, nuclear energy, has produced a volatile climate in geopolitical circles, as the very dangers of its incarnation are used as bartering chips for war and peace. The future of humanity needs to look more deeply into the frameworks that are prescribed by the scholars in this paper. Beck, Gidden, and Mythen envision a future where risk is better managed by those in position of power and by the civic society, working collaboratively and effectively towards a more manageable risk society (Beck, 1992b, 1992a, 1999, 2005; Giddens & Pierson, 1998; Mythen, 2004). Studies by Paul Slovic (1990) and Rika Morioka (2014) expose the necessary complexities of risk perception, providing us insights as to why society deems certain risks more dangerous than others, despite evidence that may prove otherwise (Morioka, 2014; P. Slovic, 1990; Paul Slovic, 2012). And finally, planning theorists John Friedmann, Thomas Kuhn, and Michael Storper give us perspectives from the planning world, where the cycle of nuclear risk reciprocity needs to stop. They propose a new approach which harnesses nuclear energy that considers more carefully the distribution of risk and the plight of the peripheral communities (Friedmann, 1981, 1994, 2003, 1973, 1987; Kuhn, 1996; Storper & Walker, 1989). If the people in Fukushima are testament to the abject failures of the risk society, let their voices be heard for a more prosperous future.

The Fortune of Places

Figure 2 The model of geographical production, distribution and consumption of nuclear energy

In a country with limited natural resources, energy becomes a highly sought-after commodity. The capitalist mode of production for nuclear energy emerged as a challenging proposition for those authorities that embraced its production. Where would this energy be produced, how would it be distributed, and what would the exchange mechanisms be for its production? Prior to the Fukushima accident, 30% of Tokyo's electricity was generated by nuclear power. This energy was produced nowhere near the greater Tokyo area; in fact, three nuclear power stations, located in Fukushima (222 km from Tokyo), Niigata (215 km), and Aomori (630 km) Prefectures, each produced the entirety of the nuclear energy that was delivered to the Tokyo region. The reasoning was simple: allocate the production of nuclear energy, a high risk—and largely untested—new industry to the peripheral communities to

keep Tokyo safe in case something was to go wrong. Peripheral communities, in exchange for shouldering Tokyo's risk would be heavily compensated through tax revenues and economic prosperity, brought about by the influx of the nuclear industry, and a transformative upgrade in urban infrastructure (new schools, hospitals, civic centers, and sports stadiums). Energy would thus be produced in the high-risk zone, distributed to the central place (Tokyo) and, consumed entirely by the central place. Revenues would be poured back into the high-risk zones, and the cycle would continue (Figure 2). It was an alluring "win-win" proposition that would seemingly benefit everybody... as long as no accidents occurred.

> Industries are able to create a productive capacity that did not exist before, often without very much regard to previous conditions of the place in which they are situated. (Storper & Walker, 1989, p. 19).

The development of nuclear power plants and their tactically planned location—what Michael Storper refers to as "geographical and territorial theory"—is true in the nuclear society. Storper stipulates that "each wave of industrialization brings into existence new growth centers and growth peripheries, stimulates disinvestment in some areas and the radical restructuring of others, and reshuffles spatial production relations and patterns of territorial income distribution and politics (Storper & Walker, 1989, p. 5)." Figure 2 reflects Marx's capitalist mode of production with Storper's location theory. It is through a central authority's determinations that the fortunes of places are determined. A mode of territorial

expansion is configured for the production of energy, penetrating distant areas to form new growth centers where none existed.

Storper's geography of capitalism resonates strongly with the development of nuclear energy in the late 1960's and 70's Japan. The "fortune of places" was determined by the nuclear hegemony that included political powers, electric utilities, and influential private industries such as the Yomiuri conglomerate. The model for geographical industrialization of the nuclear expansion would include many of the key concepts explored by Storper. Territorial development would be conducted in the peripheries of the country, specifically in regions deemed to be adequate to host nuclear power plants: coastal regions that can provide cooling ocean water, low population areas to diminish risk, communities vulnerable to the lure of an economic boost. Host villages would have their social fabric dramatically disrupted into one that catered almost entirely to the economy driven by the presence of the nuclear power plant. Unlike, however, the model prescribed by Storper which stipulates that such territorial development could fade with other competing industrialized regions, the nuclear power plant has a generational shelf life that precludes an easy shift back to normalcy. In other words, an agreement to host a nuclear power plant is a dramatic and transformative decision that can forever change the fabric of the local way of life. Storper further argues that the introduction of new industry rearranges inter-regional relations. This is especially true based on the spatial determinism that is defined by the allocation of the physical power plant. Immediate neighboring communities benefit more than peripheral communities, instantly causing an asymmetrical boost to economic prosperity, favoring those closer to the plant. As such, the restructuring of economic and

social life by such capitalist agenda that favors the centralized urban region is marked by the same three characteristics prescribed by Storper: Expansion, instability and differentiation.

Risk Theory

> The risk society begins where nature ends.
> The risk society begins where tradition ends.
>
> -Ulrich Beck and Anthony Giddens

We live in a Risk Society. Our daily lives are infused with decisions that are based on risk assessments. Is the air quality next to the freeway bad for the kids at the nearby school? Are cell phones a cancer risk? Is it safe to live next to a nuclear power plant? Science and technology bring us mechanisms that supposedly make our lives easier to manage, but at what cost? We build efficient transportation systems, nifty communication gadgets, and clean energy, but we do so by producing an added element of risk. According to several prominent social theorists, it is this risk that has rushed in a new phase in the way society functions and thinks about its future. Two factors led to the publication of Ulrich Beck's groundbreaking book titled "Risk Society: Towards a New Modernity" in 1992. First, the Chernobyl disaster in 1986, and second, how this ecological crisis has put environmental risks as a predominant focus in the industrial society. Beck claims that industrialization has forced the degradation of the ecological and natural foundations of life (Beck, 1992b, p. 80). As farmers situated around the Fukushima nuclear power plant can attest, living by the

crippled plant has forced them to rethink the notions of risk as it pertains to their way of life. With the harsh new reality that the land they have tended to for centuries is now contaminated with radiation, their relationship with the power plant and nature has forever been altered. Risk, as defined by Beck is "the modern approach to foresee and control the future consequences of human action, the various unintended consequences of radicalized modernization. It is an institutionalized attempt, a cognitive map, to colonize the future (Beck, 1999, p. 3)." Similarly, Giddens attributes the notion of risk as a "society where we increasingly live on a high technical frontier which absolutely no one completely understands and which generates a diversity of possible futures (Giddens & Pierson, 1998, p. 209)." The troubled nuclear industry is in many ways an embodiment of risk theory, where Beck and Giddens allow us to dissect the different societal structures that have given birth to what they call the *Risk Society*. One of the basic tenets of the risk society stems in its "glass is half empty" approach. Whereas traditional utopian models focus on positive goals for social change, the risk society works on the premise that the value system that governs society is "safety." Positivism is replaced with one that caters the mindset towards prevention, defense, anxiety, and an imagination of "what if" worst-case-scenarios. We confront our global economy in its post-industrial phase, one where the authority of science and technology are being challenged for their legitimacy in their authority to manage and regulate risk in our society. Somewhere along the lines, we switched the focus of our anxieties from what nature can do to us, to what we have done to nature (Beck, 1992b). Life is no longer lived as a matter of fate, instead, humanity has largely embarked into a future that it itself is beginning to control. But at what cost? Beck implies that "nature can no

longer be understood outside of society or society outside of nature." He lists four themes that have contributed to a transition in our society that have been impacted by the introduction of the risk society: (1) Ecological, where various ecological crises have put environmental risks as a predominant focus in the industrial society, (2) Industrial, where industry has forced the degradation of our ecological and natural foundation of life, unparalleled in our history, (3) Nature and society, where a new social and political dynamic is forcing us to rethink the relationship between nature and society, and (4) Global, where the violation of the natural conditions of life has in turn produced global social, economic and medical threats to people beyond normal spatial boundaries (Beck, 1992b). This transition is set in motion when our utmost anxieties are not natural disasters, but rather, man-made disasters. No longer are earthquakes, floods, and plagues our main concerns, but rather chemical spills, nuclear catastrophe, and even terrorism concerns us more today.

Technology has certainly played a key role in this transition. "A risk society is a society where we increasingly live on a high-technological frontier that no one completely understands and which generates a diversity of possible futures (Giddens & Pierson, 1998)." Giddens alludes to two types of risks: (1) External risk, which he describes as "accidents of fate," and (2) "Manufactured risk" which he refers to as risk environments created by the progression of science and technology. While science serves to dispel uncertainty, it does so by creating new ones. Additionally, technology is such that it is inherently a process that is in constant flux, revising claims of knowledge with new findings and articulations. What will tomorrow's research show that today's research does not? Scientific claims and counterclaims has produced a climate of further uncertainty. In the Fukushima nuclear

incident, science declared “allowable” levels of radiation that labeled entire regions to be “safe” for human life to presume. What is baffling to the displaced citizens then, is the assignment of arbitrary risk by supposed experts in the field of nuclear science who have no desire to live in these contaminated lands. This disillusionment is furthered by the contestation of the actual thresholds assigned, where the International Atomic Nuclear Agency and the Japanese government are not in alignment, and where scientists themselves are in constant debate over the numbers. This debate is in part dictated by the desire to control risk, and particularly, the desire to control the future. The downside of manufactured risk, is that it inevitably introduces the element of human error. What distinguishes the accident in Chernobyl with that in Fukushima is that Chernobyl was largely regarded as being entirely based on human error. The Fukushima incident was triggered by an earthquake that triggered a tsunami, that then triggered the nuclear accident. It is in this sense, a combination of both external and manufactured risk.

In this regard, we live in a society where we can no longer trust conflicting information from experts and politicians. Science is losing its traditional role as the sole expert, and the risk society is forcing us to make informed decisions. In others words, no longer can we allow other people to make these decisions for us (Franklin, 1998). These sentiments are apparent in the case of Fukushima, when government experts were assigned to measure radiation levels in the communities that surround the Fukushima Nuclear Power Plants. With the trust in the national government corroded, citizens were empowered to educate themselves and use their own technological assessments of risk, learning to use

geiger counter to measure and make their own informed decisions regarding risk in their communities.

The introduction of the term “risk” is associated with its distinction with “hazards.” Hazards are largely attributed to accepted dangers in life, or external risks as Giddens chooses to coin, whereas risks are bounded by humanity's desire to control the future, especially through the means of science and technology. With the advent of scientific advancement comes the introduction of manufactured risks, which are no longer attributed to acts of nature and God, but rather, man-made scenario’s. The risk society thus begins at the moment that humans “stopped worrying so much about what nature could do to us, and we started worrying much more about what we have done to nature (Giddens & Pierson, 1998, p. 208).” To put this in perspective consider the relationship that a farmer has with his land. The farmers in Fukushima often talk about the spiritual bond that they have with the land. How much can this land give to me and how much can I give back to the land? In this sense it is always a two-way relationship. And now consider the relationship between the nuclear power plant and land it sits on. It is no longer a discussion about how much can the land give back to us, but rather, it is now only a discussion on how much damage can be done to the land. The power plants in itself provides no benefit whatsoever to the land it sits upon. It passes only negative and damaging consequences to the ecological landscape. This turn in our relationship with nature is what Beck and Giddens refer to as the moment when nature ends, and the risk society begins.

Let me now discuss the framework that has brought these prominent theorists to designate the post-Chernobyl era as one defined by risk. Risk is evaluated through four

prominent themes that recur through their discourse: uncertainty, safety, trust, and perception. Each theme is evaluated through the lens of the Fukushima case study.

Uncertainty

> ...the essence of risk is not that it is happening, but that it might be happening.
> (Giddens, 1991, p. 109)

When humanity embarks on a quest to harness a new science driven technology, it inherits a set of risks that are incalculable on its onset, given the lack of precedence, creating an uncertain future for the civilization it is meant for. Anthony Giddens, in his seminal book "Modernity and Self-Identify," calls this the "open human control of the natural and social worlds (Giddens, 1991, p. 109)." Our universe of high modernity is to live in an environment of chance and risk, with a future that is open to human intervention regulated by risk assessment.

While some risky endeavors are attributed with having positive societal advancements—such as health vaccines and the space race—atomic science has invariably created a dark imprint with an uncertain future. The difference and characterization between "risk" and "uncertainty" has been a central debate in risk theory. This distinction is true when one considers risks and uncertainties as byproducts of technological innovations. Nuclear power, for instance, inherits risks by its manipulation of a science that is still in its infancy, and for that, certain aspects of its production produces incalculable risks, or rather, uncertainty. Given time, and through the process of a cycle of accidents—some minor and some catastrophic—uncertainties can gradually mutate into calculable risks. As Gidden

points out, science is an "inherently skeptical endeavor, involving a process of constant revision of claims to knowledge (Giddens & Pierson, 1998, p. 205)." This constant paradox between risk and uncertainty stems from our institutions' desire to control and predict the future. The probability of risk is in flux with the advancement of technological achievements, and also, through the manipulation of risk perception. It is through this tug of war—between man and nature, experts and the lay public, scientific rationale and social rationale—that further widens the gap between those who control the distribution of risk, and those who are asked to shoulder its production.

Safety

> The subject of this decree then, is not the prevention of, but the permissible extent of poisoning.
>
> (Beck, 1992b, p. 64)

What is safe, and what is not? Who determines safety thresholds, and how is it enforced? The contestation between what is deemed safe and what is not is a long-standing battle waged between those who promote the risky business against those who oppose it on grounds of public safety, health considerations, spatial infringement, political gain, or any number of reasons. The line that demarcates what is safe on one side and unsafe on the other is in constant flux based on regulations enforced due to new forms of knowledge, differing expert opinions, public opposition, and a perpetually changing political landscape. Industry has always had to balance a measure of capital gain against the amount of environmental damage it may cause due to pollutants being distributed through the air, through the waterways, or through livestock. The problem arises when there is uncertainty

on what is deemed as acceptable levels of unwanted elements that are thrust upon our environment. Beck calls this phenomenon "a phoney trick" that is controlled and manipulated by so-called risk scientists (Beck, 1992b, p. 64). He rebukes the usage of the term "permissible" and "allowed" to quantify the amount of pollutants and toxins in the air, water and food as a means of legal risk distribution. In essence, he argues, pollutants are harmful in any amount, and while thresholds are set to prevent the worst imaginable accidents, it provide a "blank check to poison nature and mankind (Willacy, 2008)." Civilization, he claims, is supplying itself with a surplus of pollutants and toxic substances.

The Fukushima accident is a perfect example to exemplify the debate around permissible levels. In the wake of the nuclear fallout, government officials raised the permissible radiation levels from one to 20 millisieverts per year, matching the maximum allowed exposure levels used globally for nuclear workers (Willacy, 2008). The reason? The government argues that it deems the new rules necessary in order to prevent schools in the Fukushima region from closing. It was only after vehement protests from parents in Fukushima, concerned that their children were at higher risk radiation-linked cancers, that the government rescinded their decision, lowering permissible levels back to one millisievert per year. The fact that permissible levels are in constant flux, swayed by differing viewpoints based on scientific evidence and continuously countered by public perception is an admittance that there is no ultimate authority on what amount is safe and what is not.

It is through these legal ramifications of the acceptable level paradigm that allows industry to normalize the landscape of "collective standardized poisoning (Beck, 1992b, p.

65).” This failure to establish responsibility for environmental risk production is a testament to a dysfunctional legal system that governs safety standards. While those guilty of exceeding acceptable regulatory levels are punishable by law, the spatial distribution of risk is such that the victims are often low-income citizens with little means for legal recourse. Furthermore, the causal relationship between negative health effects and particular environmental risks is notoriously difficult to prove in court, tipping the balance favorably towards the polluters, and away from the afflicted. In the case of Fukushima, the burden of proof is such that victims subjected to the radioactive fallout from the Fukushima nuclear power plant explosion are forced to quantify their exposure through technological means, and to take legal action for health impairments that is likely to happen in the future. In other words, they are forced to act on consequences that are yet to happen. Chemical hazards, like those generated by radiation, are not only invisible to the eye, they are also harmful through extended exposure, and whose ramifications will only become evident many years down the road. Even today, the number of cancer cases due to the radiation exposure from Chernobyl is hotly debated. While proximity to the power plant represents one measure of exposure, cancer cases recorded decades after the accident could have manifested from a variety of other reasons. Furthermore, pro-nuclear ideologists claim that the level of scrutiny and scientific attention to measuring radiation fallout did not exist prior to the accident, deeming before-and-after comparisons of data inconclusive. What this all comes down to is to say that the industrial leaders, often working in conjunction with governmental mandates, clearly hold the upper hand in risk distribution, risk negotiations, and post-disaster risk retribution.

Trust

In the risk society, the concept of trust undergoes multiple phases, a process I refer to as the "cycle of trust." When a novel scientifically rational solution is introduced, trust is solicited through the promise of prosperity. Often this is introduced as a "win-win" proposition, where a risky endeavor is validated through social advancement, and its geographic placement validated through the economic prosperity it promises to bring to hosting communities. Trust is further gained through the improved infrastructure development the industry brings. Urban centers are rebuilt with new facilities, City Halls are renovated, sports stadiums are built along with new roads, hospitals and schools. And when the trust is broken by the occasional "accident," trust is redeemed as the industrial owners further their commitment to "fixing" their own mishaps with a renewed fervor to rebuild, redesign, and better the community that was left in shatters.

How then, is trust imbued in this complicated landscape of risk assessment? On the one hand, polluters generally favor *scientific rationality*, a reliance based on the technical discourses provided by risk scientists. On the other hand, the lay public rely on *social rationality*, which stems from cultural evaluations convened through everyday lived experience (Mythen, 2004, p. 56). The nuclear reactors in Fukushima were prescribed as "safe" based on a series of scientifically validated precautionary measures that were built in to prevent the worst imaginable accident, everything from emergency water cooling systems (ECCS), backup power generators, and back-ups for the backup power generators. All this, with the startling reality that the reactor itself sits at sea-level along the Ring of Fire, one of the world's most earthquake prone areas. James Mahaffey (2014), in his book "Atomic

Accidents," describes the placement of the Fukushima power plant, saying that "it would be difficult to think of a worse place to build a nuclear power plant (Mahaffey, 2014)." No amount of scientific rationale could account for a tsunami that flooded and incapacitated the backup generators built underground, nor did it account for the backup generators to perform in crisis situations. When mobile power generations were finally transported into the Fukushima Daiichi power plant, exasperated plant operators were dismayed to find out that they had the wrong connectors, and therefore not able to power the cooling system when it was most needed (Kan, 2017; Soble & Dickie, 2011).

Trust has proven to be elusive. The trust that is needed to allow industrial giants to cohabitate in harmony with the community is maligned by the disillusionment provided by the powerful trifecta of industry, government, and science, widely regarded as the producers of risk. No longer do the men in white lab coats hold the trust they once did as authoritative figures of expertise. The Fukushima accident further illustrates these misgivings. The mechanisms in place that were promised to keep the community safe failed through a dazzling array of human mishaps, miscalculations and the underestimation of risks. As Beck points out, science has made society its laboratory. But there is no one responsible for its outcomes (Franklin, 1998, p. 14).

Perception

Why do people fear flying more than they do driving? Individual perceptions of risk are oftentimes incongruous with the statistical probabilities of harm. A summary of various empirical based risk research identifies the following behavioral and psychological strategies around risk perception (Mythen, 2004, p. 100):

- "Optimistic bias": most people underestimate the probability of being adversely affected by risk, i.e. "it won't happen to me"
- Individuals feel an unjustified sense of immunity with regards to risks that arise from familiar activities (driving, smoking, consuming alcohol)
- Individuals generally overestimate the risk presented by rare but memorable events, whilst underestimating the threat posed by more mundane risks
- Disasters that erupt immediately are more likely to provoke anxiety than those which are temporally staggered
- Groups will tend to make riskier decisions than individuals
- Sooner than facing risk in a socially responsible fashion, groups succumb to the temptation of designating blame
- Cultural factors such as class, gender, age, and ethnicity will shape understandings of risk

Paul Slovic, a prominent scholar in cognitive risk research, examines the policies implemented by those who promote health and safety and how "lay people" think and respond to risk. The inability to bridge the gap between so-called technologically sophisticated analysts who employ hazardous activities with the majority of the public who rely on intuitive risk judgement, threatens to further alienate industrial development. In his study, Slovic develops a framework that measures risk on two factors: factor 1 is labeled "dread risk," referring to hazards that one has little control over, is dreadful, has

catastrophic consequences, and inhibits an inequitable distribution of risks and benefits. Factor 2 is labeled "unknown risk," defined as hazards that are unobservable, unknown, new, and delayed in their manifestation of harm (P Slovic, 1987, p. 283). In both factors, nuclear reactor accidents and nuclear weapons fallout rank amongst the highest, while bicycles, alcohol, and swimming pools amongst the lowest. Slovic points out that nuclear power has been a frequent topic of analysis given it's high opposition from the public despite assurances of safety from the experts. His research suggests that people judge the benefits from nuclear power to be quite small and the risks to be unacceptably great (P Slovic, 1987, p. 236).

In the aftermath of the Fukushima disaster, the perception of risk receives a wide range of opinions. The divide is marked by class, gender, age, and science, as even experts disagree on radiation safety thresholds. Within the individual mindset, a conflict is born as the decision to legitimize th existence in irradiated lands is pitted against the potential hazards that may arise from long-term exposure. On the one hand, farmers claim that their produce undergoes intense scrutiny to meet safety standards, while on the other, they cry foul on the continued presence of radiation in their community. The fact of the matter is that they are caught between a rock and a hard place. Their economic survival, and their very livelihood is dependent on their continuous presence and cultivation of the land, but the newborn threat of the invisible risk of radiation poses a potential end to centuries old family traditions. A question then arises: were they put into this predicament of risk voluntarily, or was risk imposed upon them? This is not easily answered. When the nuclear industry decided to utilize coastal rural communities to host their facilities in the 60's and

70's, local leaders willingly accepted. After all, what is some added risk when compared to the prosperity it brings to its modest community? As much as it may seem as a divisive topic today, it was not so when nuclear power was first introduced as the "energy of the future," with massive public campaigns that utilized popular cultural icons such as Astro Boy, *Doraemon*, and even *Godzilla*. Hosting communities—aside from elevating their standards of living—gain national prominence as research "hubs" for this new and promising science of the future. This is not just a local phenomenon in Japan. Globally too, this pattern holds true. In the United States, communities that were involved in the development of the atomic bomb are now major scientific centers. Sites were chosen for their low existing populations, accessibility by air, highway and rail, and for its relative obscurity. Los Alamos National Laboratory and Sandia National Laboratories were top secret sites in New Mexico during World War II, and are now serving as one of the largest science and technology institutions in the world. The Oak Ridge National Laboratory in Tennessee was similarly created for the development of the atomic bomb, famously known for successfully developing plutonium from enriched uranium. The Argonne National Laboratory in the University of Chicago is an outgrowth of the Metallurgical Laboratories, or "Met Lab," established in 1942, where the world's first nuclear reactor was designed and produced (Holl et al., 1997). These laboratories exist today, playing a crucial role in their respective city's economy and culture. But while they each brought national prominence to their communities, they all share the same predicament: the risk they brought was imposed upon the sites that were chosen to host these laboratories.

The spatial distribution of risk also plays a critical role. Those closer to the nuclear power plant have a different perception of risk than those who live in the peripheral communities, as from those who live in the urban centers. Following Storper's "geographical and territorial theory" on the capitalist mode of production, space and risk are unevenly distributed, giving voice to different reactions based on how close they are to the nuclear plant. Empirical studies in the US (Bezdek & Wendling, 2006) and Japan (Edmunds, 1983; Kato et al., 2013; Nishikawa et al., 2016) show that hosting communities who were rewarded by the aforementioned compensation packages have a more positive relationship with their nuclear power plant operators. Perception is also affected by the spatial distribution of radioactive chemicals following a nuclear accident. Due to the prevailing winds following the accident, Fukushima residents living in the northwestern direction were affected disproportionately. This caused non-hosting communities to shoulder the burden of the aftermath, with radioactive chemicals spreading through communities up to 100 km away from the power plant (notably Iitate Village and Namie City). As such, resentment brews amongst displaced citizens in peripheral towns, many of whom received no compensation, nor did they benefit from the taxes and infrastructural improvements brought by the nuclear industry. Such divisive perceptions continue to permeate years after the disaster.

The gender divide in regards to perceptions of risks is also evident. Research studies by gender scholars indicate that males and females identify different threats to be riskier than others, but also perceive the same threat differently. Men are also generally less anxious about risk than women. In a chapter devoted on "Gendered Space and Conflict," Beck alludes to two catalyzing elements that are central to this division: children and

economic security. The woman, he claims, has possession of the child given that it is a product of her womb, which belongs to her both biologically and legally (Beck, 1992b, p. 113). Alternatively, the man aligns himself with the economic responsibilities of the family. This is especially true in Japan, where gendered institutional roles are more evident with males expected to work full-time, prioritizing their responsibilities as the breadwinner for the family over their private life, and mothers prioritizing the health of their children (Morioka, 2014, p. 108). In a qualitative study conducted a year after the nuclear accident, Rika Morioka discovered that fathers in Fukushima saw radiation risk as a threat to economic stability and masculine identity while mothers saw it primarily as a health risk to their families (Morioka, 2014, p. 106). In my own transgressions into the evacuation zone, I met numerous males who were *tanshin-funin,* husbands living alone in Fukushima, while their wives and children live in neighboring cities farther away, in places deemed to be safe from the radiation fallout. In these situations, the fathers chose to "stay behind" in potentially hazardous environments to fulfill their role and responsibilities to maintain order and resurrect a city left in shatters from the disaster, while women prioritized the health and safety of their family. Morioka's research informs on the gender-risk effect, stressing the risk perception gender divide where males see radiation as a threat to financial security and women perceived it as a threat to physical well-being. Men's dismissal of mothers' concerns constrained the ability for women to take their desired preventive actions (Morioka, 2014).

Social Learning in Nuclear Japan

What has contributed to the strong philosophical foundations behind the pro-nuclear faction in Japan? Japan's energy policy, specifically one that relies on nuclear energy, has been an accepted ideological framework amongst the stalwarts of elitist thought in the post-war era. A deeply divisive topic, nuclear energy is, in general, heavily promoted from the top down, and heavily opposed from the bottom up. Following the Fukushima accident, nuclear power has been shut down since 2012, allowing Japan to enjoy nuclear independence for the first time since 1970. And yet, in spite of the massive post-Fukushima public protests of scales not seen since the 1960's, the current administration continues its aggressive pursuit to restart one nuclear reactor after another. Nuclear energy, a product of postwar scientific pursuit of knowledge and a "building block" to the future of energy independence, largely falls under the planning tradition that claims that "knowledge is derived from experience and validated in practice (Friedmann, 1987, p. 81)." Of the four "traditions" of planning theory defined by John Friedmann, Social Learning informs a fitting paradigm for the nuclear situation in Japan. Friedmann explains such knowledge as:

> ...a dialectical process in which the main emphasis is on new practical undertakings: existing understanding (theory) is enriched with lessons drawn from experience, and the "new" understanding is then applied in the continuing process of action and change.
>
> (Friedmann, 1987, p. 81).

With the dramatic shift in the science and technological approach to the atom, from the creation of atomic weapons to the pursuit of peace with nuclear energy, this "new practical undertaking" can only be enriched through the lessons drawn from its creation,

production, use, and hazards. But it is this very undertaking, the decision, allurement, enforcement, encroachment, and promise that goes down in history as a pivotal moment in which humanity commits itself to the idea of the peaceful atom.

In order to apply the nuclear undertaking to Friedmann's social learning paradigm, we dive into the moment in history wherein the peaceful atom was first deployed as a commodified energy solution for the masses. While the experimentation of electricity producing nuclear reactors began in 1942, it phased into development for the purposes of civic use in the 1950's, following Eisenhower's Atoms for Peace speech. Beginning in the 1960's, France, Canada, United States, the Soviet Union and Japan successfully commercialized nuclear energy. How this came about, in the framework of "social learning" is examined by first looking at its four elements:

- The formulation of a theory of reality
- The selection of an appropriate political strategy
- The articulation of relevant social values
- Implementation of practical measures or social action

Each element builds knowledge that is derived from the experimentation of nuclear energy, validated through the civic deployment and consumption by the masses. In order to apply these elements to Japan's nuclear framework, I discuss each element in more detail.

The formulation of a theory of reality

> ...crisis simultaneously loosens the stereotypes and provides the incremental data necessary for a fundamental paradigm shift
>
> (Kuhn, 1996, p. 89)

Thomas Kuhn defines a paradigm shift as a fundamental change in the basic concepts and experimental practices of a scientific discipline. If we were to take nuclear science as a discipline, what then are the major paradigms shifts that have defined its practice? A scientific revolution occurs, according to Kuhn, when scientists encounter anomalies that cannot be explained by the universally accepted paradigm within which scientific progress has thereto been made. Nuclear science has had three moments of crisis: first, in the race to create the atomic bomb, scientists were forced into a global "puzzle solving" frenzy to discover the means to achieve nuclear fission, the splitting of the nucleus that creates tremendous amounts of energy. Second, in the wake of the nuclear bombing of Hiroshima and Nagasaki, President Eisenhower delivered his infamous "Atoms for Peace" speech in front of the United Nation's General Assembly in 1953. Nuclear technology was allocated to "serve the peaceful pursuits of mankind," and eventually provided "abundant electrical energy in the power-starved areas of the world" (Eisenhower, 1953). This ideological shift explains how an existing paradigm needs to be harnessed towards a very different goal for humanity. Third, the crisis that emerged from repeated human error, in Chernobyl, Three Mile Island, and Fukushima, has created an "anomaly" that has confounded scientists in the quest to minimize risk.

Reality is at times subjective, and a "theory of reality" is a construct applied through the knowledge gained from the past coupled with the promise of the future. The theory of reality that revolves around the civic turn for nuclear energy was largely articulated by U.S. President Dwight Eisenhower's "Atoms for Peace" speech to the UN General Assembly in 1953. Herein, the United States, according to the principles of learning defined by Friedmann, acts as a "change agent" by encouraging, guiding, coaxing, and assisting the world in its efforts to change reality. New knowledge builds a case for mutual learning that compels a global audience to rethink and redirect science towards the pursuit of nuclear energy. In doing so, it succeeds in bringing a "major cognitive restructuring that will have far-reaching practical consequences for selfimage, human relations formal authority, and the ultimate distribution of the costs and benefits of action (Friedmann, 1987, p. 186)."

It is under this new paradigm that nuclear energy turned into a commercialized commodity. As industrialism plunged the world into a mode of extreme environmental neglect, the allure of science and technology to produce a means of energy production that is clean and abundant seemed too good to be true. The age of nuclear power was born, with the U.S., France, Great Britain, Soviet Union, Canada and Japan all aggressively building nuclear reactors in the 1960's, and successfully putting them on the grid by the 1970's.

The selection of an appropriate political strategy

> It is the common experience of humanity, however, that the new will be resisted, not because it is new, but because it threatens to displace something that already exists
>
> (Friedmann, 1993, p. 483)

While innovation may appear as forward progress, it does so by displacing something that already exists. In the case of nuclear energy production, the displacement that occurred was a way of life. With peripheral, coastal villages targeted as logical sites for hosting nuclear power plants, an existing social fabric and a local economy based on fisheries and agriculture was dramatically displaced with a new economical juggernaut dominated by the nuclear industry. Hosting communities agreed to this new mode of existence, sacrificing centuries of tradition for the promise that the new industry brought. In large part, this transformation was induced by the warranty of safety, and a defined logic of truth that was baseless (given that the proposed innovation had no precedence). Thus, what was later widely referred to as the "safety myth" was born, an assertion that nuclear energy and power plants were risk-free. In an astonishing admission to the belief in the safety myth, Tokyo Electric Power Company's Vice President revealed his company's approach towards risk prior to the Fukushima accident:

> "We kept believing that Japanese nuclear power plants were safe. I was so confident in our safety that I used to tell people in the community to evacuate inside our nuclear plant during a disaster. I am embarrassed about it now, but back then, I truly believed it when I explained it to people. So even I was duped into believing the safety myth. For that, I have much regret."
>
> Yoshiyuki Ishizaki, TEPCO Vice President (Interviewed December 16, 2016)

The Articulation of Relevant Social Values

Along with the safety myth came the re-articulation of social values into the communities that were "chosen" as host sites for nuclear power plants. The promise of economic prosperity aside, the integration of rural communities as a major player in the mainstream of economic and social life at the national scale suddenly empowered and provided relevancy to previously disenfranchised and marginalized groups. The dependency that central authorities now had on these communities integrated them into the national discussion on energy policy, despite their spatial remoteness. Based on my own ethnographic inquiry, I have witnessed that the transition in social values, from predominantly fishermen and farmer societies to nuclear hosting communities were, however, not embodied by everybody. Much like innovation displaced existing ways of life, so did it displace existing social values. The transformation created a divisive agenda amongst residents, between those who actively embraced the promising new way of life as the new normative, against those who foresaw the perils of a new industry infringing on centuries old traditions and social values.

Implementation of Practical Measures or Social Action

The social learning approach requires that action must overcome resistance (Friedmann, 1987, p. 183). With the aforementioned placement of the safety myth and the restructuring of social values, resistance is effectively controlled. With the forms of knowledge solidified, forms of practical action, that is, the practical activity of actualizing the proposed vision begins. Along with the creation of nuclear reactors world-wide, came the educational promotion of their capabilities. To bridge the gap between the enormity of the nuclear facilities and their surrounding communities, plant operators built museum spaces as annexes to the power plant. Local schools regularly organized field trips to educate the children on the wonders and promise of the newly activated prodigious local industry. Any and all risks were veiled in the insistence and demonstration of extreme safety precautions. To give an example, prior to the Fukushima accident, the Fukushima Daiichi Nuclear Power Plant disseminated the promotional materials that broadcasted the following assertions:

> "In our nuclear power plant, we are prepared to address any type of crisis. We have installed multiple inspection devices and security checking instruments. If by any chance, water leaks from the reactor and lowers the water level, our emergency cooling system, "ECCS" is activated and two tons of water per second is immediately released. The reactor is flooded instantly, preventing the nuclear fuel rods from melting. Furthermore, at the same time the ECCS is activated, all exit ways in the reactor are closed, preventing any radiation from leaking to the outside."
>
> (TEPCO, 1977)

Needless to say, every safety precaution articulated in this promotional video message failed in the 2011 disaster. The vaunted promise of the ECCS, the emergency

cooling system, failed when the power supply was unable to activate it, due to its questionable placement in an underground space, despite its proximity to the ocean.

Reflections

Four theoretical frameworks have been outlined in this chapter. Each in its own, have relevancy and symbolism to the narratives of Fukushima. The "Cycle of Risk" reveals a painful reality: despite a region's trauma, risk is cyclical. The Fukushima incident has forced the reassessment of knowledge, the creation of new risks, and the formation of the "action" phase of restarting nuclear energy.

In the words of Yoshizawa, a cattle farmer in Namie City, "Fukushima is a nuclear colony." The fortune—or perhaps, the misfortune—of place frames the central argument that place matters. Peripheral regions and the marginalized populations that live within them have and will continue to shoulder the burden of risk for the sake of the metropolis. As Beck points out, industrialization has forced the degradation of the ecological and natural foundations of life, and this reality is sadly evident in abandoned spaces in Fukushima today.

The "safety myth" is a representation of a risk society gone wrong. The very imprint of the term "myth" is indicative of, in the words of Ulrich Beck, a "phoney" implementation of science and technology. The *Anzen Shinwa* as it was referred to amongst the displaced, is used in anger, an expression of betrayal, and a representation of all that went wrong. Technical wizardry in the form of multi-layered safety measures simply failed to do its job

in the singular moment of need, eroding the fragile trust between industrial giants and marginalized communities.

While Slovic suggests that people judge the benefits from nuclear power to be quite small and the risks to be unacceptably great, Mythen's research suggested that groups will tend to make riskier decisions than individuals. In this case, larger entities make decisions on behalf of the individual, enabling the situation in Fukushima to transpire.

And finally, social learning, described as the dialectical process of implementing a new technology, is examined through four elements: formulating a theory of reality, selecting an appropriate political strategy, articulating relevant social values, and implementing practical measures or social action. Later in Chapter 4: "Nuclear Japan," I describe how each element is relevant within the context of Japan's nuclear history.

Chapter 3

Methodology

In their 2014 report, "Recommendations for Improvement of the Reconstruction Policy of the Great East Japan Earthquake," the Science Council of Japan declares that this was a disaster "Made in Japan." The report urges for the implementation of several new strategies of existing policies, calling for a "comprehensive, societal monitoring of the reconstruction process," specifically asking for an "interdisciplinary inquiry that involves the humanities, social and natural sciences (Science Council of Japan, 2012)." In order to help us understand spaces that have undergone catastrophic change, I chart a multi-year, transnational fieldwork agenda that employs new research methods to monitor disaster spaces over time inside the evacuation zone, formulating a comprehensive, multiperspectival understanding of the scientific, political, social and physical fabrics that emanate these spaces.

There are three parts to this chapter. First, I look at two innovative frameworks that help define the methods conducted in this research: Spatial Ethnography and Thick Mapping. Second, I look at Visual Ethnography, and how it informs and legitimizes the methods employed in the field, with a specific focus on the validation of film as a methodology for research that serves as a healing and therapeutic form of planning in distressed communities. Finally, I articulate a fieldwork agenda that employs these methods of research in Fukushima.

Spatial Ethnography

My approach to monitor urban spaces that have experienced an event-driven transformation employs the practice of "Spatial Ethnography," a mixed-methods agenda that is applied in the humanities, architecture, urban planning and disaster science disciplines (Kawano et al., 2016). This includes extensive field reconnaissance and visual documentation of transformed urban landscapes at specified locations. Urban scholar Annette Kim defines spatial ethnography as an innovative approach to planning that better accumulates knowledge that leads to action. The fieldwork methodology involves an iterative process of interviewing, field surveying, photography, videotaping, participant observation and spatial analysis (GIS) to generate multidimensional data that is visualized on a map. It is a methodology that puts the planner directly on the ground "in conversation" with other actors, bridging the communication gap between planner and resident (user) and developing a mutual learning framework (Kim, 2015). What makes Kim's inquiry so much more credible is that her approach is entirely based on real life, situational case studies, employing an array of fieldwork methods. It is through such investigation that she explores the validity of multiple map creations.

Kim's research focuses around the question of who claims public spaces. As a reflection of urbanization, millions continue to migrate into the city where we now witness more than half of the world's population living in urban areas. Caught in this shift from rural culture to urban culture are marginalized populations, such as street vendors, who find themselves needier of free and open spaces. Kim questions the governance of such spaces in a portrayal of Ho Chi Minh City's (HCMC) vibrant and now contested sidewalks,

calling them the most "important and overlooked public space." Indeed, even sidewalk spaces in developed countries are often under the control of government bodies who enforce regulations upon its access and usability. Kim alludes to one such example in Los Angeles, where city planners are involved in multiple legal battles with vendors over the use of sidewalks and the operation of food trucks. Kim's book "Sidewalk City" takes us to HCMC, which is the spatial focus of her research fieldwork. Her inquiry is piqued by her personal observations of the shifting dynamics of HCMC's sidewalks. She marks the early 2000's as a turning point for sidewalk governance, when various clearance policies were implemented in an effort to "modernize" the city. Authorities believed that inner city sidewalks needed to undergo dramatic transformations as part of HCMC's rapid economic development and modernization, coupled with the claimed necessity of "protecting tourist safety."

Kim offers a comprehensive, historical view of cartography's role in shaping HCMC's image. Kim reviews cadastral maps and colonial maps as different perspectives that privilege certain viewpoints while suppressing others. She also examines the role of GIS as a technology that is seemingly devoid of qualitative data, as she asks "Are there certain kinds of phenomena that cannot be mapped (Kim, 2015, p. 69)?"

GIS has long prioritized quantitative data over qualitative narratives, encouraging, even enforcing, the attribute-based science as the accurate, and valid representation of space. Qualitative data has long been neglected from the narratives of GIS map-making, and forcing such data upon traditional GIS maps continues to be challenging. Kim challenges this current state of mapping, and the gravitational pull towards "GIS" as a

rapidly dominant form of mapping. She provokes our spatiality by issuing a challenge to map the unmapped, or more specifically, to explore the limits of putting "qualitative GIS" in action. In doing so, she questions, "How far can we push the map form?" and, "At what point does it stop becoming a map (Kim, 2015, p. 85)?" Her claim that certain spaces are an existential part of the city's way of life is constructed through her theoretical frameworks that employ deep ethnographies and visual research methods. From scholarship to advocacy, she proposes informed, normative interventions through visual communication.

Thick Mapping

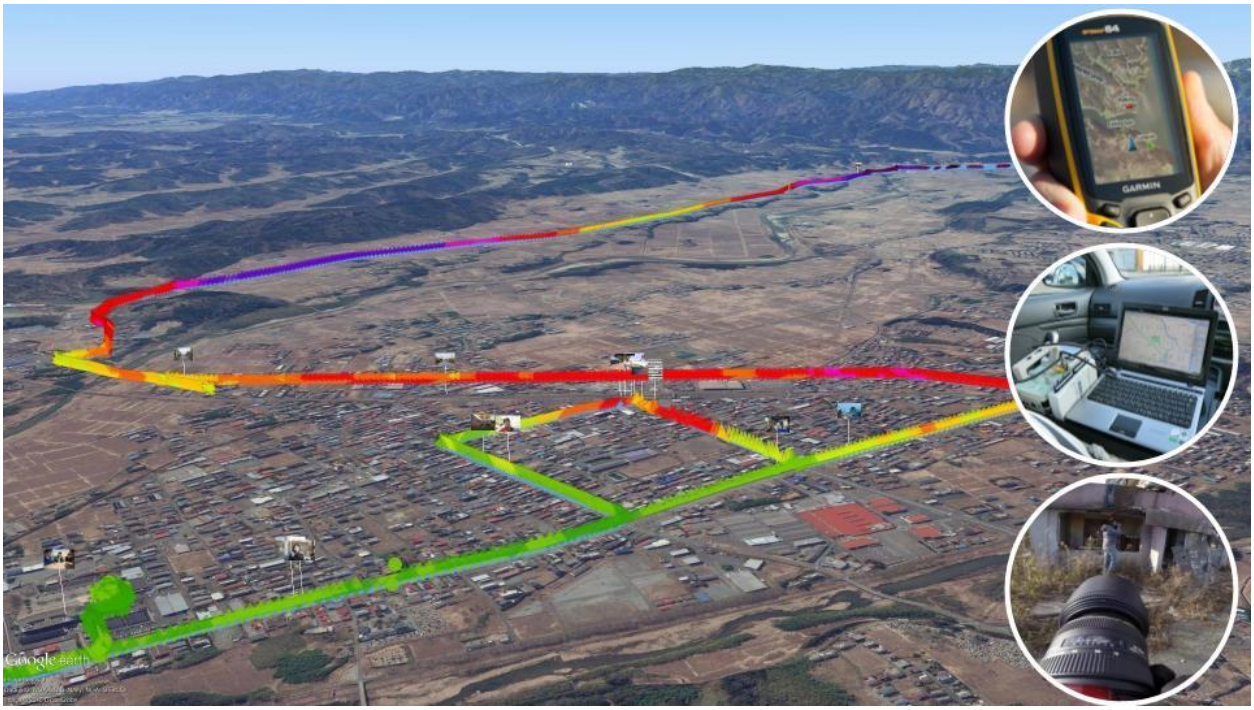

Figure 3: A Google Earth thick map of Namie City

Thick Mapping provides a dimension that allows for a collective production of place from many perspectives. Multiple layers are assembled based on the acquired ethnographic data, which interweave in dynamic relationships to one another in the form of textual, spatial and temporal connectivity's. By using interactive tools such as Google Earth and custom-built web-mapping interfaces, in which one can locate memories, histories and ongoing processes can all be represented in one place. This convergence of related or unrelated data layers into a single platform, rather than distributed in multiplicity, allows the diverse viewpoints of different disciplines to co-exist (Figure 3).

The origins of thick mapping stems from the HyperCities project, a web-based learning platform that connects geographical locations with the stories and histories of the

people who live there and those who have lived there in the past. A HyperCity is defined as being more than the physical space of a city, but something that "adds to, extends, and proliferates: many texts and media, many extensions to and contestations of the historical records, and an infinitely open field of possibilities for participation (Presner et al., 2014, p. 6)." The creation of a "HyperCity" brings together the collected mixed media content to create information networks that catalyzes the present, documents the past, and projects the future. Presner's definition of a "thick map" begins to offer us a way to work in a theoretical perspective.

> Bringing together spatial-temporal narratives, visual design and argumentation, embodied navigation, and curatorial strategies to imagine new modalities of engaging with the past and the present, these issues have been catalyzed by the digital humanities subfield variously called 'geospatial Humanities,' 'digital cultural mapping,' or simply 'thick mapping'
>
> (Presner et al., 2014, p. 53).

Arguably, we can only presuppose how the future of a site may unfold. For example, field research posits us to expand on various intervals, captured in space and time, and suggests how spaces will and continue to evolve. In other words, the aid of Spatial Ethnography does not only enable the use of tactical solutions to understand the significance of a transformative phenomenon, but also succeeds in creating a theoretical framework for discussion (Kawano et al., 2016).

The overarching goal is to critique these transformed environments through a series of interventions that influence local and regional characteristics. Much like the scholarship produced by theorists Annette Kim, and Leonnie Sandercock, socio-spatial occurrences of

urban places move beyond conventional methods in ethnography. However, visual ethnography alone does not capture the entirety of the phenomenon being documented. By utilizing GPS enabled technologies, field reconnaissance can also map the presence of invisible layers that can measure risk. For example, airborne radiation can be overlaid as a visual compilation of geotagged measurements on a map that can expose the clusters of risk that exist in an environmentally toxic site. It is through the convergence of these ethnographic layers—composed of routes, narratives, and videos—with radiation risk layers that allows the creation of the aforementioned "thick map." Every visual component now has a measure of risk and conversely, every measure of risk now comes with a visual and sensory perspective. The transect route identifies the zones that best represents the different impacts caused by a transformative phenomenon. Subsequent data collected in the form of photography, video and interviews captures the personal narratives that are rooted in place. In this way, a new humanity driven approach intersects with the physical and biological sciences to seek innovative solutions to challenging how we understand risk.

Visual Ethnography

"They should build the next nuclear power plant in the middle of Tokyo," said Sachiko Nemoto, a farmer's wife in Odaka, a small village located just north of Namie but still within the 20 km evacuation zone in Fukushima. For the thousands of citizens who lived around the crippled nuclear power plant, life has been an immense struggle following the displacement from their homes. Their narratives, in all their intricate complexities, can only be obtained through personal relationships nurtured over years of ethnographic

fieldwork. Why should we believe in the words uttered by citizens living a humble life in the rural countryside, when government officials—backed by knowledgeable experts—provide a sound and scientifically proven rationale on why their land should be home to a power plant that single handedly was capable of producing 15% of Tokyo's electricity demands? Whose "knowledge" is more important, and to which should we afford more credibility? At the same time that nuclear plants were being constructed all over Japan in the 70s, Friedmann called this problematic a *crisis of knowing*, a concern about whose knowledge should be privileged for societal guidance. After all, this was happening at a time when planning relied almost exclusively on top down authority that was given credibility by knowledgeable experts (Friedmann, 1973, p. 98). Marx argues that knowledge is class based and reflects class interests (Sandercock & Lyssiotis, 2003, p. 62). Indeed, in the case of Fukushima, the expert class stands in conflict with the local citizens. *We assume to know what you need* was the motto—rather than the alternative that required listening, talking, sharing, and experiencing. How then, can visual ethnography through communicative planning methods lead to informative action?

The methods prescribed for this research can collectively be classified under the mantra of *visual ethnography*. The debate against visual ethnography stems from its perceived legitimacy, its usage as a valid, scientific method that has enough "rigor." The critique against such visual production includes some of the following arguments: visual recordings are too subjective and lack objectivity; they are no different than "vacation" photos; they are "fiction," a constructed version of the truth; they are inherently partial representations (Pink, 2006, 2007, 2012, 2013). Even so, this research insists on using mixed

methods that largely rely on the frameworks that define visual ethnography. In order to validate this approach, let us look back on the history and debate on using visual field methods in the social sciences.

The Visual Planner

Ethnography has not always been a staple of urban planning research. When planning was engrossed in its quest for legitimacy, it pitted itself against established disciplines in the natural sciences. It was not alone in its pursuit. Sociology, Economics, and Anthropology were all jockeying for prestige, adopting the methods of the natural sciences in the 1920's and 1930's (Dandekar, 1986, 2005). The thinking goes that if the social sciences could mimic the methods employed in the natural sciences, they gain the confidence and trust that is reserved for the "experts" in their respective fields. Just as those in the white lab coats were afforded credibility, so did the logic go, planning must follow the same formula for acceptability.

Leonie Sandercock, herself an urban planner/filmmaker, extends the history of planning's roots in scientific rationale as far back to the Enlightenment period, the Age of Reason that was fueled by the scientific revolution. "Modernist planning is a child of the Enlightenment" she says, pointing out that the scientific breakthroughs transformed the entire system of production that leads to the industrial revolution (Sandercock & Lyssiotis, 2003, p. 62). A period dedicated to human reason, science and education were seen as the best means of building a stable society for humanity, freeing us from the "bonds of superstition and ignorance." A world that is tested through the practice of logic and physical sciences pursues, and it is from this Enlightenment epistemology that the history

of planning begins. Harvey Perloff refers to the post-war planning discipline as one of "decision technology, the science of society (Perloff, 1957, p. 142)." Planning knowledge privileges technical rationality and instrumental problem-solving.

In his 1973 book titled *Retracking America: A Theory of Transactive Planning*, Friedmann warns us of the tragic consequences should we continue our road to becoming an ignorant society that relies on technocrats who create "some sort of super-brain that is plugged into a nationwide monitoring system of social indicators and whose repository of quantitative models spews out appropriate answers (Friedmann, 1973, p. 193)." He continues: "We must find a way to introduce systems of societal guidance a mode of knowing that values the use of a diversity of models," he implores, lamenting the fact that actors, who possess valuable experiential knowledge are not acknowledged as having any validity in the planning process. Friedmann promotes a "transactive style" of planning which puts more emphasis on interpersonal relationships and skills. A planner should adopt mutual learning, a process that revolves around dialogue. Friedmann describes his rethinking of planning as one that encourages real time face to face interaction, a need to privilege regional and local over national and transnational space, a more decentralized view of planning, and increased citizen participation. This new mode of planning is different from the old model in five ways: it is *normative*, giving voice to the disempowered; *innovative*, providing creative solutions to social, physical, and environmental problems; *political*, where implementation of action is designed to overcome resistance to change within the limits of legality and peaceful practice; *transactive*, where participation is encouraged at the regional and local levels; and includes *social learning*, which is based on

transparency, democratic procedures, and leadership that is not afraid to admit mistakes (Friedmann, 1993, pp. 483–484). In non-euclidean planning, the planner is directly embedded in the decision making, accountable for the actions deemed appropriate for the given population. No longer is he/she a detached, top down authoritative and anonymous figure in the process, but a familiar face that promotes mutual learning.

Similarly, Donald Schön (1983) attacks the dominance of technical rationality in urban planning in his book *The Reflective Practitioner: How Professionals Think in Action*. Like Sandercock, Schön points to the origin of technical rationality as coming from the Enlightenment period and Positivist thought, when "the scientific world-view gained dominance, and the idea that human progress is achieved by harnessing science to create technology for the achievement of human ends." It was a period in society that catered to a new philosophy which "sought to give an account of the triumphs of science and technology and to purge mankind of the residues of religion, mysticism, and metaphysics which still prevented scientific thought and technological practice from wholly ruling over the affairs of men (Schön, 1983, p. 21)."

During WWII, the Manhattan project became the symbol of the successful use of science-based technology, and following the conclusion of the war, scientific research institutions proliferated. Nowhere was this push for science and technology more evident than in the fields of medicine and engineering. Social scientists begin to apply the same language to their professions, referring to their research as having "measurements, controlled experiments, applied science, laboratories, and clinics." Indeed, the ethnography conducted by anthropologists Alfred C. Haddon, Gregory Bates and Margaret Mead all

seemed to advocate this model of the scientific social sciences. However, Schon describes the limitations of this scientific pursuit. Schon calls this a "crisis of confidence in profession knowledge (Schön, 1983, p. 3)." The problem, he says, is that the scientific model of planning is that it focuses on problem "solving" and not in problem "setting." Problem setting is the process that comes before solving, which involves an assessment of what is wrong and what needs to change and how. It is a process that requires interaction. Technical and quantitative analysis are just tools, no more and no less, and are incomplete without a richer study of the human experience. He reminds us of the lexicon of actions that are achieved through experiential knowledge. He cites examples that include a baseball pitcher "finding his groove," and jazz musicians improvising. Indeed, situations that defy the abundance of metrics, such as the big underdog upsetting a champion, are situations that go against scientific logic, but are symptomatic experiences that make social interactions joyful and meaningful. There are times when the theories of science need to be abandoned in place of experiential knowledge, or what Schon refers to as "knowledge-in-action."

John Forester (1989), in *Planning in the Face of Power* called for planning to adopt an interactive communicative activity that turns its back on models of scientific rationality and systematic analysis. He claims that although the technical problem-solving image of planning appeals to a sense of scientific legitimacy, "it really sells planning short (Forester, 1989)." Forester believed that planning was much more than a technical problem-solving practice. He demanded the discipline to adhere to what he calls "people-work," promoting value in qualitative and interpretive modes of inquiry, storytelling, listening instead of

hearing, "listening well or poorly shapes the actual social policy of our everyday lives (Forester, 1989, p. 9)."

The "communicative turn" in planning has come with the acknowledgment that technical rationality—or what Friedmann refers to as the Euclidean World Order, or what Schon calls a crisis of confidence, or what Forrester calls models of scientific rationality—has its limitations. There are many challenges in the planning practice, but ultimately, planners must "plan for the people." It is the passions, anger, and fear of these people that planners must listen to and somehow mediate. How then can visual ethnography legitimize and bridge the gap between technical rationality and participatory processes? Can film, as a methodology for planning research, serve as a catalyst for social change?

Ethnography and Mutual Learning

Friedmann's observation of planning's transition from a euclidean to non-euclidean order has opened the door for visual ethnography to find its place in planning. He saw a crisis in films such as *The City*. It advocated a model that had run its course, a form of planning that largely ignored the marginalized. Knowledge was hogged by the few so-called experts who possessed the eloquence that comes with scientific discourse gained through professional planning processes, knowledge that other actors had little choice but to accept and put their faith upon. The rich medium of film was used to empower the rich and powerful, rather than to give a platform to opposing voices. The personal experiential knowledge that could be gained from the actors is largely ignored, along with the plight of the population they represented. How then is the gap in knowledge to be bridged, questions Friedman? The solution is to forge a personal relationship between the expert and the

client actor. Friedmann calls this transactive, innovative and mutual, a style of planning that fits the post-industrial society. The failures of the past, he says, is attributed to a deterministic model of society, and needs to be shifted to this new form of planning.

This possibility is especially true in film, as its innovative capacity and transactive nature allows participation, giving voice to marginalized populations. A well-crafted documentary revolves around a given crisis, an activist agenda, or a community driven plight that needs to be given a platform. It is about empowering those at the local level to be heard by those at the regional and national level. It is, in other words, a form of visual ethnography perfectly positioned to encourage a non-euclidean approach to planning. And what if the filmmaker him/herself were a planner? Friedmann laments on how planning has been a non-utilitarian relationship where impersonal, professional style of communication has been notoriously unsuccessful in joining knowledge to action(Friedmann, 1973, p. 181). But with ethnographic film, the ownership over the content that is produced comes with years of investigative, experiential, in-depth, long-term, and physical assimilation with the actors being portrayed. Robert Flaherty, the ethnographic director of *Nanook of the North*, a film largely regarded as the first example of participatory cinema (Rony, 1996, p. 116), spent more than 10 years with the Eskimos to produce the film. By incorporating such ethnographic cinematography as part of the planner's toolset, the gap between the experts and actors can be bridged. Participation can breed mutual learning, and the processed knowledge is gained through personal transactions that can lead to action that is more suitable and acceptable to both worlds. Even in his later years, Friedmann continued to rally around this planning problematic. In a 2003 paper published

in the Planning Theory Journal, almost 30 years after he first introduced the crisis of knowing, he continued to emphasize a new way of thinking about planning, proposing "an epistemology of social learning, arguing more specifically for a relation of dialogue as a basis for mutual learning between planners and client groups (Friedmann, 2003, p. 8)."

A Visual Future

In light of these debates on the legitimacy of visual and experiential knowledge, what needs to take place so that the methods of visual ethnography reflect this rigor? And how can new methods capture the true voices of the community, limiting the biases of the researcher? Here, I summarize three contemporary approaches in the social sciences that are rewriting and reimagining the practice of ethnography, and how it can be innovated in ways to better project the voices of the people involved in social struggles and representation. New innovations in mixed methods approaches proposed by Sandercock (film), Kim (spatial ethnography), and Presner (thick mapping) provide glimpses of what may be alternative research frameworks that privilege the "visual" as a means to reflect the real world. Whereas the more traditional form of film had problems in its inherent construction, where time, space and motion were linear in nature, these new innovations in visual ethnography allow for a more dynamic interaction, one where time and space are not static.

New forms of visual ethnography are embodiments of social processes that continually construct and deconstruct our world as we know it, which invites scrutiny and provokes thought. Rather than focusing on policy, or on existing scientific rationale, the focus is shifted to the sensorial aspects of post-disaster spaces: how are the people affected, how are spaces redefined, and how are those held culpable asked to undo what they have

done? As much as some disasters are based on human error, so too, must the road to recovery be based on a humane response that brings the voices of contesting parties onto the same platform. The approach of using visual ethnography forces each party to confront the realities of the other, where therapeutic planning can plant the seeds for mutual learning and understanding.

I argue that visual ethnography, especially in the form of participatory cinema, has the potential to bridge this gap in ways that other forms of reconciliation may not. In his chapter "The Transactive Style of Planning," Friedmann stipulates the importance of dialogue as a means to bridge the communication gap (Friedmann, 1973, p. 177). The characteristics he lays out for "authentic dialogue" are all practiced through the ethnographic processes taught in documentary filmmaking. Unlike, however, the process of mutual learning which pits the planner as a medium of communication between expert and client, the film in itself assumes the role of communicator. A well-crafted, documentary film that accumulates knowledge from multiple perspectives can serve as a catalyst for meaningful social change. These narratives inform the predefined field method called "Spatial Ethnography" that not only records narratives, but does so by applying the spatial and temporal dimensions to oral histories. Thick Mapping creates a new discourse around a multitude of narratives that criss cross time, space, and political landscapes. Planners, now equipped with a myriad of toolsets not available in the past, are endowed with a renewed dimension of data that can and should lead to a new way of knowing, befitting our abilities to foreground Friedmann's mutual learning framework.

Sandercock and Attili (2014) address these questions by asking whether or not the making and screening of a film can serve as a catalyst for social change in a deeply divided community. Is there a role for film as a methodological tool? As planning begins to acknowledge its limits of technical rationality, it begins to explore new tools for accessing other ways of knowing, learning, researching and practicing. Sandercock and Attili call this "therapeutic planning," an exploration in multimedia interventions in urban policy and community engagement (Sandercock & Attili, 2010a, 2014, 2010b). Therapeutic planning revolves around the creation of "safe spaces" where conflicting parties can meet and speak without fear of being dismissed or attacked. Here, historical injustices are acknowledged as a necessary prelude to addressing contemporary conflicts. To provide such an environment, a planner is required to have exceptional interpersonal, relationship building, and facilitation skills. Patience acquired through longitudinal fieldwork studies lead to the establishment of trust, enabling conversations that were previously unthinkable. The power of film, as a vehicle to weave multiple and often contesting narratives in a single production, can become an empowering, collaborative mode of planning.

Fieldwork in Fukushima

In December of 2014, I initiated a transnational and collaborative research partnership with "BISHAMON," a group of nuclear scientists, medical doctors, agronomists and engineers from the Radioisotope Center (RC) at Niigata University. Our mission was to test the effectiveness of using Spatial Ethnography to conduct societal monitoring through

a multisensorial depiction of transformed urban spaces. We conducted extensive ground-level excursions on predefined paths to scientifically measure radiation levels and simultaneously photograph, film and record sounds to capture and map the visual, sonic and spatial environment. This included a collection of data objects on roads, vegetation, boats, houses, and other artifacts (verified with GPS coordinates) that was later correlated with existing and historical airborne radiation levels. In doing so, we created a visual interaction between the spatial attributes of at-risk geographies and the social attributes of human actors. The convergence of science (radiation data), coupled with visual-based ethnography (photography, video) and verified through cartography (transect routes and GPS receivers) came to create a layering of interlinked "rich" objects, or a "thick map" that merges transdisciplinary perspectives, prompting an intellectual discourse on the meaning of the post-disaster spaces. In short, we designed the *Namie HyperCity*.

As a result of these activities, I have identified the following visual research methods that provide a comprehensive geospatial narrative, which successfully merges scientific, social and cartographic data. All of these methods were used to document disaster spaces during my Fukushima fieldwork that began in 2012, and ended in 2019.

Method 1: Transect Survey

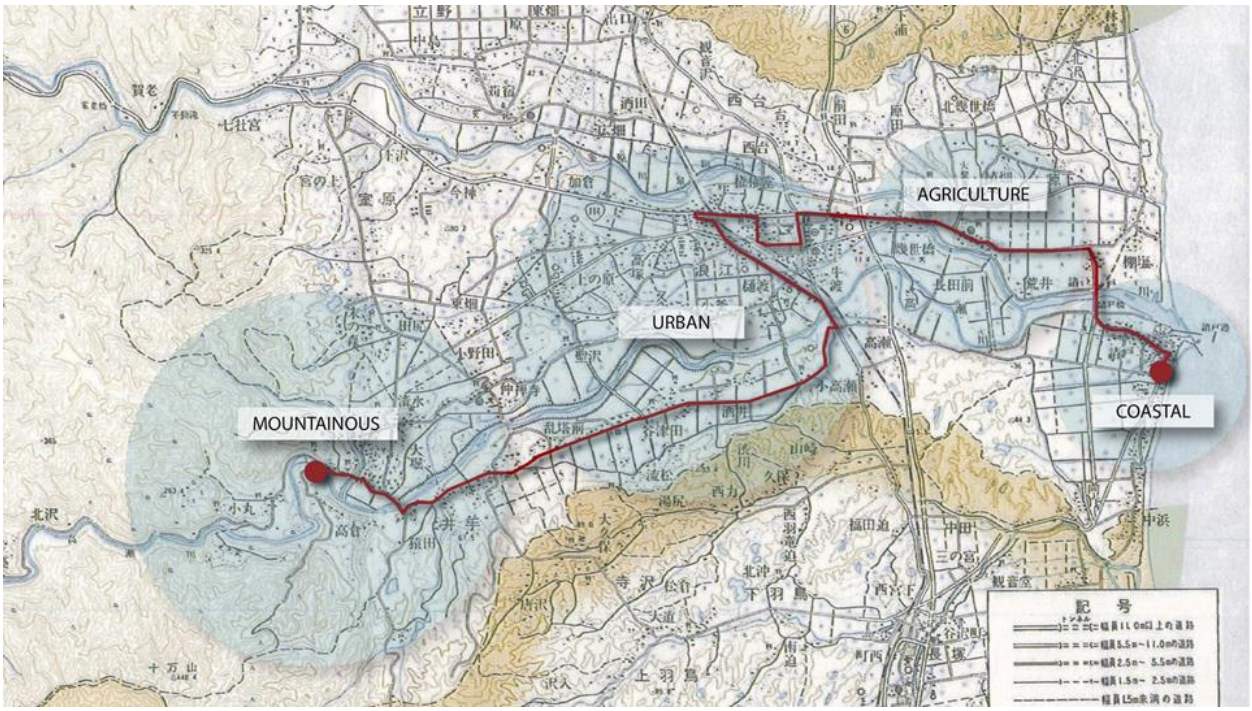

Figure 4: A transect route through Namie City drawn through a charrette style meeting with city officials

Disaster transects are often determined through satellite reconnaissance, matched with topographical data and information on GIS-based data to provide an optimal path to traverse and document an area. However, such a top-down approach neglects local knowledge. Together, researchers and local city officials of Namie City created a transect route through a charrette-style meeting—an accelerated and collaborative framework in project management (Figure 4). It seeks and successfully integrates multiple perspectives combined from all collaborators and brings transparency to the decision-making process (Moon et al., 2014; Roggema, 2014). The transect route was achieved in short, feedback loops—presented in an hour long-compressed working session that was reviewed, critiqued,

and refined through multiple iterations based on our request to match the following criteria:

- Areas of low- and high-levels of airborne radiation;
- Areas that are symbolic to the main functions of the city: coastal, agricultural, urban and mountainous regions;
- Areas that characterize the impact of each of three disasters: earthquake, tsunami and nuclear fallout.

As participant-observers in a site that is relatively unknown to us, it was important to match the City's local values as part of the team's understanding. Therefore, a collaborative and multidisciplinary approach allowed us to study the micro- and macro-scale details of Namie City.

Figure 5: Meeting with government officials in Namie City Hall (12/16/2014)

Method 2: Sensor based data collection

Quantifying risk is an essential component that can allow communities to assess current conditions for reconstruction. The question on "how safe is it to live here?" can be answered by assigning a measure that can quantify "risk" over time. The scientific measurements on the amounts of air-borne radiation accomplishes one dimension of measuring risk in post-nuclear environments. With the technology in place to measure radiation levels through vehicle mounted devices, various other forms of data can be captured simultaneously. Once the data is collected, it is synced via timestamps and geo-coordinates, enabling a rich, multi-dimensional array of both longitudinal and latitudinal analysis.

The BISHAMON team built a vehicle-mounted radiation monitoring system that consists of a survey meter, a real-time GPS receiver, a data acquisition device (DAQ) and a laptop computer. The DAQ and GPS receivers are connected to a laptop via a USB connection and a custom application takes voltage measurements from the DAQ and translates them into dose rates (Sv/hour). Then, readings are captured from the GPS receiver every second in the form of NMEA sentences, which include latitude, longitude, speed and altitude measures. The NMEA sentences are outputted as text files and imported into Geographic Information Systems (GIS) for spatial analysis (Kawano et al., 2012). Coupled with a web-based interface, BISHAMON works directly with government officials to specifically help and empower affected communities for the transparency and accessibility of radiation data.

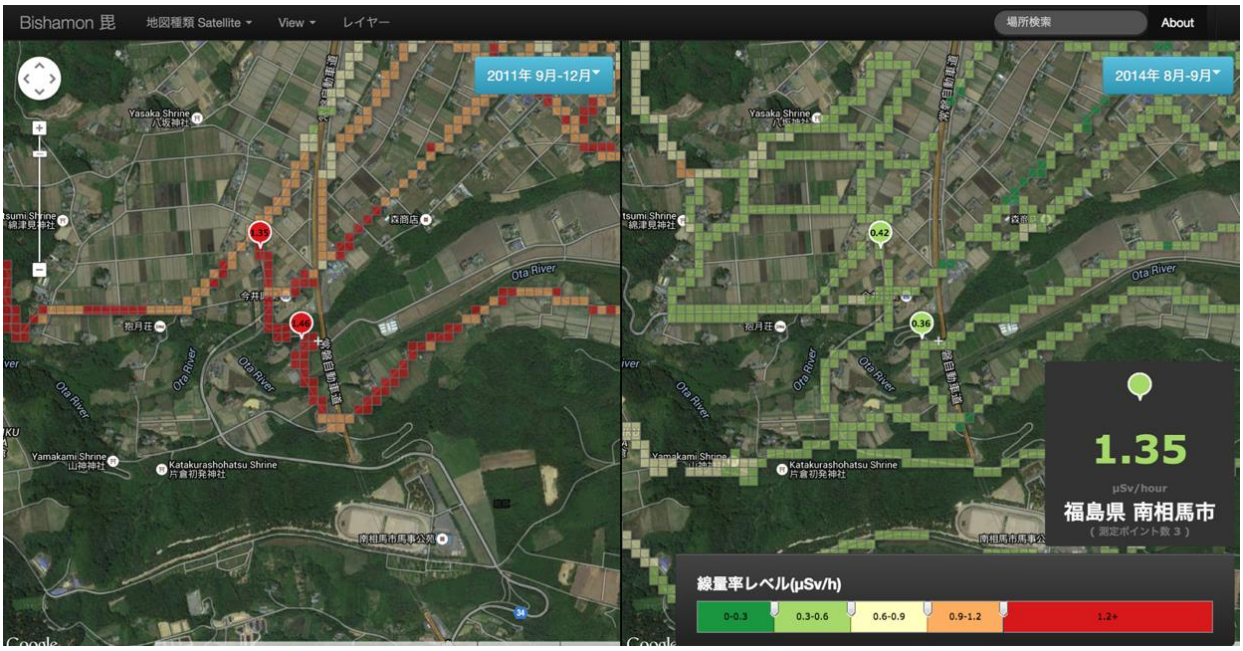

Figure 6: BISHAMON's data published on the official Minamisoma City website (http://bishamon.org/minamisoma)

The advantages of BISHAMON is its capacity to provide a temporal narrative, which measures the amount of radiation levels every second; a focused collection of millions of sensor-based data points over time. Our data have been curated by the scientific

community and the local governments they belong to (Figure 6). Therefore, BISHAMON achieves a responsive scientific method that quantifies risk through the physical collection, mapping and sensing of the where, how much, and when of radiation levels. As an urban scholar, however, I questioned the multifold dimensions that could provide new perspectives to this data: What are the urban characteristics of the areas that record high levels of risk? And, what are the causal relationships between the scientific readings (ie, radiation levels) and the community? In order to answer these questions, I sought to create the beginnings of a visual, spatial archive, one that in its completion provides a searchable interface through space and time. It allows for the interrogation of historical maps, personal narratives, pictures, documents and films that capture the reconstruction efforts in this transforming urban landscape. What then does it mean to chronicle such a transformative landscape? On one hand, this project is an attempt to make sense of the horrific tragedy that befell F1 and its surrounding communities; on the other hand, it hopes to provide a template for visual, spatial and narrative ethnographic research of urban spaces that suffer from immediate and jarring transformations.

Method 3: Photography & Video

In order to illuminate the importance of visual-based ethnography in the multimodal landscapes (coastal, urban, agriculture, mountains) of Namie City, several photographic and filmic methods are used to augment existing scientific data. Visual recordings are conducted in an objective and systematic method to provide unbiased visual evidence to existing conditions. There were three methods conducted along the transect route:

Dual video capture

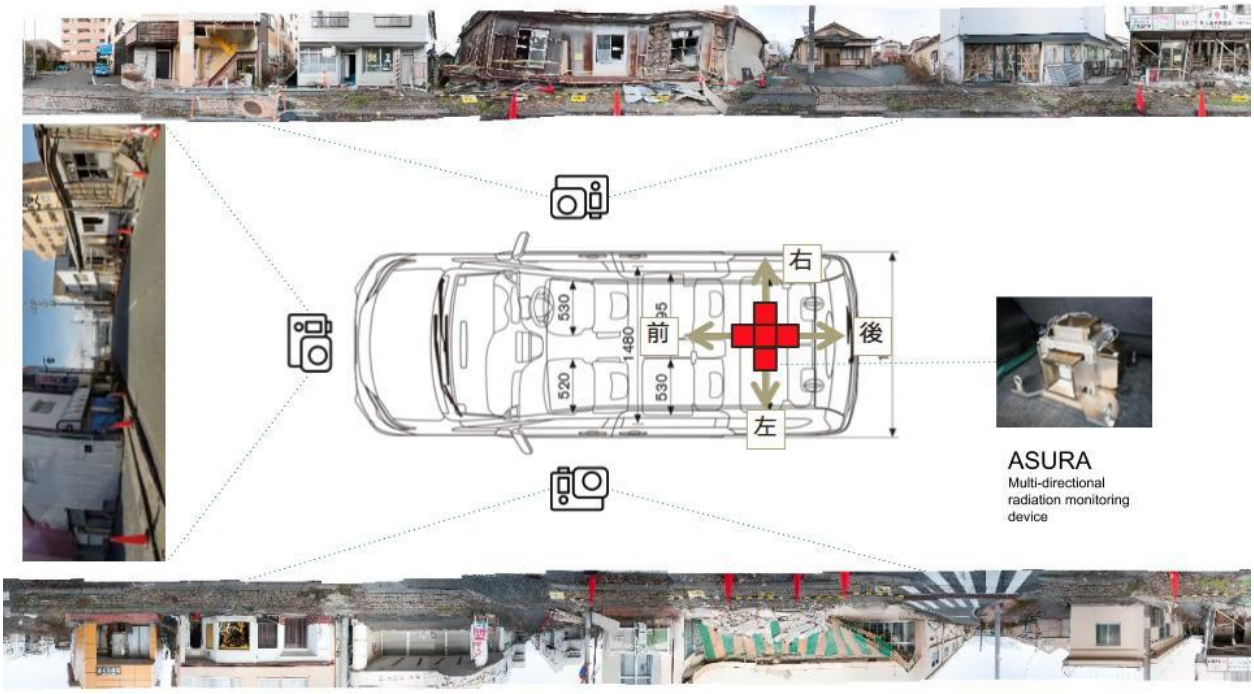

Figure 7: Cameras are mounted on each side of the vehicle, simultaneously capturing the city from multiple directions. ASURA, a multi-directional radiation monitoring device was mounted to map levels of airborne radiation.

Two GoPro cameras are attached to the front and side of the vehicle to capture a continuous wide-angle video (Figure 7). While video capture has no geo-functionalities, the timestamps on each frame are later correlated to the timestamps recorded by a separate GPS device, enabling a true and immersive filmic production that incorporates sound, imagery and location (Figure 8).

Figure 8: Screenshots from video documentation show the coastal zone (top) and the urban zone (bottom)

Panoramic Street Views

Another precedent study that has influenced this field research is the prominent work of American artist Ed Ruscha's "Every Building on Sunset Strip" (1966). Ruscha documented the exposed surfaces of a living city via a collection of sutured, discrete photographs to depict a continuous architectural facade in Los Angeles (Vinegar & Golec, 2009, p. 109). His method of stitching each photograph into a spatial montage captured a view of the world objectively with the intent of "looking nonjudgmentally at the environment (Venturi et al., 1977, p. 3)."

To understand city spaces in disaster-stricken communities, we needed to uncover the day-to-day conditions and activities that are constantly evolving over time. Our method

to create a spatial montage of the transect route: The Coastal and Urban Zone were based on foot-led and drive-by ethnography by photographing both sides of the street. Each visit entailed multiple days inside the evacuation zone areas, where we documented a library of images and film. It was revealed that the geographies of these urban spaces portray an intimate connection between the human agency, urban development and natural elements of the environment (Figure 9).

Figure 9: Multiple images are stitched together to produce a seamless facade along the transect route.

Foot-based Ethnography

Figure 10: Research associate Arfakhashad Munaim walks through the coastal zone in Namie City (December 17, 2014).

The third installment of collecting visual data was led on-foot along the transect route. Given the transformative nature of the existing built environment, photographic records are an imperative means of preserving the present state, which is slated for imminent demolition and future redevelopment. Ensuring that each photograph is associated with timestamps and geo-coordinates (either through a GPS camera or GPS devices) is essential, as it allows for spatial and temporal analysis with other layers of information (Figure 10).

Method 4: Interviews

Figure 11: Interview with TEPCO Vice President Yoshiyuki Ishizaki on December 15, 2016 (left) and Sueko Shimokobe (86) in an evacuation shelter on December 16, 2016 (right).

The disasters on March 11th and 12th posed a plethora of questions from victims that lost their livelihoods to government agencies responding to adherent protocols from TEPCO. Many questions continue to surface from citizens, yet most of them remained unanswered. Another aspect of "Spatial Ethnography" which focused on the human agency in Fukushima included a series of interviews (Figure 11). Identifying key stakeholders in the recovery process ensures multiple perspectives are represented to tell the "whole story." Interviews focused on three important groups: those who are held responsible for what transpired (TEPCO), those held responsible to bring normalcy back to the communities (government officials), and those whose lives were disrupted by their displacement from their communities (residents). Conducting in-depth interviews with members of each group brings together a narrative of multiple voices. Furthermore, follow-up interviews with the same people over the multiple phases of recovery allows us to understand the emotional and psychological changes that each group is made to go through.

This study gives no priority to seniority of age, status, or hierarchical positionality. Instead, it is intended only to solicit, as accurately and honestly as possible, a reflection from a variety of voices. How then can an ethnographer position oneself to be an entrusted party to such authentic opinions from a population that continues to suffer from trauma? Here I list four interpersonal characteristics that have been essential to this research:

1) Neutrality - Participants showed their relief upon finding out that I was not "another" journalist. The underlying message here is a sense of media fatigue; participants have been subject to media scrutiny over the years since 311, receiving countless requests for interviews. Oftentimes, these interviews have a specific agenda: a story to confirm anti-nuclear sentiment, a story to support depression in isolation, a story to confirm compensation inequalities. In this regard, participants feel "used" by media outlets for the sake of validating a specific viewpoint. Coming in as an academic who holds no judgement to solicit a specific response helped to open up conversations in an open-ended manner.
2) Detachment - Not being an insider, both locally or even nationally, has allowed participants to feel at ease with my presence. Oftentimes, participants are reluctant to reveal their inner thoughts to those in close proximity to them, in part because of a need to guard their reputation, and an anxiety that their opinions are reciprocated amongst the inner group in a negative way. Because of local, regional, and national contestation on hotly debated topics, being an academic from a foreign country provides comfort to the participants. Additionally, participants are aware that this

accident is of global concern. To this regard, their desire to transmit their message to the global community was aided by my detachment from any local agenda.

3) **Cultural awareness** - Being an academic from abroad serves me well, but being a Japanese national with a strong command and fluency of the language, customs, and traditions of rural Japan was essential. The interviewer's interpersonal skills, along with his/her knowledge of the contextual, local, and personal history of the informant are necessary to elicit information (Levy & Hollan, 2014). Fluency in the local language allows the interviewer to recognize linguistic and cultural nuances in the respondent's discourse that may be meaningful.
4) **Return** - Single short-term visits were one of the main complaints from the participants. "I never hear back from them," they say, often of journalists who obtain information, never to come back. In one particular case, a local priest was asked to be part of a documentary film, and allowed a film crew to film him working in his shrine for a few days. He never heard back from them, nor did he ever see a final product. It is therefore essential for an ethnographer to "keep coming back," especially in regards to marginalized populations who are already living with the trauma of isolation, detachment, and abandonment. Return visits to the same informants were always greeted with joy, and oftentimes, second- and third-time interviews solicited a greater level of deep personal and emotional responses.

Person-centered Interviews

With the intent to obtain rich narratives on the life stories and experiences as they relate to the Japan disasters, I have, and continue to conduct interviews as *person-centered*

interviews, using open-ended questions and occasional probes to elicit clarity and additional information on relevant topics. This method, borrowed from the "Handbook of Methods in Cultural Anthropology" by Robert Levi and Douglas Hollan (2014), enables one to "investigate, in a fine-grained way, the complex interrelationships between individuals and their social, material, and symbolic contexts (Levy & Hollan, 2014, p. 313)." My approach is based on a series of discussion topics that elaborated with each participant depending on their comfort and level of interest to divulge further. The main topics of discussion revolve around themes of "family," "community," "displacement," "nuclear energy," and "government."

Finding Participants

There is no better way to assimilate oneself with members of a distant community than through social networks that have been nurtured over years of continuous participation. Having joined the BISHAMON team in the winter of 2011, I have since witnessed and participated in many journeys into Fukushima, providing specialized assistance to the recovery efforts based on our collective expertise. This group of volunteers is led by Makoto Naito, emeritus professor and medical doctor in clinical pathology. Makoto himself has roots in Minamisoma City, and was born and raised in the largest city that neighbors the Fukushima nuclear plant. Now living in Niigata, a four-hour drive from Fukushima, Makoto is profoundly affected by the loss of life and ongoing trauma to his hometown. His dedication to provide support was the driving force behind the creation of BISHAMON, now consisting of over 50 volunteers, largely made up of professors and graduate students. Admittedly, a large contingent of my Fukushima contacts have been

initiated through Makoto's star power, as he is a highly respected and well-known professor in his hometown. Specifically, his connections enabled us to garner meetings with local government officials, a key contingent group in this ethnographic study. It is through these beginnings that I was able to make first contact with influential members of the community, despite being a complete outsider and first-time visitor to Fukushima. Additionally, other members of the BISHAMON team provided new avenues for encounters with different target groups. For example, having agronomists on our team opened up opportunities to engage with local farmers who suffer from having their crops on radiated lands. Working with public health students and medical doctors gave us access to evacuation centers that allowed us to participate in volunteer activities that looked after the mental and physical wellbeing of evacuees, many who are senior citizens. And finally, through a myriad of encounters, this network grew through persistent engagement over years of active participation. But it was the initial breeding of trust, born through the membership of a respected group of volunteer academics that served as the impetus that enabled this research to succeed.

It should be noted that such "piggybacking" on social networks built by others has its limitations. At some juncture, it is inevitable that a multi-disciplinary team encounters a difference in agenda and goals of the research in play. Such a moment dawned upon me as my interest in human narratives, opinions on nuclear energy, the origins of anti-nuclear sentiment, and views towards governance clashed with the scientific agenda of the BISHAMON team. For example, my suggestion to incorporate open-ended interviews with survivors was met with reluctance, as such personal solicitation was deemed as potentially

detrimental to the rapport they had cultivated over years of engagement with the local government officials. In order to pursue my own research, it became necessary to disconnect myself with BISHAMON's efforts, and re-engage myself with the community as a solo researcher with an entirely different research agenda.

Method 5: Film

Figure 12: A poster of my film "Human Error" was displayed at various venues within the evacuation zone

Leonie Sandercock calls for new methodologies in transformative and therapeutic planning, encouraging the use of digital ethnographic techniques of intervention. Here, I test the usage of film as a catalyst for this planning intervention in Fukushima's evacuation

zone, one that contributes to a process of healing and reconciliation in a deeply divided community (Figure 12).

Archival research

The narratives of the people involved in this disaster alone do not tell the entire story. A sketch on the political and historical context on what led to this situation is also necessary. While the theoretical and historical context can be framed in writing, visual and audio representation required digging through archival footage on the Manhattan Project, bombing of Hiroshima and Nagasaki, post-war Japan, the Atoms for Peace movement, and nuclear energy production. Such archival footage can be injected strategically in the different thematic representations throughout the film to juxtapose a context of the past with voices of the present.

Film as Therapy

Much of the groundwork to develop a film as a mode of research is accomplished through the initial phases of my fieldwork: transect surveys, sensor-based data collection, filming, and interviews all contribute towards a narrative that informs on the ongoing trauma that persists in the region. The medium of film therefore allows a multiplicity of data to be narrated in a single, linear format, pitting contesting voices onto the same platform. One voice can inform another, while another voice can contest others. The film argues for the importance of working with and through people's hopes, fears, memories, wounds, and indelible experiences of loss and trauma (Sandercock & Attili, 2010a, 2014, 2010b). Sandercock calls this a "therapeutic planning process," which she defines as:

> ...a dialogic space is created for the unspeakable, for talk of fear and loathing as well as of hope and transformation. This involves the design of a safe space in which conflicting parties can meet and speak without fear of being dismissed, attacked, or humiliated—a new space of recognition in which historic injustices are acknowledged, as a necessary prelude to addressing contemporary conflicts.
> (Sandercock & Attili, 2014, p. 20)

In the making of my film "Human Error," the conflicting parties of TEPCO, government, and community members are brought together into a single narrative (see Appendix B). While the film succeeds in its mission to transmit these narratives to a broader audience, it also achieves a significant role in the healing process in a deeply traumatized community. Multiple screenings of the film inside the evacuation zone bring together members from TEPCO, government agencies, and community members, a situation that may otherwise be unimaginable. Following these screenings, members of the community are allowed to question TEPCO directly, in an emotional but non-confrontational manner, allowing each party to acknowledge one another.

> Particularly for groups that comprise a numerical minority with fewer material resources, deliberative planning offers an alternative to dominant modes of decision making so easily swayed by economic influence or power politics.
>
> (Umemoto & Igarashi, 2009, p. 40)

Flyvbjerg (1998) summarizes the five processual requirements of discourse for communicative planning (Flyvbjerg, 1998, p. 213)

1. No party affected by what is being discussed should be excluded from the discourse (the requirement of generality)

2. All participants should have equal possibility to present and criticize validity claims (autonomy)
3. Participants must be willing and able to empathize with each other's validity claims (ideal role taking)
4. Existing power differences between participants must be neutralized such that these differences have no effect on the creation of consensus (power neutrality)
5. Participants must openly explain their goals and intentions and in this connection desist from strategic action (transparence)

In an ideal world, such a template provides a platform for a fruitful discourse in communicative planning. However, the challenge remains in the provision of, the enablement, and practicality of creating such an environment for mutual understanding. Simply bringing together contesting parties into an environment for discourse is, potentially, a recipe for disaster. As such, there needs to be a catalyst of change, a moment of contemplation, an intervention of sorts that prompts mutual discourse and understanding. This research proposes the utility of film as the catalyst for healing. It does so by engaging the community and perpetrators alike to participate in an open dialogue that is in its intake private but in its production a public discourse. By this, I mean that the film and interview process provide those who give voices to the over encompassing narrative a private and safe haven to openly at their positionality without fear of being judged or pressured from an environment that may otherwise be governed by hierarchical structures.

Reflections

I return to the original question that helped frame the methodologies outlined in this chapter. Do these methodologies facilitate our understanding of how human-caused accidents affect specific communities? When I first set foot inside the evacuation zone, it became apparent that I needed a plan to better understand spaces that had undergone significant transformation due to a human caused accident. The evacuation zone was a vast area that encompassed numerous municipalities and a wide array of urban and natural typologies. Working collaboratively with local city officials, the transect survey was used as the most effective way to survey this expansive area in the least amount of time. Photography, video captures, and radiation monitoring were all conducted simultaneously to provide a rich temporal picture of a scarred landscape. Once this methodology was in place, it was repeated during subsequent visits, enabling an archival memory of the transect route. Doing so familiarized myself with the place of study, valuable experiential and recorded data that came in handy during interactions with citizens who became part of this ethnography.

BISHAMON, the sensor-based device that mapped the amount of air-borne radiation, allowed me to understand the space through a different lens. Being able to visualize areas of invisible risk was integral to understanding the experience of those who live within these spaces. Displacement, forced mobility, and invisible boundaries were all essential topics during discussions on community risk.

To represent human behavior and subjective and intersubjective experiences and to explore motives behind their actions, I chose to use the anthropological ethnographic

approach of person-centered interviews through multiple sessions. The interviews probed on the relationships between place in relation to a person, how place influences thoughts and emotions, and how actions have implications on history and change (Levy & Hollan, 2014, p. 314).

Collectively, these methods prescribe a rigorous model for place-based investigation, combining quantitative data collection (through sensor-based risk measurements), visual ethnography (through photography and film), and ethnography (through open ended interviews).

Chapter 4

Nuclear Japan

> "We reflect on our past actions and are working with great resolution to inform the public on our ongoing efforts, with full understanding that the public is still in need of assurances along the way."
>
> TEPCO Vice President Yoshiyuki Ishizaki
>
> "This is something that has never been experienced. A textbook doesn't exist for something like this."
>
> TEPCO Chief Decommissioning Officer at Fukushima Daiichi Nuclear Power Plant

The words echoed by TEPCO leaders are hardly encouraging. Seven years have passed since three nuclear reactors experienced meltdowns at the Fukushima Daiichi Nuclear Power Plant, and the situation seems far from being resolved. The radiation contained within the power plant is so powerful, TEPCO has yet to find a way to remove the extremely dangerous debris from the melted fuel rods. In 2016 alone, we saw news footage of remote-controlled robots "dying" in their vain attempts to clean up nuclear debris (Crew, 2016), and we also witnessed the seemingly preposterous implementation of the world's largest "ice wall," an underground refrigerator system consisting of 1500 pillars, each measuring 30 meters in height, plunged into the earth to preemptively freeze any natural groundwater that passes through the nuclear reactors (Sheldrick & Foster, 2018). Each outlandish undertaking is pushing scientific boundaries to prevent further radiation leaks, at the same time evoking feelings of a dystopian future bereft of reason. TEPCO has to confront the collapse of the very technology they promised, a future they called "safe, clean, and cheap" and an alternative to supposedly more damaging energy options. While TEPCO grapples with the unprecedented task of preventing further radiation leaks into the air and water that surrounds the crippled nuclear plant, the communities that surround it are left to

contemplate an uncertain future. Should local officials decontaminate, rebuild, and resurrect their cities? When and how should the evacuation order be lifted to welcome residents back? And given the lingering trauma and the social stigma associated with their inevitable proximity to the nuclear plant, was anybody going to venture to come back?

With so much uncertainty facing these displaced residents, we are left to ponder what all this means to the future of nuclear energy. The current administration, led by the polarizing Prime Minister Shinzo Abe, is eager to denote the Fukushima tragedy as a black swan, an event so rare that it occurs once-in-a-thousand years, which can only be evaluated in hindsight. It is poised to restart nuclear reactors throughout the country, a sign that reconfirms its long-held desire to become a self-sufficient, energy independent nation (Kingston, 2012, 2014, 2019).

What then, is the historical context that has brought upon this tragedy to a nation that is renowned for its technological prowess? And how has a single moment in time so vociferously paralyzed an entire industry? To answer these questions, I dive into the history of the nuclear industry in Japan beginning with its awakening from the post-World War II atomic apocalypse. I look at this oft contested relationship between the public and the powerful nuclear hegemony by introducing a four-part framework that helps explain the complicated discourse on the impact that nuclear energy has had in Japan. In this chapter, I cover Japan's post-war survival after suffering the devastation caused by the atomic bomb. I discuss how popular culture helped to galvanize public support and create the safety myth around nuclear energy. A third section discusses the nuclear village, and a final section

dives into the history of the anti-nuclear movement that has been revitalized in the wake of the Fukushima disaster.

Post War survival: From Eisenhower to Obama

> Some day, the voices of the hibakusha will no longer be with us to bear witness. But the memory of the morning of Aug. 6, 1945, must never fade. That memory allows us to fight complacency. It fuels our moral imagination. It allows us to change.
>
> – President Barack Obama's speech in Hiroshima (May 27, 2016)

President Obama stood where 71 years ago, Enola Gay, a B-29 U.S. bomber dropped the "Little Boy," an atomic bomb that annihilated the city of Hiroshima. "Death fell from the sky and the world was changed" he said, marking the first time a U.S. President had paid a visit to the Hiroshima Peace Memorial. As he walks away from the podium, he makes a brief detour to engage in a tearful embrace with two Japanese men, Shigeaki Mori and Sunao Tsuboi, both survivors of the atomic bomb, or hibakusha as they are known in Japan (Soble, 2016). Obama's use of the Japanese word *hibakusha*—which literally translates as "bomb affected people"—is profound in many ways. *Hibakusha* is an allusion to those who suffered the consequences of the atomic bombs dropped on Hiroshima and Nagasaki. But it also embodies a broader context that is inclusive of all persons affected by other radiation related incidents. While drawing attention to the few remaining survivors of the atomic bomb, it was also a subtle reference to all radiation exposed victims, most recently, those affected by the Fukushima nuclear meltdown. Standing next to Obama was a seemingly subdued Shinzo Abe, Japan's prime minister. This odd pairing was quite ironic. It pitted

one world leader, whose country had once used nuclear weapons against the other leader, whose country had experienced its horrible consequences. But now, President Obama was sending a global message, an appeal to eliminate nuclear weapons, proclaiming that "we must have the courage to escape the logic of fear and pursue a world without them." While for his part, Abe, who assumed power in 2012, all but abandoned his predecessor Prime Minister Noda's platform to reduce reliance on nuclear power. The phasing out of nuclear power in Japan was halted, and instead, two reactors were restarted in 2015 with plans to revive the entire nuclear industry in the years to come (Fam et al., 2014; Frid, 2012).

Both leaders spoke poignantly of an imagined world without nuclear weapons, and yet their recent political actions betray their words in Hiroshima. Obama's administration is poised to spend $350 billion over the next ten years to modernize the U.S. nuclear arsenal (Le, 2016), while Abe has repeatedly made it his mission to revise Article 9 of the "peace constitution" hinting towards the possibility of Japan possessing their own nuclear arsenal.

Article 9 is part of the post-war constitution that was put in effect by Allied forces in 1947, shortly after the end of World War II. The larger doctrine of this "new" constitution was multifold: to replace Japan's previously militaristic stance; to reduce the Emperor's role to be purely ceremonial; and to declare the renunciation of the right to wage war. The opening statement includes the following passage, declaring Japan's pacifist post-war stance:

> We, the Japanese people, desire peace for all time and are deeply conscious of the high ideals controlling human relationship, and we have determined to preserve our security and existence, trusting in the justice and faith of the peace-loving peoples of the world. We desire to occupy an honored place in an international society striving for the preservation of peace, and the banishment of tyranny and slavery, oppression and intolerance for all time from the earth. We recognize that all peoples of the world have the right to live in peace, free from fear and want.

The aforementioned Article 9, located in Chapter 2 of the constitution under the sub-title "Renunciation of War" stipulates the following:

> Aspiring sincerely to an international peace based on justice and order, the Japanese people forever renounce war as a sovereign right of the nation and the threat or use of force as means of settling international disputes.
>
> In order to accomplish the aim of the preceding paragraph, land, sea, and air forces, as well as other war potential, will never be maintained. The right of belligerency of the state will not be recognized.

According to an Asahi Newspaper report, the Abe Cabinet has decided that war-renouncing Article 9 of the Constitution does not necessarily ban Japan from possessing and using nuclear weapons (The Asahi Shimbun, 2016).

Looking at this current state of affairs, it seems astonishing that much of the same bombast was evident more than half a century ago. Obama's speech is eerily reminiscent of the infamous "Atoms for Peace" speech, delivered by former U.S. President Eisenhower in front of the United Nations' general assembly in 1953. Eisenhower started his oratory by hinting at the likelihood of a nuclear armageddon, given the current pace of nuclear proliferation.

> Should an atomic attack be launched against the United States, our reactions would be swift and resolute. But for me to say that the defense capabilities of the United States are such that they could inflict terrible losses upon an aggressor, for me to say that the retaliation capabilities of the United States are so great that such an aggressor's land would be laid waste, all this, while fact, is not the true expression of the purpose and the hopes of the United States.

Later in his speech, Eisenhower reversed his tone and offered a solution: the creation of an international atomic energy agency.

> The more important responsibility of this atomic energy agency would be to devise methods whereby this fissionable material would be allocated to serve the peaceful pursuits of mankind. Experts would be mobilized to apply atomic energy to the needs of agriculture, medicine and other peaceful activities. A special purpose would be to provide abundant electrical energy in the power-starved areas of the world.

But, could the outlined purposes really be possible? Could the ingenuity of our best scientists now be served towards peaceful pursuits for mankind? It is here where the idea for a globally shared nuclear knowledge base for the development of nuclear power for civilian and not military purposes was born. To his credit, Eisenhower opened the files of the Manhattan Project, insisting that "every document, scientific finding, and gained expertise that did not relate directly to the weapons be declassified and released to the entire world (Mahaffey, 2014, p. 75)."

Indeed, despite the gap of almost three quarters of a century between their presidencies, both US presidents confronted some similar situations in regards to nuclear proliferation being a threat to global security. President Eisenhower was talking during the Cold War, when the nation's communist archrival, the Soviet Union, was also developing its nuclear war chest. While the Cold War is over today, another communist nation, North

Korea is brandishing its nuclear capabilities, while concerns exist about the building of nuclear weapons in other countries (for example Iran, Pakistan, North Korea, etc.). Both presidents implored for the global community to imagine a future where nations are not pointing nuclear weapons at each other. Both presidents proposed disarmament as a means to reconcile this aim.

> "...among those nations like my own that hold nuclear stockpiles, we must have the courage to escape the logic of fear and pursue a world without them."
> – President Barack Obama

> "The United States would seek more than the mere reduction or elimination of atomic materials for military purposes. It is not enough to take this weapon out of the hands of the soldiers. It must be put into the hands of those who will know how to strip its military casing and adapt it to the arts of peace."
>
> – President Eisenhower

However, both presidents' message for peace was overshadowed by the troubling reality that getting rid of nuclear weapons is highly unlikely. Eisenhower's proposal to convert nuclear energy from a weapon of mass destruction to a clean energy source for civilian use presents a great peril due to the potential it poses as a dual-use technology. The possibility that such civilian nuclear power technology can be reimagined for military use remains real. Additional risks are embodied by the simple nature of having to handle highly radioactive materials, such as plutonium and uranium, volatile to even the slightest of mishaps, and the great risk for natural and anthropogenic hazards. Despite the prospect of these risks, as of May 2019, 30 countries worldwide are operating 440 nuclear reactors for

electricity generation and 50 new nuclear plants are under construction in 15 countries (World Nuclear Association, 2020b).

One cannot help but wonder why Japan, as the only nation in the world to fall victim to not one, but two atomic bombs, considered a reincarnation of nuclear technology as a means to supply energy to its citizens. World War II had given birth to the discovery of nuclear fission, a mechanism that could (and did) release intense amounts of radiation with the potential to cause mass human casualties. War provided the perfect testbed for just such a carnage. Prior to Hiroshima and Nagasaki, the United States dropped a total of 160,800 tons of conventional and incendiary bombs onto 100 cities and more than 300 towns and villages in Japan, causing more than half a million deaths (Tanaka, 2010).

On August 6, 1945, President Harry Truman approved the dropping of the atomic bomb on Hiroshima. While there was much speculation on just how much damage the bomb could deliver, no one really knew what would happen, given the lack of any precedence. What was further unknown were the consequences that radioactivity would have on the affected populace. Why Hiroshima? At the time, Hiroshima had been largely spared from the torment of war. Located more than 600 kilometers from Tokyo, the city sits comfortably in the southern edge of Japan's main island. In 1945, it boasted a population of 350,000 civilians, and, like many other mid-sized urban areas during the war, it was home to manufacturing factories dedicated to the production of war materials. The choice to target Hiroshima presented a calculated, albeit terrifying decision: to inflict maximum civilian deaths in one lethal sweep. An attack so psychologically devastating, it forced the immediate surrender of the Empire of Japan. It did just that.

Following the end of World War II, the Eisenhower administration oversaw a series of top-secret ventures to further experiment with nuclear technology, notably the development of the hydrogen bomb, a weapon 1,000 times more powerful than the "little boy" that befell Hiroshima (Mahaffey, 2014). Entire uninhabited islands in the Pacific Ocean were pulverized by these experiments. Notable for Japan was the operation code named Castle Bravo in 1954. Based on a larger research effort to advance thermonuclear weapons design, the U.S. grossly miscalculated the yield of their device. Designed by Edward Teller, "father of the hydrogen bomb," Castle Bravo was detonated on the Marshall Islands, where it yielded an astounding 15 megatons (1 megaton is the equivalent of 1 million tons of TNT), more than 1,000 times as powerful as the atomic bomb dropped on Hiroshima and Nagasaki less than ten years ago (Rowberry, 2014). The fallout exposed inhabitants of nearby islands to lethal doses of radiation. It also reached an ironically named Japanese fishing vessel "The Lucky Dragon 5" and its 23 crew members who were out on a tuna expedition. The entire crew was eventually diagnosed with acute radiation syndromes, but not before their tuna haul made its way into the fish market. Mass hysteria ensued upon the realization that radioactive fish had made it into the fish market, causing the fabled Tokyo Fish Market to shut down. The perception of fear created by this debacle went far beyond the actual risk caused by a single vessel's tuna yield, but the ensuing trauma took years to be undone.

The Seeds of Nuclear Japan

Haunted by the specter of nuclear warfare and by the Castle Bravo experiments, Japan nevertheless embarked on a pathway towards energy self-sufficiency, doing so by embracing nuclear dependency. Spearheading this cause was an ambitious young member of the lower house of the National Diet (*kokkai*), Yasuhiro Nakasone. Nakasone was joined by two powerful affiliates, Ichiro Ishikawa, chair of the Japan Business Federation (*keidanran*) and Matsutaro Shoriki, media mogul and owner of Yomiuri Shimbun, the most influential newspaper in the country, and Nippon Television, Japan's first commercial TV station. Nakasone was instrumental in acquiring governmental funds to promote nuclear power research and eventually became prime minister in 1982. "I strongly felt that Japan should rebuild itself with science and technology," Nakasone wrote in his autobiography in 2004. "Japan needed to move with the times or we would be left behind immediately (Biggs, 2011)." True to their pacifist commitment, the Atomic Energy Basic Law was passed in 1955, strictly limiting the use of nuclear technology to peaceful purposes. The law promoted three principles—democratic methods, independent management, and transparency—as the basis of nuclear research activities, as well as promoting international cooperation (World Nuclear Association, 2020a). Also in the same year, the U.S.-Japan Atomic Energy Agreement gave Japan the right to buy nuclear fuel and technology from the U.S. A year later, the Japan Atomic Energy Commission (JAE), a regulatory body for nuclear power, was formed with Shoriki appointed as its founding chairman. Thus, a nuclear trifecta composed of these powerful elites was formed and together they created a formidable hegemony, so

dominant it proved to be impenetrable, despite the numerous nuclear accidents that troubled them in the years to come.

The choice to pursue a nuclear future was not without reason. With Japan's imperial conquests vanquished by the conclusion of World War II, there was a renewed urgency to address the shortage of minerals and energy on the island nation. In the rebuilding process, energy scarcity was a primary concern amongst policy makers. As a renewable energy source, hydroelectric power plants had provided one of the few self-sufficient energy resources and by the mid-1950's, most of the easily dammed sites had already been developed (Nelson, 2011), making Japan one of the biggest hydroelectric producers in the world. In addition, what little sources of coal available remained, had all but been depleted by the effects of the war, forcing Japan to become completely dependent on fossil fuel imports, particularly oil from the Middle East, which fueled 66% of the nation's electricity in 1974 (World Nuclear Association, 2020a). In this climate of defeat and extreme energy scarcity, the allure of nuclear technology as the means to bring on a new industrial revolution was born.

The Nuclear Beginnings

Tokaimura is a village located almost exactly at the halfway point between Tokyo and the Fukushima Daiichi Nuclear Power Plant. In 1961, the construction of Tokai 1, a 160 MWe reactor began on a 188-acre coastal patch of land facing the Pacific Ocean. The reactor began generating power for civilian use on July 25, 1966, marking Tokaimura as the first nuclear village to fuel its citizens. The design for Tokai 1 was called Magnox, a gas-

cooled reactor that was imported from the UK. In the UK, the Magnox reactors were designed for the dual use of generating commercial electricity as well as being able to produce plutonium for the country's defense program (World Nuclear Association, 2020a). While the Tokai 1 reactor was not built with any military intent, the potential it posed as a dual use technology helped fuel the nuclear debate. Tokai became a hotbed for nuclear research, with government and private research facilities moving in, and along with the Tokai Nuclear Power Plant, they provided the basis of its local economy (World Nuclear Association, 2020a).

Subsequent designs for additional nuclear reactors, which used only light water reactors (LWRs), were purchased from U.S. vendors. Shortly after the Tokai reactor went into operation, TEPCO began the construction of a General Electric boiling water reactor (BWR) in Fukushima. TEPCO is one of nine regional utilities formed in 1951, marking a departure from the state-run electric industry regime of wartime Japan. It services the Greater Tokyo Area along with nine surrounding prefectures: Gunma, Tochigi, Ibaraki, Saitama, Chiba, Kanagawa, Yamanashi, and the eastern part of Shizuoka (Hoover, 2018). Similarly located on a coastal zone facing the Pacific Ocean, the Fukushima Daiichi Nuclear Power Plant (Fukushima I) situated itself within multiple villages, notably Namie to its north, Futaba and Okuma to its west, and Tomioka to its south. Covering 860 acres of land, it was the largest nuclear facility in the country, eventually housing six boiling water reactors. On March 26, 1971, unit 1 was switched into the power grid. Five other boiling water reactors were built on the same property, and by 1979, all six reactors were fully operational. TEPCO built two additional nuclear power plants. Fukushima Daini (Fukushima II), situated just 10

kilometers south of Fukushima I went into operation in 1982. Their third facility, built on a coastal zone in Niigata Prefecture, sits on the west side of Japan facing the Japan Sea. The Kashiwazaki-Kariwa Nuclear Power Plant went into operation in 1985. None of the TEPCO owned nuclear plants are located within their service area, feeding into the anti-nuclear sentiments that are bred within the communities it imposes its facilities upon (Kato et al., 2013). Starting with Tokai, the first reactor built in 1966, a total of 58 reactors were built over the next half century.

Pop Culture and the Safety Myth

> Indeed, many popular action and animated television shows for children and teenagers in the late 1960s to the 1980s, including Tetsuwan Atom (1952), Doraemon (1969), Kamen Rider Series (1971), Mazinger Z (1972), and Kido Senshi Gandamu (1981), all had heroes that relied on genshiryoku as their energy source. They had super-compact nuclear reactors embedded in their bodies and were able to retrieve unlimited energy from the reactors. Regardless of the intention of the creators, these shows did not simply domesticate and naturalize genshiryoku; they made it a hero.
>
> (Kinefuchi, 2015)

> The *anzen shinwa* ("safety myth") image portrayed by the Japanese government and electric power companies tended to stifle honest and open discussion of the risks.
>
> (Nöggerath et al., 2011)

The nuclear industry, galvanized by the backing of their trifecta elite, nevertheless needed to garner public support. Popular culture played a pivotal role in the portrayal of nuclear power as the promise of the future, a science-fiction romanticism of a utopian Japan with a seemingly endless supply of clean energy. "Japanamerica: How Japanese Pop

Culture Has Invaded the US," a widely acclaimed book published in 2006 introduces Japanese popular culture and its "invasion" to the U.S., focusing largely around the influence, or perhaps the infiltration of anime into the American mainstream. Roland Kelts (2006) describes the allure of the genre from an American perspective, but also how it helped shape the post-war cultural renewal. His narrative is rife with references to the atomic bomb, calling Japan the "first truly post-apocalyptic society (Kelts, 2006, p. 26)." Much of Japanese *manga* (comics) and anime in the 1950's and 1960's is an expression of its relationship to its American conqueror. In 1951, *Tetsuwan Atomu* (otherwise known as "Astro Boy" in the U.S.) rocketed into the airwaves as a nuclear-powered superhero of the future. Created by legendary animator Tezuka Osamu, the story is set in a utopian future with an abundance of energy—all derived from nuclear power sources. Atomu was assembled by a scientist mourning the death of his son. Unlike traditional American super heroes with bulging muscles and charismatic personas, this robotic replica was a humanoid created to mimic the loving persona of a young child, with the appeal of boyish innocence. The sorrow of a mourning father coupled with the reincarnation of a child through nuclear energy depicts an image of a Japanese future freed from its foreign dependence on energy resources.

The industry seized on the opportunity to use animated cartoons and figurines to promote nuclear safety. Much of the targeted campaigns for public acceptance were aimed at children and women. Pamphlets, newspapers, magazines, and television commercials depicted cute cartoon figures and famous celebrity intellectuals (often in the company of children) promoting and spreading the word on how necessary and "safe" nuclear power

was for the future of Japan (Onishi, 2011; Onishi & Belson, 2011). Power plants themselves built annexes that housed museum spaces displaying the history of nuclear energy and hosting real-size replica models of various components of the nuclear facilities. Schools regularly organize educational field trips to these power plants (The New York Times, 2011). In 1993, the Japan Atomic Energy Agency published an 11-minute animation, which was widely distributed to nuclear power plants. The video highlighted a cartoon character named *Puruto-kun* (Pluto Boy):

> Pluto-kun looks human but is made of plutonium. He introduces peaceful use of plutonium and explains that, although "bad people" say he is dangerous, he won't hurt anyone even if you drink him. With a childish and sometimes sad voice and ordinary boy appearance, he hails viewers to believe him and sympathize with him.
>
> (Kinefuchi, 2015)

In numerous pre-311 commercials, TEPCO was active in advocating safety as its number one priority. In many industries in Japan, safety checks are conducted by workers who are trained to point their finger at pre-established checkpoints in repetitive motions to physically acknowledge the safety of each operation. This finger wag became TEPCO's symbolic moniker for safety, and was the iconic stance that their mascot (image character) "Denko" assumed.

Other commercials published by TEPCO also promoted the finger wag as a symbolism for safety. Sakuji Yoshimura, an Egyptologist and Emeritus Professor from Waseda University became a TEPCO spokesperson in the 1990's, featuring in multiple commercials for them. He promoted the perception of nuclear safety by referencing ancient Egyptian mythology. In one such example, Yoshimura is seen inside an Egyptian tomb

filled with hieroglyphs. He points at one of them, the Eye of Hours, and explains, like a good professor, on how it is a symbol of protection. It is followed by several scenes of TEPCO employers conducting safety checks at various locations within the power plant, each wagging their finger after each safety check. It ends with Yoshimura inside a nuclear power plant surrounded by TEPCO employees declaring that "safety is our number one priority." A prominent academic, from one of the top universities in the country conveys intellectual credibility and trust, one of the key themes TEPCO was eager to push forward.

The hero-ification, intellectualization, and cute-ification of nuclear energy translated as powerful, trustworthy, and family friendly. While the change in the public perception in a population that was still very much traumatized by the nuclear holocaust was no easy matter, the rebranding strategy had a profound effect in the transformation of evil nuclear weapons to necessary nuclear energy.

Genpatsu Mura: Japan's Nuclear Village

> The "nuclear village" is the term commonly used in Japan to refer to the institutional and individual pro-nuclear advocates who comprise the utilities, nuclear vendors, bureaucracy, Diet (Japan's parliament), financial sector, media and academia.
>
> (Kingston, 2012)

It is generally understood that Japan's Nuclear Village is a reference to all the special interest groups, administrators, utilities (including TEPCO), academics, and public entities with a shared agenda to promote nuclear energy. I argue, however, that the term is a misnomer; it also embodies a duality in meaning, and includes in its denotation the *nuclear village buyout*, a controversial industry practice that began in the 1970's. In the wake of the

oil crisis, the Japanese government was pressured to foresee a future that was not dependent on foreign oil sources. In 1974, it passed the Three Basic Electric Power Laws, which together provided a legal basis for massive subsidies to local governments that agreed to accept nuclear power plants (Pickett, 2002, p. 1338; Samuels, 2013, p. 114). Hosting municipalities were given 45 billion yen (approximately US$561 million) over ten years before the power plant was built. Once the reactor began to function, they received an additional 1.2 billion yen (US$1.5 trillion) over a 45-year period (Nakamura & Kikuchi, 2011). These subsidies served to combat the anti-nuclear NIMBY-ism associated with the encroachment of nuclear power plants in existing communities. Coupled with the promise of absolute safety, the temptations, especially from the perspective of poor rural communities, was too much to pass on. Numerous communities agreed to host nuclear power plants, given lucrative offers that had profound and transformative impacts on the livelihoods of their residents. Suddenly, marginalized villages were transformed overnight, and the financial injection would be seen in the form of new civic centers, museums, schools, and hospitals (Samuels, 2013, p. 114).

The backstory behind this practice comes from the government's desire to monopolize and increase nuclear power dependency. By building a rapport with the nuclear industry, it facilitated the construction of nuclear power plants (54 in total) in these "nuclear villages." This is best explained by Koide Hiroaki, an anti-nuclear activist scholar from Kyoto University:

> The history of nuclear power is actually the history of postwar Japan. Nuclear energy was chosen in the name of economic growth, and risk was shifted to poor localities with weak citizens, so that city dwellers could enjoy the good life, while the real costs could be buried and a new form of discrimination evolved.
>
> (Koide, 2012)

Between 1990 and 2010 TEPCO donated 40 billion yen in unpublicized payments to hosting communities in Fukushima, Niigata, and Aomori (Kingston, 2012). Many of these villages spiraled into an addiction to these nuclear subsidies. The economic bubble that was born to these circumstances created a one-way dependency between the nuclear power plant and its surrounding communities. Jobs were created, revenues were high, social services were provided, infrastructures were updated, and livelihoods were lifted, all in the name of the nuclear power plant and its promise of safety.

The People Against Nuclear Power

事実は隠されるのだ。
The truth will be hidden

国は国民を守らないのだ。
The government will not protect its citizens

事故は未だに終わらないのだ。
There is no end to the disaster

福島県民は、核の実験材料にされるのだ。
The people of Fukushima continue to be a guinea pigs for atomic testing

莫大な放射能のゴミは残るのだ。
Massive amounts of radiation will remain

大きな犠牲の上になお、原発を推進しようとする勢力があるのだ。
Despite countless number of victims, powerful forces continue to promote nuclear energy

私達は捨てられたのだ。
We have been forgotten

- Excerpt from Ruiko Muto's speech on September 9, 2011 at a peace rally in Meiji Park. Ruiko is a long-time antinuclear activist based in Fukushima.

Niigata Prefecture, situated in the west coast of Japan's Honshu Island, is known for its national parks, ski resorts, and an abundance of hot springs. It is also the home to the world's largest nuclear power plant, the Kashiwazaki-Kariwa power station, boasting a facility that covers a grandiose 1000 acres of land. Even before the Fukushima disaster, the Niigata plant has been mired by a history of incidents that has caused numerous shutdowns. Most notably, the 2007 Chuetsu earthquake (magnitude 6.6) caused three of its seven reactors to shut down, indicating that further earthquake-proofing was needed before

operations could resume. With the power plant still undergoing safety checks, the 2011 earthquake rocked the troubled facility, leading to the shutdown of its remaining reactors. While the debate on whether to restart nuclear reactors across the country persists, local opposition to the troubled power plant in Niigata gained momentum. The Niigata mayoral elections in 2016 provided a dictum for the anti-nuclear sentiment that brews in local communities. Abe Shinzo's pro-nuclear LDP (Liberal Democratic Party) suffered a crushing blow to its nuclear hopes when Ryuichi Yoneyama, a doctor-lawyer who had never held office and was backed mostly by left-wing parties, won the race for governor of Niigata.

Such a victory, if we may so choose to call it so, proves to be a historic rarity. Antinuclear movements are first and foremost driven by grassroots revolts against a technology perceived to be a societal risk, often in the backdrop of a planned nuclear plant construction in one's own backyard, or in the case of Fukushima, in the planned restart of existing ones. Such local oppositions stem from larger societal anxieties and antagonism towards powerful industries and governmental policies, reflecting the struggle to balance power and social movements. In the case of Niigata's Kashiwazaki-Kariwa Nuclear Plant, local opposition was predominantly driven by the larger societal antagonism against two factors: one, the government's pivot towards restarting nuclear plants, and two, the nuclear industry's continuous presence in the rural countryside to feed metropolitan regions located hundreds of kilometers away. The Niigata case stands as a successful model for a social movement that grew from localized, segmented conflicts that speaks to a larger national debate.

In what follows, I first take a look at the historical backdrop that contributed to the rise of the anti-nuclear movement in Japan. I then turn to the global picture, looking at the 1973 oil crisis and how it stood as the pivotal moment that gave legitimacy and political leverage to push forward the development of nuclear energy, at the same time giving rise to social movements against it.

Anti-nuclear Japan

As the only nation to succumb to the horrors of the atomic bomb, the ongoing debate on whether to use nuclear power as a primary source of Japan's energy policy has been one of the most hotly contested directives in the country's modern history. On the one side, a populace haunted by the specter of Hiroshima and Nagasaki; on the other, a government flummoxed by its inability to get out of the shackles of foreign oil dependency. The push-and-pull between these two extremes has created a contested battleground that continues to be a divisive topic in any political discussion today. The history of the movement against nuclear technology cannot be told without the acknowledgement that nuclear weapons and nuclear power inherently embody the same risk. It is this risk, the threat of being physically and ecologically exposed to the effects of large doses of radiation, that spurs the antinuclear sentiment.

We begin by putting forth the question on how it came to be that the nuclear industry was so easily capable of infiltrating itself into the Japanese society. Bolstered by their success in convincing the general public on the safety and validity of nuclear energy as a necessary source of energy for the future of the country, the industry eventually built

more than 50 nuclear reactors, mostly along the coast and many on top of seismic fault lines. Numbers wise, this represents the third most in the world following the United States and France (World Nuclear Association, 2020b). Despite the resounding authority and hegemony with which the nuclear industry took command of energy policy in Japan, it was not without public resistance. In fact, antinuclear sentiment has been the cause of some of the nation's largest public protests to date, reaching its height in the aftermath of the Fukushima crisis. A year after the nuclear meltdown, millions of anti-nuclear citizens gathered outside the prime minister's residence in Tokyo. While the rest of the world was raptured in numerous social unrests such as the revolutionary gatherings in Tahrir Square in Egypt and the plethora of Occupy movements in the US and elsewhere, the Japanese public was holding its own version of protest in the form of anti-nuclear gatherings in the summer of 2012. The catalyst to these protests was Prime Minister Noda's controversial decision to restart two nuclear reactors, Ōi 1 and Ōi 2 in western Japan (Kageyama, 2015). This came in the heels of Japan enjoying a 100% nuclear free energy dependency for the first time since 1970. The timing was catastrophic, enraging the public and causing vocal protests of massive numbers not witnessed since the 1960's. Noda's decision to reverse Kan's mission to eliminate nuclear energy by 2030 was behind the spectacular rise in public protest against nuclear power, marked by weekly rallies outside the Prime Minister's residence. *Saikido Hantai*, or "we oppose nuclear restarts," became the rallying cry for the movement, attracting hundreds of thousands of people from all walks of life. On June 29, 250,000 protesters gathered in front of the Prime Minister's residence, followed by 150,000 people on July 6, and another 150,000 on July 13. Other huge crowds congregated in

historical landmarks such as Yoyogi Park (170,000 on July 16), and the National Diet building encircled by 200,000 demonstrators on July 29 (Oguma, 2016).

While the Fukushima incident proved to be the catalyst to this massive human protest, it was by no means without precedence. Anti-nuclear voices in Japan have been around since nuclear energy was first introduced in the 1960's. But even before that, the seeds of protest were born as early as when the atomic bomb was being developed during World War II. Nuclear fission, the process that splits atoms into smaller parts to release large amounts of energy, was discovered as a consequence during the race to produce "the Bomb." Top scientists from around the world with knowledge on nuclear science were ordained to participate in the atomic race. They were confronted with an unsettling ethical dilemma: to get involved in the race to produce the first nuclear bomb, or to risk other nations getting there first. In the United States, the dilemma revolved around the idea of dropping the bomb on Japan, but as Japan teetered towards its World War II defeat in 1945, General Dwight Eisenhower professed to having "grave misgivings, first on the basis of my belief that Japan was already defeated and that dropping the bomb was completely unnecessary, and secondly because I thought that our country should avoid shocking world opinion (Wittner, 2009, p. 28)." Backing up Eisenhower's anxieties were a trove of scientists from Los Alamos in Albuquerque, the Met Lab in Chicago, and Oak Ridge in Tennessee. Leading the charge against using the bomb on Japan was Leo Szilard, a Jewish-Hungarian born physicist and inventor who had studied in Berlin alongside Albert Einstein. Having fled Nazi Germany, he came to the United States in 1938, conducting various experiments at Columbia University that eventually convinced him of the possibility of nuclear fission:

"the large-scale liberation of atomic energy was just around the corner... There was very little doubt in my mind that the world was headed for grief (Fernandez & Ripka, 2012, p. 373)." And yet, despite his reservations of constructing the bomb, the prospect of a German atomic bomb fueled his desire to make sure that the Americans beat them to it. It was in this realm that the first seeds of antinuclear sentiments appeared, not from the public, but from the very scientists who were responsible for producing the weapon of mass destruction.

Social movements in Japan took some time to develop. Following their defeat in WWII, the Japanese priority leaned heavily on the task of rebuilding the economy. The 1950's provided a time of relative calm waters. This was partly due to the installation of the new constitution which turned over sovereign authority from the emperor to the people: "sovereign power rests with the people." It also provided equal civil rights to all its citizens, including women: "All of the people are equal under the law and there shall be no discrimination in political, economic or social relations because of race, creed, sex, social status or family origin." The dramatic and sudden shift in the constitutional goals of Japan marked the beginnings of the antinuclear sentiment. For the first time, the legal barriers were removed, allowing for social movements to foster. The provision of equal rights for women also had a profound impact on citizen participation, as housewives came to play a critical role in the anti-nuclear movement.

Globally, the dropping of the bomb had a profound effect for the burgeoning pacifist movement. The prevailing and dominant thought in the post Hiroshima and Nagasaki era was summarized simply by Einstein's warning: "General annihilation beckons (Isaacson &

Thomas, 2012)." Far from signaling the end of global conflict, Hiroshima came to symbolize the start of an intense debate on the use of nuclear weapons.

Despite shouldering the horrors of the nuclear holocaust, the decade that followed the bombings only spurred small scale protests. Why was the antinuclear movement slow in developing? This was partly due to General MacArthur's systematic censorship of all mentions of the bomb in Japanese scientific publications. Particularly, the effects of radiation on the human body were censored by the occupational forces, eager to conceal the long term after effects of the bomb: keloids, leukemia, and cancers. It took almost an entire decade for the Japanese public to even begin to understand the true meaning of atomic disasters (Yamazaki, 2008).

Just as the true multidimensional impact of the bomb was dawning upon the Japanese people, the nationwide panic that followed the Lucky Dragon incident came to coalesce the social anger, fear and hatred towards nuclear weapons testing. The incident rekindled the horrors of the atomic bomb, symbiotic in its reminder of the underlying fear of nuclear technology: radiation fallout. Dubbed as the "atomic tuna" incident, it came to symbolize the most enduring environmental legacies of the cold war. During the period between 1945 and 1980, 535 atomic weapons were detonated above ground, scattering a layer of radiation dust on planet earth. As much as the atoms for peace initiative had shifted the dialogue on the use of nuclear fission for peaceful purposes, the Lucky Dragon provided fresh evidence on the real consequences of nuclear risk in the form of radiation, an invisible layer of death that if released, could threaten environmental, ecological, and human habitats.

A massive social movement to prevent further expansion of nuclear technologies ensued, and it came from the most unlikely of sources. It began at a book club where an astonishing grassroots effort was set in motion by a few housewives in Suginami-ku, a small district in Western Tokyo (DiFilippo, 2006, p. 170). Often referred to as "housewives," women became a prevailing force in the antinuclear movement. In her 1992 essay titled "The Rise of the Housewife Activist," Mary Goebel Noguchi presents a picture of the unlikely authority of Japanese activism:

> It may come as a surprise, then, to learn that in Japan the kind of person most apt to represent an environmental concern on a television program or in the printed media is a middle-aged woman who calls herself a housewife.
>
> (Noguchi, 1992, p. 339)

Noguchi concludes that the Japanese housewife is culturally better positioned to get involved in environmental issues, partly due to their acute concerns towards family health, and partly due to the grueling and demanding work life that their husbands assume, giving them little time and energy to participate in community affairs. Toshihiro Higuchi, a historian in Georgetown University, writes on the grassroots movement's predominant origins in Japanese housewives that began in 1954. A joint appeal from different women's activist groups emerged: the National Coordinating Council of Regional Women's Associations (Chifuren), the Housewives' Association (Shufuren), and other groups, eloquently proclaimed their sacred duty to speak to the world: "We the Japanese women are firmly determined not to let our suffering happen again to any other country in the world and not to let the 'ash of death' fall in the sky worldwide any longer (Higuchi, 2008, p. 342)."

With this female authority working as its driving force, a "ban-the-bomb" petition began, and within a month, 260,000 signatures were collected. Humanitarian concern over radioactive pollution on the environment was at the core of their campaign. The campaign's pamphlet in January 1955 rekindled a national experience of facing radioactive tuna, rain, rice, drinking water, vegetables, as well as weather changes. "The first reason" to account for the petition's success was "the fact that it is rooted in the most immediate demand of citizens' livelihoods and lives." It was "why we call this … 'the movement to protect lives and happiness.'" By the end of 1954, more than 20 million Japanese had signed the Suginami Appeal for the Prohibition of Atomic and Hydrogen bombs, prompting both houses of Japan's Diet to unanimously pass resolutions calling for the prohibition of nuclear weapons and international control of nuclear energy (Kamiya, 2002). This profound hatred towards nuclear weapons furthered the cause to abolish non-peaceful use of nuclear technology, and in 1955, the Atomic Energy Basic Law was passed, limiting nuclear energy use to peaceful purposes. The law lists a total of 21 articles that addresses the commitment in the usage of atomic energy, from safety protocols, acquisition of nuclear materials, control over reactors, prevention of radiation hazards, and compensation. The first two articles articulate the objective and basic policy of the law:

Article 1

The objective of this Law should be to secure energy resources in the future, to achieve the progress of science and technology and the promotion of industries by fostering the research, development and utilization of atomic energy and thereby to contribute to the welfare of mankind and to the elevation of the national living standard.

Article 2

The research, development and utilization of atomic energy shall be limited to peaceful purposes, aimed at ensuring safety and performed independently under democratic management, the results therefrom shall be made public to contribute to international cooperation.

The last article is titled "compensation," which came under intense scrutiny in the post-Fukushima era:

Article 21 (Compensation)

Where the Government or a person designated by the Government, when exercising its or the person's authority for the development of Nuclear Source Materials under this Act and the law enacted to enforce this Act, has caused a loss in relation to a right to land, mining right or mining lease right, or any other right to the right holder and the parties concerned, the Government or such person shall provide justifiable compensation to them as respectively provided by law.

The basic principle of these Atomic Energy Laws is what continues to fuel the ongoing debate on exactly what was lost to the person whose land has been contaminated by the residue of radiation around the Fukushima nuclear power plant.

Going back to the Japanese housewives, we acknowledge that such female oriented protests were not isolated incidents. Shortly after the Suginami Appeal, a similar social movement was initiated by mothers in the United States. Women Strike for Peace was a peace activist group established in 1961 with a mission to "...nurture children and human

life. Yet, the nuclear arms race threatened to annihilate their children and all human life in man-made apocalypse (Swerdlow, 1993, p. x)." On November 1, 1961, fifty thousand women in sixty communities around the country demanded from President Kennedy to "End the Arms Race–Not the Human Race." Their actions played a crucial role in the adoption of the Limited Test Ban Treaty in 1963, which prohibited all test detonations of nuclear weapons except for those conducted underground (Swerdlow, 1993, p. 81). The treaty was entered into force on October 10, 1963 with signatures from 108 countries (117 more countries acceded in subsequent years). The treaty itself is marked by its simplicity. Only five articles are listed, with the first expounding on the promise to limit nuclear tests with these new provisions:

> Article I
>
> I. Each of the Parties to this Treaty undertakes to prohibit, to prevent, and not to carry out any nuclear weapon test explosion, or any other nuclear explosion, at any place under its jurisdiction or control:
>
> (a) in the atmosphere; beyond its limits, including outer space; or under water, including territorial waters or high seas; or
>
> (b) in any other environment if such explosion causes radioactive debris to be present outside the territorial limits of the State under whose jurisdiction or control such explosion is conducted. It is understood in this connection that the provisions of this subparagraph are without prejudice to the conclusion of a Treaty resulting in the permanent banning of all nuclear test explosions, including all such explosions underground, the conclusion of which, as the Parties have stated in the Preamble to this Treaty, they seek to achieve.

The U.S. State Department further stipulates that in accepting limitations on testing, the nuclear powers acknowledged as a common goal "an end to the contamination of man's environment by radioactive substances." Similar to Japan's Atomic Energy Laws, the pledge

acknowledges a commitment to prevent harmful radioactive release, a promise that rings hollow in hindsight.

While the Suginami Appeal may have succeeded in creating an administrative unit that oversaw the peaceful use of nuclear technologies, it ironically also managed to stimulate the rapid development of other agencies geared to establish the nuclear power industry. The Atomic Energy Commission (AEC), the Nuclear safety Commission, the Science and Technology Agency, the Japan Atomic Energy Research Institute (JAERI), and the Atomic Fuel Corporation were all established in 1956 under the Atomic Energy Basic Law. Exactly 10 years later, Japan's first commercial nuclear power reactor, Tokai I, began its operation in July 1966.

Public opposition to nuclear technology prior to 1970 was largely targeted at concerns relating to military uses. But it was another set of events in the late 1960's that had a dramatic impact in galvanizing grassroots movements. This rise in anti-nuclear voices was preceded by citizen movements in the 60's that revolved around pollution and environmental issues. In the post-war era, Japan rose to phenomenal economic heights, a period that is often referred to as the "Japanese economic miracle." It did so in large part by building steel mills, chemical plants, and thermal power facilities that accounted for large sulfur oxide emissions, sparking the concern on its effects on the environment (Edmunds, 1983, p. 123). Tragedy, however, struck in the form of mercury poisoning caused by wastewater knowingly disposed into the bay by Chisso Corporation, one of the largest and most modern chemical plants in the country, located in Minamata City, Kumamoto. At the time of the outbreak, approximately 200,000 people were living in the coastal area, most of

whom were engaged in the fishing industry. This malpractice continued unnoticed for decades until mysterious health effects materialized amongst those who ingested the contaminated seafood. This was to become the most terrifying pollution-related outbreak to have ever occurred in Japan, causing severe disfigurations, damage to the central nervous system, and deaths to thousands of victims (Imura & Schreurs, 2005; Walker & Cronon, 2011). The narrative will sound familiar to anti-nuclear activists. A powerful industrial presence imposing its prowess onto a vulnerable community, and in time, "owning" the local economy. For years Chisso Corporation was able to get away with irresponsible practices of discharging large amounts of wastewater into the Minamata Bay by continuously paying off the Fisherman's Union through monetary compensation. At the time the fatal mercury disease was discovered, Chisso, along with its subsidiaries, accounted for more than 25% of local employment (George, 2001, p. 37). But with the exploding epidemic that led to the deaths of more than 1500 people, public awareness to environmental issues led to activism that challenged the government's strategy to promote stricter development strategies.

As the first set of nuclear reactors were started, the movement shifted its focus to nuclear energy. Spurred by the tragedy that befell Minamata, local grassroots groups gathered to protest the building of nuclear reactors in their communities (Rüdig, 1990, p. 2). These efforts began with those directly impacted by their proximity to the proposed nuclear power plant location. The power utilities, eager to capitulate on the promise of nuclear energy and the perils of foreign energy dependency went into a frenzy to find ideal locations to host their nuclear reactors. The checklist to do so included the following

characteristics: (1) a location with a small population size, (2) a location at the coast, (3) a surrounding community that would readily accept compensation to host the nuclear facility. In other words, this was the same formula used by chemical factories like Chisso prior to the nuclear plant insurgence. This prioritized checklist resulted in nuclear power plants targeting predominantly rural, economically underdeveloped areas that were far away from the industrial and urban areas they were meant to serve. Vulnerable communities were confronted with a sudden and irresistible offer for instant wealth and prosperity, accompanied by a massive upgrade in municipal services that included subsidies for public works such as roads, schools, bridges, and parks (Rüdig, 1990, p. 207). The risk associated with nuclear power was tempered by a marketing campaign that promised clean energy, along with the long sought-after freedom from foreign oil dependency. Furthermore, the novelty of a futuristic, science-fiction like technology was supported through the various campaigns that utilized popular cultural icons. The lack of any disastrous precedence due to the technology's infancy eventually coalesced to a feeling of "why not"? The excitement that built up in the local communities made up of fishermen and farmers was polarizing in nature. The key element that built the schism among community members boiled down to compensations. The split was registered across gender lines. Housewives were more likely to strongly oppose nuclear benefits, while men considered the risks and weighed them carefully against the lucrative compensation packages offered by the power companies. It should be noted that when nuclear energy was first proposed by the industry in the 1960s, it was deemed as the *yumeno enerugi*, or "the dream energy." In the pre-Chernobyl/Fukushima era, the potential risk associated with

nuclear energy had no precedence, and rural communities were sold on the promise of its cleanness with little or no downside in its adoption. There was no discussion about matters concerning the energy cycle (nuclear waste) or the consequences of a major disaster, and had there been any real concerns, they were never shared with members of the nearby communities.

However much local or federal anti-nuclear sentiment brew, much of it was subdued by powerful political entities of the time. In his critical essay "A New Wave Against the Rock: New social movements in Japan since the Fukushima nuclear meltdown," Eiji Oguma describes the political climate in the 1970s that helped suppress the anti-nuclear power movement. Four circumstances contributed to the relatively quiet period of anti-nuclear sentiment prior to the Chernobyl incident in 1986: (1) general time of economic prosperity, (2) LDP spending in public works and subsidies in farmer and fisherman communities, (3) low poverty, and (4) students finding steady jobs. Indeed, the 1970s saw Japan's GDP climb to phenomenal heights, and the country becoming the world's third largest growth national product (GDP) behind the United States and the Soviet Union (Oguma, 2016). This precipitous climb was accompanied by massive migrations from rural regions into urban environments. As late as 1955, 40% of Japan's labor force worked in agriculture; this figure dropped to 17% in 1970, 7.2% in 1990, and less than 5% in the twenty-first century (Allinson, 2004, p. 84). It was precisely during this period of agricultural stagnation that the nuclear industry pounced on its opportunity to target vulnerable communities in coastal, rural regions to promote economic revival through the hosting of nuclear facilities.

The Global Picture

Japan was not alone. Globally, the nuclear industry seized on the opportunity presented in the aftermath of the energy crisis of 1973. No longer would countries have the luxury to enjoy the premise of economic growth based on cheap and abundant fuel supplies. The skyrocketing fuel prices caused by the Arab oil embargo triggered a severe economic recession throughout the OECD countries, even causing, at one point, seven European nations to impose driving bans on Sundays (Joppke, 1991, p. 46). In the United States, President Nixon informed a panicked nation of a new vision for energy independence, appropriately titled "Project Independence." On November 7th, 1973, Nixon addressed the nation announcing the quest for energy independence, likening the monumental effort needed to achieve this goal to the Manhattan Project and the Apollo Project of decades past.

> "Let us unite in committing the resources of this Nation to a major new endeavor, an endeavor that in this Bicentennial Era we can appropriately call "Project Independence."
>
> Let us set as our national goal, in the spirit of Apollo, with the determination of the Manhattan Project, that by the end of this decade we will have developed the potential to meet our own energy needs without depending on any foreign energy sources.
>
> Let us pledge that by 1980, under Project Independence, we shall be able to meet America's energy needs from America's own energy resources...."

While much of the initial reactions to the oil crisis was a psychological approach calling for energy saving and rationing campaigns, plans for regulatory actions soon followed. Nixon called for the construction of 1000 nuclear power plants in the United States by the turn of the century, a lofty ambition that fell well short of fruition. In West

Germany, Chancellor Schmidt laid out a similar agenda by introducing the first Energy Programme, demanding that within the next twelve years, 45% of Germany's electricity be supplied by nuclear power (Joppke, 1991). France was similarly prompted to adopt aggressive transition policies towards nuclear energy in 1974, and unlike the United States and Germany, succeeded in its aspirations to have more than half of its nation's energy supply be derived from nuclear power.

A global crusade to relinquish centralized control of oil in the middle east was thus under way. In the meantime, the anti-nuclear energy movement also swept through political landscapes in the United States and Europe. In a rare comparative study of democratic nations undergoing intense anti-nuclear protests, Herbert Kitschelt, a political scientist from Duke University, provides a cross-national case study of social movements that were spurned by the energy crisis. He does so by comparing anti-nuclear protest movements in four advanced industrial democracies: France, Sweden, the United States, and West Germany. These social movements shared similar operational objectives: to prevent the completion of nuclear power plants under construction, to prevent work from beginning on planned projects and, ultimately, to shut down existing nuclear facilities. This local-to-national framework of social dissent is shared by the social movements in Japan. Kitschelt argues that the impact that anti-nuclear movements have upon overall energy policy is largely dependent on the "political opportunity structure," comprised of a specific configuration of resources, institutional arrangements, and historical precedents for social mobilization (Kitschelt, 1986, p. 58). Arguably, the single largest impact that anti-nuclear activists have had is on policies regarding safety regulations. In his comparative study,

Kitschelt differentiates between states that have conducive political opportunity structures (United States, Sweden, and West Germany), and ones that does not (France). In the United States and Japan, a pattern has emerged wherein social movements routinely contribute to the readjustment of safety standards, which in turn justifies oppositional voices to seek additional requirements, or else, to request existing power plants to be upgraded to meet those new standards. Kitschelt concludes with the assertion that new policies are triggered in states that have political input structures that are open and responsive to the mobilization of protest (US and Sweden). Those that are closed, as in France and West Germany, predetermined energy policies prevailed. Japan, which leans more towards a government that is closed and impartial to social movements, has had this pattern debunked due to the overwhelming anti-nuclear sentiment triggered by the Fukushima disaster. Voices of dissent from massive protests have contributed to the delay of restarting existing nuclear reactors, despite Abe's insistence on getting nuclear power back on the grid. The restarts are now dependent on power plant "restart reviews," based on an exhaustive safety assessment conducted by the Nuclear Regulation Authority (NRA). In fact, safety guidelines that make-up the 30-point measures were formulated after public consultation in 2013 (World Nuclear Association, 2020a). In this sense, one can surmise that a compromise of sorts has been made. Whereas a complete halt on nuclear *saikado* (restarts) has not been made, significant delays and massive safety overhauls have given the nation time to reconsider its future energy policies.

Post 311

Immediately after the events of March 11th, 2011 unfolded, the voices to shut down nuclear energy resonated loudly throughout Japan. The trajectory to embrace nuclear energy as the main source of clean energy for future generations came to a screeching halt as the catastrophic events continue to unfold around the nuclear power plant. Prior to 2011, nuclear power was contributing 30% of Japan's energy supply. Plans had it that by 2030, nuclear energy would power up to 50% of the country's needs, rapidly escalating its dependency on this form of energy in order to keep its promise to reduce carbon emissions (Fam et al., 2014). 311 however had a profound effect on the Democratic Party of Japan (DPJ) and its then Prime Minister Naoto Kan. He was haunted by the realization of how narrowly Japan avoided an even bigger catastrophe, one that would have forced the evacuation of millions who live in megacities like Fukushima and Tokyo. In an interview conducted a year after the disaster, Kan reflected on his change in direction:

> "Having experienced the 3/11 nuclear disaster, I changed my way of thinking. The biggest factor was how at one point, we faced a situation where there was a chance that people might not be able to live in the capital zone including Tokyo and would have to evacuate"
>
> (Sieg & Kubota, 2012)

Kan led the charge to eliminate nuclear power from Japan's energy mix by 2040. A seesawing debate on "to nuclear or not to nuclear" ensued. The DPJ's "zero nuclear policy" was installed, and the shutdown of all nuclear reactors in the country began. Development on existing nuclear power plants was stopped, and future projects were dropped. Despite

his efforts to eliminate nuclear power, Kan's approval ratings plummeted, largely because of his early handling of the nuclear disaster, and the slow reconstruction efforts. He was forced to resign as Prime Minister, leaving office in the middle of this maelstrom, and was succeeded by fellow DPJ member Yoshihiko Noda. Under his administration, Noda, albeit temporarily, pursued the abandonment of nuclear power. By May 1st, 2012, every nuclear reactor in the country was shut down for the first time since 1970. It was to be but a brief moment of calm before the storm. Unlike Kan's "zero nuclear policy," Noda was intent on restarting the reactors, mandating that each undergo new stringent security checks before doing so. The Nuclear Regulation Authority (NRA) was summoned to install new safety standards, and once a reactor's safety was confirmed, it gave the green light to restart, pending local and federal government approval (World Nuclear Association, 2020a). Just two months after the last of the reactors was shut off, and despite massive public opposition, Noda approved the restart of two reactors at the Oi nuclear power plant in Fukui Prefecture. Within the same year, and after only 15 months in office, Noda d bowed out following a resounding defeat in the general elections held in December, losing to the presumptive Liberal Democratic Party (LDP). The LDP returned former Prime Minister Shinzo Abe to power, a conservative and outspoken nationalist who openly campaigned to restart nuclear power. The main items on his agenda were the various measures with which he proposed to address the faltering economy—dubbed as "Abenomics" by the media—immediately shifting the national conversation away from the nuclear debate, and effectively silencing the anti-nuclear voices (Fackler, 2012).

The nuclear village, down but not out, seized on this opportunity and never looked back. Stimulated by the Ohi restart, other power plants from across the country hastily remodeled their facilities to meet the new safety guidelines. Seawalls were made higher, structures were made more seismic resistant, venting systems were renewed, backup diesel generators and seawater pumps were revamped. Restart applications from each of the regional utilities began to pour in: Kyushu, Chugoku, Shikoku, Kansai, Tepco, Tohoku, Hokuriku, and Hokkaido. A total of 25 nuclear power plants applied for safety inspections, and two reactors in Kyushu (Sendai 1 and 2) were restarted in 2015 (World Nuclear Association, 2020a).

Buoyed by the successful rebirth of the nuclear industry, Abe's administration updated the nation's Strategic Energy Plan in 2014. This was the first modification since 311, and while it proposed a reduced reliance on nuclear power, it did not eliminate it from the energy mix, targeting for at least 20% by 2030 from a depleted fleet of reactors (World Nuclear Association, 2020a). The plan considers nuclear power as an essential energy source for the future that will help combat global warming (Hiranuma, 2014).

Reflections

Over the many years of traversing the areas in and around the evacuation zone, I have come to observe the history of place in different ways. The imprint of the nuclear legacy in the coastal towns of Fukushima are evident through various impressive modern structures, seemingly out of place from their more mundane surroundings. Regions that were formerly dependent on agriculture have transitioned to having TEPCO as a major

employer. Many state-of-the-art facilities, including youth gyms, hospitals, schools, and stadiums were gifts from TEPCO in tranquil communities where the main source of living is in agriculture and fisheries. One government official complained that such facilities were a complete waste of money, but since the funds were earmarked specifically for them, municipalities had no other option but to build them. History was brought up repeatedly when I first interviewed TEPCO Vice President Yoshiyuki Ishizaki, as he reminisced on the wonder he felt as a child, watching Astro Boy launch into the skies. He dreamed of a day that he could be part of this future of energy independence.

His narrative, along with many others are compiled in the next chapter, "The Narratives of Fukushima." I look at the how nuclear Japan shaped the history of Fukushima's coastal towns, and how social, political and economic changes altered the lives of ten people, including the narratives of two City Mayors who have struggled with the adoption of nuclear energy and the torment in decisions that come when things go wrong.

Chapter 5

The Narratives of Fukushima

What was Fukushima like before the nuclear accident gave it a new identity? And what are the consequences that led to its defamation? Fukushima, the third largest prefecture in Japan, is smaller only to Hokkaido and Iwate. It is roughly six times the size of Tokyo despite having only one sixth of its population. Let us now consider Fukushima with a focus on "personal communities," putting relevance to "locality" and "community" for understanding the ways in which history and transformative events shape people's experiences (Allan & Phillipson, 2008). Ten people were interviewed for this study, conducted over a span of four years, between 2016 and 2019. Interviewees were selected based on several criteria: gender (four women, six men), age (18 to 85), occupation (farmers, cattle farmers, city mayors, travel inn owners, public health worker, student), and lastly, each having a strong desire to stay or return to their homes within the evacuation zone. Transcripts have been compiled, summarized, and subsequently edited to build intermingling narratives that speak on the following three themes: "The Memory of Place," "The Evacuation," and "Thoughts on Nuclear Power." With the exception of the two city mayors, each person was interviewed multiple times, providing a glimpse of how sentiments have changed—or not—over the course of a transformative period.

The first interview was held at a place called J-Village, a soccer stadium and former training facility for Japan's national soccer team situated 20km south of the nuclear power plant. J-Village was built in 1996 by TEPCO, a gift to the Prefecture of Fukushima as part of their promotional campaign to bring economic benefits to communities that agree to host their nuclear plants. A staggering $120 million dollars was spent in its construction, a fee that TEPCO deemed necessary to promote its goodwill and appease anti-nuclear

sentiments amongst residents. Following the Fukushima debacle, J-Village was quickly transformed into an emergency center to manage the ongoing crisis. Soccer fields were demolished, and in theirs place, temporary dormitories for workers, office spaces, and emergency control centers were set up. All operations regarding the crisis management for the stricken power plant were centralized here, and workers going in and out of the power plant had to come here first in full body protective gear, and then be transported by buses towards "ground zero," The Fukushima Dai-ichi Nuclear Power Plant.

When I first gained access to visit the nuclear power plant, I was asked to meet at J-Village, and was greeted by Vice President Ishizaki. The sight of hundreds of workers lined up in full hazmat suits awaiting their turn to go on a bus remains a strong memory from this visit. Prior to being transported into the power plant, we were escorted into a conference room for a one-hour welcome that included a video presentation by TEPCO operators, largely focused on their expressions of remorse for what had transpired, followed by a status report on ongoing efforts to contain the unresolved melted fuel rods. Following this fortuitous encounter with Ishizaki, he agreed to subsequent interviews related to this research, even rearranging his schedule to accommodate my summer fieldwork agenda. This dedication and desire to be heard was a sentiment that was shared not only by TEPCO operators, but by all the citizens who were victimized by the nuclear fallout.

The Ten Voices of Fukushima

Chihiro Sato

Shelter resident: Nihonmatsu, Fukushima
Interview dates: 7/19/2018, 7/17/2019
Distance from Fukushima Daiichi Nuclear Power Plant: 57km

Figure 13: Chihiro Sato

Chihiro was 13 years old at the time of the accident, and she was attending her elementary school graduation in Namie. Unlike some others in this ethnographic study, she was born and raised in a world where the nuclear power plant already existed in her backyard. When she was told to evacuate, she kept wondering, "Why? What are we running away from?" She eventually settled and lived in an evacuation shelter where she spent the

next seven years of her life, taking care of her ill father. In 2018, she agreed to come to Namie with me, the first time she visited her hometown since the disaster.

Tomoko Kobayashi

Futabaya Ryokan (Inn) owner - Odaka, Minamisoma, Fukushima
Interview dates: 12/14/2016, 4/1/2017, 7/4/2017, 7/16/2019
Distance from the Fukushima Daiichi Nuclear Power Plant: 15.6 kilometers

Figure 14: Tomoko Kobayashi

Like many who live in the countryside, Tomoko left Fukushima shortly after getting married, with thoughts that she may never go back. But because of an unfortunate incident leading to the injury of her mother, she chose to return and take over her family *Ryokan* (travel inn) that had been around for several generations. She encountered the earthquake shortly after she took over and was forced to evacuate immediately afterwards. A year later,

she returned to her *ryokan* —the moment the government allowed her to do so—and planted flowers to give a sense of life to an otherwise desolate and abandoned space. As the city re-opened, people began to show up, and her *ryokan* has since become a hub for community, and a space for therapy and healing.

Yoshiyuki Ishizaki

TEPCO Vice President
Interview dates: 12/16/2016, 4/5/2017, 7/15/2019

Figure 15: Yoshiyuki Ishizaki

The nuclear industry is represented by Yoshiyuki Ishizaki, the TEPCO Vice President who leads the reconstruction efforts while continuing to advocate for nuclear energy. Following the disaster in 2011, Yoshiyuki has vowed to lead the rebuilding efforts in the affected communities. He does so by launching the TEPCO *Fukko Honsha*, "revitalization

headquarters," located in a makeshift supermarket in Odaka, a district located just outside the 20km evacuation zone. Here, he coordinates a daily influx of TEPCO employees coming from all over the country (there are more than 30,000 of them). These mandated community volunteer efforts, a program he himself instituted, is a means to reconcile for the damage caused by TEPCO to the local communities.

Koichi and Sachiko Nemoto

Nemoto Farm: Odaka, Fukushima
Interview dates: 12/16/2016
Distance from the Fukushima Daiichi Nuclear Power Plant: 10km

Figure 16: Koichi and Sachiko Nemoto

Koichi and Sachiko Nemoto are farmers living in Odaka, located just within the 20 km evacuation zone boundary. Their farmland was heavily contaminated, having the misfortune of being positioned at the crosswinds on the day that the explosion sent

radioactive materials into the air. When I first met Koichi in 2014, he was filled with anger towards the policies that prohibited him from farming in Odaka. His family has a lineage that goes back 500 years, occupying the same plot of land through generations. Slowly, this anger has shifted to acceptance, and with the opening of the city in the summer of 2016, he hopes that more people will come back to the largely abandoned city. Sachiko laments the social networks that have forever been lost due to the evacuations. “We used to have three generations living happily under one roof. Now all the young people are gone, and we are left all alone in this house.” She also delivers a staunch message to TEPCO and the government: “if you say it is so safe, then you should build the next nuclear power plant in the middle of Tokyo.”

Noritomo Nishiyama

Head priest at Hiwashi Shrine - Odaka, Minamisoma, Fukushima
Interview dates: 3/31/2017
Distance from the Fukushima Daiichi Nuclear Power Plant: 13.4 kilometers

Figure 17: Noritomo Nishiyama

As Noritomo Nishiyama recalls the past, he is unable to suppress a huge smile. “If you ran out of soy sauce or miso, you ran to your neighbor and asked if you could ‘borrow’ some. That is the kind of human relations that existed here. This was truly a wonderful place.” But now he is left to ponder the present, reconnecting with past worshippers, pleading for them to come back and visit. Noritomo is the 27th head priest of Hiwashi Shrine, boasting an astounding 650 year history. “There can never be another Fukushima,” he says, as he contemplates an uncertain future.

Sueko Shimokobe

Shelter resident: Nihonmatsu, Fukushima
Interview dates: 12/16/2016, 3/30/2017, 7/13/2019
Distance from Fukushima Daiichi Nuclear Power Plant: 57km

Figure 18: Sueko Shimokobe

At 86 years old, Sueko acknowledges that she does not have much time to live. Sueko has lived the last seven years of her life in a cramped evacuation shelter, seemingly ignored by TEPCO and the federal government who have been slow to provide alternative housing for displaced citizens. Her life after 311 is a microcosm of the suffering that has been brought upon the displaced citizens of Fukushima. Even after years of living at the shelter, there is little resolution to returning to her hometown, nor has she been provided with a better living environment. In the winter of 2017, Sueko finally decided to move out of the

shelter and into a senior care facility in Sendai. Namie, a place she has called home for more than 60 years, is no longer capable of supporting her in her later years.

Katsunobu Sakurai

Mayor of Minamisoma City, Fukushima. Population in 2011: 65,000
Interview date: 7/15/2019
Distance from the Fukushima Daiichi Nuclear Power Plant to City Hall: 25 kilometers

Figure 19: Katsunobu Sakurai

Many years after the disaster, Katsunobu Sakurai, Minamisoma's Mayor, can easily summon the rage he felt in the harrowing days that followed the evacuation of his citizens. Trapped inside the evacuation zone, he witnessed death without the support of the central government or the military, as they were the first to abandon the area, leaving behind a search and rescue operation that was far from finished. In his despair, he launched a

YouTube video condemning the government for their lack of support, and making a global plea for support. It went viral and made him a Time Magazine top 100 most influential person of the year. A former cattle farmer himself, Katsunobu decries the advent of nuclear energy, and seeks a future of a nuclear zero nation.

Tamotsu Baba

Mayor of Namie City. Population in 2011: 20,000
Interview date: 7/4/2017
Distance from the Fukushima Daiichi Nuclear Power Plant to City Hall: 8 kilometers

Figure 20: Tamotsu Baba

As he recollects his memories of Namie, Tamotsu Baba tears up. "The place that you are born and raised in... there is something about it... when I look back at my childhood I don't just have memories of Namie. I can feel it, like I am still there. The air, the wind, it is

all part of my body." The sense of attachment to place that he feels for his *kokyou*, or hometown, is emblematic of many who live in rural Japan. As mayor, Tamotsu is torn between the mandate from the federal government to reopen his city, and the responsibility to the well-being of his former residents. This anguish he feels is symbolic of the rift between the local and federal governments, where local demands are not always aligned with federal mandates. This reality is especially true in the efforts for *fukkou*, or revitalization of the towns that fall within the evacuation zone.

Masami Yoshizawa

Kibou no Bokujo (Cattle Farm of Hope), Namie, Fukushima
Interview dates: 12/17/2016, 7/20/2018
Distance from Fukushima Daiichi Nuclear Power Plant: 14 km

Figure 21: Masami Yoshizawa

"Fukushima is a nuclear colony. There is no hope for Namie," laments Masami Yoshizawa, the embattled cattle farmer. The symbolism behind his words breeds divisiveness even amongst his peers and fellow community members. But his message is clear: the government has abandoned his cattle, much like they have abandoned the people who used to live in the evacuation zone. *Kimin*, or "abandoned people" are what Masami and many others in rural areas claim to be, discriminated by the policies set by the national government (Norimatsu, 2011). His claim that Fukushima is a nuclear colony is a reference to this discriminatory policy, one that positions peripheral regions to protect the state by guaranteeing energy needs of the metropolis. Masami sees himself as a vanguard to the *kimin*, keeping his cows alive and defying federal orders to kill them.

The Memory of Place

Here, I bring a collection of open-ended conversations on thoughts of abandoned hometowns, its history and cultural attributes, its ambiance, and its memory. These are not just life histories or autobiographies, but narratives that elicit how the experiences of the individual inform a larger historical context. Some of the questions I ask are: "what was Namie like before the accident," "what are some of your fondest memories," and "what was it like when nuclear energy was brought into your community?"

Tomoko Kobayashi

Futabaya Ryokan (Inn) owner - Odaka, Minamisoma, Fukushima
Distance from the Fukushima Daiichi Nuclear Power Plant: 15.6 kilometers

To tell you what kind of place this is, it is a typical *ekimae ryokan*, or "by the train stations travel inn." This *ryokan* was started by my great-grandmother. I'm not certain for sure, but most likely this was before World War II. We started with five, maybe six rooms. I remember as a child, we had a *nakai-san* (helper), who wore a proper kimono and welcomed the guests with a hearty *irashaimase* (welcome) and took you to your room. Meals were prepared by the *okamisan* (inn owner mother), which at the time was obviously my great grandmother. Other senior ladies were around to help run the *ryokan*. We remodeled the building once in 1959, and again in 1974.

Today, we see lots of cars, but back then, it was all about the train, and as we sit right next to the Joban line, we hosted many guests who came to work around here. That's why we were called a *shonin* ryokan. Back then, we had wholesalers. They went around, built stuff,

and walked around and showed them off to small businesses. We hosted many of these walking salesmen. Also, we are located right next to an agricultural coop, and many farmers stayed here. As the years went by, and cars started to take over, the same guests continued to stay here, and we'd have repeat customers from way back, coming once or even twice a month. We were busy, and a few times a month, we'd be filled to capacity. And construction sites. Whenever they built new structures, power plants, this was the place for blue collar workers to stay. Odaka isn't known for any kind of tourism, so it was mostly businessmen. And of course, any time there were high school sports tournaments hosted nearby, we had large student groups come and stay with us for their *gasshuku*. [1]

It was in 1976 when I got married here, and then I left, and never really thought I would come back. I left Odaka, following my husband wherever his many businesses took him. We moved around, to Chiba, Tsukuba, Tokyo, Sapporo. But then, in 2001, my mother got injured. She burned 70% of her body one day. And during her moment of extreme pain—from within the hospital bed and with an oxygen mask wrapped around her head—she told me, "You know, in about a week, Okaachan (mother) will be back at work." This made me think, what is the meaning of all this? At the time, she said matter of fact, "I just fell into the *furo* (bath tub).[2]" You see, in those days, the *furo* was different from what it is today. And my mother being impatient, she put boiling water directly into the *furo*, and then

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1 *Gassuku's* are Japanese sports camps for high school and college sports teams. They are usually annual events where entire teams go to a remote location for multiple days to train, bond, and drink. It is common to use *ryokan's* for *gasshuku's* where students share large tatami rooms to sleep in, and have banquet style meals prepared by the *okamisan.*

2 A *furo* in a ryokan is usually a large public bath, separated by male and female areas.

added cold water to even the temperature. But she fell in before the temperature was evened out. And at the Fukushima Hospital, she refused to entertain the idea of abandoning our *ryokan*. Like anything in life, quitting is easy, but that's the easy way out. I had no choice but to say, "oh, I guess it is my turn and I must do my duty now, I have to take over." I told my husband that I was going back to our Fukushima *ryokan*. He eventually joined me six years later in 2007.

When I started out at the *ryokan*, I had a vision of running it in a way that I could manage by myself. You know, like those you find in the mountains, where families come to spend a weekend. But we have this rather large *shokudo* (dining area) that we kept, and I thought, this space can be used for something special. And before I knew it, the *shokudo* became a popular gathering space for people to eat and drink and just talk. There is no other place like this in Odaka. After the disaster, when many of the locals left, the *shokudo* became a place where community members, volunteers, guests, journalists, and many other people congregated.

And for those who lost their homes, destroyed by the tsunami and earthquake, our *ryokan* became a welcome space for them to stay. They come back regularly, and slowly we begin to move on. When I see them again and again, I notice a change in their faces. Those that accept and experience the current reality are able to move on. On the flip side, those who have left and gone far away, they continue to live in 311. So, every year is 311 for them. But for me, the last five, six years, I have lived inside the evacuation zone, so I see the changes, I *feel* the changes, and I understand the consequences. And for those who left, the 311 image of Odaka remains ingrained in their memory, and that gap is difficult to fill.

Over the years, the sentiment of "we can't live here anymore," and "we have to destroy everything," has changed into a new reality. For these reasons, I'm happy I decided to come back and start all over again.

Looking back, when I was in middle school, oh how many years ago was that? Yes, this was about 50 years ago. I remember I stood up against nuclear energy. This was the time they made an announcement that Namie and Odaka was chosen to be the next nuclear hosting site. It was then that our teacher told us that nuclear power plants were dangerous. I went home and I told my parents. But you know, they are from the generation that suffered the most from the war. They remembered and experienced a time when they had absolutely nothing, no food on the table. So, when you are told that the nuclear power plant will bring you happiness, and not just happiness, but *opportunities*. It was hard for them to refuse. And for the next generation, which is me and my brothers, if we couldn't find food, there were always *jobs* out there for us to make money and feed ourselves. And our children now have the opportunity to go to college. These were real, tangible benefits... but now? It's all gone. Today we are told that the things we have kept for 10 years, 100 years, have to be thrown away. Our children and grandchildren are not allowed to visit us, let alone live with us. Our families are torn apart.

Katsunobu Sakurai

Mayor of Minamisoma City, Fukushima. Population in 2011: 65,000
Distance from the Fukushima Daiichi Nuclear Power Plant to City Hall: 25 kilometers

The construction of the Fukushima nuclear power plant was completed when I was in middle school. I believe it was around 1970 or 1971. During that time, the labor force to

operate the plant consisted of people coming from all over: United States, Japan, and many others from the local communities in Fukushima who were hired by subsidiary companies contracted to help in the operations. I remember how the local workers in our community gathered and hopped on these microbuses to be transported to the nuclear power plant. One of my classmates' father was one of them, and he boasted about how working just 30 minutes per day at the plant made him more money than any other job around here. Unfortunately, he died after a few years due to leukemia. I heard similar stories from the families of people who worked in the power plant, which made me question the popular notion of "the energy of the future," and how this power plant was more dangerous than it appeared to be. Seeing how my friend's father, barely above 50, died by working just 30 minutes a day at the power plant, it made me think of my own father, a farmer, who was also of the same age group. My father worked in agriculture, and even though he made little money compared to nuclear workers, at least he didn't have to worry about the possibility that his life was endangered by his work.

When I entered college, I learned about the *hibakusha* (people exposed to radiation) from Hiroshima and Nagasaki, and visited these sites myself when I was 19 years old. At a young age, I was active as an anti-nuclear activist, fighting to protect the rights of the *hibakusha*. I learned about our troubled nuclear history, from the *Daikokumaru* incident, to the nuclear tests conducted by the USA and the USSR during the Cold War. The race for the bomb structured the global hierarchy at the time. As a scientific weapon, the atomic bomb and the hydrogen bomb have had a troubled legacy. Growing up, I developed a fear for the atom. Many years later, as the Mayor of Minamisoma City during the nuclear disaster, I

witnessed my people being abandoned by the government, supplies being depleted, and people going crazy for being forced into long periods of shelter life. And in the midst of this predicament, family ties were disrupted, a sense of place was lost, and towns were split off. It was then that I made a vow to do everything in my power to ensure that something like this would never happen again. I do believe that the genesis of this forceful stance was brought about from my activism during my college days.

Noritomo Nishiyama

Head priest at Hiwashi Shrine - Odaka, Minamisoma, Fukushima
Distance from the Fukushima Daiichi Nuclear Power Plant: 13.4 kilometers

This shinto shrine was built in 1364, more than 650 years ago. I am the 27th head priest here. Thinking about it now (after the *shinsai*), this is a truly wonderful place. It is different from living in the city, where you may not even know your neighbor's face, let alone their name, or even have a conversation with them. It's not like that here. For example, if you ran out of soy sauce, you ran over to your neighbor and said, "I ran out of soy sauce, can I borrow some? Oh, and do you happen to have some miso as well?" And even if you got what you wanted, they would say, "why don't you come in and have some tea with us?" And with the children, whenever you see a child outside, you always knew whose child that was, and maybe even ask them to do you a small favor.

My fondest memories came in the winter. Right before New Year's, on the last Sunday of December, people from the community gathered together and helped clean the

shrine. The men put the *shimenawa* (white rope) on the *torii*[3], while the women got together in the common area to prepare for the *mochitsuki*[4]. And for the kids, we had a "three-generation exchange" event where grandma, grandpa, father, mother, and children played bingo, or did *mochitsuki*, sing, and so on, all the way from lunchtime until after dinner. The adults drank sake and got merry, and all of this represented a festive end of the year. This is how we got ready for the new year, and this was what I enjoyed the most. This feeling of community, the kind of human relationships that we value around here. It's the countryside lifestyle, full of warmth and compassion. But now all that is gone.

With the Great East Japan Earthquake, I knew that I had a responsibility to make sure that the shrine would not stop with me, at its 27th generation. My ancestors worked so hard to protect it for all these years. I am now devoting myself to ensure that the shrine is reconstructed and cleaned up for the public to once again be able to come and pray. The hardest part was when they evacuated us and forbid re-entry into this region from April 2011 to April 2012. I kept thinking, "What would happen to the shrine? To *kamisama* (God)?" I was at a loss, but of course, *kamisama* has a reason to reside in the shrine, so even if the people were not present to enjoy his company, he is here to ensure peace. With this in mind, I endured a year of being evacuated and away from the shrine.

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3 A *torii* is a gateway commonly built at the entrance to a Shinto shrine. A *shimenawa* is a special rope tied around or across an object or space–in this case on the *torii*– to denote its sanctity or purity.

4 *Mochitsuki* is an annual Japanese tradition usually performed at the end of year. Typically, community members gather at a shrine to pound steamed sticky rice in order to make "mochi," a Japanese rice cake.

Sachiko Nemoto

Nemoto Farm - Odaka, Minamisoma, Fukushima
Distance from the Fukushima Daiichi Nuclear Power Plant: 12 kilometers

For many of us living in the countryside, it is typical to have three generations living under one roof. And let me tell you, it was a joyful time where all seven or eight of us got together in one dinner table, talking about this and that on topics that were really not that important. Those were the most enjoyable moments of my life. Grandparents, young parents, grandchildren living together, and when the parents went to work, the grandparents took care of the kids, did the laundry, and cooked dinner. All of this was the livelihood of being a grandparent. The young parents too, they went to work knowing that their children were in safe hands. So even if they got a phone call from the nursery school informing them that their child was sick, they could rely on the grandparents to pick them up and take them home and care for them. In this way, parents dedicated themselves to work, and the grandparents, well, they feel joy in taking care of their grandchildren. Everybody around here was like that. Three generations living together in harmony.

But then this *shinsai* came along and destroyed everything. It truly made everything *barabara* (divided us). Suddenly, we all became selfish. Young couples joked and said, "so this is what it is like not having the in-laws around." The evacuation disrupted the core structure of family life. Jobs were now situated in a far-away place, causing even the couples to be farther apart from one another. The children were also impacted, and the distance between them spread apart. What kind of living is this? It didn't used to be like that. When the evening came, everybody came home, and everybody ate dinner together. The grandkids

helped set up the dinner table, and we all ate merrily. All that is gone now, it is so lonely. Something vital has been taken away from us, and we will never get it back.

But the real crime in all of this is the impact it has had on the children. The children are the victims here. All the friends that they had up to this point, they were all displaced to different regions all over the country. All the fun regional class activities that we used to have, such as the *undokai*[5], these are all gone now. Our children are forced to join other schools, where they have two or three classes jammed into one classroom. Think about this, this is not the kind of environment where kids can learn and grow. We are not in post-war Japan where it was the norm back then. My generation grew up in those conditions, where kids were forced to go to school really early or really late in order to account for the lack of classroom spaces. But this is rural Japan, where a single class usually has 18 to 28 students. That is happiness. From kindergarten to middle school, every child together, bonded as if they were brothers and sisters. But the *shinsai* has broken this all apart, it is so sad. It makes me cry just thinking that these children are now forced to move between three or four schools, from one home to another. They are not able to relax and learn. And trying to study in those crammed shelters, especially for the entrance exams, just thinking about that makes me mad.

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5 *Undokai* is an annual "sports day" in Japanese schools where students compete with one another in activities ranging from short runs, relays, tossing red and white balls into a basket, and other group activities that promote teamwork and comradery. Parents are invited and are usually seen jostling for the best spots to view their children.

Chihiro Sato

Shelter resident: Nihonmatsu, Fukushima
Distance from Fukushima Daiichi Nuclear Power Plant: 57km

Namie is my *kokyo* (hometown). It's a place where I feel... how can I say this... at ease? Yes, it's the place I feel most comfortable and secure. *Hamadori* (coastal region where Namie resides) is where my heart is. Before the *shinsai* (accident), I never really thought of Namie in that way. It was just a place where I grew up and lived my life. But now, after being displaced for so many years, I can finally appreciate those memories as something special, and feel that it was the best place in my life. It's hard to explain, but it's in the air; the air of Namie, it just smells right. It's like a part of my body, my essence. I don't have to think hard to remember it because it's a part of my being. I am now 19 years old, and in September, I will turn 20. I plan to have my *seijinshiki* (adult ceremony) in Namie next year.

I was actually born in Odaka, and moved to Namie shortly after, and lived there until the day I was displaced by the *shinsai*, which happened when I was in 6th grade. My grandmother took care of me first, and then my parents came to live with me. My mother though, she died when I was in elementary school in a car accident. After that, it was just me and my father living together. As a child, I had friends all around me. They were like family, none of the *sempai kohai* (senior/junior) relationships that is typical in other parts of the country. We'd all get together at somebody's house, with absolutely nothing planned. Then we'd head out to the river, climb some boulders, and just wander around aimlessly. There was this chime that could be heard across the town that symbolized 6 o'clock in the evening, and that was our signal to head home, or otherwise we'd get in trouble.

Before my mom passed away, we lived in the forest, where I took the bus to school. But after she passed, my father and I moved to an apartment closer to school. He took me to school in the morning, and I walked on my way home. You see, he couldn't get out of work to pick me up, so I had to walk home by myself, usually for about an hour. But once in a while, I'd go home with a friend, and we'd listen to our iPods, and since it was not allowed in school, we'd have to sneak it in. And as we walked home together, we'd share one ear piece each and listen to music along the way. And every time we saw a school bus, we'd yell, "hide the iPod!" and all that was just a lot of fun memories. When I got home, my father was usually the one to cook dinner for us. But he's a man and cooking is difficult for him, so he'd often buy *konbini-bento* (packed bento boxes from convenience stores), or get some from *hotto-motto* (a bento shop). I didn't mind that at all, and just had whatever he prepared. Then I'd go in the *furo*, watch some TV, and sleep together. That was my every day in Namie, and it was just a home that I felt secure in.

Sueko Shimokobe

Shelter resident: Nihonmatsu, Fukushima
Distance from Fukushima Daiichi Nuclear Power Plant: 57km

I don't know why I couldn't die. It's not like I didn't try. It all started before the *genpatsu jiko* (nuclear disaster). I was born in Hokkaido, on August 30, *showa* year 5 (1930). I'm turning 90 years old this year, isn't it terrible? As a child, I never knew what my father looked like, but my mother, she was a beauty, looked like Setsuko Hara, the famous Japanese actress from the early 20th century. I don't have any brothers or sisters. Well, at least none that are my real brothers. They say they were born from my mother, but they all

have different last names. My father had children from different mothers, and partly because of that, I was treated horribly by my brothers. The oldest brother, I even thought of suing him for attempted murder. He hit me with a weapon and split my head open, I almost filled a sink with blood. But I didn't die then, and I can't die now either.

It was also in Hokkaido that I met my husband. At the time, he was training as a police reserve. You see, it was a way for those with criminal records to be pardoned from their crimes, by joining the reserves. They came to the hospital where I was working, once a month, to have their health checkups. And that's when he saw me and said "that woman." He was always getting in trouble with the cops, and asked me if I could take care of him. And that was the beginning of the end. We got married in Sapporo (Hokkaido) and soon after came to Namie when I was 29. Married life in Namie was hell. He was a gambler, an alcoholic, abusive, and had multiple mistresses. I wanted to leave him, and that's all I thought about for a long time, but he threatened to kill me if I did. And so, I remained in Namie. There, I worked in the hospital. I supervised a group of young nurses, and they always encouraged me to stay. And my husband was always kind to these girls. They even told me "your husband is so nice." So, I continued to live for the sake of living. It was around that time that the Fukushima Ono Hospital was built, and they needed instructors for their new nursing school. I was recruited and began to commute from Namie. During this time, I made sure to get certificates in various fields: midwife, nursing, cooking, and more.

It's not that I didn't have any enjoyment in life. In Sapporo, I used to go to this dance hall regularly. It was at a time that I was working at the National Sapporo Hospital, and it took more than 20 minutes to get there. But you see, the dorm that I was staying at, the

curfew was at 9pm, and that's when they'd turn the lights out. But getting home from the dance hall, I always got home past the curfew. I would sneak back into the dorm through the window because they locked the main gates. What a fool I was. I also love to sing. There was a popular local radio program hosted by Jun Aoki and Mariko Ando and I used to sing as their opening act. I wasn't all that good, but I loved it. And so, I had a dream: to have a living room large enough that I could also use as a dance floor. Over the years, I saved up enough money to rebuild my house in Namie. I spent 13,800,000 yen ($126,000 US) on the reform which began in April of 2010. While I was living in the house, they redid the roof tiles, the *genkan* (main entry), toilet, bathroom, furo, flooring, they expanded the bedrooms, and most importantly, I made sure the living room was enlarged to 20 tatamis (400 square feet) for me to be able to dance my Tango. All this was completed in December. The earthquake struck in March, so I enjoyed it for three months. But the nuclear evacuation, it killed my dreams.

Despite all of this, before the nuclear power plant was built, life in Namie was vivid. It was a place for commerce, and six small villages, including Karino, Okutsu, Tsushima, merged to create Namie. And then the conversations began with TEPCO, regarding the hosting of the nuclear plant. The leaders of each town were fools, blinded by the greed and monetary gain they obtained by working with TEPCO. There were only a few of us who stood up against nuclear energy. Everybody else was excited about it. And so, the town was transformed overnight. We were a traditional *inaka*, a tranquil countryside village. But now with the nuclear economy? Hotels sprung up, new stores, bento shops all became trendy, and even car salesmen began to make loads of money. But the thing is, most of the people who worked for TEPCO were outsiders, and not the people who used to live here.

Yoshiyuki Ishizaki

TEPCO Vice President

I fell in love with Fukushima. When I first set foot here on a hot July night in 2007, I was 53 years old, arriving in Iwaki Station on the Joban express line. The next morning, I began my first day as the Chief Executive of the Fukushima Daini Nuclear Power Plant located in Tomioka City[6]. Of the 41 years that I have worked for TEPCO, the three years between 2007 and 2010 were the happiest, most fruitful years of my otherwise stereotypical salary-man life. During this time, I decided that I would only return to my Tokyo home once a year. On other holidays, I strolled down Hamadori, went around the different local neighborhoods, and immersed myself in as many of the local cultural events as I could. Through my interactions, I was drawn to Fukushima's beauty: the ocean, mountains, rivers, hot springs, nature, weather, food, sake, and more than anything, the people. I remember the day in 2010 that I left Fukushima after my three-year term was over like it was yesterday. The Tomioka station was packed with local people bidding their thanks and farewell, and I boarded the train with my hands full of gifts. And to think that less than a year from that day, that very station would be washed away by a tsunami...

And so it was that I—a person with hardly any expertise in nuclear energy—assumed the top position that oversaw the operations at a Japanese nuclear power plant. Prior to

6 The Fukushima Daini Nuclear Power Plant is located 12 kilometers south of its sister plant, the Daiichi Nuclear Power Plant that suffered extensive damage that eventually led to the evacuation of 150,000 citizens. Both power plants have since been shut down, and are in the process of being decommissioned.

being transferred to Fukushima, I was the Director of Public Relations at TEPCO. At the first morning assembly, there was a noticeable look of confusion amongst the employees—a mixture of uncertainty and curiosity etched in their faces. I had been one of the people who had voiced concerns on alleged public scandals on our nuclear operations regarding the falsification of safety data, and concealing site accident reports from the public[7]. My boss told me, "if you are so critical of the nuclear department, why don't you do something about it?" and promptly assigned me to be the next chief.

We are all aware of the incredible risks that are associated in the production of energy that comes from a nuclear power plant. Yet, as a society, we have collectively deemed this risk as a worthwhile endeavor for the sake of maintaining our desired standard of living. My biggest concern going into this new position was on whether or not safety precautions were truly being pursued from within the department and the nuclear power plant itself. As the new chief, I asked myself, what can I do to ensure "true" safety? My approach was to first and foremost, observe with my own eyes the day to day operations at the plant, and to meet people face to face. I came up with a 30-minute, one-hour, two-hour daily routine where I walked around the plant and watch employees at work and greet them with a hearty *otsukaresama* (good work). With more than 2000 workers at the plant, this was no easy task, and many must have been thinking, "who is this crazy old man?" But

7 In 2000, a whistleblower informed METI (Ministry of Economy, Trade and Industry) that TEPCO's nuclear plant repair and maintenance records had been systematically falsified since the 1980s. All TEPCO reactors were shut down in 2002 in order to undergo inspections (Kingston, 2019).

eventually they warmed up to me and said, “the new chief is weird, but at least he is friendly.”

While the power plant had 750 TEPCO employees, it had more than double those numbers of subsidiary company workers, many of whom were members of the local communities. This is a critical point to make, because it is through the integration of the local community into the workforce that made it possible to operate the power plant. It is then that I realized how misguided I had been to assume that the safety of the power plant was entirely dependent on TEPCO employees alone. In fact, safety and trust is something that is built upon the various partnerships with subsidiary companies, and with the immersion of the local communities. Daily interactions with the region and showing ourselves as members of the local community are paramount to building trust; trust in turn is the basis that allows us to operate successfully in Fukushima. Once this trust is gained, we need to preserve and cherish it for life. This model of trust became the framework of my vision that set the priorities during my tenure at the nuclear power plant.

Through the years, I came to witness how each person worked tirelessly and diligently on the tasks assigned to them; each on their own working to improve and maintain the safety of their operations. But these efforts were not being recognized by the public, and therefore not feeding into the public narrative on safety. On the flip side, the workers were not aware of the concerns being expressed by the public. I came to the conclusion that there was a critical mismatch between communicating our efforts and ideas, and understanding the public demands and concerns. There simply was not enough exchange between both parties. And so, I made up my mind. As Chief, I would become the

biggest PR man for the nuclear power plant! As the former Director of Public Relations, I utilized my experience and invited all media outlets to come to the power plant and talk to our employees, creating opportunities for them to directly exchange information on what each party was doing. I wanted the people in the community to feel safe through an added effort on transparency.

The Evacuation

The conversation shifts to the effects that displacement and evacuation had on the individual. What was prioritized in times of crisis, from individual necessities to communal support? What were the harrowing days of evacuating your hometown like? What decisions needed to be made, and how did that affect your evacuation?

Sueko Shimokobe

Shelter resident: Nihonmatsu, Fukushima
Distance from Fukushima Daiichi Nuclear Power Plant: 57km

On the night of March 11th, with the city-wide emergency sirens blaring, an announcement was made for us to evacuate immediately. The Namie middle school gym was designated as our evacuation center, and it was filled with hundreds of evacuees that night. All we were told was that we had to evacuate our homes. And then the following day, the nuclear explosion happened. But nobody told us how it happened, or what the consequences were. We eventually found out, but at the time, we had no clue. Nobody from the power plant came over to give us an explanation, so we all had to figure out a way to escape from there. Fortunately for me, my son-in-law came by with his car and ordered me to get on. He told us that we were going to Niigata, and along with my husband, and his sister's family, we took off to Niigata. The only thing I was able to pick up from my home was my bank cards, some cash, and clothes. I left everything else behind. All I can say is that we had no idea what to think at that moment. I thought at the time that if I could die, I might as well just die. Eventually, we found out what happened only after we arrived in

Niigata, just like the rest of the world. Through the newspapers, and watching the news on the television, and finding out just what a catastrophe the whole situation was that we had just escaped. And all this time, not a word from TEPCO, and I thought, oh, they just choose to stay silent. The thieves that they are have now not only stolen our lands, but stolen our lives as well. I didn't know anything about Niigata either. We ended up living there for the next five months. Everybody there was very kind to us. All along, I just accepted this as my fate. And I kept telling myself that this was just another situation I had to endure.

Chihiro Sato

Shelter resident: Nihonmatsu, Fukushima
Distance from Fukushima Daiichi Nuclear Power Plant: 57km

The earthquake happened on March 11th. To be honest, at the time, we had no idea about the tsunami. But then we heard the sirens blaring, and that made us think that maybe the tsunami could reach us, even though we are quite a way from the ocean front. Then the announcements were made to run! Run away! We all took off inland and into the mountains. And after we were assured that the waves would no longer come our way, we went back home, but it was a disaster. Everything was a mess, the toilet was not working, and I don't even remember if we had electricity or not. I don't think we could even turn on the TV to find out what was going on. The following morning, I heard it. A loud booming sound of the nuclear power plant exploding. And I remember my father saying "oh, it's all over now!" You see, he used to work for the power plant. But I was confused. I wondered, "what is so dangerous? What are we running away from?" I really did not understand what was going on. Later I found out that it was radiation that we were running away from. But you can't see

radiation. They tell you it is dangerous, but you can't see it. It is measured, and they show you numbers, telling you that these numbers indicate dangerous levels.

Shortly thereafter my father drove us to Haramachi on Highway 6, which runs north and south, parallel to the coast. We headed north, away from the power plant, and I remember that the entire east side of the highway was devastated by the tsunami. When we got there, I don't remember which school we evacuated to, but the gym was packed, and we had to stay a few nights... or no, maybe it was closer to five days. Yes, we even had to move from one evacuation center to another. Either way, there was always a huge shortage of gasoline and food. The gasoline stands constantly had a long line of cars. And even if you had money, you were only allowed to purchase a certain amount in liters. And food, there was so little of it. Like one cold *onigiri* (rice ball), miso soup and one piece of bread a day. The unwritten rule was that we couldn't accept any food unless there was enough for everybody, and at times, we even refused food because it was against the "rules." With hundreds of people there, we couldn't hide and eat food just for ourselves. It would not have been right. There were days when we didn't have any food, and we didn't take a shower either. Eventually, they told us that this place was unsafe, and we moved to three different centers.

After some time, we heard from our friends that there was a bigger evacuation center in Nihonmatsu, and we moved there. We were given a *kasetsu juutaku* (evacuation housing) to live in, and while initially it was nice to finally have a place to settle in, after living there for a while, we soon realized that it was nothing more than a makeshift hut. The summers were unbearably hot, winters were cold, and we could hear all the sounds from our

neighbors. It wasn't a place we could live comfortably, but we just had to bear with it and tell ourselves that we would survive somehow. And we did, for the next six to seven years.

After settling in here, I had to go back to school. I was in 7th grade, and I attended the local public middle school. There were about 20 of us from Namie, and none of us had the local school uniforms, so we had to go in our street clothes. I didn't think much of it at the time, but later the parents said, "oh, we felt so sorry for you!" But it's true, there was a huge distinction between the local kids and the Namie kids, perhaps and because of this, the kids were not really nice to us "outsiders." And even with my friends, I never liked to tell them I was going "home." I didn't like the word "home" for the six years that I lived in the *kasetsu juutaku*. I kept telling my father, let's move to a normal house, and he kept telling me, "yes, eventually we will." I was always embarrassed to invite anybody home. For many of us, we lived in shame as being the ones who lived in the shelters.

All these memories of evacuation, they bring back so much pain. I don't really want to think about those days, and I force myself to think of other things. I just couldn't face reality, not wanting to accept the reality that I would never be able to go back home even though I knew that was my fate. And to be honest, I don't remember much of it anymore. It is as if much of it has been erased from my memory, it is now just a painful past of an extraordinary incident.

Noritomo Nishiyama

Head priest at Hiwashi Shrine - Odaka, Minamisoma, Fukushima
Distance from the Fukushima Daiichi Nuclear Power Plant: 13.4 kilometers

On the day of the earthquake, I was teaching at a local high school that was located 3.6 kilometers from the nuclear power plant. The first thing I was thinking was whether or not my shrine survived the earthquake. Normally, it took 15 to 20 minutes to get home, but on that day, it took two and a half hours. The first thing I noticed when I got back was that the 150-year-old structure had not budged at all, even though on my way I had witnessed many buildings destroyed. But when I looked to the side, I noticed that there was nothing there. As I went down the mountain, a bunch of pine trees had been washed inland from the ocean front. And then I noticed how the tsunami waves had split in two different directions right at the bottom of the mountain that the shrine is on. I am still not sure how this happened. On one side, the water went down a path that leads to the area behind the mountain and onto Highway 6 for about one kilometer. On the other side, it went down the road for another 100 meters. And so, my shrine sustained no water damage. It's a miracle. 1000 years ago, there was another major tsunami called the "Joban Tsunami," and it is said that the shrine, although not in this exact location, also survived. It is truly a miracle, and I believe that God's will is strong in times of crisis.

Tomoko Kobayashi

Futabaya Ryokan (Inn) owner - Odaka, Minamisoma, Fukushima
Distance from the Fukushima Daiichi Nuclear Power Plant: 15.6 kilometers

It just so happens that on March 11th, Otoosan (my husband) and I were planning a short trip to Kashiwa to visit some relatives. It was a Friday and we had just packed our bags and put them at the *genkan* (entrance) of our inn, preparing to leave at three. But we couldn't agree on our travel agenda and got into a quarrel—which is typical for us, and he yelled, "are you an idiot?" and stormed off to a Pachinko parlor. At the time, he had retired from his job, and had just returned to Fukushima, so he must have felt a bit on edge. He came back around noon, and then... it was at 2:46 right? The earthquake. We thought the whole country of Japan would sink. I mean, the earthquake lasted for so long. I just held on to this pillar here for dear life thinking that this was the end. And it just went on and on, the shaking. When it finally stopped, there was no electricity. We stepped outside, and noticed a huge crack that split the road, and glass doors were shattered around the neighborhood. And that's when we noticed the water. Otoosan shouted, "Water!" It was about an hour after the earthquake, and we had not thought about the possibility of a tsunami, we were so preoccupied in recovering and cleaning up the mess caused by the earthquake. We were also thinking about our guests, and how this disrupted their schedule. And then we *heard* it. What sounded like a river flowing. Suddenly, the water came into our hallway. And that is the first time we thought "oh, is this a tsunami?" We must have been so distracted by our own situation that we did not hear the sirens or the evacuation orders. With no electricity, we could not turn on the TV, and the batteries in our radio had died, so Otoosan was

scrambling to find new ones. But it was all just chaos. The tsunami came when we were cleaning up. And Dal, our dog, we had a dalmatian at the time, he was crying, so we put him on our truck bed, but he still didn't stop crying. Soon, our neighbor came running by and yelled at us, "What are you doing? The tsunami is coming!" And I just yelled back, "nothing to worry about, we're ok here." You see, our inn is located just a block west of the train station. We couldn't see what was happening on the *other* side of the station. We never thought of going to the roof to find out what was going on. Instead, we just stayed here, and as the water inundated our first floor, we frantically moved everything to the second floor.

We also had to take care of our guests. They came back to the *ryokan*, and since they were not able to communicate with their loved ones, they prepared to go back to where they came from. I made *onigiri's* (rice balls) for them to take back. We were fortunate, as a *ryokan* to have a surplus of food. I made a ton of rice and prepared *onigiri* to deliver to the evacuation shelters. To be honest, we were not yet aware that hundreds of people were dying on the other side of the station. Eventually, Otoosan did see the other side. He loaded our truck with *futon's* (bed mattresses) and took off to deliver them to the shelters. He had trouble getting around because there were so many boats and wrecked cars that had been carried by the tsunami that were now blocking the roads. Along the way, he ran into injured people and took them to the Odaka hospital. I was only made aware of the severity of the other side when on the following day, I went up to the bridge over there. A young couple came over. "Can I help you?" I asked, and they said "we are looking to buy trash bags, but we can't find them anywhere." They said this while looking at the direction of the ocean. "Are you ok?" I asked, and they said, "well, our home, over by the ocean, it got washed away." I

looked that way, and sure enough, there was no longer anything there. Buildings that used to adorn the horizon had unfathomably disappeared, washed away by the powerful waves. All I could say was a hapless and incredulous "Really?" I just couldn't come up with anything else to say.

Many people in our community perished due to the tsunami. Most notably were the people at the Yoshiland Senior Care Home. Even though the facility was not within the city-defined tsunami zone, it was located right at the end of the road that happened to carry the tsunami waves. The first floor was completely engulfed by the waves. The old folks and caretakers died when the waves came crashing in, a total of 36 people. Some people tried to save their grandparents, but many of them refused to leave, simply clinging on to their *futon's*, feeling safer that way. I heard a story about a son driving to his father's home by the coast in hopes of saving him from the tsunami, but by the time he got there, the entire house had been uplifted and had floated away. The son and his truck were picked up by the waves and floated away, but he miraculously survived. Many others died because after the earthquake, they went back to their homes to recover some belongings, only to be swept away by the tsunami. Also, at a nearby cemetery by the coast, people evacuated to the roof and stayed there until 10pm before they were finally rescued. And from there in the dark, they could hear the voices of "help me," and "I'm here" and all they could do was to listen helplessly.

I heard stories from some of the firefighters. One particular firefighter said, "I saw so many horrific scenes of death." He told us of the time he had to dislodge a tree from a dead body, or not being able to forget the weight of a dead child in his arms. For those who were

in the rescue operations, these memories are haunting and will continue to torment them for life.

There are many, many stories like this. And all this is before the next nightmare even began. The following day, on March 12, the nuclear power plant exploded. We heard the calls to evacuate, so everybody who was in Odaka, including those in the temporary shelter at Odaka Elementary School were forced to leave, many heading towards Haramachi, the town just North and further away from the power plant. This was because Odaka is within the 20km zone, and Haramachi is just outside of it. I remember that many people did not want to leave because that meant that they would not be able to continue the search for their loved ones. At the time, many of us who were left in Odaka were still looking for friends and relatives who had not been accounted for, fearing that they had been swept away by the tsunami. Although we did not know it at the time, once we left, there was no going back, as we dispersed to other shelters and hospitals around the country and were forbidden from returning. Wherever we went, we were screened upon entry because it was feared that we carried radiation particles with us. No matter how cold we were, or even if we came with children, we'd be asked to line up, get a number, and get screened before entering the next facility. Just because we came from a city inside the evacuation zone, we were discriminated against wherever we went. In any case, we finally decided to evacuate on the 14th. On that morning, I donned my jacket and put the hood over my head and took a last walk around Odaka with my dog, Dal. Do you know what a world without sound is like? Well, that was exactly what it was like then. No sound. Not even the sound of birds. No cars,

no people, just the slightest sound of the waves. And just the blinking lights of the traffic lights.

We packed water, portable gas cans, rice, food, clothes, and futons. But we had to leave Dal behind because they were not accepting pets at the evacuation centers. We left him behind, leaving him with ample food and water, foolishly thinking that we would be back within a few days at most. We headed five kilometers further north to Ishigami Elementary School. That's where hundreds of people were packed inside a single gymnasium. When we got there on the morning of the 14th, we recognized a few faces, but we were struck by how silent it was. Everyone just sat there without saying a word. The gym had an elevated stage area at one end, and that's where we went to sign in. It was for *anpi kakunin*, to ensure a record of our safety. That's when we heard the TV. It was situated behind the stage, where the administrators could look at it. It was the first time I had *seen* the news since the evacuation, it had all been radio up to this point. But they did not show the TV to the people in the gym. Maybe that is why we could stay relatively calm about the situation. The people inside the gym, they had this grim look on their faces. It wasn't hopelessness, but rather, angst? We soon realized there was no space left for us, so we left and went back to our car. And then it happened. The second nuclear explosion, the one in reactor #3. It was at 11 on the morning of the 14th. And that's the first time I thought, "oh, it's the nuclear power plant." And everybody started yelling, "get indoors now!" Yes, we were all scared of the radiation fallout in that moment.

It was around this time that our cell phones finally started working again. My son was frantically trying to call me, and we finally got in touch. He had been checking the flood

zones on Google Maps, and knew that the water had come all the way up to Odaka station. He immediately offered to come pick us up. He lives in Nagoya, some 700 km away. He has a Prius, so he said it wasn't be a problem. My immediate reaction was, "You're young! Don't come here!" After convincing him not to come, I got a call from my cousin who was staying at his house that was not destroyed in Haramachi. He said, "why don't you guys come over and stay with me." So, we did. The moment we got there, I again made some more *onigiri*, around 40 of them, and filled them with *umeboshi* (plums). I went to the evacuation centers hoping to hand them out, but nobody accepted them. You see, I didn't make enough for the entire center. So then, I offered it to a person I knew there, but he also refused, saying that he can't be the only one eating a warm onigiri. "I can't possibly go to the side and hide and eat an onigiri next to all these other people suffering." There was really a shortage of food. And the priority was always for young children, followed by senior citizens. Those in the middle barely had anything to eat for days.

And so, it wasn't until the 14th that I finally saw the images of the disaster. And at that moment, I knew we had no choice but to leave. My cousin's car had a full tank of gas, and we packed whatever food we could get, and clothes. But there was one thing that bothered me. Our dog. We had left him behind in our Inn in Odaka. And now, with the nuclear fallout, there was no way for us to go back inside. I kept asking my husband, "what should we do about Dal, Otoosan." And he kept saying, "Nothing we can do. But I'm not worried. Remember, he escaped many times when we were there." Much later on, we found out that he was picked up by the rescue squad. They posted a video on YouTube searching for the dog's owners, and someone told us about it. It was a full month afterwards that we

went to pick him up, and they had made sure to clean him up nicely for us. There is even a scene of our reunion on YouTube somewhere. It was all very emotional.

We left Haramachi on the morning of the 15th, around 8am. We headed towards Fukushima and stayed a night at our cousin's place. My son called me and told us to come to Nagoya. We packed up again, and went to Koriyama station hoping to get on a bullet train to Nagoya. But there was no bullet train running there, and we were told that we had to go to Nasushiobara station to get on the bullet train to Nagoya. We hopped on a taxi, and paid $200 to get to Nasushiobara. And finally, we got on the bullet train. The train was handing out vouchers for those who did not have cash on them, allowing people to ride as long as they promised to pay later. Fortunately, we had gone to the ATM right before the earthquake, so we had enough cash, and were able to pay our fare. I plopped down into my seat next to my husband, and began chatting on the phone with my son. My husband scolded me, saying how impolite it was for me to be on my phone, and ordered me to go to the back of the train. But at this time, fatigue had taken over, and I was so exhausted, I could barely move. The man sitting in front of me even told me to shut up, but really, I was so tired, I couldn't move. On the phone, my son was ordering me to throw all our clothes away. All of it. To put it all in a garbage bag. I knew he was feeling anxious, so I prepared to get new shoes in Nagoya, and even go to a *sento* (public bath) before going to his house. And when we finally arrived in Nagoya and got out of the station, I was struck by how *normal* everything was. The station, the people, everything was normal. I was thinking, "what are we even doing here?" My son arrived, and he had a full set of clothes for both of us. He said,

"here, change into these." We got changed and bought new shoes at the station before going to his house.

We stayed with my son for about a month. After that we moved to one of his company housing facilities that was allocated for survivors. He works for Toyota, so they were good about these things. We stayed there for another six months. During that time, I tried to find some work. I have a teaching certificate, and a chef certificate, but I couldn't find a job. I was close to 60 years old, and of course, they want to hire somebody younger. Fortunately, my husband had some retirement funds we could rely on, but it was tough times.

Katsunobu Sakurai

Mayor of Minamisoma City, Fukushima. Population in 2011: 65,000
Distance from the Fukushima Daiichi Nuclear Power Plant to City Hall: 25 kilometers

On that fateful Friday of March 11th, I was attending the Haramachi #2 Middle School graduation ceremony, delivering a speech to the graduating class, talking about hope. The ceremony ended around noon, and I returned to City Hall afterwards. At 1pm, there was a plenary session, where I answered questions from legislators. It was during this session, at 2:46 when the Great Japan earthquake happened. It was a vertical shake, it continued on and on, and the shaking did not stop. Everybody was engulfed in fear, legislators were crouching under desks, others in attendance were crying; these terrifying moments lasted for eight to ten minutes. When it was finally over, I called the session off, and the first thing I did was to set up a disaster response headquarters. At 3pm, the police called me and informed me that the nuclear power plant may have exploded. At that

moment, this was not even a consideration, but I made an announcement and ordered the entire city to remain indoors. I continued to communicate with neighboring emergency response personnel, but at the time, could not get any confirmation on what was going on at the power plant. At 4pm reports came out that this was fake news, that the plant was in fact, intact. But at 5pm, the television news coverage showed images of the roof exploding off the #1 nuclear reactor. So the order to stay indoors was reinstated. In this way, accurate information was constantly hard to obtain, and we did not know who to trust. The television then announced the 20km evacuation area. But how was this area defined? We didn't know. Was the border on the northside of Haramachi? Or was it along the Otawara border? Eventually, we decided to give an order to evacuate to those living South of this border. Simultaneously, there were ongoing operations to save and recover bodies from the tsunami, with many people already situated in various evacuation shelters. To order them to evacuate again was an especially cruel thing to do. At that moment, nine civilians and four government employees had already died from the tsunami, and in order to prevent others from dying, I insisted on the evacuation orders. Later, I was blamed by my people for forcing families to abandon the search for their loved ones, and for abandoning them during times of crisis. All this was brought about because of the evacuation orders caused by the nuclear explosion.

That night it was all chaos. Odaka had to be evacuated, and more than 12,000 citizens had to be transported overnight. Without any sleep, we ordered the evacuation of the entire town. We also found out that there were iodine pills in Odaka, so we began to strategize on how we could possibly distribute these pills to the civilians effectively. But we

had no idea who it was delivered to, and how many people were able to intake it. Moving onto the 13th, we had a situation where the evacuation centers at the border of the 20km zone were packed, with more than 2000 people occupying a single elementary school gymnasium. Because of the explosion on the 12th, many civilians escaped before the official order was in place. These people left on the night of the 12th, onto the 13th, and the 14th. This caused a logjam of traffic on all our roads. But the biggest problem came on the 14th when reactor #3 exploded. There was a false report that the military released a statement for a 100km evacuation zone. City Hall was thrown into confusion, and on the 15th, a 30km order was made by the central government. Minamisoma at that point was already suffering from a lack of emergency supplies as it was, and with the erection of the 30km barricades, supplies completely stopped from coming in. I then asked the president of a bus company to go to Soma, Date, and Marumori, places where evacuation centers were located at the 20km border, in order to rescue approximately 1500 people and bring them outside of the evacuation zone. This I did on my own, without getting permission from the federal government. Many didn't even know where they were headed. Some buses took them to Soma, to Marumorimachi, to Iitate Village. For evacuees, it was a time of so much uncertainty as to where they were being taken. On the flip side, for those outside the evacuation border, and still in the evacuation shelters, they were under strict indoor orders. With supplies not being delivered, and with shelters now being overcrowded, civilians were forced to find ways to evacuate on their own. But we had another crisis: there was no gasoline. I was able to communicate with METI, and we finally got news that gasoline trucks were on their way to Minamisoma. But the drivers abandoned their vehicles in Koriyama,

fearing radiation exposure. We then had to find our own lorry drivers and send them to Koriyama. When they finally got there, even the gasoline station employees had abandoned the site. So, we had to manage the situation entirely on our own. Eventually, we brought the gasoline over, and distributed just 10 liters to each vehicle. After that, we were told to pick up gasoline from Utsunomiya. We just couldn't go all the way there. Eventually, we had to solicit the military to deliver it for us.

When the federal government ordered us to remain indoors on March 15th, disaster supplies abruptly stopped coming our way. This was at a time when we were busy recovering countless bodies from the aftermath of the tsunami. These bodies were being laid out in a high school gym located inside the evacuation zone. Not having any supplies or support from the government, and with the dead bodies being abandoned, relatives of the dead were exasperated, complaining that the bodies were beginning to rot. They implored on me to do something, anything— they couldn't stand the thought of their father's body rotting away. But without any oil coming in, we could not cremate the corpses. These frustrations were not only coming from the families, but from me as well. Why is this happening, and who can I address my anger to, was all I could think of at the time.

On March 16, the Niigata governor called me and told me that his prefecture would accept the entire civilian population of Minamisoma. On the night of March 16 and 17, we prepared the evacuation to Niigata with all the buses we could get our hands on. Fortunately, Suginami-ku (sister city), provided more than 10 buses, and we got 24 more buses from Gunma. 5500 people were evacuated to Niigata using these buses. In total, the nuclear disaster caused the temporary evacuation of 63,000 out of 71,500 Minamisoma

citizens. Because of this, evacuation related deaths are reported at 513 (from stress, fatigue, and other medical factors), by far the highest number in the country. Even within Fukushima, 2200 people died of evacuation deaths, with one out of four of them from Minamisoma. As a non-nuclear hosting city, the injustice imposed on my city should be clear to everybody.

Yoshiyuki Ishizaki

TEPCO Vice President

It came suddenly. The day was March 11th, roughly a year after I returned to Tokyo from my tenure as the Chief Executive at the Fukushima Daiini Nuclear Power Plant. I was at our TEPCO headquarters in Tokyo attending to some clients when the powerful shakes began. My clients and I tried in vain to hold up the bookshelves in the office space, as we noticed the cracks on the wall forming. TEPCO immediately established the Emergency Disaster Response Headquarters, and I became a member of the emergency response team. Having just left the nuclear power plant, my immediate concern was on the condition of the reactors at both the Daiichi and Daini power plants in Fukushima. I remember how relieved I was to get the initial reports indicating that the reactors in both plants had all successfully shut down. But this was before the tsunami came. Shortly afterwards, we learned that the giant tsunami had crashed into the power plants, and with every moment that passed, the tension increased until the situation at the Daiichi plant got out of control. What transpired at the Daiichi plant was so extreme and chaotic, my recollection of it is rather hazy and incomplete. We could only look on helplessly as one incident led to another. I recalled how

proud I was of my own belief that "By working hard for my company I will serve the people which will lead to a better world," and how this belief was crumbling right before my very eyes. From this day onwards, within TEPCO and in Fukushima, I began a life of seeking atonement for what had just transpired.

My pilgrimage to seek atonement began by visiting the many evacuation shelters. Given my familiarity with Hamadori (Fukushima coastal area), I assumed the lead and took our President and other fellow executives to the many shelters to show our remorse. At each shelter, I recognized people with whom I had met through my tenure as the Chief Executive at the Daini power plant. I recalled my ill-advised comment at the time: "Japan's nuclear power plants are 100% safe places. There will never be an accident here. I am so confident in our safety, that if there is an earthquake, please come and evacuate inside our nuclear facilities." Back then, I truly believed in this. I never imagined a situation where the backup generators could possibly fail. In hindsight, I realize what a foolish lie this was, and for that, I will forever hold regrets from the bottom of my heart. And in the cramped and chilly confines of the evacuation shelter gymnasiums, the evacuees looked at me—from their makeshift cardboard homes, wrapped in their futons—coldly, as if to say, "you fooled us, claiming your nuclear plants were 100% safe." I vowed to never forget the look on their faces as they looked down upon us as we bowed our heads deeply in apology.

Two years later, I met Ueno-san, in March 2013. It was about two months after I launched our *Fukko Honsha* (Revitalization Headquarters), a TEPCO subsidiary company dedicated to the recovery efforts in post-disaster Fukushima. Our headquarters were located in Namie City, where we converted an abandoned supermarket into office spaces. An

acquaintance of mine insisted that I go visit Mr. Ueno at his beach house, and sure enough, he was standing in front of his house when I arrived. The first floor of his house was ravaged by the tsunami, like many other coastal homes in Fukushima. As I gave him my business card, he said, "What is this?" and threw it to the ground. "I am here to introduce myself and to listen to what you may want to say." Upon saying this, I noticed his hands were shaking, and wondered if he might jump on me and start to beat me up. He had such an expression.

Mr. Ueno lost four of his family members: his father Kikuzo (63), his mother Junko (60), his eight year old daughter Erika, and his three year old son Kotaro. The bodies of his mother and daughter were found two days after the disaster, but his father and son are still unaccounted for. This is in part due to the fact that immediately after the nuclear explosion, recovery efforts within a 20km zone were halted by government orders to evacuate and remain indoors. All military and police workers in the region were evacuated, unable to continue their search and rescue operations. Mr. Ueno had no choice but to continue the search on his own. Two weeks after the disaster, Mr. Ueno's mother and daughter were cremated. His wife, who was three months pregnant with their third child, had evacuated to Ibaraki Prefecture, far away from the dangers of radiation exposure. She missed her own daughter's cremation ceremony.

Upon entering Mr. Ueno's house, he said, "Isn't there something you are supposed to do?" I obliged and performed *dogeza*, the act of getting down on my knees and bowing deeply. For two hours, I sustained his fury while maintaining my *dogeza* stance. I had no words to provide in response. At the end of his tirade, he said, "I am watching you, and will

see how you live the rest of your life." It is true that because of our nuclear power plant, the search and rescue operations were terminated, and for that, I have much to regret.

With the establishment of the *Fukko Honsha*, I knew I could no longer run away. If someone in Fukushima asks for me, I went to meet them wherever they were. Decontamination efforts, cleanup operations, town hall gatherings, nuclear study groups, I made myself available to participate. And even if the people in Fukushima had no desire to see TEPCO signs, I always showed up in my blue TEPCO uniform. As long as I am a TEPCO employee, I will go around and atone for our deeds in full disclosure. Otherwise, TEPCO will never be forgiven.

As I went around atoning for what we had done, I knew that these actions alone were not enough. We need to confront the very people we have disrupted, face them, and *listen* to what they have to say. Otherwise, we will not know what each and every person has been made to go through, and we will not understand the pain they are burdened with. If we cannot share in this anger, hatred, and sorrow, then we cannot fully bear the responsibility of causing the nuclear accident. I now understand that this nuclear incident is bigger, wider, and more complicated than ever imagined, and it is something that I have deeply etched into my heart.

Thoughts on Nuclear Power

The fortune of place was radically altered when TEPCO built nuclear power plants in Fukushima. I ask the very general question, "what are your thoughts on nuclear power?" Further probes include questions on nuclear and radiation risks, belief in its safety, and whether their viewpoint on nuclear energy has changed over time.

Tomoko Kobayashi

Futabaya Ryokan (Inn) owner - Odaka, Minamisoma, Fukushima
Distance from the Fukushima Daiichi Nuclear Power Plant: 15.6 kilometers

It is almost guaranteed that one day human error will cause something bad to happen. I mean, human error is inevitable. It happened in Chernobyl. It happened at Tokaimura. People are quick to say that they can control something, even though they are not yet capable of doing so. And when there is risk involved, it is not revealed publicly. That is what is wrong with this. You need to explain how things work. This is how it is, and these are the risks. But the risks are not explained. Sure, it is also our fault for believing what we are told. We just think, "really?" and then say, "oh well," and move on. It is paramount that all the risks be explained prior to embarking on a new direction that affects so many people. You see, citizens are not allowed to participate in the discussion with what happens at the nuclear plants. We have to do our own research, and educate ourselves

Katsunobu Sakurai

Mayor of Minamisoma City, Fukushima. Population in 2011: 65,000
Distance from the Fukushima Daiichi Nuclear Power Plant to City Hall: 25 kilometers

Because humans invented and developed the atomic bomb and subsequently nuclear energy, it has endangered not just humanity, but the entire planet earth. I think about what we have learned from the Fukushima accident, and can't help but come to the conclusion that we have adopted a science that we do not know how to control yet. Saying it another way, we have made a deal with the devil.

Tamotsu Baba

Mayor of Namie City. Population in 2011: 20,000
Distance from the Fukushima Daiichi Nuclear Power Plant to City Hall: 8 kilometers

We don't need nuclear power plants. Energy policy needs to prioritize human life. This is something that we were all forced to learn from the *shinsai*. Everybody in Fukushima has expressed their desire to see the nuclear power plant decommissioned. Not only the Fukushima Daiichi plant, but the Fukushima Daini plant as well. At the prefectural assembly and the municipal assembly, we voted to have both power plants in Fukushima decommissioned. When we think back on March 11th, 2011, we have seen how the energy situation changed in our country. With every nuclear power plant in the country shut down, we survived for years. We even had a surplus of energy. We don't need nuclear energy, we can survive without it. We need to invest more in renewable energy technology and we will be ok.

Unfortunately, looking back, I have to admit that before the accident, I was not against nuclear energy. I thought it was logical to have a nuclear power plant generate energy. This was largely because of the narrative created by TEPCO and the government, and how they assured us of absolute safety, the "safety myth." The origins of this myth came from their multiple defense systems they had implemented. For example, if this situation were to arise, this system would be activated, and if that system failed to operate, then the secondary system would be activated, and so on and so on. They made it sound simple and foolproof, and we were all duped into believing their every word. This is how TEPCO teamed up with the government to build their power plants in our neighborhoods.

And of course, I was completely fooled into buying into the safety myth. When the nuclear power plant exploded, my mind went completely blank, it was a situation that I could not fathom even in my wildest dreams. What? This can happen to a nuclear power plant? It was truly an unimaginable situation. But the truth is that TEPCO had hired earthquake scientists to conduct simulations in 2008 or 2009, a few years before the accident. They are now being questioned in court about this, and the truth will come out in due time. But the truth of the matter is that they knew about this possibility and chose not to do anything about it. They knew that if a big tsunami were to come, the power generators were in danger of being inundated, so they could have had a backup plan, or rebuild the power generators above ground, or perhaps even extend the height of the levees protecting the power plant. They had many options to prevent a big tsunami from causing all this damage. And so, to blame the natural disaster for what happened and dismiss human responsibility is simply wrong. I truly believe that this accident was caused by human error.

If you look at the situation at the Fukushima Daini Nuclear Power Plant, the vents there were able to be opened manually, and furthermore, Daini is situated on top of a bluff. In contrast, Daiichi is situated right on the oceanfront. It should be obvious that if a tsunami were to hit Daiichi, the power supplies should be situated on higher ground, but instead, they were built in an underground facility. But more importantly, they should have had a backup plan in place should the power generated fail. And one more thing. According to the post disaster report, it was determined that the cooling water pumps were already cracked by the earthquake. With broken pipes, the cooling water could not pass. By the time the tsunami came, the cooling water was not able to reach the reactors, which caused the hydrogen explosion. There is no doubt that much of this was caused by human error.

Yoshiyuki Ishizaki

TEPCO Vice President

When I was in elementary school, I fell in love with the television anime series, "Atom Boy." Atom Boy represented the promise of a bright future that relied on science and technology, and besides, it was cool to see how a flying nuclear-powered robot dedicated himself to helping people and society in pursuit of justice. As a child, I believed that this was the pathway for Japan's future, by using nuclear technology for peaceful purposes, which would eventually lead to a more secure world. Even today, these memories have not left me, and they served as a catalyst for me to enter the energy industry. In college, I was influenced by the work of Yasuzaemon Matsunaga, dubbed the "Demon of Power" by the Japanese media for his influential role in shaping Japan's energy industry. He was also my

senpai (elder mentor) of my college. It was then that I began to understand and appreciate where and how this energy—something that we all take for granted—was generated, and how quietly, these powerful power companies were behind it. Just like Atom Boy, "For the people, for society" became my mantra as I joined this industry.

Japan is the only country to suffer the consequences of the atom bomb. Because of this, I believe that Japan needs to consider nuclear technology as a source of "new" energy, one which is used for *peace* rather than *war*. "Atoms for Peace" is a concept introduced by the United States, in a speech by President Eisenhower in 1953, in front of the UN General Assembly in New York City, a logical pathway I think Japan should embark on.

But of course, I am well aware that we live in a country that is in constant threat of natural disasters. And because of this, there is a heightened risk in building and operating nuclear power plants. But it is precisely because of this risk that humans need to harness the principles of science and technology for a better life. Abandoning this pathway means also that we are turning our backs to science, which leads to a regression in our evolution. Just like Atom Boy soared the skies as a symbol of progress, I believe that science is necessary for development. However, we must always be thinking, "how do we avoid accidents?" which is something that the Fukushima nuclear accident has made us all reconsider. We must now learn from our mistakes and incorporate measures that will ensure that such accidents never again manifest. It is now our responsibility to transmit our lessons learned to the global nuclear industry.

Masami Yoshizawa

Kibou no Bokujo (Cattle Farm of Hope), Namie, Fukushima
Distance from Fukushima Daiichi Nuclear Power Plant: 14 km

My sign says "The 2020 time bomb." It refers to the fact that the switch has already been turned on for the next disaster. Japan is sitting on a ticking bomb. The 2020 Great Tokyo Earthquake. The 2020 Great Tsunami. 2020 is the next nuclear disaster. The next volcanic eruption. Even Mt. Fuji may not remain dormant forever. This is what I say in my rallies to get people riled up. Don't be fooled by Abe. We're not North Korea. We're Abe Mario. Don't be fooled. The Olympics *Gambaro* campaign is nothing more than a propaganda for Abe, it's all a trick. Japanese are so gullible to such tricks. We're such an under-control population.

From my farm, you can see the tip of each of the towers in the Fukushima Daiichi Nuclear Power Plant. I heard the explosion on March 14th. And on the 17th, I saw the plumes rising from the futile efforts to contain the damage. Everyone ran away, and Namie became nothing more than a ghost town. And now, six years later, the government has plans to reopen the city, but nobody is coming back. You see, this place holds a very strategic role for the country. We send energy to the entire Tokyo Kanto region. From the Fukushima power plant, over the mountains, all the way to Tokyo.[8] We supply one third of the entire energy needs of Tokyo. We are a nuclear colony, this is what we are. By sacrificing

8 Tokyo is situated 222km from Fukushima. The Kanto region includes the Greater Tokyo Area and encompasses seven prefectures: Gunma, Tochigi, Ibaraki, Saitama, Tokyo, Chiba, and Kanagawa. As of 2019, it is home to 43.5 million people.

Fukushima, and without a thought, Tokyo people continue to use energy on a daily basis. And yet they say, "don't go to Fukushima, it is contaminated." They discriminate against us now because of the radiation exposure caused by their own energy power plants. All I can say to that is that it is all bullshit. Olympics? Do it on your own. But you'd better watch out and think twice. The whole Olympic campaign is a diversion tactic geared to make the country forget about the 2011 Tohoku Earthquake, forget about the nuclear explosion, to make believe that nothing ever happened in order to go back to a nuclear-powered Japan. Looking at the radiation map of Namie, you will notice that 70% of our lands have been determined to be high radiation zones. As the largest city inside the evacuation zone, the government is telling us that 70% of our city is no longer habitable. When 20,000 evacuees look at this map of their hometown, they see a place they can no longer go back to. In other words, there is no going back to the "old" Namie. It is no longer the same city, village, it is less than that now. With only 1/10 of its former population coming back[9], and largely senior citizens, what is the meaning of all this? With no industry to sustain the city, or the ability to continue agriculture, the basic functions of our city are no longer possible to perform. It's over. And that is why I say, "Sayonara Namie." Namie is nothing more than a radiation waste land. A place of memories. We need to think of this as a place with no future. And yet Namie City Hall continues to employ 200 workers. They continue to promote the message of encouragement for their citizens to "come home" and are even setting up a *fukko* (revitalization) headquarters. But is there any meaning to this? With none of the evacuees

9 As of December, 2019, the population of Namie was at 1100 people. Prior to the earthquake, the population was 21,500 people.

wanting to come home, this vision that the fukko headquarters are promoting is worthless. There is no need to sugar coat it. Let's face reality. There is no meaning for false hope.

And yet, there are a few of us who choose to return. I am one of them. I have been here since December, 2011, defying governmental orders to stay out. I have lived in this forbidden land for over five years. I know I am radiated. And my cows are radiated. If you were to test my cows, their blood, urine, meat, sure, there is radiation there. But these cows must be shown to the people in order for us not to forget the reality of Fukushima. These cows that I can no longer sell, these cows that have no economic benefit, sure, I'm an idiot for keeping them around. From a farmer's perspective, to keep 300 radiated cows for the past six years is foolhardy. But the cows now represent something new. I am going to keep them alive until they die as a symbol of life. I'm going to show them to everybody. I want people to think. For all of us who have been forced to live the last six years in exile, we have been made to think how it is that we value life. We can't be the kind of humans who abandon their cows. But most farmers, they left their cows to die. And for the cows that survived, they were all collected and killed by the government. The nation's policy is to kill our cows. This disregard for animal life is similar to their disregard for human life. Fukushima citizens are treated as second class citizens, abandoned humans who can be sacrificed for the sake of the metropolis. But there are about seven or eight of us farmers who have vowed not to let them kill our cows. We are defying our country's order in doing so. This place is now a lawless farmers' land. A place to reconsider a nuclear future with these cows. We have to rise and start a nuclear strike. I am ready to sacrifice myself to this cause, to fight for a nuclear zero nation.

Noritomo Nishiyama

Head priest at Hiwashi Shrine - Odaka, Minamisoma, Fukushima
Distance from the Fukushima Daiichi Nuclear Power Plant: 13.4 kilometers

Color coding our lands by the amount of radiation has divided our communities. My shrine has had the good fortune of being situated directly north of the power plant, where the levels of radiation are relatively low. But while I may be fortunate, countless others are not, many of whom are unable to return to their homes. The problem is that you cannot *see* it. If you could, you then have visual cues as to knowing which areas are dangerous and which areas are safe. But we can't, it's an invisible danger. And what's more, we don't even know how this danger affects our bodies. What we do know is that around here, we were all told that nuclear power plants were safe. The "safety myth" was a belief we all held to be true prior to the accident. So when it happened, it was truly an unthinkable, inconceivable set of circumstances that unfolded in front of our eyes. That is when we first began to doubt what we had been told before. Maybe, just maybe, it wasn't as safe as we were being made to believe.

The hardest thing to cope with today is the loss of our community. Over here, it is common to have three generations living under one roof. Grandpa and grandma, father and mother, children living together. Grandpa and grandma wake up in the morning and take the children to school and pick them up afterwards. Father and mother both go to work. Everybody comes home to eat dinner together. This was *normal* back then. But after the *shinsai*, it is now typical to see grandpa and grandma remain in Fukushima, father to find work in Yamagata, and mother and child to live in Niigata. Even today, this kind of

splitting-apart persists. It is no longer feasible for three generations to live together. It has destroyed families. And the basic tenets of life, society, family, place, community, all of that has been taken away due to the nuclear accident. This is what pains me the most.

Do I think Japan needs nuclear energy? I remember I evacuated and spent three months in the Kanto region after the *shinsai*. We experienced "scheduled blackouts" back then. From 1pm to 5pm, this region will be without electricity, we were told. It was a big deal back then, but what about now, five years later? There are no more blackouts. Tokyo Sky Tree is shining brighter than ever before. Christmas illuminations are as abundant as ever. Certainly by the looks of it, there is no shortage in energy usage.[10] Even if Fukushima and Niigata no longer existed, the people in Tokyo can survive without nuclear energy, and without blackout schedules. So aren't we ok without nuclear power plants?

Sueko Shimokobe

Shelter resident: Nihonmatsu, Fukushima
Distance from Fukushima Daiichi Nuclear Power Plant: 57km

I never believed in the safety myth. Building something for the very first time? There is no way it could be safe. But I was, in essence, an outsider, coming from Hokkaido. I saw the locals get rich overnight, and have their kids go to schools that did not exist before. And their kids went on to find good jobs, and the parents settled in newly constructed homes. It was a good life, all brought about by the nuclear industry. But even so, I never believed in

10 At the time of this interview (March, 2017), Japan's entire nuclear power fleet was shut down. It was the first time in its history that Japan's energy was entirely non-nuclear.

the safety of the nuclear power plant. I always thought they were hiding something from us. I mean, even the scientists were fooled, weren't they? In the end, it's all about the money. It didn't matter how much we fought against it. TEPCO insisted on its safety, and nobody believed that in their wildest dreams, that one day, radiation would fly into the skies, and cause mass disruption to everyone. Nobody saw that coming, blinded by economic prosperity. They kept on building and building, promising and promising, until the inevitable happened. More money, more people, more business hotels, and more people from Tokyo, all contributed to this so-called elevation of life. Even my husband had absolutely no qualms about the nuclear power plant. But few people think about the energy we consume, and where it is coming from. We are all immature, just thinking about profits. Even those who opposed nuclear energy were eventually converted when their own sons and daughters found jobs in companies that profited from nuclear energy. Such fools! And the flip side of all this? There was never any discussion about the risks.

You see, the *to* in *toden* (TEPCO) doesn't stand for "east," it stands for *to* as in "thief." Fukushima has long been a nuclear colony for Tokyo. None of the energy produced in Fukushima is consumed by Fukushima. It all goes to Tokyo. We sold our land and our soul, all of it, to Tokyo. Everybody agreed to it, blinded by greed, and ignoring, or not even considering the risks that may come with it. As long as it made money they all said. But there was a small contingent of us, we who were against nuclear energy. When the nuclear power plant was built, we used to sing a variation of the anti war song titled *Genbaku Yurusumaji*, "No More Atomic Bombs." Often sang in antiwar rallies, in the post-war years, the song went like this:

原爆許すまじ

ふるさとの街やかれ
身よりの骨うめし焼土[やけつち]に
今は白い花咲く
ああ許すまじ原爆を 三度許すまじ原爆を
われらの街に

ふるさとの海荒れて
黒き雨喜びの日はなく
今は舟に人もなし
ああ許すまじ原爆を 三度許すまじ原爆を
われらの海に

ふるさとの空重く
黒き雲今日も大地おおい
今は空に陽もささず
ああ許すまじ原爆を 三度許すまじ原爆を
われらの空に

はらからのたえまなき
労働にきずきあぐ富と幸
今はすべてついえ去らん
ああ許すまじ原爆を 三度許すまじ原爆を
世界の上に

HIROSHIMA SONG

In the place where our city was destroyed,
Where we buried the ashes of the ones that we loved,
There the green grass grows and the white waving weeds,
Deadly the harvest of two atom bombs.

Then brothers and sisters you must watch, and take care
That the third atom bomb never comes.

The sky hangs like a shroud overhead
And the sun's in the cage of the black, lowering cloud.
No birds fly in the leaden sky,
Deadly the harvest of two atom bombs.

Then, brothers and sisters you must watch, and take care
That the third atom bomb never comes,

Gentle rain gathers poison from the sky
And the fish carry death in the depths of the sea;
Fishing boats are idle, their owners are blind,
Deadly the harvest of two atom bombs.

Then, landsmen and seamen you must watch, and take care
That the third atom bomb never comes,

All that men have created with their hands
And their minds, for the glory of the world we live in,
Now it can be smashed, in a moment destroyed,
Deadly the harvest of two atom bombs.

Then, people of the world, you must watch, and take care
That the third atom bomb never comes.

We sang the song, changing the lyrics from *genbaku* "atom bombs" to *genpatsu* "nuclear power plants," but it was to no avail. We were all fools at the time and had our

lands taken over. And then the nuclear economy took over our quiet lives. No matter what we did to try to prevent it from happening, it was impossible to stop.

Chihiro Sato

Shelter resident: Nihonmatsu, Fukushima
Distance from Fukushima Daiichi Nuclear Power Plant: 57km

Before the *shinsai*, I had absolutely no interest in nuclear energy, zero. To be honest, I was not even aware of the nuclear power plant. I mean, it existed before I was born, so I never gave it any thought, other than the fact that my father used to work there, and subsequently, had several jobs that were related to the nuclear industry. And TEPCO? I was barely aware of their existence, and just kind of knew that they were taking energy from us. I had no idea of how dangerous their facilities were, or how they were built. I just thought it was "normal" for them to be here. After the accidents though, the adults lamented that they were all told that the nuclear power plant was safe, and I thought, oh, so that's what we've been told all along. They should never have told us that it was safe in the first place! But then again, much of it was caused by the tsunami, so it's hard to know who or what to blame for what happened. I myself don't have any problems with the creation of energy with nuclear technology. But after the *shinsai*, we went to city hall to negotiate compensations, and saw all the adults fighting with each other. Even I felt the anger as a child. But me myself, I feel no anger towards TEPCO. It's just that the accident, the fact that it happened, has brought so much misery to so many people. It's hard to describe this feeling in words, and given that I am now living an entirely different life than I was before the accident. But maybe my way of thinking will change over time. Maybe one day I will honestly confront

reality in a serious way. You see, after all, Namie is my home, a place I feel safe and secure. It is a place that I will... or should... one day go home to. But the reality is, that today, despite Namie finally being open to the public, it is no place to live. Sure, those who are promoting *fukko* (revitalization) are doing everything they can for the city, but it is far from a place where one could comfortably live in. In contrast, Nakadori, the place where I'm currently at is becoming familiar, and as the years go by, I have learned to be comfortable in this new environment. I graduated from high school here, and have now started working, so for now, I wish to settle here as the thought of moving yet again is just too much.

And since the last time we met, I did go to my *seijinshiki* (adult ceremony) in Namie. It wasn't an easy decision. I had made new friends in Nakadori, but eventually decided to go back to Namie for the ceremony. Even though there were about 100 people who attended, it was still a low number in comparison. All of us now live in faraway places, so for many of us, it was difficult to coordinate a trip back to Namie. I was lucky. I wore my kimono and had my father drive me there. You see, the adult ceremony kimonos are so tight, you can barely move in them. It is truly uncomfortable and difficult to breathe once you wear it. I remember that city officials were crying as they made their speeches in front of us. It must have been hard for them, with so much going on after the disasters. And we sang our school song for the first time in eight years. It is amazing how we were all able to remember the words. But none of us decided to go back to Namie and live there. Oh no, there was one boy, yes, just one person who decided to come back, as he got a job in Namie City Hall.

In regards to the efforts for *fukko* (revitalization) of Namie, I have mixed feelings. To be honest, I do not have a desire to be involved. It's not that I am running away. It has now

been eight, nine years since, and there is still no end in sight. While there are tangible goals to accomplish, I do not yet know where my heart wants to go. Even after all these years, I still need time to sort my feelings out. When I see Namie today, I see a place where time has stopped. Maybe some things have changed, and some buildings have disappeared, but the air, the smells, the ambiance remains the same. But all these memories, it brings back much pain. And with my friends from Namie, we rarely talk about the past. We only talk about the future and what lies ahead of us.

Despite my personal feelings, I do think that *fukko* should continue. But they need to consider more strongly the feelings of the people who have been dispersed all over the country. In many ways, we still have not been "saved" from the situation. And as citizens, our voices are getting fainter and fainter as the years go by. Many of us now have the attitude of "It doesn't matter what we say," or "What use is it to say anything?" *Fukko* needs to address these issues. They should know that we are not, or that we *cannot* go back to Namie. For years, the city officials called us to inquire about our wellbeing. In the beginning, we told them exactly how we felt. But we soon realized that no matter what we said, not much happened, and there was little gained from this type of communication. I understand that there was possibly a limit to what they could do, but after a while, we stopped sharing our opinions because we knew it was useless. You see, the people in City Hall, they are not here with us. And as for us, we are not all in one place. Some of us are in Nihonmatsu, some in the Kanto region, we are all over the place. There is no unity in our voices. We have no leader to unite us. The only people we end up sharing our thoughts with are our close relatives and family members, and it just ends there. When they call us and

ask us "Do you want to come back to Namie?" we just think how inconsiderate they are to ask us that. I know it is somebody in City Hall who was tasked to call former residents, but for us we are thinking "how dare you call us now after all these years?" Our life at the moment has finally normalized, and we are all trying to move on, so when they still call to ask whether we want to come back, or what we want to do for *fukko*, it just serves to infuriate us. We just want to respond by saying, "Do you know anything? Who do you think you are? Do you even know what we have been through? What gives you the authority to ask us those questions?" They should be more sensitive to our situation and carefully ask us how we are doing, but instead, they jump right in and expect us to answer these big questions. There are many of us, and each one of us has a different narrative. Some of us have lost loved ones, lost homes, and all of us have lost Namie. And for us, especially the youth, there is no *fukko*. All in all, it feels as if the actions of City Hall have now become just another routine. As former residents, we don't know what it is that they want from us, and we don't know what it is that they want to do with the city. I know each of us is powerless, but it should be the mandate of city officials to do something about it.

Reflections

The ten voices of Fukushima remember the past, examine the present, and contemplate an uncertain future. Each represents a unique perspective on the memory of place, thoughts on nuclear energy, survival from the accident, and post-disaster trauma. Contesting voices are brought together, expressing the aftermath of a single event that continues to haunt them personally, and haunt their region as a whole. This ethnography

contends that soliciting deep perspectives at a local level remains pertinent. The personal and social consequences of evacuation and displacement, the cultural identities that are protected, the solidarity formed through mutual suffering, and a collaborative will to survive all contribute to fuller understandings of the impact of large-scale transformative events. Simply put, without their voices, one cannot possibly grasp the true impact of a disaster.

Despite these narratives, the cycle of risk has not and will not be broken. Let us recall how Friedmann defines this cycle as a process where knowledge leads to action, action is met by resistance, resistance is overcome, knowledge is reassessed, and normative is restored. With Fukushima now entering its normative phase, how are these theories helping us understand the way risk is perceived? Let us look at two prominent themes that persistently came up in the interviews: uncertainty and safety.

Uncertainty

Despite the fact that nuclear energy has been around for more than half a century, uncertainty about its use proliferates. While uncertainties can mutate into calculable risks, this is done through the process of a cycle of accidents, from which a revised claim to knowledge is made and uncertainties minimized. But with only a handful of accidents to inform such knowledge, nuclear certainty has yet to be validated to a level that promotes global reception. Tomoko comments that "human error will always be a part of nuclear power plants. It is not right to proclaim that everything is ok when we are trying to harness something we have yet to contain. Risk and uncertainty should always be made transparent to the public."

Uncertainty relates to the sentiments about the future. When asked about the future of his town, Namie Mayor Baba was candid about what lies ahead: "our uncertain future affects people's sentiments on returning to their hometowns. They estimate another 40 years before the nuclear power plant is decommissioned. But now six years after the accident, there is still no resolution on how the removal of molten nuclear fuel debris will be conducted, and where it will be stored. Is it even possible for residents to come back and live in such a dangerous environment? We must first decommission, and promise a land of safety. In other words, put it back to where it was before. And even then, we must have plans to welcome a new community in a safe and secure place, with sound disaster protocols: If another accident were to arise, how would we evacuate? And after evacuating, what kind of care would one receive, such as food, clothes and shelter? A town must have all of this thought out prior to welcoming its residents back." The case of Sueko, the 86-year-old evacuee who lived seven years of her life in a cramped evacuation shelter, demonstrates the unforeseeable circumstances that ultimately led to her decision not to return. With little assurances for life as a senior citizen in an abandoned town, it was simply not sustainable for her to pursue her life in Namie, despite her strong desire to do so. Shortly after his interview, Mayor Baba passed away in the summer of 2017. It is unfortunate that despite his vision to resurrect his city to a place "where it was before," the reality is far from so. As of the time of this writing in May, 2020, the population stands at 1,375 people. Prior to the earthquake, Namie had a population of 21,434.

As uncertainty is tied to risks that are incalculable in its onset, the Fukushima incident fueled anxieties for those who lived through it. Chihiro described her fear: "I didn't

understand what it meant to escape from radiation. They tell us that radiation is dangerous, but you can't see it. They measure and give us numbers, and all we can do is learn that certain numbers are dangerous." Displacement is yet another factor that contributes to uncertainty, largely in the context of not knowing when or if a return is imminent, or possible at all. Yoshizawa, the embattled cattle farmer, describes the future of Namie as a place that will never return to its former state. "It is no longer a town, or even a village, it is something less than that. What is the meaning of place when only a tenth of its senior population chooses to return? The basic functions of a town, its economy and agriculture no longer exist. It's over. I will tell you straight up: Sayonara Namie. Namie is now and forever a nuclear ghost town."

Safety

Today, TEPCO commercials steer clear from mentions of nuclear power. But prior to the Fukushima accident, their commercials were dominated with the discourse on nuclear safety, none more so than through their mascot Denko's finger wagging symbolism of safety, and their usage of Sakji Yoshimura, a famed Egyptologist from Waseda University as a spokesperson who used ancient Egyptian mythology as a form of persuasion. When I interviewed Mayor Baba, the lament he expressed on his belief in nuclear energy prior to the accident was palpable. It was as if he blamed himself and his faith in nuclear energy as the source of all the tragedies that befell his citizens. His use of the word "damasareta," or, "I was duped" is emblematic of the sentiment that percolates amongst those who suffered the consequences of the disaster. The blind faith on the absolute safety of nuclear power plants was so persuasive, even the plant operators themselves demonstrated regret for

believing in its sanctitude. Yoshiyuki Ishizaki, TEPCO's Vice President, admitted that even he believed that Japanese nuclear power plants were 100% safe places. And yet, even in the aftermath of Fukushima, nuclear operators insist on its necessity for the nation. When asked how we can restore safety, Ishizaki said, "This will require a herculean effort. We have to establish new safety regulations, and only the power plants that can pass will be allowed to restart, and those that don't shall be decommissioned. The new safety standards are agreed upon at the national level. For the survival of Japan's economy, and for the future of our country, this energy policy is integral."

"Personal communities," the original focus of this chapter, looks at patterns in social networks to better understand the diverse charter of people's social integration in society. "In focusing on the particular," this ethnography "illuminates the general (Allan & Phillipson, 2008; Charles & Davies, 2005)." The narratives of the ten people in my network has focused on depth, through multiple open-ended interactions over an extended period of time. It has allowed me as an ethnographer to view relationships collectively, rather than as individual constructs, and it advances the much-criticized aspects of community studies with edited narratives that fulfill the potential to answer difficult questions on social incorporation, isolation, displacement, and direction.

Chapter 6

Healing in a Risk Society

Today, the word "Fukushima" is synonymous to a catastrophe caused by human error. Unlike other regions—such as Miyagi and Iwate Prefecture to the North—that were ravaged by the tsunami, Fukushima's fate is anthropogenic, as radiation is a human borne hazard. Following the nuclear accident in 2011, the International Atomic Energy Agency defined a program to strengthen the global nuclear safety framework. The plan outlined actions to strengthen safety in 12 areas: safety assessment of nuclear power plants; IAEA peer reviews; emergency preparedness and response; national regulatory bodies; operating organizations; IAEA safety standards; the international legal framework; Member States planning to embark on a nuclear power programme; capacity building; protection of people and the environment from ionizing radiation; communication and information dissemination; and research and development (IAEA, 2011). In the United States, the Nuclear Regulatory Commission issued their own version of the "Post-Fukushima Safety Enhancements," adding capabilities to maintain key plant safety functions following a large-scale natural disaster; updating evaluations on the potential impact from seismic and flooding events; adding new equipment to better handle potential reactor core damage events; and strengthening emergency preparedness capabilities (Nuclear Regulatory Commission, 2019). With new policies and safety measures in place, TEPCO, owners of the stricken Fukushima nuclear power plant, have taken it upon themselves to rebuild abandoned communities. TEPCO's commitment to develop additional infrastructures and facilities—similar to their directive to develop J-Village prior to the accident—continues to profit their industry, strengthens the grip by federal agencies to control the countryside, and ensures their regional authority for the foreseeable future. When Abe proclaimed that

"Fukushima will never do, and has never done, any damage to Tokyo," he single-handedly labeled, and in doing so, isolated the entire prefecture as a scapegoat for everything that went wrong in the nuclear disaster. At the same time, he absolved Tokyo from any consequential damage from the fallout. Now, the world associates Fukushima with the nuclear fallout, much as Chernobyl is associated with its own catastrophe in 1986.

Chernobyl and Fukushima are forever linked by the dark nuclear legacy that defines them. Every year since 2011, citizens from both regions routinely visit each other for cultural and knowledge exchange, and to find solace in sharing a pain that only they can understand. Chernobyl is currently a "ghost city" with no inhabitants due to the nuclear fallout. Prior to the disaster, it was home to 14,000 residents, a location chosen to host Ukraine's first nuclear power plant. Construction of the Chernobyl Nuclear Power Plant began in 1970, the same year that the Fukushima Nuclear Power Plant was first commissioned, making it a "newer" facility than its Japanese counterpart. Chernobyl's first reactor was completed and commissioned in 1977, a full seven years after Fukushima. Despite its name, the nuclear power plant is situated 15km from the actual city of Chernobyl. Pripyat, the city closer to and situated one-kilometer northwest of the power plant, is often associated with the fallout, with famous disaster imagery of its rows of apartment blocks and the infamous abandoned ferris wheel. Pripyat, now also a ghost city, did not exist prior to the construction of the nuclear plant; in fact, it was known officially as "atomograd," an official designation for cities constructed for the sole purpose of housing atomic scientists and nuclear workers. Pripyat was planned as an exemplary socialist town, and at the time of the Chernobyl disaster, it was a thriving, family oriented new urban city,

with a population of 49,400, 15 kindergartens and elementary schools for 4980 children, 5 secondary schools for 6786 students, one hospital, and 13,414 apartments in 160 apartment blocks. (Dobraszczyk, 2010). With an average age of 26 years old, it represented the realization of the utopian modernist city within the Soviet context.

Scaling up, Chernobyl is located within Kiev Oblast, a province of Ukraine. According to the Ukraine census, the population of Kiev Oblast in 2019 is 1,767,940 (*Population of Ukraine*, n.d.), roughly the same as Fukushima prefecture at 1.8 million (*福島県の位置・人口・面積 - 福島県ホームページ*, n.d.). And this is where the Fukushima conundrum resides. The Chernobyl Nuclear Power Plant was labeled after its closest *city*, one with a small population of 14,000. This is equivalent to Namie Town, located just Northwest of the Fukushima power plant, with a population of 20,000 prior to the evacuation call. However, due to the simple fact that the nuclear power plant was named after a *prefecture*, rather than a city, the entire region of Fukushima is now associated—however unfairly—with the stigma that comes with radiated people and produce. Now, *fuhyo higai*, or harmful rumors, is identified with anything coming from the prefecture, rather than the small area that was directly impacted by the radiation leak (Mabon & Kawabe, 2018).

Let me now return to the questions that set this research in motion. My original involvement began as a technology volunteer during the immediate aftermath of the nuclear fallout, working with local governments, mapping airborne radiation, and informing citizens on the level of risk in their communities. In traversing areas of trauma, displacement, and ecological transformation, a simple question began to formulate: Why

did this happen? In these moments of tribulation, we question our relationship with risk. We live in a risk society where our daily lives are infused with decisions that are based on risk assessments. As we contemplate the Fukushima conundrum, the ethos of a post-disaster risk society is considered through its history, where the inception of science and technology in the form of a nuclear power plant was brought into an otherwise tranquil countryside. Bear the burden of risk for the sake of the metropolis and you shall be rewarded, was the message. With the 2011 incident, vast swaths of lands have since been exposed to radiated particles, affecting generations into the future. According to Ishizaki, the TEPCO Vice President, and Baba, Namie City's Mayor, it will take at least another 40 years before the Fukushima Daiichi Nuclear Power Plant's decommissioning is complete. Hundreds of thousands of contaminated bags are strewn all over Fukushima, like a plague that has left its indelible mark, a constant reminder to an already traumatized region.

Healing through Ethnography

Even in a country as prosperous as Japan, the narratives of displacement, evacuation, and escape, are not unlike many other situations that may transpire during a crisis in other parts of the world. The fear, anxiety, exhaustion, and emotional toll it takes to mobilize oneself, along with those close to you, with the heavy heart of losing or leaving behind others in the wake of catastrophe, can be felt through these narratives of Fukushima. As we approach the eight year anniversary of 311, members of this ethnography have assumed varied paths for disparate reasons. For them, the world appears unchanged, but in truth, they are no longer the same. Instead, there's a disquieting dread, an uncertain

future, and the aftertaste of continued marginalization. Despite the unspeakable horrors each character has witnessed, the world still spins, impassive and unmoved by the spectacle of crisis. Nuclear energy, which has been at the core of this argument, faces a momentary crisis, but eventually, the needs of capitalism and the powers of the nuclear hegemony will likely overwhelm the anti-nuclear movement, and put the nation back in its path of nuclear dependency.

One of the primary questions that has framed this research resides on whether or not disaster ethnography as an action research can result in some kind of therapeutic planning intervention that can address a deeply traumatized and divided community. Sandercock defines therapeutic planning "as the process of bringing people together not only to share their experiences and work in solidarity, but also to work through their differences... to talk of fear and loathing as well as of hope and transformation" (Sandercock & Lyssiotis, 2003, pp. 159–166). Three kinds of healing in the context of Sandercock's research are befitting the situation in Fukushima. First is the internal psychological healing of traumatized individuals. Second is a broader collective healing of marginalized communities whose culture has been affected by outside influences for long periods of time. And third is the healing and reconciliation between community members and authorities of power. Sandercock claims that it is not the business or competence of the ethnographer to address the first and second kinds of healing. In this research study, while not directly addressing internal or collective healing, the process of ethnographic inquiry and the revelations that came from the subjects have allowed for the possibility of psychological healing for traumatized individuals. This was made possible by employing a

methodological approach adhering to anthropological ethnographic practices of person-centered interviews, using open-ended questions and probes to elicit rich narratives that are based on unfiltered sentiments. Three characteristics of the ethnographer's role were critical to its success: acting as a neutral participant, being a detached individual from any local or contesting parties, and establishing trust through persistence over a period of multiple years. Providing a platform for traumatized citizens to express their inner sentiments that are otherwise suppressed by social norms can serve as a turning point in the expression of pain. Take the situation of Sueko, a woman in her 80s, who lived in a cramped evacuation shelter for seven years before finally moving to a senior care home. As a senior citizen, haunted by a past and lifelong suffering from a troubled relationship with an abusive husband, the effects of displacement furthered her isolation and thoughts on the futility of living. During each of my visits, she invariably greeted me with a broad smile and said, *shikatanaku ikiteru* (I'm living just for the sake of living), words that belied her jovial nature, exposing her indifference to live other than for the sake of living. But through our numerous interactions, she began to articulate and express blame squarely on her abusive husband, proclaim her deep hatred towards the state of affairs that nuclear energy produced, and eventually evaluate her options in a state of lucidity and pragmatism, opting to relocate and live in a senior care facility rather than return to the troubled city of Namie.

The second kind of healing—that of the collective healing of marginalized communities—while not produced as a direct result of any intervention by this ethnography, was nevertheless observed over the course of revisiting a traumatized region through multiple years of inquiry. It was during one of my participant observations that I

overheard the mention of "Odaka no Sanbaba," the *Three Old Ladies of Odaka*. The story goes on to say that the *Sanbaba* were powerful women in the abandoned city of Odaka, and they had single-handedly resurrected it back to some form of normalcy. I later found out that Tomoko, the owner of the *ryokan* where I spent much of my days and nights during my fieldwork, was one of three *Sanbaba's*. She explained to me how the gradual process of post-disaster community based healing initiated around the Joban Odaka train station, an ideal location based on its centrality for urban activities. In order to attract visitors to their unfrequented town, the *Sanbaba* organized events around food: Chocolate fondue, gyoza, BBQ, flea markets, *mochitsuki*. Eventually, they added non-food events to their repertoire, like walking tours and stamp rallies. These activities, initiated by the "three old ladies" held tremendous value in the process of healing through collective action, as their efforts galvanized a torn and depleted community around the theme of normality: bringing the everyday back into a new reality. It was, in fact, one of the *sanbaba's* who told me that "atarashii futsuu," a new normal was the path forward, rather than continuously seeking justice by looking at the back mirror.

The third and final form of healing—reconciliation between community members and authorities of power—was observed in the creation of a film, a process that required a multitude of interviews from numerous participants over the course of five years. This process of ethnographic inquiry in itself probed the sentiments around contestation, those subjected to the injustices created by the nuclear fallout, those in positions of political authority, and those who had brought the nuclear industry there in the first place. The dualism between contesting parties, ranging from anger, sadness, exasperation, lament, and

remorse, were all integrated into a single visual format: film. Film as a medium can explore the usage of new tools to access other ways of knowing, learning, researching, and practicing, drawing on a case study that uses multimedia interventions in urban policy and community engagement in planning (Sandercock & Attili, 2010a, 2014, 2010b). While I make no claims that my film has been a catalyst for social change in a deeply divided community, it has played a significant role in promoting healing and reconciliation between contesting parties.

"Human Error" was first screened in Tomoko's travel inn (*ryokan*) in Odaka in 2017 (Appendix B). Within this communal space, invitations were made to citizens in the local community, largely comprised of a small segment of the population that had chosen to return, along with volunteers who were in Fukushima helping with the efforts of reconstruction. Additionally, all members who were participants in the film were invited, including the TEPCO Vice President, Yoshiyuki Ishizaki. Ishizaki's presence amongst a group of locals introduced tension and urgency in an otherwise festive occasion. In addition, the role of the planner, which in this case was also the sole director and producer of the film, was instrumental in bringing unity, calm, and mediation to an otherwise uncertain environment. As a mediator, the planner can use a film as a visual medium, to enable the bridging of unlikely parties in a non-confrontational manner. The film serves as a recognition of the past, situating historical injustices as a way to shape what is possible in the present. It is a process that allows recognition and working through historical wounds and memories to inform an uncertain future (Sandercock & Attili, 2014). The unlikely assembly of community members brought together by the screening of the film set up a

cathartic release of shared personal stories of anger, shame, and reconciliation. Formal settings that involve government officials and community members, such as town halls and public seminars, represent controlled environments with fixed agendas. In contrast, a film screening, with the narratives expressed in raw format through a visual medium, produces an organic setting suited for resolution rather than confrontation.

A pensive silence pervaded the communal space immediately following the culmination of the screening of "Human Error." Eventually, a member of the community spoke up, and facing Ishizaki, asked whether or not he could say a few words to those present in the room. Ishizaki, later confided in me, admitting that he had no intention to speak during the event unless asked to do so. Nevertheless, he took this opportunity to stand up and face the audience, and proceeded to bow, expressing a deep and sincere apology. Eventually, a member in the audience asked him to speak. Ishizaki went on to express remorse, specifically on how TEPCO had inadvertently torn apart communities, but also, despite the tragedy that had unfolded, how nuclear energy is still a necessity in today's society. While not in agreement, the audience accepted his positionality, and a non-confrontational debate ensued, providing a peaceful outlet for both sides to express and share their stories.

As the film made its rounds in community centers, academic conferences, and film festivals around the world, it found an unexpected audience. TEPCO, in an event organized by the vice president, invited me to screen the film at their Tokyo headquarters. This event mandated 100 of their top executives to be in attendance, by far the largest audience the film has garnered in any of its screenings. To put things in perspective,

TEPCO is the largest electric utility in Japan, and the 4th largest in the world. Upon arrival at their Shinbashi headquarters, I was given the red-carpet treatment, ushered into a holding room where the Vice Chairman Naomi Hirose awaited to welcome me. He guided me into the screening room, where all 100 executives—98% of whom were male— were seated quietly in their dark suits. At the culmination of the film, the large ballroom sized room was engulfed in silence. Asked to make a speech, I stood before my audience where I saw many hands on knees and faces looking down. A posture symbolic of shame and remorse. Many were in tears. In this awkward space, I expressed that their reactions to what they had just witnessed should not be expressed to me, that I was but a conduit to the voices of Fukushima, and that their feelings should be directed to the people in the film. I chastised them for not doing more for them, and ended my discourse with a quote from Sachiko, the farmer's wife in Odaka: "If you are so confident in your nuclear power plant's safety, why don't you build the next nuclear reactor in the middle of Tokyo?" That a small, self-funded film about the narratives of people who live in Fukushima can engage—perhaps some against their will—an audience of top executives from such a powerful company is testament to the effectiveness of film. An academic article, let alone a dissertation, would undoubtedly not have enabled such meaningful opportunities for introspection.

Final Thoughts

In the year that this dissertation is being concluded, another invisible threat, at a scale never seen before, has engulfed our planet. The COVID-19 virus has paralyzed entire

cities, finding no boundaries to mitigate its global spread. And much like the situation in Fukushima, one cannot *see* this threat, nor can one accurately or definitively assess the danger it poses to our health. It is this uncertainty that paralyzes us, the inability to perceive risk that engulfs us, the fear of the unknown. And while at the end of the day, many threats may be conceived as being more dangerous, simply by the measures of casualties or other forms of measurable metrics, one cannot undermine the emotional, psychological, and physical trauma that fear produces to our psyche. It infiltrates the very fabric of the social, cultural, historical, and future of our being. And often what is lost in the big picture are the narratives of how these phenomena affect us.

Decisions are made devoid of a thorough understanding of how they impact those who live and die in the affected communities. Risk is re-introduced in a modified fashion, with new safety measures, and with new promises of a brighter future. Until, that is, the next disaster strikes. Have we learned from lessons of our past? Is human life worthy of the sacrifices for capital and economic prosperity? As the world grapples with this conundrum, something is unmistakably true: the cycle will repeat itself. There will be another pandemic after COVID-19, and there will be another nuclear power plant accident. One way of looking at the Fukushima disaster is that it unraveled exactly as planned. This, from the national perspective, was exactly why the power plant was situated where it was, and exactly how the damage was minimized and isolated to the place and people targeted to bear the burden of catastrophe. And while the accident produced a momentary blip in the nation's energy policy, the big picture, in retrospect, has changed little. With nine nuclear reactors now back online, and with 17 more in the process of being restarted, the administration is

aggressively pursuing a future that will put nuclear energy production as a key pillar in its energy policy. The familiar narratives prevail, that of Japan being a country with scarce natural resources, and that of nuclear energy being the safest, most obvious choice for energy production, in spite of, or because of the added security measures imposed by the Fukushima disaster.

What this body of work contributes to the world is in its sincere and ambitious effort to document and serve the people who are directly impacted by disasters, and to then provide a space and participation towards healing and moving forward. It also aims to transmit their stories to the world through the medium of film. History will no doubt repeat itself, and a new set of injustices will be bestowed upon a new group of marginalized populations. Let us think back to the narrative of Tomoko, an ordinary *okamisan*, owner of a modest travel inn in Fukushima. As a small business owner, she was determined to return to Odaka, and remain there, ready to face whatever obstacles were to come her way. What started out as a solitary labor of love—she planted flowers around the abandoned train station way before it was operational again—has finally borne its fruits, evidenced by a daily stream of visitors who stay at her *ryokan*, and the lively conversations that abound in her *shokudo* (cafeteria). She embodies the notion of building resilience through social capital in post-disaster recovery (Aldrich, 2012). In this sense, she has single handedly designed a narrative that promotes a transformative reality towards a new sustainable society within the evacuation zone. She serves as an intermediary between the individual's internal anguish and the structure of a new social collective. Tomoko lives for the future, and for the survival of her community. "I am supported by my community... the memories won't fade

away. It might be 30 years, or even 100 years. But we need to build a place for these memories to live on."

Appendix A: Photo Journal: The Evacuation Zone

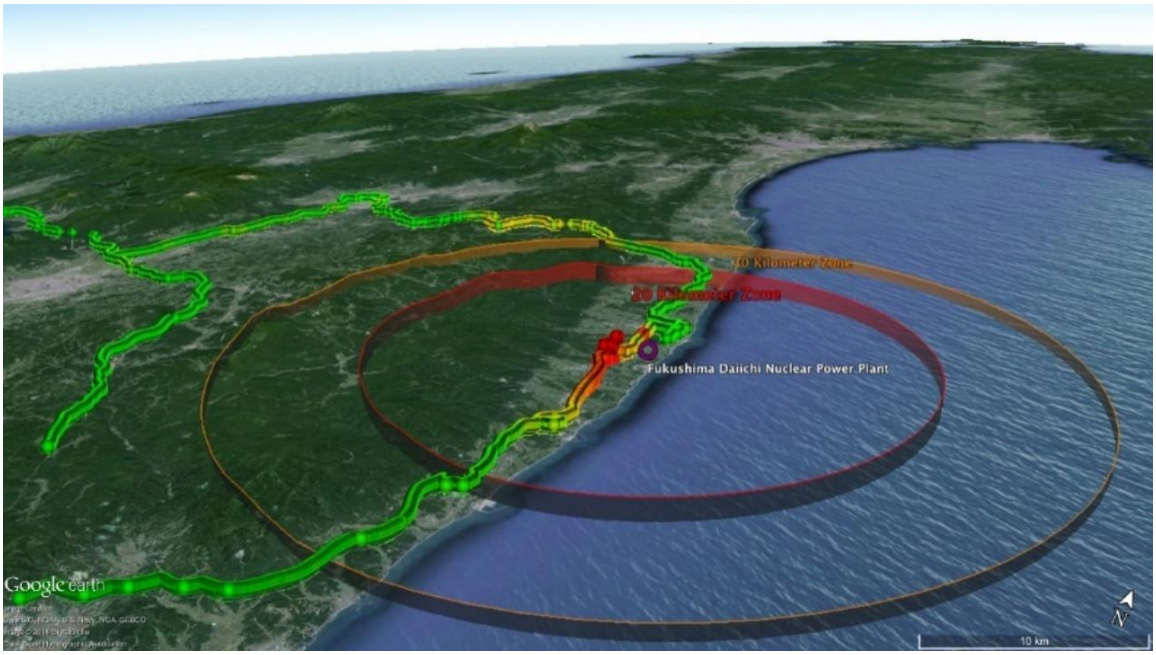

Figure 22: Google Earth image of the Evacuation Zone

2012

Figure 23: A view of a Fukushima landscape prior to entry into the Evacuation Zone (7/18/2012)

Figure 24: BISHAMON team members from left: Yoh Kawano, Makoto Naito, Yugo Shobugawa, Jun Goto (7/18/2012)

Figure 25: BISHAMON mounted on a vehicle by Jun Goto (7/18/2012)

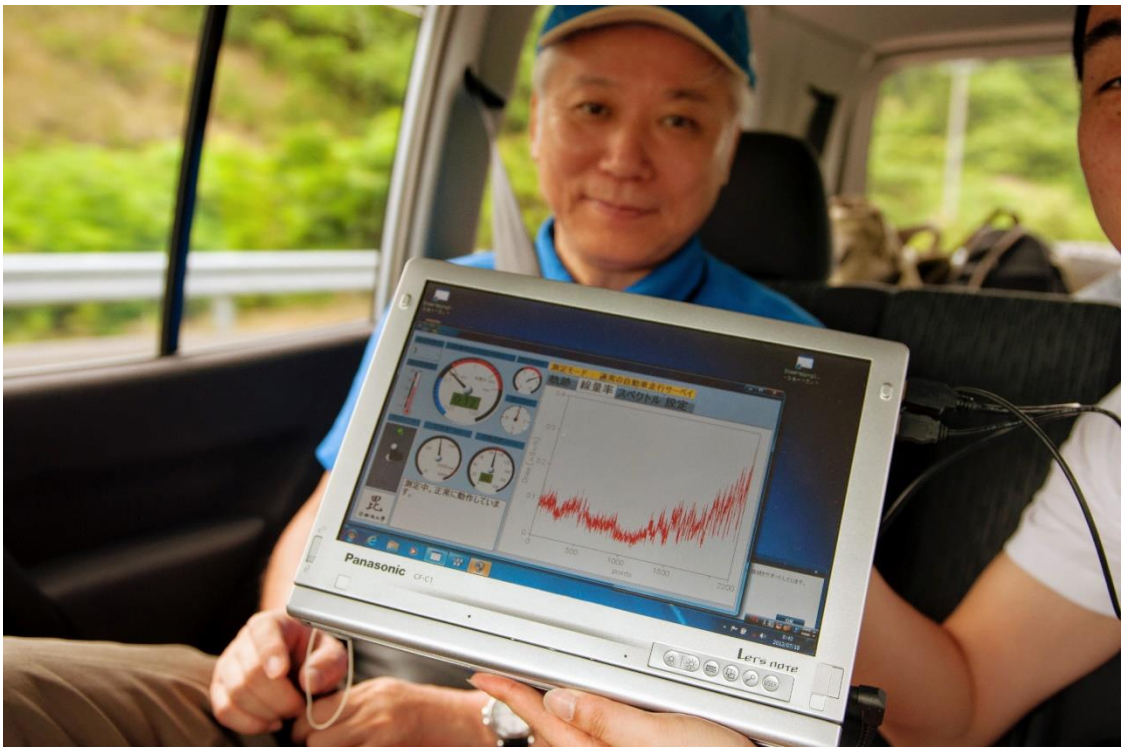

Figure 26: Niigata University Professor Naito looks at real time radiation data inside the evacuation zone (7/18/2012)

Figure 27: Yoh Kawano (author) and Jun Goto (Niigata University) measure radiation levels inside the evacuation zone (7/18/2012)

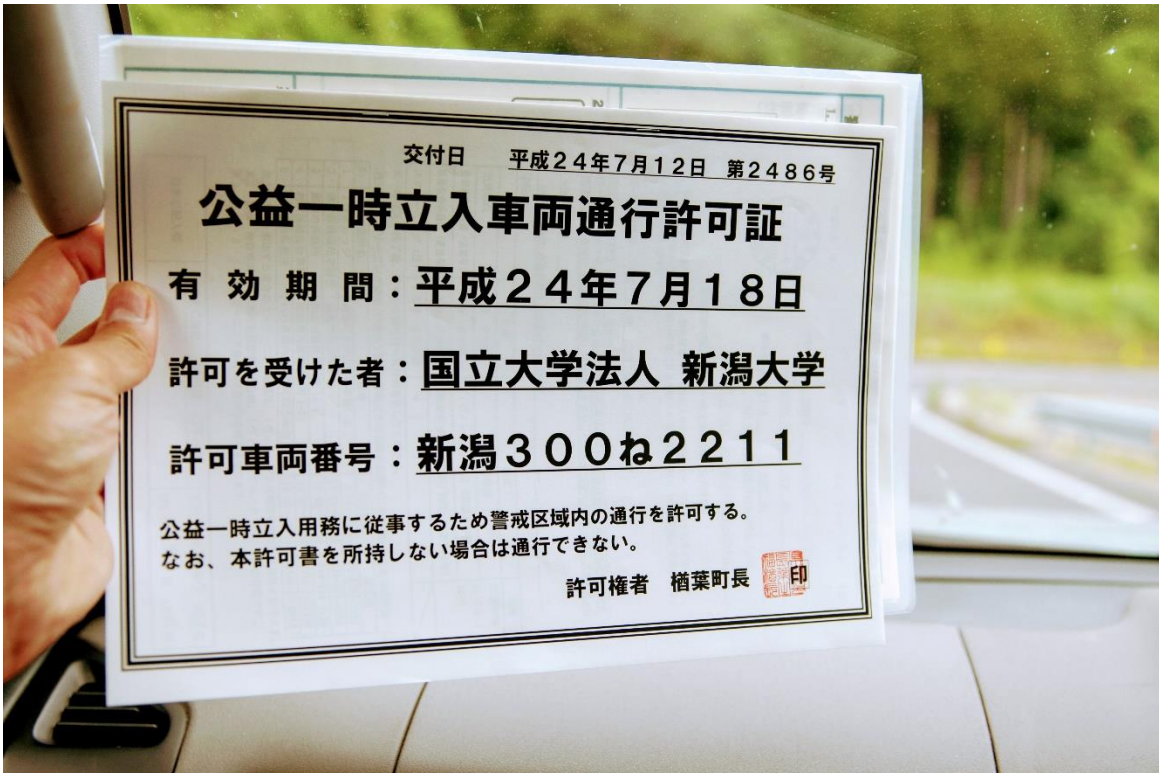

Figure 28: Official Evacuation Zone entry pass for July 18, 2012

Figure 29: Heading towards the coastal zone in Namie City (7/18/2012)

Figure 30: Coastal zone littered with debris inside the evacuation zone (7/18/2012)

Figure 31: Approaching Ukedo Elementary school, 300 meters from the Pacific Ocean (7/18/2012)

Figure 32: A map of Ukedo inside the Ukedo Elementary School (7/18/2012)

Figure 33: Gymnasium with caved floor and remnants of the graduation ceremony (7/18/2012)

Figure 34: A classroom with messages from relief agencies and a clock stuck at 3:37 (7/18/2012)

Figure 35: A classroom with messages from relief agencies and a clock stuck at 3:37 (7/18/2012)

Figure 36: A classroom with a globe and a clock stuck at 3:37 (7/18/2012)

Figure 37: Inside a classroom in Ukedo Elementary School (7/18/2012)

Figure 38: Yoh Kawano (author) inside a classroom in Ukedo Elementary School (7/18/2012)

Figure 39: Makoto Naito, Yoh Kawano, and Yugo Shobugawa inside the evacuation zone (nuclear power plant is in the background) (7/18/2012)

Figure 40: A view of the Pacific Ocean in Namie City (7/18/2012)

2014

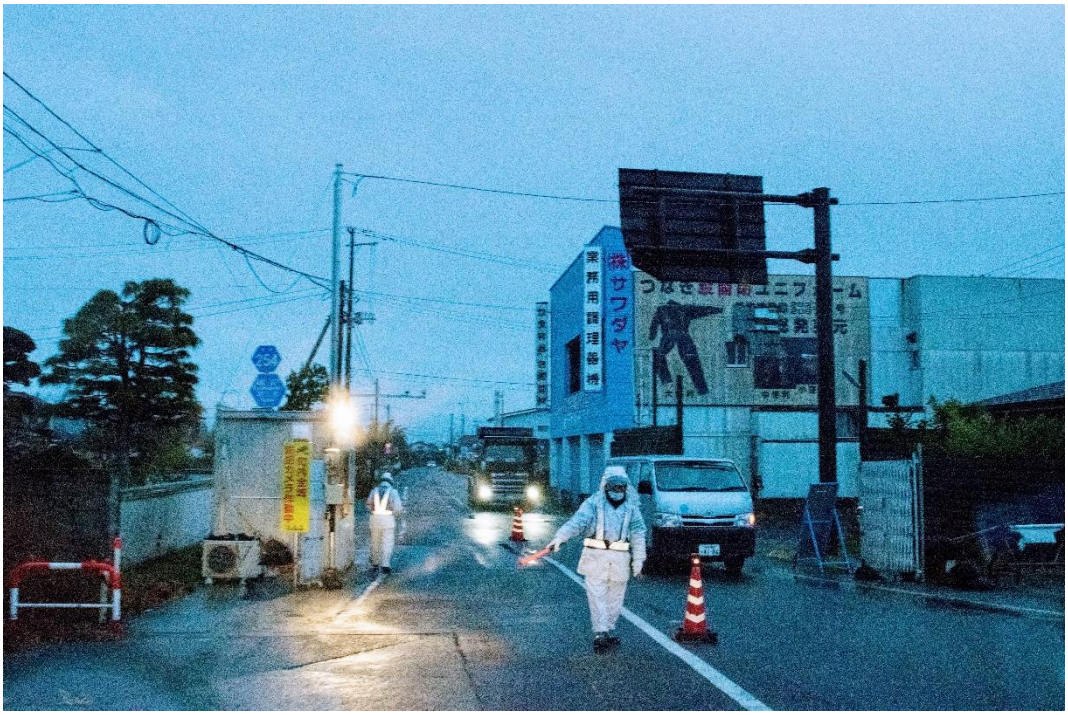

Figure 41: Entry into Namie City (12/16/2014)

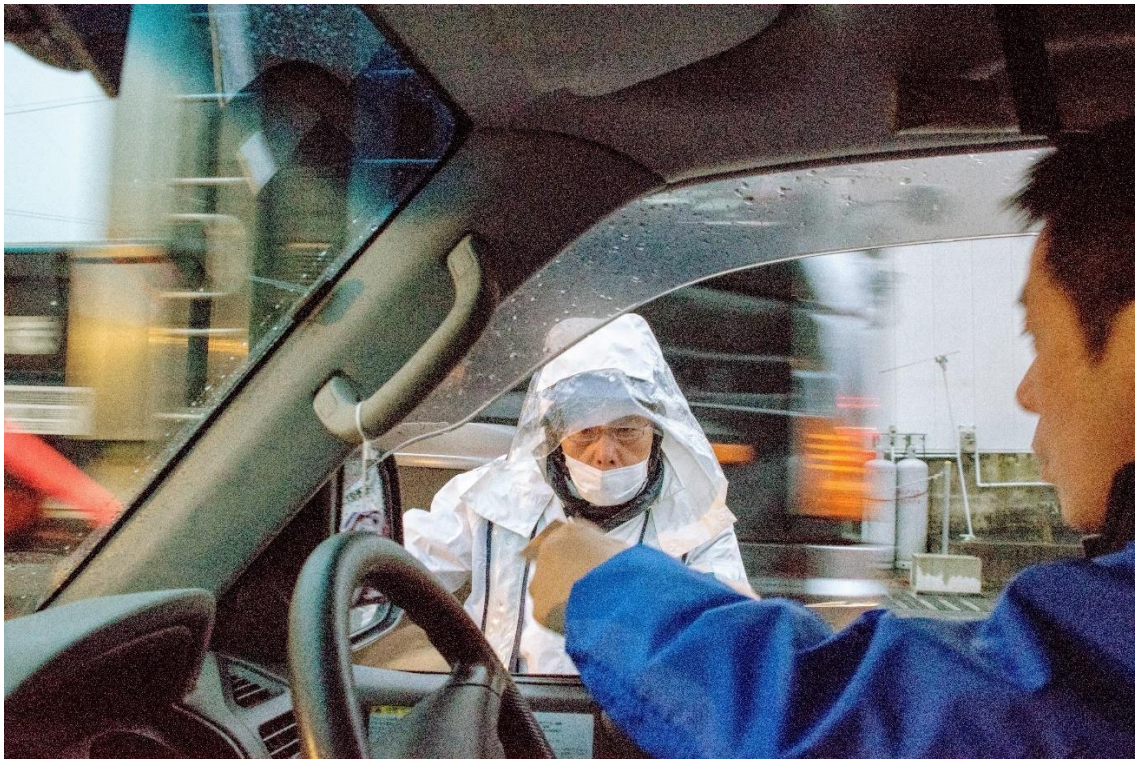

Figure 42: Niigata Professor Shobugawa shows our government approved security pass as we enter the evacuation zone (12/16/2014)

Figure 43: Filming inside the Evacuation Zone (12/16/2014)

Figure 44: Exhausted after a day of ethnographic fieldwork (Jun Goto on the left, Yoh Kawano on the right) (12/16/2014)

Figure 45: Abandoned ship in the coastal zone of Namie City (12/17/2014)

Figure 46: Kids crossing sign in the evacuation zone of Namie City (12/17/2014)

Figure 47: Abandoned home in the coastal zone of Namie City (12/17/2014)

Figure 48: Abandoned ship in the coastal zone of Namie City (12/17/2014)

Figure 49: Abandoned ship in the coastal zone of Namie City (12/17/2014)

Figure 50: UCLA research scholar Arfakhashad Munaim walks along the coast of Namie City (12/17/2014)

Figure 51: Debris cleanup for coastal zone in Namie begins in 2014 (12/17/2014)

Figure 52: Debris cleanup for coastal zone in Namie begins in 2014 (12/17/2014)

Figure 53: Entry into Namie City urban zone (12/17/2014)

Figure 54: Abandoned urban zone of Namie City (12/17/2014)

Figure 55: Namie City train station (12/17/2014)

Figure 56: Inside the abandoned Namie City train station (12/17/2014)

Figure 57: Inside the abandoned Namie City train station (12/17/2014)

Figure 58: Radiation monitoring station in Namie City (12/17/2014)

Figure 59: Coastal zone of Namie City (12/17/2014)

Figure 60: Coastal zone of Namie City (12/17/2014)

Figure 61: Urban zone of Namie City (12/17/2014)

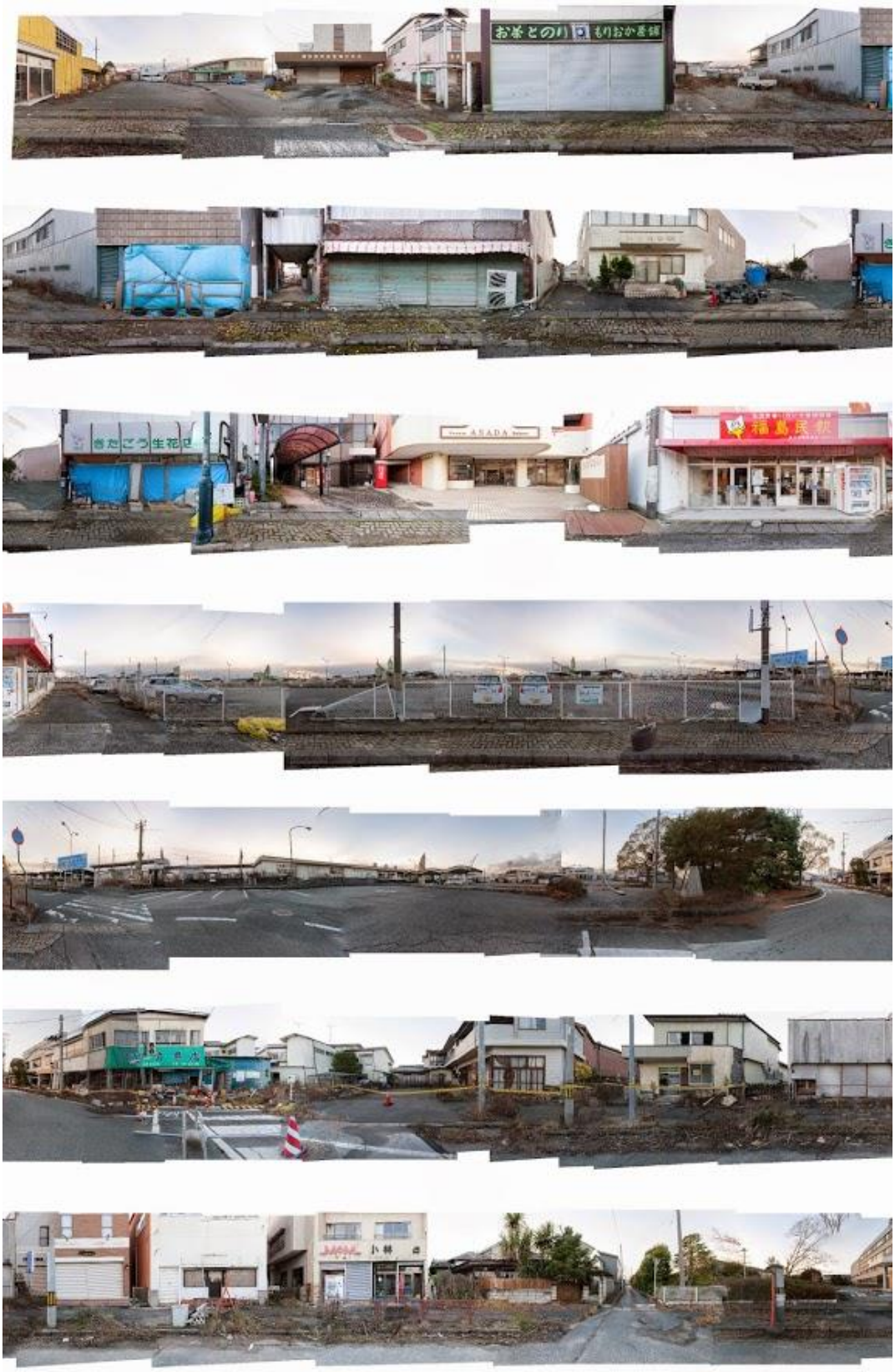

Figure 62: Urban zone of Namie City (12/17/2014)

Figure 63: Nihonmatsu evacuation shelter built in a parking lot (7/12/2016)

Figure 64: Sueko Shimokobe (right) with her friends in the Nihonmatsu evacuation shelter (7/12/2016)

Figure 65: Sueko Shimokobe inside her evacuation shelter home (7/12/2016)

Figure 66: Sueko's living room wall inside her shelter home (7/12/2016)

Figure 67: Sueko's bedroom in her evacuation shelter home (7/12/2016)

Figure 68: Sueko Shimokobe inside her shelter home in Nihonmatsu (7/12/2016)

Figure 69: Sueko exercises in the community room with volunteers (7/12/2016)

Figure 70: In a waiting room inside the Fukushima Daiichi Nuclear Power Plant (7/1/2016)

Figure 71: TEPCO employees inside the nuclear power plant (7/11/2016)

Figure 72: All power plant workers are required to wear protective gear (7/11/2016)

Figure 73: All power plant workers are required to wear protective gear (7/11/2016)

Figure 74: All power plant workers are required to wear protective gear (7/11/2016)

Figure 75: All power plant workers are required to wear protective gear (7/11/2016)

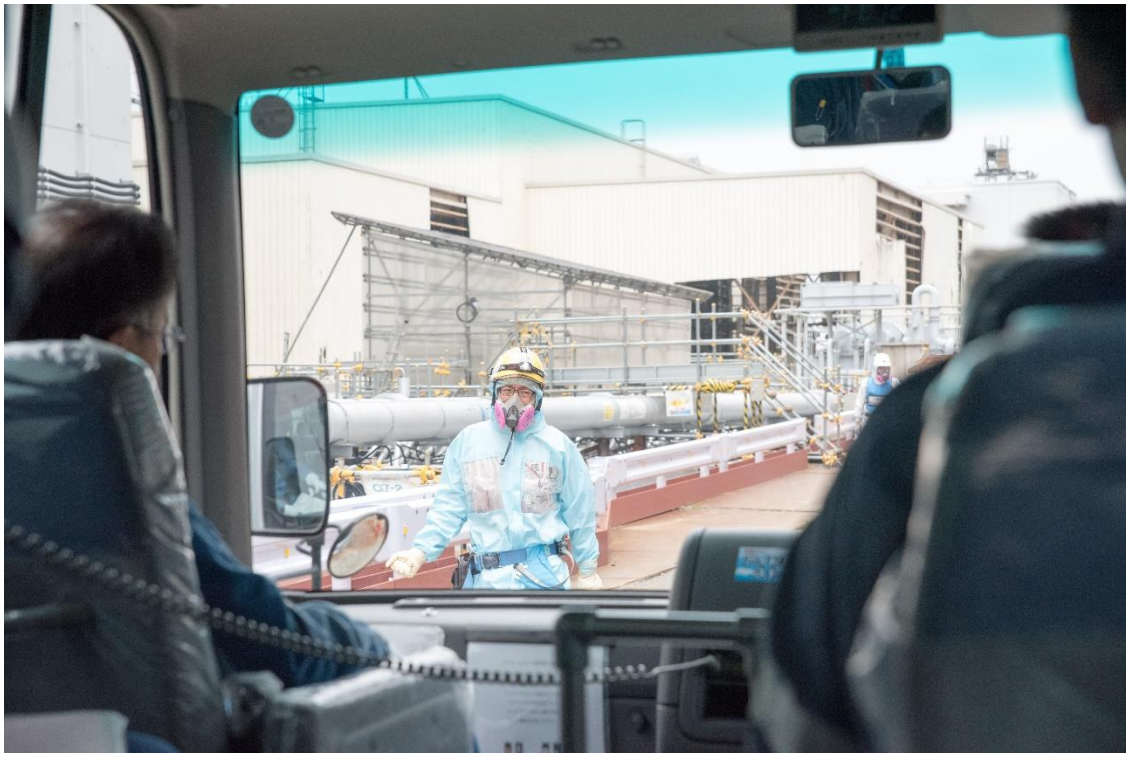

Figure 76: A view of the Fukushima power plant from inside our tour bus (7/11/2016)

Figure 77: TEPCO employee explains decommissioning procedures inside the Fukushima nuclear power plant (7/11/2016)

Figure 78: Workers in full protective gear inside the Fukushima nuclear power plant (7/11/2016)

Figure 79: Workers in full protective gear inside the Fukushima nuclear power plant (7/11/2016)

Figure 80: Nuclear reactor #3 shows building damage (7/11/2016)

Figure 81: Huge liquid container tanks are transported inside the power plant (7/11/2016)

Figure 82: A lone worker inside the power plant (7/11/2016)

Faces of Fukushima

Figure 83: UCLA and Niigata University in Fukushima. Top: Arfakhashad Munaim, Morgan Currie, Hannah Gustafson, Caitlin Mee Olson-Kenny, Yoshihiro Amaya. Bottom: Yoh Kawano, Yugo Shobugawa, Shigeru Hirayama, Makoto Naito. (12/15/2015)

Figure 84: Interviewing Koichi and Sachiko Nemoto at their farm in Odaka, Fukushima (12/15/2015)

Figure 85: At Nemoto Farm in Odaka, Fukushima (from left: Katsuya Hirano, Koichi Nemoto, Yoshihiro Amaya, Arfakhashad Munaim, Yoh Kawano) (6/30/2016)

Figure 86: At Nemoto's Farm. From left: Koichi Nemoto, Katsuya Hirano, Yoshihiro Amaya, Arfakhashad Munaim (6/30/2016)

Figure 87: Inside the Evacuation Zone in Namie. From left:, Yoshihiro Amaya, Jun Goto, Arfakhashad Munaim, Katsuya Hirano, Yugo Shobugawa, Yoh Kawano (6/30/2016)

Figure 88: Interviewing Yoshiyuki Ishizaki inside the Evacuation Zone (7/1/2016)

Figure 89: Interviewing Masami Yoshizawa at his cattle farm, "kibou no bokujou" 希望の牧場 (12/14/2016)

Figure 90: Visiting Hiwashi Shrine's Guji-san (head priest) in Odaka, Fukushima (12/15/2016)

Figure 91: Koichi and Sachiko Nemoto at their farm in Odaka, Fukushima (12/16/2016)

Figure 92: With Sueko Shimokobe at her Namie home (12/17/2016)

Figure 93: Interviewing Sueko Shimokobe at her shelter home in Nihonmatsu (3/30/2017)

Figure 94: Interviewing Yoshiyuki Ishizaki at the Namie Port (4/11/2017)

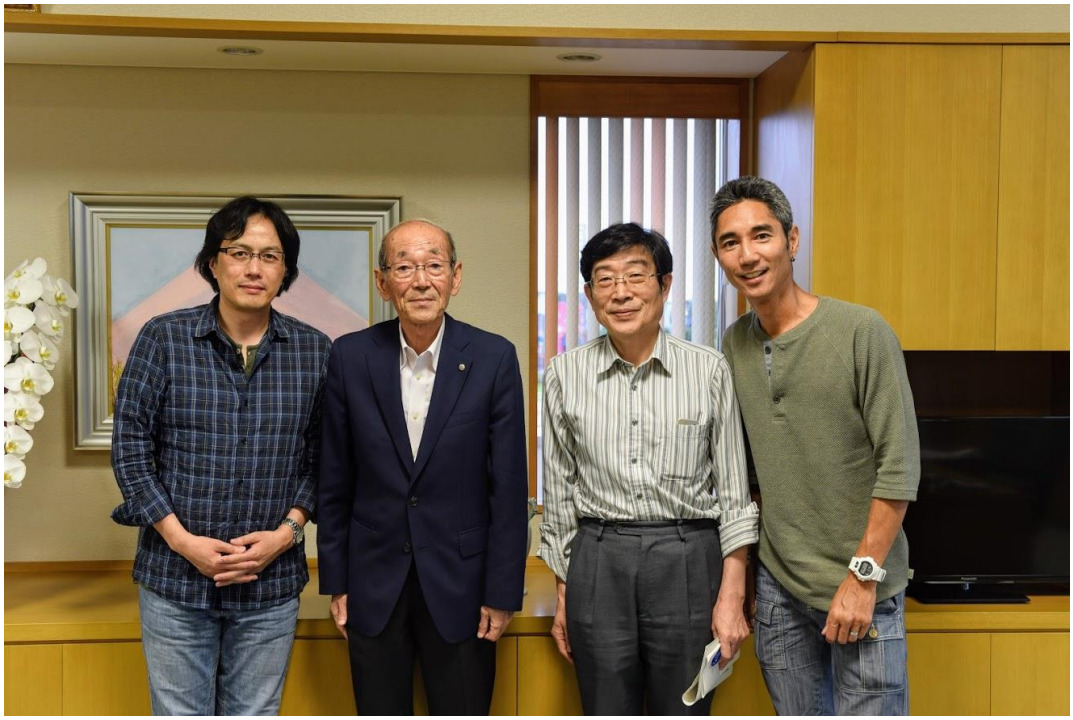

Figure 95: With Namie City Mayor Tamotsu Baba. From left: Katsuya Hirano, Tamotsu Baba, Yoshihiro Amaya, Yoh Kawano (7/4/2017)

Figure 96: Interviewing Tomoko Kobayashi at her Futabaya Ryokan (travel inn) (7/5/2017)

Figure 97: "Human Error" film screening at Bamba Juku in Minamisoma, Fukushima (7/4/2017)

Figure 98: "Human Error" film screening at Bamba Juku in Minamisoma, Fukushima (7/4/2017)

Figure 99: At TEPCO's Tokyo headquarters (from left: Vice Chairman Naomi Hirose, Yoshihiro Amaya, Yoh Kawano, Kaede Kawano, Yoshiyuki Ishizaki, Suomi Ishibashi) (12/15/2017)

Figure 100: "Human Error" screening at TEPCO's Tokyo headquarters (12/15/2017)

Figure 101: Masami Yoshizawa's Ranch of Hope in Fukushima (12/18/2017)

Figure 102: Entrance to Tomoko's Futabaya Ryokan on the day of Human Error's first screening in Fukushima (12/18/2017)

Figure 103: "Human Error" film screening in Futabaya Ryokan (12/18/2017)

Figure 104: Singer songwriter nappo 's live performance at "Human Error" film screening in Futabaya Ryokan (12/18/2017)

Figure 105: Showing "Human Error" to Sachiko and Koichi Nemoto at their farm home in Odaka, Fukushima (12/19/2017)

Figure 106: With Sachiko Nemoto at her farm home in Odaka, Fukushima (12/19/2017)

Figure 107: Showing "Human Error" to head priest Noritomo Nishiyama and his wife at his Hiwashi Shrine in Odaka, Fukushima (12/19/2017)

Figure 108: Tomoko and Takenori Kobayashi at their Futabaya Ryokan cafeteria (12/20/2017)

Figure 109: Interviewing former Minamisoma Mayor Katsunobu Sakurai (7/15/2019)

Appendix B: Human Error, the Film

Available at: https://filmfreeway.com/HumanError

Synopsis

The Japanese government claims that "everything is under control" in Fukushima. But is it? Six years has passed since the morning of March 12, 2011, when the decision to evacuate more than 150,000 residents was made due to the nuclear explosion. This film follows a group of people whose lives have forever been disrupted by the disaster: a nuclear power plant executive, a priest, a travel inn owner, a farmer, the mayor of a local town, an 86-year-old evacuee, and a 19-year-old teenager. As villages inside the evacuation zone prepare for its reopening, successful resurrection depends on the return of their citizens and the perception that spaces are once again safe for everyday human life.

Director's Statement

Shortly after the 2004 Indian Ocean earthquake and tsunami, I visited the city of Banda Aceh, Indonesia and stood at the center of what was once a vibrant city, bearing witness to the unfathomable force of nature that took the lives of more than 100,000 of its residents. The thought that entire cities could be subjected to such unmitigated demolition was mind boggling; the desolate landscape that lay before me forever ingrained in my brain, the narratives from survivors, beyond heartbreaking. I fast forward six years to March, 2011, where once again humanity would surrender to the devastating forces of nature, this time in the eastern coast of Japan, my home country. Here again, I would visit the landscapes of devastation, from Iwate in the north to Fukushima in the south. But this time, an additional factor would entail a different kind of narrative: Human Error. Whatever thin line of reconciliation can be afforded to a disaster caused by nature is in this case, replaced with a never-ending pursuit for justice and accountability.

I first ventured inside the so-called nuclear evacuation zone in 2012, where I joined a group of volunteer scientist in their quest to measure the amount of radiation that was in the air. How dangerous was it, and when might the environment be safe enough to assume human life once again? But perhaps, more importantly, how has the disaster affected the people who were forced to evacuate? In order to seek answers to these questions, I began an extensive ethnography of these Fukushima rural towns. My frequent visits to Fukushima put me in contact with government officials, nuclear industry leaders, displaced senior citizens, priests, farmers, teachers, community leaders and children. I discovered a simple way of life that was in an instant transformed by the after effects of radiation exposure. These wounds run deep and linger on more than six years after their collective

abandonment. On the one end, the nation's leadership proclaims that "everything is under control," on the other, displaced citizens need to come to terms with their shattered lives, lamenting the loss of human relations that will never be restored.

Human Error is a film that sheds light to the many narratives that percolate the abandoned spaces of Fukushima. The repercussions of the troubled nuclear industry in Japan are humanized through the personal narratives of those who operate the nuclear plant, the struggles to resurrect the city by government officials, and the painful decisions that former residents are left with: to return, or not to return. With cities inside the evacuation zone finally lifting their evacuation orders, successful resurrection depends on the return of their citizens and the perception that spaces are once again safe for everyday human life. This film is a means to give voice to the forgotten citizens of the abandoned cities of Fukushima.

概要

日本政府は、福島は「すべてコントロールのもとにある」と言っているが、それは果たして本当なのだろうか。原発の事故により、１５万人を避難させる決定が下された2011年3月12日の朝より6年が経過した。この映画は、あの惨事に日常の生活を壊された人々ー東京電力の幹部、宮司、旅館の女将、農家、地元の市長、86歳と19歳の避難者ーを追ったものである。避難区域内の町が避難勧告を解かれ再生を目指す今、復興の成功は住民の帰還と土地の安全性にかかっているだろう。

監督の言葉

2004年に起きたスマトラ島沖地震の直後、私はバンダアチェを訪れた。かつて活気のあったバンダアチェの街は、果てしない自然の威力によって10万人以上もの命が奪われた。街全体が破滅してしまうのだということに私は唖然とさせられた。私の前にたちはかだる荒廃した情景は、私の脳裏に永遠と刻まれ、生き残った者の経験談は悲痛と言う言葉では言い尽くされなかった。そしてその6年後の2011年3月、今度は私の祖国である東日本で自然の驚異はまたもや人類を脅かした。私は破壊された情景を北は岩手から南は福島まで見ることとなった。しかし今回はヒューマンエラー（人為的過ち）と言う新たな要因が足され、スマトラ島沖地震とは異なるナラティブが生まれた。すなわち自然災害から少しずつでも立ち上がっていくと言う行為が、今回は永遠に終わらない正義と説明責任の追求に取って代わられた。私は2012年にボランティアのサイエンティストたちと共に、空気中の放射能を測定するために初めて避難区域と呼ばれる場所に足を踏み入れた。一体どれだけ危険なのか、人間が住むのに安全になるのは一体いつなのか。いや、それよりも大切なのは、この災害は強制的に避難を強いられた人々にどのような影響を与えたのだろうか。これらの質問の答えを出すために、私は福島の地方都

市の大掛かりなエスノグラフィーを行った。福島を度々訪れることによって、私は国家公務員、原発産業のリーダー、住む場所を失った高齢者、宮司、農家の人々、教師、地域のリーダーや子供に接触することができた。そして放射性物質の放出によって人々の生活は一瞬で変わってしまったことを知った。「集団遺棄」によってもたされた傷は深く、そしてもう 6 年以上もつきまとっている。その一方で国のリーダーたちは「全てはコントロールのもとにある」と言うが、避難を促された人々は失われてしまった人間関係を嘆き悲しみながら打ち砕かれた日々の生活を受け入れなくてはいけない。ヒューマンエラー（Human Error）と言う映画は、見捨てられた福島の土地の人々の声に焦点を当てたものである。問題を抱えた日本の原子力産業の影響は、原子力発電所で働く人々の声、町を復興させようと奮闘する政府関係者、そして避難勧告が解かれた町へ戻るか戻るまいかの選択を住民が迫られるている。避難区域内の町が避難勧告を解かれ再生を目指す今、復興の成功は住民の帰還と、土地の安全性にかかっているだろう。この映画は、福島の見捨てられた町の住民の声を表明するための手法である。

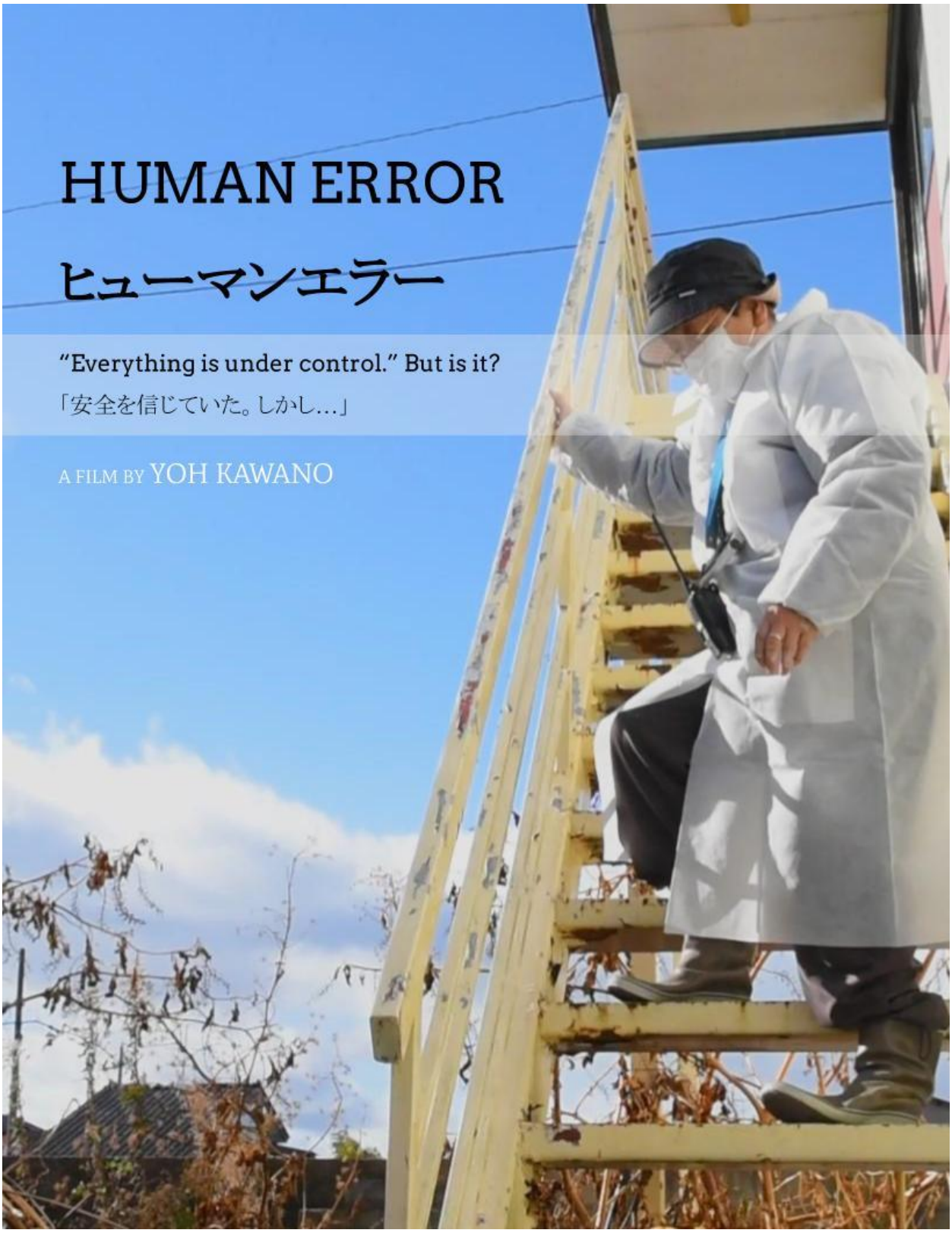

Figure 110: Human Error Poster

Figure III: Human Error poster

Screentshots

Figure 112: Human Error screenshot of Yoshizawa

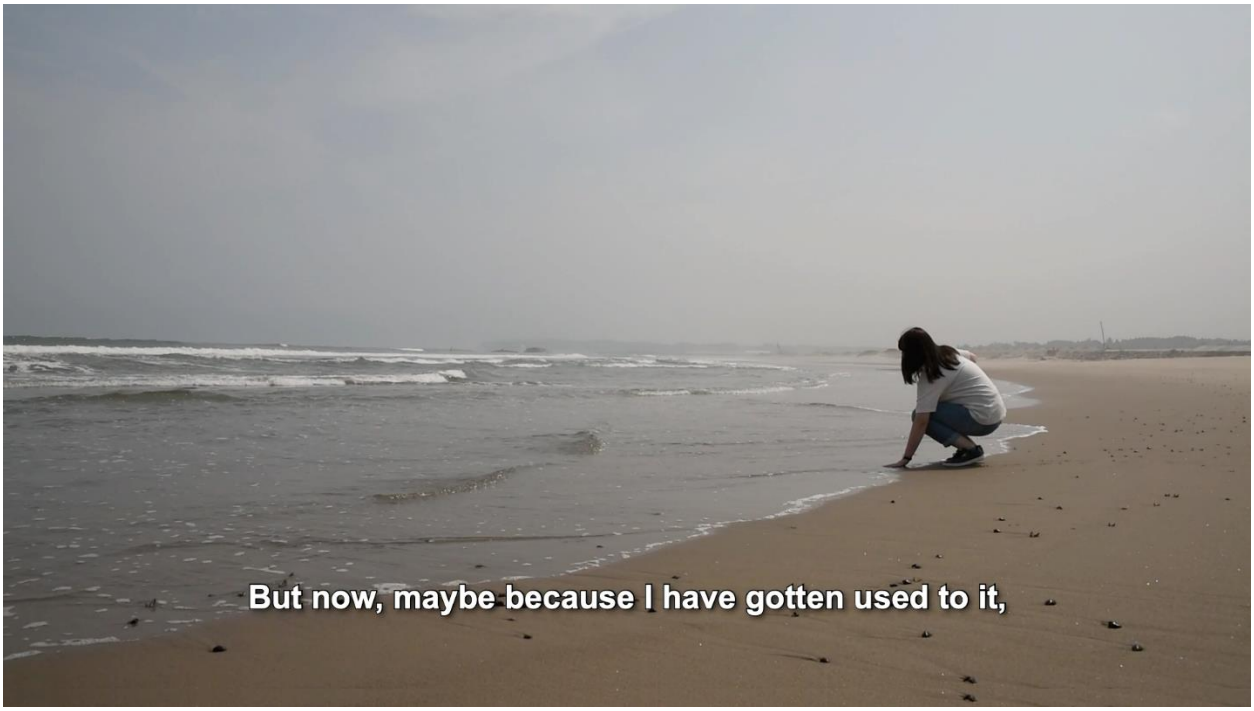

Figure 113: Human Error screenshot of Chihiro at the beach

Figure 114: Human Error screenshot of Tomoko at Futabaya Ryokan

Figure 115: Human Error screenshot of Koichi at his farm

Figure 116: Human Error screenshot of Hiwashi Shrine

Figure 117: Human Error screenshot of Namie City

Figure 118: Human Error screenshot inside the Fukushima Daiichi Nuclear Power Plant

Figure 119: Human Error screenshot of Yoshizawa and his cow

Figure 120: Human Error screenshot of Sueko at her Namie home

Figure 121: Human Error screenshot of TEPCO VP Ishizaki and Hiwashi Shrine head priest

Figure 122: Human Error screenshot of the reopening of Namie Station

Figure 123: Human Error screenshot of Yoshizawa protesting at Namie station

Figure 124: Human Error screenshot of Chihiro in front of her Namie home

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