

2017

The City Where the Storks Fly: Sustainable Agriculture and Species Reintroduction in Toyooka City, Japan

Nako Kobayashi

Connecticut College, nkobayas@conncoll.edu

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**The City Where the Storks Fly:
Sustainable Agriculture and Species Reintroduction in Toyooka City, Japan**



Nako Kobayashi '17

An Anthropology Honors Thesis

Thesis Adviser: Rachel Black

Second Reader: Kjell Ericson

Third Reader: Robert Askins

Connecticut College

New London, Connecticut

May 2017

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Acknowledgements

First and foremost, I have to thank **my father, Miharū Kobayashi** without whose help in finding a summer internship, I would not have been able to write this thesis. Thank you so much for convincing me that Toyooka would make a great case study for my studies and interests, and for connecting me to the people in Toyooka that I ended up interning for.

Thanks also to **my mom** for supporting me throughout my first experience living completely alone in Toyooka, and for showing me on facetime how to make chicken gapao rice one lonely night.

This thesis would also not have materialized if it were not for the incredibly friendly, generous, and informative government officials I had the pleasure of interning for at **Toyooka City Hall**, as well as all the farmers, JA employees, and community members I met throughout my time in Toyooka.

Rachel, thank you so much for being the best advisor I could have asked for in pursuing this long and often difficult endeavor. The confidence you had in me throughout the process helped motivate me to work harder than I ever have.

I also want to thank my readers **Professor Ericson** and **Professor Askins**. I was incredibly fortunate to have people with expertise so closely related to my topic help me clarify my ideas.

Thank you to **the Anthropology department at Connecticut College**, and in particular Professor Graesch and Professor Bennett for supporting me through my participation in the NEAA conference where I presented a portion of this thesis.

Thank you also to the **Goodwin-Niering Center for the Environment** and all my fellow center students for listening to me rant about storks and sustainable agriculture on numerous occasions and for always giving me great, thoughtful advice on my thesis work and presentations.

Winch 3, all the honorary residents of our lively home, and anyone else who patiently listened to me freak out about this thesis and who let me know that I can do this: sorry you had to deal with me all year and especially spring semester. You guys rock.

Abstract

In 1971, the Oriental White Stork went locally extinct in Toyooka, Japan. Today, around 80 of the birds fly free throughout the city. Toyooka uses the Stork Reintroduction Project and the promotion of “Stork-Friendly” agriculture to help combat the difficulties faced as a rural Japanese municipality including population decline, increased farmland abandonment, and falling rice prices. This thesis investigates how Toyooka City uses a pragmatic approach to achieve holistic sustainability that works within the framework of our current globalized cultural, political, social and economic landscape. By drawing on the fieldwork I conducted in Toyooka as well as the informal and formal conversations I had with farmers, government officials, employees of Japan Agricultural Cooperatives (JA) and others, I illustrate how Toyooka has worked towards building a socially and environmentally sound community with an emphasis on sustainable agricultural practices. Placing Toyooka’s efforts today within the larger context of Japan’s history and the constantly evolving cultural context, I explore the role of environmentalism and sustainable agriculture within today’s Japanese society.

“Until he extends his circle of compassion to include all living things, man will not himself find peace.”

- Albert Schweitzer

Introduction

Toyooka's Challenge

On September 24th, 2005, around 3500 people gathered to watch the release of five Oriental White Storks, carefully trained in captivity for life in the wild, back into the skies of Toyooka, Japan. The large crowd watched with anticipation as the five birds were released from their small steel box into the rural agricultural landscape of Toyooka. The significance of the event was perhaps most clearly illustrated by the participation of Prince Akishino of the Japanese imperial family, an ornithology enthusiast in the release of the storks. On this day, for the first time since their local extinction in 1971, storks could once again be seen flying in Japan. Today in Toyooka, there are 88 storks flying free throughout Toyooka, and an additional 95 being trained for eventual release in captivity. Every year, more storks hatch in the wild, and the storks are increasingly sighted in neighboring prefectures. In just four decades, Toyooka successfully reestablished a beneficial environment for the once-disappeared storks and now birds from Russia and Korea also come to nest in the artificial stork-towers found throughout the city.

This environmental success may, at first, seem too good to be true. The prevalence of negative language depicting a doom and gloom scenario within environmental rhetoric can be discouraging and make one feel hopeless about the fate of our natural world. I have even had Environmental Studies professors who begin the semester by warning the class, "I'm sorry in advance, but what we're going to be talking about is unfortunately quite bleak." This mindset is so widespread within environmental studies that I often find myself skeptical of any environmental "successes" that I hear of. *Is it really a success? Surely, there must be something that is being compromised.* One of the reasons I felt compelled to write an honors thesis about

Toyooka City's stork reintroduction project is that from the first time I heard about the city's efforts, although I was admittedly a bit skeptical, I felt a sense of hope and possibility that is unfortunately rare to come by as a student of environmental studies.

What Toyooka has been able to achieve in the past few decades are not a simple matter of species conservation and reintroduction. Located on the northern coast of Hyogo Prefecture, Toyooka was once the perfect environment for the large carnivorous bird, the Oriental White Stork, *Ciconia boyciana*, to thrive. Before the building of dams and the restructuring of the rivers and rice paddies, the valleys would often flood over when it rained. Storks could catch plentiful prey in the rice paddies or surrounding wetlands and rivers, and build nests in the tall Japanese Pines that covered the mountains. However, in the early to mid 1900s, Japan's imperial expansion required the increased production of food and timber. The government harvested the large pine trees to create more agricultural land and collect timber. In addition, they encourage farmers to build up soil to create higher mounded rice paddies that would dry more easily and be more accessible for new agricultural machinery like combines and tractors. After World War II, agricultural chemicals like pesticides and herbicides, much stronger than those used today, were also introduced in order to maximize food production and make farmers' jobs easier.

One book we often read or at least discuss in part in environmental studies classes in the U.S. is Rachel Carson's *Silent Spring* (1962). Starting with an example of an unnamed American community that experienced a lifeless, silent, spring after agrochemicals lead to the death of the landscape's wildlife, Carson exposed the dangerous threat synthetic chemicals like DDT impose not only on the environment but also on human health. This sparked a huge grassroots environmental movement in the U.S. that led to the creation of the Environmental Protection Agency. Carson's book influenced the ban of DDT and raised suspicion about the previously

widely accepted use of agricultural chemicals. Yet today, despite the millions of copies of *Silent Spring* sold, and while DDT may have been banned, the use of agricultural chemicals, albeit ones much less potent than those used in Carson's day, persists both in the U.S. and in places like Toyooka, Japan. While there is certainly a much larger presence of environmental movements as well as a more mainstream incorporation of environmental ideals today, the same kind of environmentally degrading mindsets Carson attempted to address continue to be prevalent today.

Throughout this thesis, I question why we as a global society have been largely unable to make necessary changes to combat environmental problems despite the increasing prevalence of literature articulating possible solutions. Like Carson's unnamed American town, Toyooka also experienced species loss due to the introduction of agrochemicals. Instead of silent springs, they witnessed silent rice paddies. What makes Toyooka's story different than many of the doom and gloom scenarios we often hear about, however, is that a concrete and viable solution was found and is currently being implemented within the community. Today, Toyooka, like many municipalities in Japan, faces population decline, increased abandonment of farmland, and falling rice prices. Despite these challenging circumstances, the Toyooka Municipal Government has succeeded in simultaneously increasing the economic viability of local rice farmers and the biodiversity in their rice paddies through an "environment-economy" strategy that specifically aims to bring the once locally extinct Oriental White Stork back to the skies of Japan. There is often the common perception that environmentally sound practices inherently hinder economic growth and development (Matthews 2011, 59-85). The case of Toyooka, however, challenges this perceived environment-economy dichotomy and demonstrates how a common goal, in this case, living in harmony with storks, can facilitate the creation of solidarity between regional actors with often conflicting environmental and economic objectives. This cooperation has lead

to environmentally sound and socially sustainable economic opportunities that fit into Japan's contemporary economic, political, and social contexts.

This thesis will investigate how Toyooka City uses a pragmatic approach to achieve holistic sustainability that works within the framework of our current globalized cultural, political, social and economic landscape. By drawing on the fieldwork I conducted in Toyooka as well as the informal conversations and sit-down interviews I had with farmers, government officials, employees of Japan Agricultural Cooperatives (JA) and others, I illustrate how Toyooka has worked towards building a socially and environmentally sound community with an emphasis on sustainable agricultural practices. Placing Toyooka's efforts today within the larger context of Japan's history and its constantly evolving cultural context, I explore the role of environmentalism and sustainable agriculture within contemporary Japanese society. By providing an ethnographic account of an environmental initiative that has achieved some visible success in the form of a growing stork population, I hope to shed light on the possibilities of establishing cultures of sustainability within the contemporary economic and political contexts. I also hope that through this thesis, I can contribute to Toyooka's efforts to promote the stork reintroduction project both nationally and globally.

Finding My Case Study

This thesis is largely a result of fortunate coincidence. I first learned of Toyooka and the stork reintroduction project through my father. Explaining my interest in sustainable agriculture and food systems, I expressed to him my hopes of finding an appropriate internship for the summer between my junior and senior years of college. Almost exclusively looking at NGOs in the U.S. and a few in Europe that work in food systems and food security issues, I had not

considered any opportunities in Japan. Despite being a Japanese citizen, having never received an education within the Japanese school system and having spent the majority of my life overseas, I always imagined myself living and working outside of Japan for most of my life. It's only very recently that I regained an interest in my native country. During my initial conversation with my father, he passionately told to me about a project for which he spearheaded the funding at his former workplace. He re-sent me articles to which he had attempted to attract my attention a year or two prior, when he was actively engaged in the project. Especially because he knew of my interest in the feasibility of sustainable food initiatives, he insisted that Toyooka, Japan would make a great case study for contemplating the future of agriculture not only in Japan but in the world. At the time, I had glossed over the articles, not realizing how perfectly Toyooka's project aligned with my own emerging interest in food systems.

Fortunately, as much as I needed such an experience, Toyooka also needed someone like me at the same time. Toyooka's mayor was engaged in a mission to increase Toyooka's international profile and make the rural municipality a "small global city". A key part of this mission is the publicizing of Toyooka's environmental contributions to the rest of the world. Being a small rural city in Japan, however, much of the city hall lacked personnel who spoke sufficient English to promote the project overseas. When my father put me in touch with my eventual supervisor, Toyooka City was delighted that city officials would have a near-native English speaker helping them with international promotional efforts for a summer.

Methodology

My summer internship gave me the perfect opportunity to conduct participant observation, both in the form of informal conversation with informants and more structured

interviews to collect data for my research. As an intern, I was able to shadow my coworkers and supervisor, who served as informants in the field. This internship allowed me to immerse myself in the various dimensions of this multi-faceted project. I attended educational events, shadowed visiting academics, corporate buyers, and government officials, helped out at city-sponsored environmental events, and tagged along with farmers, city government officials and the local agricultural cooperative representatives who drove around Toyooka to check the progress of the “stork-friendly” rice paddies. Working at the city hall also allowed me to access information that would have otherwise been very difficult to obtain. While I only conducted five formal interviews, I was able to access various surveys conducted by the city government. In addition, I had the opportunity to sit in on my co-worker’s meetings with visiting government officials and academics, as well as information sessions attended by officials from other municipalities. In these ways, being an intern allowed me to gain an insider perspective on the city’s various efforts that would have otherwise been unavailable to me.

In addition to helping my co-workers and supervisor with daily tasks, I completed my own individual projects that entailed translating and creating new promotional materials for the city’s “Stork Natural Rice”. Contributing to the city’s efforts and directly engaging with the stork reintroduction project allowed me to better comprehend the city’s goals and values. By the end of my internship, I also acquired a copious number of pamphlets, brochures, and handouts published by the city government that were given to me in order to ensure that I fully understood the history and goals of Toyooka’s efforts before I worked to translate them in a way that would be accessible for a foreign audience.

Not wanting to limit my knowledge to what could be learned from my co-workers at the city hall, I sought out the opportunity to hear firsthand from those who are directly impacted by

the municipal government's project. One of my co-workers became very interested in my project, and helped me choose a diverse and representative group of interviewees - a younger female farmer working independently, the representative of a corporatized community farming organization, one of the initial participant farmers of "stork-friendly" rice farming, a representative of an independent company that buys abandoned rice paddies and cultivates rice for profit while simultaneously selling acquired land to new farmers, and two representatives from JA Tajima, the region's extension of the Japan Agricultural Cooperative. Through this selection of interviewees, I hope to provide a cross-section of views that speak to how Toyooka's stork reintroduction program and the implementation of "stork-friendly" farming in the region has affected different parts of the region's agricultural sector. In particular, I believe these interviews might reveal the effect of age and gender on a farmer's willingness to participate in environmental agriculture, as my youngest, female interviewee had clearly different reasons for participating in the city's subsidy program than my oldest, male interviewee.

I use what I learned through these interviews along with my own observations and experiences to support, refute, or provide an alternative angle on existing literature on environmental anthropology, cultural ecology, agroecology, sustainable agriculture, and sustainable food systems. My research for this thesis included a substantial review of relevant literature from a variety of disciplines including anthropology, environmental studies, economics, government, history, and philosophy. I also use all the promotional, educational, and informative pamphlets, fact sheets, and other material related to the stork reintroduction project that I collected throughout my time in Toyooka. Most of the information in this collected material is used as data to back up my arguments. I reference materials published by the Toyooka Municipal Government as well as conversations I had with my coworkers while

interning at the city hall as sources for any claims I make about the Stork Reintroduction Project or the city's stance on certain topics. In addition, images I collected and photos that I took in Toyooka are used to further illustrate certain points made and situations described throughout the thesis. The interdisciplinary approach of this thesis is necessary in order to understand Toyooka's wide-reaching efforts that rely on the participation of farmers, government workers, corporations, scientists, activists and the community at large. Upon returning to Connecticut College in the fall, I began organizing and analyzing the data I collected throughout the summer. After transcribing all my interviews in the original Japanese as well as digitizing the notes I took in my notebook, I separated all my notes, interviews, and materials collected in Toyooka into emerging themes and categories.

The aforementioned methods I used to write this thesis make it a specifically ethnographic effort. During my time in Toyooka, my co-workers informed me that they do not feel that their work is by any means completed, and that the stork reintroduction project is very much still in development. Given the complexity of the project and its very dynamic and evolving nature, my personally being able to engage with the project as an intern and conduct ethnographic methods in the field helped me articulate and more accurately portray what is happening in Toyooka better than any indirect research would have allowed. In addition, given my own personal relationship to the project having interned at the city hall, ethnographic methods best allowed me to reflect on the influences of my own position both as someone who worked directly with the project and as a Japanese national with existing views on certain topics in Japan on the analyses and conclusions I make in this thesis.

My proficiency, or lack thereof, in the Japanese language was one of the largest barriers I faced while conducting my research. While I speak Japanese fluently, having never attended a

Japanese school, I can only read and write Japanese at an elementary level. Toyooka also has its own distinct accent that I was previously unfamiliar with which made the translating and transcribing of interviews extremely difficult and time-consuming. In addition, having only studied about food anthropology, food systems, sustainable agriculture, and other related topics in the U.S., I also had no framework or vocabulary with which to understand those concepts within the context of Japan. Looking back at my fieldnotes, I can see that I gradually started taking more notes in Japanese. In my first week at my internship, I got to sit in on an interview being conducted by a Taiwanese TV station with a local rice farmer. While they were not translating his answers into English at the time, I took down all my notes in English, most likely subconsciously translating what the farmer was saying as I jotted down what I felt was important. Flipping through to the latter part of my notes, I can see that later on when I sat in on meetings, interviews, or visits from government officials, corporate buyers and academics, I had more notes jotted down directly in Japanese. While these latter notes are harder to decipher, as my written Japanese is very rudimentary, they most likely portray more accurately the conversations I was trying to record as they include what was being said verbatim, while my earlier notes only include summaries and paraphrases.

Most of the ethnographic data collected from my internship comes from city government workers and farmers. A shortcoming of my research is that I was unable to interview or talk significantly to other community members due to time constraints. Through some very short and casual conversations with local residents I came to know during time off from my internship, I learned that not everyone in Toyooka was on board with or happy about the city spending so much time, effort, and money on the stork reintroduction project. While I was able to gain a sense of the community perception of the city's various efforts through my internship and access

to governmental surveys of public opinion, it did seem that a lot of the data I gained focused on what farmers thought of the stork reintroduction program, with less emphasis on individuals with no direct stake in the project. Had I been able to spend more time in Toyooka and make more connections with the local community, I may have been able to obtain a more representative perspective on the reaction of the residents of Toyooka to the stork reintroduction project.

Despite these shortcomings, I believe that the knowledge I gained while in Toyooka gives me appropriate insights into the city's efforts towards promoting sustainability within the specific economic and political context of contemporary Japan, especially as this project is very heavily promoted and supported by the city's mayor who has been re-elected multiple times.

Literature Review

Through its stork reintroduction project, Toyooka attempts to reverse much of the damage that has been caused by the incorporation of modern, industrial agriculture within contemporary society. Today, we have grown accustomed to the convenience and ease of life that has been attained, in large part, due to our intervention in and misuse of natural resources and ecosystems. It may seem impossible to now live in truly sustainable ways since few people would be willing to give up what technological innovations and neoliberal capitalism have now made possible. In particular, modern conventional agriculture depends on the existence and use of pesticides and other agrochemicals in order to meet consumers' expectations related to the quality of their food. The increasingly apparent consequences of human degradation of land and misuse of natural resources, however, has led to various counter-movements, including the organic food and conservation movements (Muramoto, Kazumasa, and Mineta 2009, 274-297; Meine 2013, 170). This shift in attitude can now also be seen in the global political and

economic agenda. In 2015, the U.N. adopted a resolution outlining an agenda for Sustainable Development by the year 2030 (UN General Assembly 2015) which attempt to revise and go beyond the Millennium Development Goals established in 2000 (UN General Assembly 2000), adding 17 Sustainable Development goals to the global agenda. The second goal within this resolution aims to “end hunger, achieve food security and improved nutrition and promote sustainable agriculture” (UN General Assembly 2015, 15). In this thesis, I hope to outline the specific case of Toyooka as an example of the kinds of projects that could be pursued worldwide to contribute international efforts towards sustainability.

The definition of sustainability that I use in thesis is grounded in the idea that an environmental project cannot be truly sustainable if it is not also economically viable and socially just (Sharma and Ruud, 2003). Within the specific Japanese context, the term “sustainable” takes on a different meaning when considering the nation’s declining population. Japan’s fertility rate has been below replacement levels since the 1970s, and some estimate that the its total population will decline to two-thirds of the current size in 50 years (Population and Development Review, 2015). The consequences of this aging population are most severe in rural areas, where the small proportion of young people tend to migrate to urban areas, leaving the rural areas underpopulated. Scholars have noted the impact of the depopulation of agrarian communities in Japan on the nation’s biodiversity and ecosystems. In one particular study, Koyanagi and Furukawa (2013) focused on the semi-natural grasslands, a particular ecosystem with rich biodiversity that requires continuous management that is usually associated with local agricultural systems. The study investigates the relationship between anthropogenic pressures, such as local and regional environmental changes and resource use, and the loss of grassland species in Japan. While an increase in population is often associated with negative environmental

changes, this study found an opposite relationship, where “prefectures with larger decreases in agrarian populations had higher overall extinction risk of grassland species” (Koyanagi and Furukawa 2013, 4). While Toyooka’s project aims to combat the loss of biodiversity in the rice paddy systems due to agricultural pesticide use, the abandonment of farmland and its effect on the natural landscape was an issue of concern for one of my interviewees in particular, as I will note in more detail later. Sustainable initiatives need to ensure the continued existence of these communities themselves. In order for rice agriculture to be truly sustainable in Japan, there must be measures taken to ensure the economic viability of the farmers despite the decreased consumption of rice in the country. Khush (2004, 3) describes the relationship between economic growth and the consumption of rice, noting in particular that per capita rice consumption begins to decline once people can afford a more “high value balanced diet”.

There is now a growing literature on the study of sustainability transition which refers to the ways certain groups have adjusted to more environmentally sound and socially just solutions to currently problematic practices (Mancebo 2015). With the increased popularity of organic food, scholars across disciplines have turned towards recent agricultural shifts in certain rural communities to look at the various factors that influence farmers’ decisions to shift to more environmentally sound forms of agriculture, and how exactly these farmers go about this transition. Most of the discourse surrounding sustainability transitions in agriculture looks at the influence of economic and political factors in shaping farmers’ decisions to transition to alternative methods (Comelieu 2015). Environmental anthropologist David Meek (2015), on the other hand, looks at the transition of farmers from conventional to ecological methods of agriculture through a particularly anthropological lens, stating that “changes in agricultural practices are an inherently cultural process” (Meek 2015, 276). Meek argues that, in addition to

political and economic constraints and motivations, farmers' decisions are also linked to certain values, both their own and those tied to the traditions and local knowledge of the broader community to which they belong. Situating Toyooka's project within the larger context of Japanese culture and environmental history, I will explore how certain values that exist in Japan shape the agricultural methods used by farmers and vice versa.

Anthropologists often scrutinize the relationship between humans and nature. In particular, scholars often note the existence of a dualism between nature and culture in Western thought, in which the two realms are considered distinct and separate (Uggla 2010). One of the first scholars to seriously contemplate human adaptation to social and physical environments was Julian Steward, with his notion of cultural ecology (1955). Steward argues that cultures are significantly influenced by the way communities adapt to their environments and that social institutions serve the function of expressing solutions to environmental problems faced by those communities. Subsequent anthropologists have criticized Steward's view. Anthropologist Ben Orlove (1980) in particular re-theorized ecological anthropology using actor-based models to incorporate individual actions and perceptions of the environment in analyses of attitudes towards and actions pertaining to the environment, rather than focusing solely on the collective perceptions of the community. By considering the insights gained through the interviews of individual farmers and recognizing the subjective nature of the farmers' decisions to participate in Toyooka's stork restoration project, I hope to contribute to this particular conception of ecological anthropology, as well as to Meek's ideas about the individual factors that impact sustainability transitions in agriculture (Meek 2015).

Toyooka's efforts towards sustainable development are part of a larger trend of increased attention to the loss of global biodiversity, especially in their emphasis on propagating species

conservation initiatives. However, most cases of species reintroduction are studied exclusively in isolated and protected areas (Redford, Brandon, and Sanderson 1998; Haenn 1999), not in residential areas as in the case of Toyooka. As a result, most of the discourse on biodiversity in anthropology has dealt with the concept's cultural construction. Many anthropologists view the propagation of biodiversity conservation as the cultural imposition of Western thought onto other communities that may organize conceptions of the natural environment in different ways (Escobar 1998). Finnish zoologist and ecologist Yrjo Haila (1999, 165) in particular argues that while the term biodiversity may help in looking past the nature-culture dualism, when employed incorrectly, the concept may lead to solutions that serve only "the short-term interest of powerful social actors such as corporations, state agencies, or professional groups". Using Toyooka as a case study, I consider the anthropological implications of the biodiversity rhetoric within the specific context of Japan, a place where the idea of biodiversity is not necessarily viewed as a cultural imposition of foreign ideals. In addition, I hope to contribute to the emerging literature on the role of biodiversity conservation in pursuing rural development (Light et al. 2004). By focusing on how Toyooka approaches rural sustainability and species conservation, I hope to illustrate the possibilities of more sustainable rural development within the Japanese context of continuous and increasing urbanization.

This thesis will also expand on the existing literature on social movements, especially those comparing the effectiveness of top-down versus grassroots environmental movements and the role of governments in pursuing and promoting sustainable practices. In a paper prepared for the Environmental Futures Forum involving G8 country experts, David Bell (2002, 2) notes that the government represents the biggest "business" in most of the world's developed nations, consuming the most amount of energy and having the largest impact the environment. Therefore,

in addition to promoting corporate sustainability through the use of “policy levers”, Bell argues that governments should also include sustainability practices as an integral part of their own organization (Bell 2002, 15). On the other hand, many scholars argue for a more critical view of top-down approaches to environmental management and urge instead for more grassroots participation on a local, community level. Smith (2008, 354) in particular argues that top-down approaches, in prioritizing the knowledge of “rational” experts with degrees in fields like hydrology, forestry, ecology, geology and biochemistry, “can be lacking in crucially relevant local realities, perspectives and input”.

Consolidating the two sides of the grassroots versus policy debate is Ockwell, Whitmarsh and O’Neill’s article on environmental communication related to climate change (2009) in which the authors argue that both top-down (governmental regulation and legislation) and bottom-up (grassroots movements) approaches are necessary. The authors conclude that the barriers associated with the top-down approach cannot be overcome without bottom-up intervention, and vice versa. Using Toyooka as a case study, I also take a critical stance on the existing rhetoric surrounding various types of sustainability initiatives and explore the possibilities of community, government, and corporate collaboration in pursuing sustainable development.

It is important to note that while I focus specifically on Toyooka for the purposes of this thesis, there are other community-based, agricultural conservation initiatives taking place in Japan today. Askins (2014, 231) notes in particular that conservation efforts in Japan tend to be conducted by local conservation groups often made up of unpaid volunteers, instead of being organized by the national government agency or professional conservation organization.

Toyooka’s case is not the only one where agriculture has been transformed to accommodate the protection of birds. In 2008, Sado City in Niigata Prefecture has followed Toyooka’s model and

created a rice certification scheme to support populations of the Japanese crested ibis. Similarly, the rice paddies surrounding Katano Kamoike, a “duck pond” located in Kaga City, Ishikawa Prefecture are being cultivated with similar ecological methods in order to support populations of baikal teal. Toyooka’s project was one of the first ones of its kind in Japan, and is therefore further developed. Many of the other projects, like Sado City’s models after Toyooka’s efforts. Overall, however, there has been a general trend in Japan in the past few decades to revitalize the rice paddy ecosystems that once maintained rich biodiversity throughout the country, and to bring back many of Japan’s iconic birds.

Overview of Thesis

The first chapter of this thesis will explore the historic context of agricultural and environmentalism in Japan. I trace some of the methods used in Toyooka’s contemporary stork reintroduction efforts to the agriculture of the Edo period, before synthetic pesticides and modern machinery were introduced into Japanese rice paddies. Throughout, I emphasize that environmentalism was promoted and accepted in Japan not because the Japanese people have an inherent love for nature in its vague and abstract form, but because some people realized that the preservation and thoughtful use of the few resources Japan had was imperative to the survival of the nation. Chapter 2 delves deep into the case study of Toyooka and the rural city’s efforts towards creating an environmentally sound community. I outline in detail the various steps being taken in the agricultural sector to ensure economic, social, and environmental sustainability through its stork restoration program. In the third chapter, I step back once again to situate Toyooka’s project within the larger context of Japanese culture to understand how Toyooka has succeeded in the almost impossible effort of reintroducing a species to a residential area.

The concluding chapter synthesizes my fieldnotes and experiences in Toyooka with my

research on sustainable agriculture. Looking at the influence Toyooka's efforts already have had on other municipalities, I contemplate the significance of the spread of stork populations to other regions of Japan means within Japan's contemporary context. Summarizing how Toyooka successfully works within the limits of contemporary Japanese culture, I reemphasize the importance of understanding cultural contexts in successfully implementing environmental initiatives. I also offer some concluding remarks about some of the barriers that await Toyooka as their stork reintroduction efforts and "stork-friendly" farming continues to spread and expand.

Chapter 1

The Historical Context: How Environmental Changes Have Impacted Life in Japan

Japan's Urban Sprawl

My grandparents live in a residential neighborhood in Fukuoka City, the fifth largest city in Japan by population. As Fukuoka continues to grow and transform, my grandparents' traditionally built, two-story house, where my mother and aunt lived until they got married and moved out, is increasingly enveloped by larger apartment buildings and shops that have encroached into the once quiet and local neighborhood. Recently, two houses adjacent to my grandparents' home were torn down in order to make room for an apartment complex whose construction is planned to start next year. The prospect of a large building towering over my grandparents' home has become a source of anxiety for many of my family members as they worry how my grandparents' quality of life will change due to this new encroachment of Japanese urban sprawl.

My mother called me one day during her visit to her hometown to report the various developments related to the construction project and all the questions and concerns my family has. *How tall will this building be, exactly? But what will happen to our orange tree? Will the garden get enough sunlight? Will the shadows make it colder in the house? Will it be noisy?* I got the sense that there was a lot of uncertainty about how my grandparents' lives would be affected by this change. While thinking about how to relate this chapter, which is intended to provide relative historic context about Japanese agriculture and the environment, back to Toyooka and the storks, I was reminded of these various worries my grandparents as well as other members of

the neighborhood and larger community have expressed to the developers of the new apartment complex. Since the 1600s, with the establishment of the Tokugawa shogunate in Edo, or modern day Tokyo, Japan's urban centers have continued to grow and expand, and stories like my family's are common. Throughout Japan, less dense, more traditional neighborhoods are constantly being torn down and replaced by clusters of massive residential apartment buildings. While human concerns are often voiced and heard, it is much rarer that we consider the impact these changes may be having on non-human life. How do animals adapt to manmade changes made to the landscape?

In this chapter, I trace many of the farming methods used in Toyooka today back to the Edo period of Japan, and outline how the shift in Japanese agricultural methods played a key role in the Oriental White Stork's eventual disappearance from Japanese skies. As I contextualize Toyooka's project historically, I will illustrate how life, both human and non-human, has adapted and responded to the various changes that have been made to the Japanese landscape between the beginning of the Edo period in the early 17th century and today.

Agriculture and the Environment during the Edo Period (1603-1868)



Fig. 1. Image of a stork in an Edo-period flower-watching guide.
 Oka, Sancho. *Kinogawa yakushi* in the 4th volume of *Edo yūran hanagoyomi*, 40. National Diet Museum, Tokyo, Japan. Available from: <http://dl.ndl.go.jp/info:ndljp/pid/2536365/11>

The above image (fig. 1) shows two pages out of a guide to Edo's best sightseeing locations for flowers, published in 1837. At the top of the left page, perched atop a pine tree, is the Oriental White Stork. Until recently, many thought that these birds, often seen depicted in Japanese traditional art as well as books like these, were red-crowned cranes. The red-crowned crane, *Grus japonensis*, or *tancho-zuru*, in Japanese, symbolizes longevity within East Asian culture due to their long lifespan (Sung 2014, 119). Cranes perched in pine trees, often depicted

by artists including the great Edo period woodblock artist Hiroshige, are an easily recognizable cultural symbol that juxtaposes the crane with the long-lived pine tree, another symbol of longevity (Chwalkowski 2016, 180). However, we now know that the structure of cranes' feet does not allow them grasp onto tree branches, while storks can. While storks nest atop tall trees; cranes, on the other hand, nest in wetlands and rivers. As academics, especially from Hyogo prefecture, increasingly focus on studying storks due to Toyooka's efforts, and as government officials search for ways to relate the stork reintroduction project to the Japanese public, this discrepancy in the birds' anatomy and the way they are depicted in art has come under speculation, and a consensus has formed that the birds are often storks, rather than cranes (Naito et al. 2004, 228; Shu 2000, 47). The two birds, similar in appearance and size, were often conflated, and during my time in Toyooka, I met some older residents who still call the storks cranes, as that's what they were called in their childhood. Izushi, a town that is now a part of Toyooka's municipality, was once known for their *tsuru yama*, or "crane mountain", which was one of the last places in Japan where you could see the storks nesting in the wild.

While this new finding does not in any way affect the symbolic place of cranes in Japanese culture, what we can tell from these historical documents, accounts, and artworks is that storks were once quite common and prevalent throughout the Japanese archipelago. This is largely due to the way agriculture was traditionally conducted in Japan before the introduction of agricultural chemicals in the 20th century. During the Edo period, rice paddies served as artificial wetlands that flourished with life and supported rich biodiversity especially during the growing season, but also throughout the year. Carnivorous birds including storks, crested-ibises, grey herons, egrets, and cranes would visit the rice paddies to feed on the wide variety of wetland organisms that could be found there (Brown 2009, 74).

Rice paddies formed a significant part of what is now often referred to as the *satoyama landscape*. Combining the words *sato*, “village”, and *yama*, “mountain”, the term represents the intersection of culture and nature in traditional rural Japanese life. While the term *satoyama* is now used prevalently within Japanese environmental rhetoric in order to evoke traditional Japanese landscapes, the phrase and concept only came into widespread use since the 1960s especially within the context of attempts to revitalize aspects of traditional life in contemporary Japan (Takeuchi 2003, 9). Although the definition of the term is ambiguous and changes depending on who is employing it, *satoyama* usually includes an “agricultural woodland” (Shidei 2000 quoted in Takeuchi 2003), and describes residential areas close to the wooded, mountainous areas of Japan where people lived in close proximity to wild animals and various resources necessary for survival. It also describes the complex and sophisticated system through which people could subsist on the land. Timber for fuel, manure for fertilizer, animals for agricultural work, and paddies and fields for food--the *satoyama* landscape offered all one might need to survive in the rugged terrain of the Japanese rural landscape. Toyooka, too, was once such a *satoyama*, providing a means for residents to live sustainably on the land.

Within this landscape, rice agriculture played a significant role in the experience of both human and non-human life. A formal metallic monetary system existed in Japan during this period, but the Japanese economy was supported in large part by the annual rice crop yields of farmers due to the rice-based tax system (Deal 2005, 124). A portion of every household’s annual rice yield was given to the government, while the rest was either sold for profit or consumed by the farmer. While rice was grown throughout Japan, providing a habitat for birds like storks where geographic and climate conditions allowed, much of a farmer’s crop yield was used to pay the domain’s *daimyo*, the feudal lords who reported to and collected taxes for the

Tokugawa shogunate. Outside of the political and economic elite, many people consumed other grains such as millet, barley and wheat as well as locally sourced vegetables, fruit, and sometimes fish or game (Francks 2007). However, after polished rice was given to the daimyo as tax payment, farmers and their families used the many byproducts the rice crop provided in a variety of ways, including using dried stalks to weave bags and shoes, burning the stalks for fuel, and using the hulls of rice grains to polish and clean wooden surfaces (Brown 2009). Every part of the plant without a more practical use was composted for fertilizer or used as mulch and covering. Much of life during the Edo period ran on these kinds of closed-loop material cycles (Brown 2009). Human feces, for example, collected in the urban capital of Edo, was bought by farmers who used it as a natural fertilizer when they went into the city to sell their produce (Howell 2013).

Human-animal relations were not always so harmonious within the Edo period landscape, and there were occasional conflicts as both parties fought for their own survival. While storks, unlike cranes, are carnivorous and would not impact crop yields because of their consuming the rice crop, the large birds often visited the biodiverse rice paddies in order to find prey. In doing so, storks often trampled on farmer's crops, reducing yields (Toyooka City Government 2017). Early in the growing season, the young crop could recover and continue to grow vertically, but the trampling of the crops later on in the season could significantly impact that year's harvest, especially when considering that Japanese rice paddies, then and today, are small, segmented and intensely cultivated (USDA 2013). Even a small area impacted by the storks could signify large costs for the farmer, especially if they were depending on a good yield to be able to have some rice left over for their family after paying of the local daimyo. As a result, storks were occasionally hunted down during the Edo period, despite being considered a good omen

(Toyooka City Government 2017).

The urbanization of early modern Japan took place against this backdrop of agricultural change. Under the Tokugawa shogunate, the center of Japan, both literally and figuratively, became Edo, or modern day Tokyo, replacing Kyoto as the capital city (Walker 2001, 330). In order to maintain control over Japan and thereby guarantee peace throughout the nation, the Tokugawa government deliberately centered all of Japan's political and economic activity in its new capital city. They ensured that the 250-300 feudal lords throughout Japan maintained loyalty to the government by holding their families hostage in Edo and requiring them to return to Edo every 2 years (McKean 1982). The over 200 families and their servants brought along with them a new concentrated demand for goods and services. Several regions across Japan began to produce food for consumption in Edo, instead of the communities in close proximity to the origin of production (Walker 2001). Many farming communities also began to abandon traditional subsistence-type farming and instead began to cultivate desirable cash crops such as soybeans for consumption in the new urban center. The numerous daimyo also created commercial centers in the form of castle towns in their respective domains (Hayami 2015, 69). Like Edo, these towns led to the creation of an economic society in which an increasing number of people started to rely on currency in order to purchase food instead of cultivating it themselves.

This introduction of mono-crop production had some major consequences for both human and non-human life in these areas. In the Hachinohe domain, soybeans were being produced almost exclusively for Edo, and since they had to be processed in order to be consumed, they did not provide a useful immediate source of food for the people of Hachinohe itself (Walker 2001). In addition, because Hachinohe became responsible for producing one specific crop for Edo, the quality of the soil in the region, as well as other regions that switched

to monoculture farming, degraded significantly. The introduction of this new type of agriculture surely affected stork habitats, as more domains began to increase their production of cash crops that relied on dry, rather than wet, agriculture. While not all cash crop production took over the land previously used for wet agriculture, with less farmers maintaining the artificial rice paddy ecosystem, these lands became a less desirable feeding grounds for wild birds.

While storks did occasionally come into conflict with farmers during this time period, they were also impacted positively by some of the Tokugawa shogunate's policies. Most significantly, many of Japan's forests were reforested during the Edo period. By 1550, around a quarter of Japan's forests were already deforested. During the early Edo period, the shogunate and various daimyos, wanting to show their power, constructed elaborate and timber-intensive castles and cultural buildings throughout Japan (Diamond 2005). By 1710, most of Japan's easily accessible forests had been cut down, and Japan faced its first timber crisis. To combat timber shortages and to ensure that the Tokugawa regime could endure and maintain power, a top-down reforestation policy was enforced (Diamond 2005; Totman 1989).

From the examples given in this section, it becomes clear that in the Edo period had a very utilitarian and anthropocentric way of viewing nature and Japan's natural resources. For farmers with very little capacity to make a large profit, sustainability was a necessity for survival, not a preferential choice. Once Edo grew as a city and demand for rice grown elsewhere increased, farmers eagerly switched to commercial agricultural methods that would allow them the possibility of making more profit. While books with titles like *Just Enough: Lessons in Living Green From Traditional Japan* or *The Green Archipelago* give the impression that there was a sort of environmental consciousness and deliberate effort to live in environmentally sound ways during the Edo period, in reality, people were simply doing everything they could to

maintain or increase their quality of life and do what was expected of them given their societal position. If a farmer saw that a stork was trampling over their rice crop, they would do all that they could to shoo the bird away, even if that meant hunting them down. The top-down reforestation policy, commended by Jared Diamond (2005) as an environmental success story, in actuality reflects the appearance of the term “kaibutsu” during the Edo period, which means “the opening up of things” but which came to be interpreted as “making use of the natural world” (Morris-Suzuki 1991, 84). Instead of regrowing the forests for the sake of having more forested land in Japan, the Tokugawa shogunate wanted to regrow the forests so that there would be more resources available for human use. The policies were implemented to ensure the prosperity and unified control of the Tokugawa regime rather than for the benefit of the natural environment.

Rich Nation, Strong Army - The Importation of the West

In 1868, the Tokugawa shogunate fell out of power, and the nation was rapidly thrust into a new era of Westernization, industrialization, and militarization under the new Meiji government and the newly restored power of the emperor (Hazama 1976). For the Meiji government, incorporation of certain Western ideals, technology, and procedures into Japan was a very deliberate choice. As the presence of foreign powers increased during the later years of the Edo period, Japanese intellectuals including Sakuma Shozan came to the consensus that incorporating Western culture in order to protect Japan, or, “controlling the barbarians with their own methods”, would be the best way to ensure that Japan would not follow the path of many other Asian nations at the time that lead to being colonized (Shozan in Harootunian 1995, 126). This sentiment is well represented in the Charter Oath of the Meiji Restoration, which declared that “knowledge shall be sought throughout the world so as to invigorate the foundations of

imperial rule”. Japan quickly mobilized to learn the ways of European and American societies, through what Patrick Hein calls “anti-Western Westernization” (Hein 2009, 72), in order to see what elements the once isolated nation could incorporate in order to expand their global power.

Where the Edo period was marked by self-sufficiency, the Meiji period saw a new era of industrialization and resource importation. Due to resource imports as well as the proliferation of new technologies and procedures adopted from the West, the Japanese people no longer needed to rely only on manual labor and the resources available to them in their immediate surroundings. The Tokugawa shogunate enforced various policies, including their policy of isolationism, in order to guarantee that they would have complete control over a relatively unified Japan. Unintentionally, these policies also necessitated much of the Japanese population to rely only on domestically available resources for their daily needs. Once the Tokugawa government fell and these policies disappeared, the need to maintain self-sufficiency diminished for much of Japanese society. With the opening up of ports, the enterprising and curious attitude towards finding ways to use the natural world for the benefit of society, already well established in the Tokugawa period, was extended to imported and exported goods. It was in this period that Japan truly shifted from a largely agrarian society to an industrial one. As Kenneth Strong explains in the introduction to his biography of a Meiji era politician and activist, Tanaka Shozo, “in the 1890s ... the government could count on overwhelming public support for its policy favoring industry rather than agriculture” (Strong 1997, XV). The quality of the natural environment and the viability of the land for agricultural use was sacrificed for the sake of the new government’s desires to make Japan an industrial economic power.

Japanese agriculture was significantly transformed during the Meiji period due to changes the Meiji government put in place concerning currency, taxes, and land ownership. In an

effort to rid Japan of its “evil customs of the past”¹, the Meiji government put in place the Land-Tax Reform of 1873 (Howell 2005, 72). The reformed land-tax laws signified the decreased importance of rice, and agriculture as a whole, on Japan’s economic identity, as the reform replaced rice with cash as the medium with which to pay taxes. In addition, the ownership of land was transferred from daimyos to landowners who hired tenant farmers to cultivate their land (Morris 1956). These new landowners, wanting to obtain maximum profits from their land, increasingly demanded more fertilizer in order to increase production. During the Edo period, fertilizer was created based on available forest resources and human feces from urban centers (Howell 2013). As the urban centers developed, however, farmers also started to rely on other natural fertilizers obtained through urban markets from more distant locations, including fish based fertilizer (Nakai and McClain 1991). Trade with the West, already well along the path of industrialization by the late 19th and early 20th century, allowed Japan to also begin investing in the research and production of synthetic fertilizers, and in 1886, the first superphosphate fertilizer was manufactured in Osaka. While these new fertilizers were not initially popular, as farmers started seeing large increase in yields, the new chemicals quickly caught on and spread throughout the country (Pizzi 2003).

The militarization and armament of Japan during this period of Japan’s modernization also had an impact on the way the government and the public treated wildlife, including the storks. Due to the increased importation and proliferation of guns, large birds were hunted for sport, as well as for the benefit of farmers whose crop yields were harmed by certain birds (Hancock, Kushlan, and Kahl 1992). In 1892, in the 25th year of the Meiji period, new hunting regulations were promulgated that protected birds like cranes and barn swallows (Toyooka City

¹ From the Meiji Charter Oath

Government 2017). However, because storks presented a barrier to consistent crop yields due to their trampling in rice paddies, they were not protected by these new laws. In Toyooka, only the storks residing in the only *tsuru yama* of the region were subject to protection from hunting. The population of Oriental White Storks residing elsewhere in Japan greatly diminished during this period of frequent hunting.

World War II's Impact on Storks and Japanese Agriculture

The population of storks in Japan was further reduced during and immediately following World War II. In 1941, the U.S. placed an oil embargo on all oil exports to Japan, cutting the nation off of its major fuel supply (Anderson 1975). In order to keep fighting in the war, the Japanese government turned their attention to alternative sources of fuel. Against the backdrop of Meiji modernization, the solution was ironically found back in the nation's forested landscape. The Meiji government turned their attention to the roots of pine trees, from which oil could be extracted for fuel (Tsutsui 2003). This led to the rapid deforestation of Japan's old evergreen forests, and led to the destruction of nesting habitat for the storks. During times of war, famine, poverty, and chaos, there is little room for any concerns beyond one's immediate and personal needs. As Tsutsui describes, "even trees of great age and beauty, and cultural significance - the stately rows of pines along the Tokaido highway, the ancient avenue of cryptomeria leading to the Nikko Shrine - were sacrificed in the war effort (Tsutsui 2003, 299). The storks, who also once held cultural importance within Japan, were also sacrificed. At one historical lecture I attended in Toyooka, the lecturer explained that there is some anecdotal and documented evidence to suggest that some residents of the region surrounding Toyooka shot and ate storks during World War II.

Following Japan's surrender from World War II in 1945, the Allied forces, lead by General Douglas MacArthur, occupied Japan for almost seven years. Among several objectives, a major goal during the occupation was the democratization of the country. Additionally, imperative for the U.S. was the creation of a new market for American industrial and agricultural products and guaranteeing that Japan would remain a capitalist ally of America within the context of Cold War East Asia (Muller et al. 2013). One of the most significant and lasting impacts of the American occupation of Japan following Japan's defeat in World War II is represented in the dramatic land reforms that took place during this time. While the 1873 Land Tax Reforms during the early Meiji period did allow many individual farmers to own their own land, due to economic downturns and community-specific contexts, landowner-tenant relationships continued to exist into the 1940s, with tenants and part-tenants comprising 70% of farm families in pre-war Japan (Gilmartin and Ladejinsky 1948; Ladejinsky 1959, 95).

In order to democratize the nation, one of the first steps taken was to reform the land ownership laws that previously allowed for a tenant-based farming system. MacArthur, upon the passing of the land reform bill, expressed his opinion that the land reforms are “one of the most important milestones yet by Japan in the creation of an economically stable and politically democratic society. It marks the beginning of the end of an outmoded agricultural system” (Kawagoe 1999, 8). The Japanese government's official stance during this period was that a land use reform would help combat rural poverty as well as increase agricultural productivity and “save the Japanese people from starvation” (Hashiguchi 2014, 4). MacArthur's land reforms ensured that absentee landowners would not be able to profit from farmers' labor on their purchased lands by instating compulsory sales of their land and limiting the land allowed to be owned by non-cultivating resident (Ladejinsky 1959; Kasuya 1991). This reorganization of land

between landowners and tenants lead to increased fragmentation of agricultural lands in Japan (Kasuya 1991, 5). As a result, many animals that relied on rice paddies for prey, including storks, saw their viable feedings grounds greatly reduced.

The Allied occupation also significantly impacted the Japanese diet. In order to create a consumer base for American imports in Japan, the U.S. government funded various projects and endeavours to help propagate the consumption of Western foods such as canned meat and wheat-based products. Many Japanese nutritionists helped the cause, citing their scientific authority in order to argue against eating rice for various physical and mental reasons. In fact, a pamphlet sensationally titled, “Eating Rice Makes You Stupid”, was created based on the results of Professor Takashi Hayashi’s 1958 book, *The Brain* (George Solt 2014, 79). With the help of these efforts, “U.S. wheat exports to Japan increased from 1.28 million tons in 1956 to a high of 3.24 million metric tons in 1974” (79). In contrast, rice consumption declined during this same period (Chern et al. 2002).

Agrochemicals to Feed a Hungry Nation

World War II had some dramatic and devastating effects on Japan’s landscape due to the impact of firebombing and the dropping of the two atomic bombs. Less clear are the effects of the aftermath of the war on the way the environment was viewed and treated in the long-term as the Japanese government embarked on a nationwide effort to overcome Japan’s defeat in the war and develop its economy. When Japan came out of the war defeated, its citizens were left demoralized and hungry. The severe food shortage caused citizens to resort to paying high prices for daily necessities through black markets (Dower 2000, 100). In order to combat the creation of an underground economy and to ensure a more equal distribution of food in particular throughout

Japan, the government reorganized the existing association of farmers and landowners into Japan Agricultural Cooperatives (collectively known as JA) (Mulgan 2013).

It was also around in this immediate post-war period that chemical herbicides and pesticides were introduced to Japan. My oldest interviewee, a member of the original group of farmers that began reduce pesticide use in Toyooka, remembers vividly when agrochemicals first gained popularity in Japan. During our interview, he recalled when farmers in the region first started using herbicides, around 1950. “When we spread it, it worked so well. The very first year, when we used it, after two or three days, well there’s a river around here, and all the fish around here had floated up (to the top of the river). It must have been mercury preparation”. Even as a young boy in either elementary or middle school at the time, he could see the connections between the use of the new chemicals and the death of the fish and other wildlife in the water in and surrounding the rice paddies. However, despite the obvious negative impacts of these new chemicals, farmers could not give them up as they instantly allowed them to do what once had to be done manually throughout the growing season.

In Toyooka, storks were once a commonplace part of the local agricultural landscape. Even in the years of increased hunting during which stork populations began to diminish throughout Japan, storks persisted in places like Izushi that became known for their “crane mountains”. My interviewee recalls how he saw gradually fewer storks visiting rice paddies in Toyooka as the use of agrochemicals increased in the region. Throughout Japan, bird species, as well as other animal species that depended on the artificial rice paddy ecosystem, further decreased in number (Katayama et al. 2015). The population of Oriental White Storks rapidly dwindled through the 1960s until Japan’s last stork died in Toyooka in 1971. Since the Oriental White Stork is found in other parts of East Asia it did not go extinct globally, but the bird

disappeared from Japanese skies. In the early 1960s, even before the storks' local extinction, efforts began to save the few remaining birds in the wild and raise them in captivity in the hopes of one day releasing them back (Hyogo Park of the Oriental White Stork 2017).

Whenever my supervisor gives presentations about Toyooka's stork reintroduction efforts, he often includes a particular image taken in the 1960s in Toyooka that depicts a farmer spraying his crops in close proximity to one of the city's artificial stork nests that had been installed in the late 50s to preserve the rapidly declining population of storks. "When I show this picture to some children they often get upset, asking how a farmer could be so mean as to spray chemicals right underneath the nesting storks." My supervisor's response to this, he explains, is that "we shouldn't think of these farmers as mean. They were doing what they needed to in order to support their livelihoods, with the technology that was then available". When agrochemicals were first introduced to Japan, people were still largely unaware of the toxicity or appropriate use of the chemicals, and wildlife as well as the farmers spraying the chemicals in large quantities were severely affected. Because the herbicides and pesticides made the once tedious tasks of weeding and pest control easy and helped farmers save time and money while increasing production, their popularity increased and their use persists today. Why pesticides continue to be used today, despite evidence supporting the harmful effects they can have, may be due to the perception that the benefits of these innovations outweigh their various consequences.

The role of JA in Contemporary Japan

Today, the Japanese diet differs drastically from what it was during the Edo period, before the official opening up of Japan to the rest of the world. Most notably, the consumption of foods such as beef and bread has increased dramatically while the consumption of rice continues

to decrease. During the period of rapid economic development immediately following World War II, rice consumption reached a peak of 120 kg per person per year by 1960. This increase can be attributed to the need for a consistent supply of sustenance and nutrients, rather than to preference for the grain (Khush 2005). However, as incomes rose over a certain threshold, rice consumption declined as people could afford to diversify their diets. As a result, by the late 1980s, rice consumption in Japan was 40% less than in the 1960s (Khush, 2004 in reference to Hossain and Sombilla, 1999).

In addition to many of the social and cultural reasons for this change in food preference that I will discuss later in chapter three, one historic reason for the decline of rice consumption in Japan is associated with the larger phenomenon of Japan's increasingly aging population, referred to in Japan as *shoshi-koreika*, or the simultaneous and dual phenomenon of sub-replacement fertility levels and population aging (Muramatsu and Akiyama 2011). According to the latest census, people above the age of 65 represent 26.6% of Japan's overall population (Statistics Bureau 2015). People in this age group contributed to the peak in rice consumption in the 50s and 60s but are now consuming fewer calories as they age. Comparatively, only 12.6% of the population are under the age of 15. In addition to their being unable to replace the older generations in numbers, this younger age group also eats less rice in general due to more recent diversification of the Japanese diet.

While rice consumption, along with the market price of rice, continues to drop, production costs have stayed stable or have increased. For the majority of farmers in Japan, agricultural inputs such as agrochemicals and machinery are sourced through the local branch of JA. The Central Union of Agricultural Cooperatives, JA-Zenchu, singlehandedly controls the price of both the input and output sides of agricultural production, guaranteeing that the

cooperatives can maintain a profit regardless of the larger domestic and international economic context (Esham et al. 2012). Farmers, consumers, and politicians alike are becoming weary of the power JA holds on Japan's agricultural economy. While Toyooka's city government has been able to cultivate amicable relationships with the local agricultural cooperative, the representatives I was able to interview noted that they felt they were the exception, and that they had not heard of many other municipalities cooperating so closely and effectively with JA. For many visiting government officials and academics, the participation of the local JA in a project with an environmental focus was particularly surprising. In the past, JA was the main supplier of agricultural inputs such as agrochemicals in Japan (Esham et al. 2012). As such, one would not expect JA to encourage agricultural techniques that relied less on agricultural inputs.

The willingness of JA Tajima, Toyooka's local extension of JA, to participate in "stork-friendly" farming endeavors may be related to the decline of the dominance JA has held over the agricultural input market. Esham et al. note that while JA, as recently as 1995, supplied 94.5% of fertilizers, 70% of agrochemicals, and 35.5% of feed required by farmers, by 2006, these numbers had declined drastically to 54%, 37%, and 30% respectively (Esham et al. 2012). Within this context, JA can participate in efforts that would reduce the need of agricultural inputs without too much risk, as they are no longer the main supplier of these resources.

Japanese Agriculture and Environmentalism in a Globalized World

Even in Japan's period of "isolation" during the Edo period, foreign concepts and ideas influenced the way Japanese scholars thought about and viewed the world. When Japan was officially "opened up" to the rest of the world, the influence of foreign nations and their economies on Japan increased to an unprecedented level. Because of changing food preferences

and the availability of more affordable imported foods, today, Japan has one of the lowest self-sufficiency rates among the world's major economies, with the national caloric intake sourced nationally staying stagnant at around 40% for the last two decades (Kyodo 2016). When sustainability in the holistic sense is considered, these statistics pose various barriers that the government must overcome in order to ensure work for Japanese producers as well as to meet the targeted benchmarks for carbon emission reduction, as imported goods tend to have a higher carbon footprint than goods produced and consumed domestically (Peters et al. 2011).

JA-Zenchu and the Japanese government have long attempted to protect Japan's agricultural economy through high import tariffs placed on imported rice. However, in the past few decades, they have been increasingly unable to curtail the effects of neoliberal capitalism and the free-market on Japanese agriculture. Most recently, the current Prime Minister, Shinzo Abe, has distanced many of the farmers that have traditionally tended to side with the political right, of which Abe is a part, due to his push for Japan's participation in the Trans-Pacific Partnership (TPP), the trade agreement among several countries that seeks to lower the import tariffs on a wide variety of goods between these nations. Many in Japan's agricultural sector fear that the reduction of import tariffs on rice produced outside of Japan could greatly reduce the already diminishing market for domestic rice. Because Japan's rice paddies are traditionally small and segmented, production costs tend to be higher for Japanese rice farmers than for the larger, industrial scale rice producers in places like California. While the U.S.'s new anti-TPP stance since Donald Trump became the President of the United States means that these changes may not come to fruition, the fears of trade liberalization and its impact on the economic viability of farmers remains a pertinent issue throughout the country's agricultural communities.

Conclusion

This chapter has outlined the ways in which agriculture, and specifically rice agriculture, has changed in Japan throughout the past few centuries. In particular, I have emphasized how the changes made to Japan's landscapes affected both human and non-human life. Throughout history, people everywhere have innovated to work within their means to better their own lives and the lives of those around them. Within this context, sustainability was once a necessity of life for many people. In Japan, people searched for immediately available resources taken from the forests and the fields and used them as efficiently as they could. While there were people in the societal elite that could afford to look elsewhere for food and other material goods, a large proportion of the population had to make do with what they could find within close proximity. Today, due to globalized free markets, the distancing of production from consumers, and urbanization, people today can live in ignorance of the direct consequences of unsustainability.

This chapter has also articulated how, while the transition to modern, industrial agriculture ultimately led to the demise of storks in Japan, stork populations had already been gradually decreasing since the Edo period due to changing pre-industrial agricultural methods and perceptions of nature. In the next chapter, I will illustrate how Toyooka is attempting not only to provide an alternative to the destructive conventional agricultural methods, but also to cultivate a broader culture of accepting storks as a desired part of Toyooka's landscape.

CHAPTER 2

Work for Farmers, Food for Storks: Engaging in Paradigm Shifts through Solidarity

The Stork Reintroduction Project and the “Stork-Friendly” Farming Method



Fig. 2. The author embodying the Oriental White Stork at Hyogo Park of the Oriental White Stork, Summer 2016. (Hyogo Park of the Oriental White Stork, used with permission)

In one of the first few weeks of my internship, my supervisor had me visit the Hyogo Park of the Oriental White Stork to learn more about the background behind the city’s stork reintroduction efforts as well as the scientific and ecological context of the project. Tens of thousands of visitors visit the park every year wanting to see the “city where the storks fly”, and many pose as a stork as I did as a fun way to end the day at the park (fig. 2). The location of the replica stork nest I’m posing on is very strategic and deliberate. Behind me, you see the cage containing some of the storks being raised in captivity at the park. From the replica nest, visitors have a great view of the rice paddies that surround the park. The stork suit is an example of one

way in which the city attempts to engage a wide variety of people to consider the connections between biodiversity and agriculture, two seemingly distant concepts, and how these relationships affect the storks. The hope is that people will enjoy themselves while becoming a bit more knowledgeable about the city's efforts to reintroduce this culturally and ecologically significant bird to its traditional habitat. After learning about the city's various efforts, many of the park's visitors purchase the various "stork-friendly" agricultural products that are available at the gift shop.

Toyooka's overall project, which they call "Stork Reintroduction into the Wild", may, on the surface, seem like an idealistic and perhaps even eco-centric effort to reintroduce a critically endangered species to its "natural" environment. However, in many ways, Toyooka City unapologetically frames the project as an anthropocentric endeavor. The stork suit, along with the park itself are indicative of the way the city holistically fuses the realms of ecotourism, sustainable agriculture, rural economic revitalization and species conservation in their effort to reintroduce storks to Japan. The main objective of the city government is to serve its residents. At its core, Toyooka's stork reintroduction project is a pragmatic one that attempts to ameliorate the lives of the city's residents through environmentalism. Through their efforts to create a beneficial environment for storks, the Toyooka City government hopes to simultaneously increase the economic viability of local farmers and the region in general through revenue generated by stork-related ecotourism. In this chapter, I illustrate how Toyooka pursues initiatives related to sustainable agriculture and development through the creation of solidarity between a variety of actors within the local community. The Toyooka City government simultaneously targets ecological issues related to species conservation and loss of biodiversity and social issues related to farmers' economic viability and rural revitalization through their

inclusive, pragmatic and ecologically sound agriculture initiative and the development of a culture of environmental consciousness. Toyooka City's efforts offer an example of how local economic and political interests can be linked to ecologically sound practices that community members, regardless of their ideas about the environment, can engage in and support.

Local Governments and Paradigm Shifts

The last Oriental White Stork residing in Japan died in captivity in Toyooka in 1971. In just a few decades, agriculture based on the use of agrochemicals and heavy machinery led to the loss of a once common and culturally important species. Biodiversity, species loss and environmental degradation are unfortunately often the common consequences of industrial development and capitalist consumer culture. The questions that remain, however, are how to successfully reverse or curtail the negative impacts we have made, and how to engage in changes in individual behaviours in order to normalize sustainable practices and behaviours that are currently still considered “alternative”.

Ian Hackling, in the introduction to Thomas Kuhn's book, *The Structure of Scientific Revolutions*, lays out Kuhn's conception of scientific revolutions: “normal science with a paradigm and a dedication to solving puzzles; followed by a series of anomalies, which lead to a crisis; and finally resolution of the crisis by a new paradigm” (Hackling in Kuhn 2012, xi). In the case of agriculture, the current dominant paradigm in Japan was born largely out of the aftermath of World War II, when much of the nation was left hungry due to food shortages. In order to create a stable food supply, in addition to the increase imports of food from countries like the U.S., many of today's conventional agricultural techniques were implemented (Dower 2000). Japan's conventional agriculture depends on the use of agrochemicals such as synthetic

fertilizers and chemical pesticides and herbicides in order to maximize crop growth and yields. While these methods were first put in place in an effort to guarantee a stable food supply and to make life easier for farmers through the mechanization of agriculture, today, they have had many negative impacts not only on the natural environment but also on human health. These new crises have lead many environmentalists to see the need for the creation of a new paradigm within which the negative impacts of conventional agriculture are reduced.

While the need for a paradigm shift in the way people view their relationship with nature is often recognized by both environmentalists and anthropologists alike, how to go about shifting these paradigms is still up for debate. Until recently, environmentalists have tended to focus on the various environmental crises as a way of turning the public's attention to the destructive impacts many of today's common practices have on the environment. In their book, *Breakthrough: From the Death of Environmentalism to the Politics of Possibility* (2007, 7), Shellenberger and Nordhaus urge readers to "think of the verbs associated with environmentalism and conservation: "stop", "restrict", "reverse", "prevent", "regulate", and "constrain"", explaining that "all of them direct our thinking to stopping the bad, not creating the good". This latter goal, "creating the good", is exactly what Toyooka City has decided to focus on. Through Toyooka's case, this chapter will shed light on ways that pragmatism and positive engagement can be the first step towards enacting paradigm shifts necessary for global society to become more sustainable.

From an ethical standpoint, Parker (1996) explains that pragmatism is the school of thought that understands the dynamic nature of society, and that "no list of virtues, no list of rights and duties, no table of laws, no account of the good should be expected to serve in every possible situation that we confront" (Parker 1996, 26). He argues that the "aim of ethics is not

perfect rightness, then, since there is no absolute standard for reference, but rather creative mediation of conflicting claims to value, aimed at making life on the planet relatively better than it is” (Parker 1996, 27). In this sense, pragmatism diverges from ideologically bound practices and instead focuses on practices that ameliorate the environmental situation within the relevant contexts. Within political discourses, pragmatic solutions tend to be those that emphasize the practicality of certain policies of actually influencing change rather than those that emphasize the environmental ideal being pursued. These approaches tend to work within existing political and economic structures rather than trying to transform them (Rosenbaum 2013, 52).

Pragmatic solutions to environmental problems are often criticized for compromising truly ecological goals because many fear that, in the end, economic concerns will win over environmental concerns. However, as I will discuss throughout this chapter, pragmatic approaches can often be the most effective in engaging the public to shift their ways in thinking about the environment, often unconsciously. Even those who initially participate in the environmental efforts for personal and anthropocentric reasons often eventually better understand and appreciate the benefits of environmental protection over time. One of the books that served as an inspiration for me in writing this thesis is Lockyer and Veteto’s *Environmental Anthropology Engaging Ecotopia*. They, too, choose to focus on the solutions already being worked on throughout the world in order to combat today’s various environmental crises instead of dwelling on the specifics of the crises themselves. However, in their introduction, Lockyer and Veteto explain that their reasoning for moving away from a problem-oriented work to one that focuses more on solution is in part because they recognize that “solutions are already being developed from the bottom up”, and “these grassroots solutions can potentially be strengthened and made more viable through academic analysis”. In this chapter, I emphasize that, while

grassroots efforts are an important part of many environmental movements, there are cases where local governments can serve as an outlet for grassroots movements to gain more traction and to have more widespread influence. With the case of Toyooka, the participation of the local government in the stork reintroduction efforts have been instrumental to the success of the overall project.

Cultivating Environmentalism through Solidarity

While it is widely understood that a paradigm shift must occur for the formation of truly sustainable communities within the contemporary context, there has yet to be concrete solutions developed in order to help initiate this shift. In his book, *The Pursuit of Ecotopia* (2010), anthropologist Eugene N. Anderson claims that “our environmental crisis is not the result of simple overconsumption or irresponsibility. It is the result of lack of solidarity. We have failed to come together to get the job done” (p. 1). Environmentalism is often polarizing, and in pursuing sustainability initiatives, it can be difficult to get all parties involved to agree upon any single solution. Recognizing this issue, Toyooka City has made their slogan for pursuing their sustainable development projects, “kounotori *mo* sumeru kankyō zukuri”, which roughly translates to “the creation of an environment in which storks can *also* live”. The key to how Toyooka creates solidarity among Toyooka’s residents and institutions as well as among human and non-human life is the usage of the Japanese binding particle “*mo*” which translates to “also”. Throughout my time in Toyooka, my supervisor emphasized to me on multiple occasions that “it’s this *mo* that’s really important to us”. The city government deliberately uses this binding particle instead of “*ga*”, the common Japanese subject marker. When “*ga*” is used instead of “*mo*” in the slogan, the meaning changes to “the creation of an environment in which storks can

live”, which implies that what is good for the storks is somehow separate from what is good for people. By emphasizing the use of the word “*mo*”, the city government highlights the inclusive nature of their project, eliminating the division between nature and culture that we often see in contemporary economic and environmental rhetoric. For the city government, the effort to reintroduce storks into Toyooka is a holistic one that is inherently linked to its efforts to revitalize the local community and make it an attractive place for both its residents and visitors. Through the “stork-friendly” farming initiatives, Toyooka hopes to create a beneficial environment for storks while simultaneously reviving its economy through the increased profitability of farmers and through increased eco-tourism opportunities.

My co-workers often extended the use of this word, *mo*, to different aspects of the stork reintroduction project. Especially in relation to the sustainable agriculture initiatives that form a part of the overall species reintroduction efforts, this *mo* is what has allowed the government to create a culture of cooperation among actors with differing ideals. My co-worker expressed to me that their wish as a city is to support all types of agriculture in the region, including *both* conventional and ecological agriculture. In addition, they hope that the support of the city government and *also* the local extension of Japan Agricultural Cooperatives (JA) can help increase participation and support for the project. This prioritization of inclusiveness is the hallmark of Toyooka’s pragmatic approach to environmental conservation, and this mentality extends to how the city hall promotes and supports these efforts on many levels. Through the use of the word *mo*, the city hopes that the project can appeal to many of Toyooka’s residents, not just those who hold larger concerns for the natural environment.

Instead of solely appealing to environmentalists and those who have a larger concern for ecosystems, they attempt to relate the project to the various concerns residents and consumers

throughout Japan might have about rice. My supervisor, for example, often told me passionately about his concerns about the effects of the bioaccumulation of agrochemicals in various organisms on people, and this concern for health was something that was reflected by many farmers and consumers. When I asked a young female farmer I interviewed about her reasons for employing the “stork-friendly” farming method, she also expressed her concerns about health especially because she is a mother, explaining that she attempts to reduce the synthetic chemicals applied to even her conventionally grown rice, “because it’s something we deliver directly to our mouths”. It is important to note that the organic food movement was largely born out of the dual concern by farmers about issues with soil degradation, which led to the inception of Rudolph Steiner’s biodynamic farming method in the early 1920s (Steiner 2004), as well as the disastrous impacts of agrochemicals as outlined in Rachel Carson’s *Silent Spring* (1962). Throughout the movement’s history, proponents of organic agriculture have had a variety of different concerns related to the conventional systems of food and agriculture. While “stork-friendly” farming method has its origins in a desire to reintroduce a once locally extinct and now critically endangered species, the city government realizes that for many consumers and producers of organic products, environmental goals are often not the most significant factor impacting their choices (Lassen and Korzen 2009). My co-workers repeatedly made it explicitly clear that to them, it doesn’t matter if farmers want to participate in the subsidy program for purely economic reasons. In the spirit of inclusivity, they want to support people of all different attitudes, perspectives, and desires. In doing so, they also mentioned how they noticed that many farmers who initially participated in the project for financial reason are now committed to the ideological concept of bringing back storks and increasing biodiversity through the cultivation of “stork-friendly” rice.

The pragmatic and inclusive nature of the stork reintroduction project can be directly attributed to the city government's involvement in the conservation effort, and in the way government work is structured in Japan. In Toyooka, the government employees who working on the project are not necessarily environmentalists. A common aspect of Japanese institutional organization involves a job rotation scheme that frequently shifts employees from one section to another (Cosgel and Miceli, 1999). Because the city government serves the municipality as a whole, employees are often shuffled around every few years to different departments to serve the city in many various ways. Only a small minority of employees self-identify as "specialists" and stay in single departments for extended periods of time. My supervisor, for example, worked for many years with the city government's internal finances before being moved to the Agriculture, Forestry, and Fisheries department. When one of my co-workers and my supervisor had the opportunity to visit Connecticut College in September 2016, a staff member helping organize the environmental talk saw my supervisor smoking a cigarette and commented, "well, that's a bit unusual for an environmentalist, isn't it?". Throughout my internship I also often chuckled at the sight of my co-workers chain smoking cigarettes in between counting the number of organisms residing in rice paddies or speaking to other government officials about the importance of eco-friendly agriculture. Most of the government employees working in the "environmental" sections of the city government do not have a formal education in environmental studies. While they definitely do care about the natural environment, they care because the natural environment is a part of the larger community that they serve. The inclusive and pragmatic nature of Toyooka's efforts relates directly to the government workers' focus on serving the municipality as a whole rather than solely environmental ideals.

The City Where the Storks Fly - Cultivating a Sustainable Community

The section for eco-friendly agriculture where I interned is housed under the larger Division of Agriculture, Forestry, and Fisheries. In other municipalities and in the national government this division is usually a separate department under which there are a wide variety of divisions dealing with agricultural subsidies, taxes, and farmer aid would be organized. However, in Toyooka, this department has become a division under the Department for Coexistence with Storks. In addition to departments typically seen in municipal governments dealing with the community's water supply and sewage, education, and taxes, Toyooka has an entire department dedicated to establishing a community in which people and storks can coexist. The reorganization of government departments and divisions occurred as a result of the "Environment-Economy Strategy", established in 2005 with the goal of developing a culture of harmony between the natural environment and the local economy of Toyooka. In the same year, five storks were to be experimentally released from captivity into the residential areas of Toyooka. The "environment-economy strategy" originates from an understanding that if the natural and cultural environment of Toyooka stayed the same as it was before, the storks would be destined to perish once again. Instead, there would be a need to establish new social and economic norms and values throughout Toyooka that would help the new stork population persist.

Toyooka's unique "environment-economy strategy", *kankyō-keizai senryaku*, has five pillars: encouraging the consumption of locally produced goods within the community, the promotion of "agriculture imagining the environment", the promotion of stork tourism, supporting industries committed to the environment as well as the local economy, and promoting the use and production of renewable energy within the region. While the city's efforts to

reintroduce storks to Toyooka originate from an ecological desire to recreate a benign habitat for storks and the biodiversity on which they rely, it is clear that they are simultaneously aiming to further the economic development of Toyooka and ensure that the community can continue to exist. Instead of viewing the environment and the economy as separate spheres, the city actively attempts to combine the two realms and emphasize that what is good for one or the other are not mutually exclusive. It is of particular note that Toyooka aims to reintroduce the storks to a residential area as opposed to a protected conservation area. When you visit Toyooka today, it is likely that you will see one of these magnificent birds flying over electric lines and houses, feeding in rice paddies, or perched in nests on man-made “stork-towers” (fig. 3). Because the city hopes to create an “environment in which storks can *also* live”, it is crucial that the economic and developmental endeavors of Toyooka, as well as the lifestyle of its residents, coincide with the city’s stork reintroduction efforts.



Fig. 3 Storks and farmers by a stork tower (City of Toyooka, used with permission)

Toyooka City deliberately uses the term *kankyō souzougata nougyō*, “agriculture that creates the environment”, instead of “organic agriculture”, the term used by The Japanese Agricultural Standards for their environmental certification system. The use of the term “Agriculture that creates the environment” originated in Hyogo Prefecture in 1992, when the prefecture first began to promote the implementation of agricultural techniques that would help to reduce the negative environmental impacts of agriculture (Hyogo Prefecture 2009). Because the “Environment-Economy Strategy” originated from Toyooka’s wish to create an environment in which storks could thrive alongside people, it is imperative that the agricultural methods used specifically help support stork populations. The use of the term “sustainability” has often been criticized for its vagueness and the potential ethical problems it creates. Conservation biologist Reed Noss (1991) in particular poses the question, “what are we sustaining?”, arguing that, “We hear a lot about sustaining “productive” ecosystems, but the products are unquestioningly assumed to be for human use” (121). As the name of the project itself implies, the main goal of Toyooka’s efforts is to reintroduce storks to the wild. Through the use of the term “agriculture that creates the environment”, Toyooka illustrates how the “stork-friendly” method aims specifically to mimic the systems that once existed in the rice paddies that allowed for stork populations to persist in the wild in order to actively create a better environment for both people and the storks.

The Oriental White Stork is a large carnivorous bird whose diet consists of a variety of different organisms traditionally found in rice paddies such as frogs, loaches, small fish, snakes, and dragonflies. Successful reintroduction of storks to the wild, therefore, necessitates the re-establishment of natural food chains back into the rice paddy ecosystem. While the reduction or elimination of agrochemicals is also necessary for such endeavors, the parameters for Japan’s

organic agriculture certification are not enough to ensure that the rice paddies will serve as sufficient feeding grounds for the storks. The “stork-friendly farming-method”, the farming method approved through the city’s certification program, originated in the minds of conscientious farmers who wanted to help the city in their newly established commitment to reintroducing storks back to the skies of Toyooka. In many cases, ecological methods of agriculture require the farmer to sacrifice crop yields or adapt in one way or another for the sake of employing methods that are “better for the environment”. Most farmers in the U.S. who participate in organic farming are often, as a result, extremely ideologically minded people who want to contribute to the greater good, excluding those who produce for larger corporations that now sell “organic” products and are often criticized for greenwashing (Sutherland 2011; Lockie and Halpin 2005). The “stork-friendly” method of farming, however, attempts to illustrate how ecological farming can actually provide many benefits to the farmer. What is particularly striking is that in addition to noting the benefits each procedural requirement of the farming method has for biodiversity and environmental concerns, the farming method also emphasizes how the farmer will be affected by and can benefit from these same requirements. The inclusion of the farmer’s perspective and situation within the requirements for the “stork-friendly” farming method makes the method more accessible to farmers who many not be driven by the ideological goal of helping recreate a beneficial environment for storks. The creation of an environment in which stork populations can persist depends on the presence of farmers. The main feeding grounds for the storks are the rice paddies, so it would be unproductive for the city government to propagate an ecologically sound farming method if it is not one that is useful and accessible to farmers.

In order to qualify as “stork-friendly”, in addition to reducing or eliminating

agrochemical use, farmers must also agree to drastically change the way water is used and controlled throughout the entire year in order to maximize the activity of various organisms that can reside in rice paddies. Draining the rice paddies mid-season, done to maximize growth of the rice crop, must be delayed by around a month, until early July. This approach allows tadpoles to start growing legs and hop away before the water is drained. Throughout the growing season, aside from the mid-season draining period, “stork-friendly” farmers must also maintain water levels of over 8 cm in the rice paddies, compared to 3 cm in conventional rice paddies. The deeper water levels harbor more biological activity, leading to the persistence of a wide variety of organisms that can then become prey for the storks. The various organisms also move around dirt and other particles in the rice paddy, leaving the water very murky. The murky water prevents sunlight from hitting the small seedlings of weeds, while the rice crop, already taller than the level of the water upon planting, remains unaffected. The paddies which are conventionally drained prior to harvesting and left dry until planting season the next spring must also be left flooded throughout the winter allowing a wide variety of organisms, most importantly sludge worms, to persist throughout the year. Sludge worms, *Tubifex tubifex*, are an essential part of the success of the “stork-friendly” farming method. These tiny decomposers help create a “sludgy layer” of mud that can help inhibit the growth of weeds by burying their seeds deep in the ground. The abundant life in the rice paddies also provide natural fertilizer in the form of fecal and decaying matter to the rice crop. While each of the requirements have a clear ecological justification, they also emphasize how the farmer will be able to maintain certain levels of crop yields despite the reduction or elimination of agrochemicals and synthetic fertilizers.

One issue associated with the mainstreaming of organic and other alternative forms of

agriculture in the past decade has been accountability. Because of the mainstreaming of sustainable agriculture there often exists some skepticism as to whether products labelled as “organic” or “all-natural” continue to have any meaning (Goldberger 2011). In Toyooka, however, “stork-friendly” farming is a part of the larger community effort towards reintroducing storks to the environment, and participating farmers themselves are very committed to keeping others accountable for their practices. On one day of my internship, I shadowed one of my co-workers on a tour around various rice paddies that were registered as “stork-friendly” to check on the progress of the rice paddies, and to make sure that the farmers were following the requirements for “stork-friendly” farming according to the level of subsidy they were registered for. We went with a group of five farmers, a representative from the local agricultural cooperative, and a representative from the agricultural knowledge diffusion center. We found that a few farmers had violated some of the requirements for the certification and subsidy, and had already drained water from their paddies even though it was weeks before the tadpoles would develop legs. Smirking in dismay, one farmer commented, “Well, this is just not “stork-friendly farming” at all”. Within the community of “stork-friendly” farmers in Toyooka, we can see the establishment of what E.P. Thompson describes as a “moral economy” which operates “within a popular consensus as to what were legitimate and what were illegitimate practices”, and that is “grounded upon a consistent traditional view of social norms and obligations, of the proper economic functions of several parties within the community” (Thompson 1971, 79). Because this particular ecological farming method originated from the farming community itself, participating farmers, especially those with leadership responsibilities within the local agricultural cooperative, take pride in their work, and look with dismay at those who try to collect the subsidy without following the rules. Violators are quickly reported to the city

government and their subsidy will not be paid at the end of the growing season. There is a clear community effort in Toyooka to keep other farmers accountable for their practices which adds to the solidarity the city attempts to foster within the community through the stork reintroduction efforts.

The municipal government's participation has also been crucial to the success of the implementation of this ecological farming and species conservation effort. While these aforementioned changes to agricultural methods alone can help ameliorate the rice paddy conditions for the benefit of biodiversity, these changes alone cannot guarantee a viable environment for the storks. One significant component of the rice paddy ecosystems that could be found within the *satoyama* landscapes of Edo period Japan was the connection between the rice paddies and the natural bodies of water that surrounded them. Fish would utilize the irrigation systems used to water the rice paddies in order to lay eggs (Brown 2009, 74). However, after World War II, many changes were made to the irrigation systems that lead to the inability of many fish species to make their way into the rice paddies (Katayama et al. 2015) In order to recreate the former environment, the city government invested in the implementation of fish ladders throughout the city that would allow fish to make their way from rivers into the rice paddies in order to lay their eggs. In addition to facilitating these kinds of infrastructural changes, the city government also helps consolidate local resources for the approved organic fertilizer for *Stork Natural Rice*, which includes locally sourced rice bran and manure from local chicken and cows.

The stork reintroduction effort is a community-wide effort to re-establish the kinds of relationships, both among people and between human and non-human life, that once existed within the *satoyama* landscape. However, they do so within the modern economic context.

Through their subsidy program, the city successfully incentivizes the use of ecological agricultural techniques. Because these farming techniques came, in large part, from the farming community itself, a “moral economy” like the one Thompson describes is established within the community. Within this context, receiving the governmental subsidy without implementing the proper ecological techniques is highly scrutinized (Thompson 1971). Through the city government’s active involvement, a closed-loop system is also established within the region in which farmers can obtain animal manure and other organic fertilizers from the local region. Although Toyooka’s municipal government is unapologetically anthropocentric and pragmatic in the way that they present the stork reintroduction project, the environmental goals of the project are maintained through the establishment of solidarity within the community and the emphasis on the notion that both humans and storks simultaneously benefit from the upholding of ecological values.

Economic viability and marketing a value-added product

The city’s direct involvement in the stork reintroduction efforts has been very significant for the economic success of “stork-friendly” farming. As emphasized throughout this chapter, while increasing biodiversity and creating a beneficial environment for storks is one of the city’s main aims, the city government also hopes to use their overall sustainability efforts to help support local farmers and revive the agricultural economy of Toyooka. It may seem odd that the city uses an ecological agriculture initiative in an attempt to revitalize the local agricultural economy and making rice farming economically viable for producers. Because ecological agriculture is much more laborious, it is often seen as harming farmers’ economic viability. However, in Japan, rice farming is an increasingly unprofitable vocation. Because of the

influence of Japan's agricultural cooperatives on the market value of Japanese crops, the importation of foreign rice, and the decline of rice consumption, the price of rice has continued to drop while the prices of agrochemicals needed to cultivate rice have remained stable (Kawai et al. 2010). While the "stork-friendly" farming method requires the farmer expend more time and energy into rice cultivation when compared to conventional rice farming, often with decreased yields, the ability to cultivate a partially subsidized, value-added product presents a much desired economic opportunity for many local farmers, even those who were not a part of the original group that sought to help the stork reintroduction efforts.

All of my interviewees expressed their concern about the falling price of rice. The representative from the Nakanotani cooperative farming company, told me how this trend is something farmers have noticed and feared for quite some time now. In 1993, before the city government officially put in place their subsidy program for ecological farming, their company was attempting to make rice farming economically viable for participating farmers. They consolidated the rice paddies owned by the "employee farmers" and began to cultivate their own original brand of value-added rice, "roppoginmai", that they produced by reducing the agrochemicals used by 85%. When the city started to promote their efforts for "agriculture imagining the environment", Nakanotani quickly joined. In addition to receiving the subsidy given for ecologically produced rice, the farmers are now able to sell their rice to JA for 1.5 times the amount for conventionally grown rice.

In order to help motivate farmers to pursue ecological methods of agriculture, Toyooka city has implemented a subsidy program based on Payments for Ecosystem Services (PES), an incentive-based policy solution that has emerged in the past few decades within environmental economics rhetoric, and is now being employed throughout both developed and developing

countries. PES attempts to mitigate the added costs associated with the creation of ecosystems services such as increasing biodiversity in agricultural settings (Jack, Kousky and Sims 2008; Banerjee et al. 2013; Wegner 2016). In Toyooka, the PES scheme involves varying degrees of monetary subsidies depending on whether the farmer completely eliminates or reduces by 85% the amount of pesticides used, as well as whether they flood the rice paddy throughout the winter or not. Toyooka's PES scheme is especially well-received by many farmers because of the Japanese economic context surrounding rice farming. While the profits that can be gained from conventional rice farming has continued to decrease over the past half century, the subsidy, financed through the local, regional and national governments, helps make rice farming an economically viable profession in Toyooka. In addition, as there are multiple levels to the subsidy program; farmers can easily start out at a lower subsidy level and gradually increase the intensity of which they approach the ecological farming method, rather than having to engage in an immediate and drastic change to their farming practices.

The city government partners with the local agricultural cooperative, JA Tajima, to help market, sell, and distribute "Stork Natural Rice", the brand for all rice cultivating using the "stork-friendly" method. One difficulty associated with marketing an "environmentally friendly" item is justifying its price (Bhaskaran et al. 2006, 677-690). Products made through environmentally sound methods tend to be more expensive as they often require significantly more manual labor and careful planning in comparison to conventional agriculture (Brumfield, Rimal, and Reiners 2000). Because of this, farms utilizing alternative methods of agriculture tend to be smaller scale, with lower crop yields. Because farmers can only produce comparatively small amounts with greater added costs and labor, they must sell their products at a higher price. Normally, the value of any good is related to its quality and desirability - the economic principles

of supply and demand. However, when considering value-added products like organic food, the determinants of a consumer's willingness to pay are very subjective and dependent on the consumer's understanding of the ecological and social value of the product in comparison to less expensive, conventional alternatives (Basha et al. 2015). While Toyooka has been successful in increasing the number of participating farmers, one challenge has been to increase "Stork Natural Rice" sales at the same rate as the increase of "stork-friendly" rice acreage. In most recent years, this has resulted in a surplus of rice produced ecologically, and JA Tajima has had to cover the costs.

Recognizing this issue, the city has actively attempted to engage in the promotional activities related to selling "Stork Natural Rice", something that has traditionally been exclusively done by the agricultural cooperatives in Japan. Throughout the year, my co-workers, along with employees of JA Tajima, went to locations selling Toyooka's ecologically cultivated rice, standing by the product in order to personally promote and explain the benefits of this particular brand of rice. One day during my internship, a few of us in the Eco-Friendly Agriculture section went out to a rice field to collect a wide variety of organisms that my co-worker then took to an event at a grocery store in Kobe, a large urban city, to demonstrate the impacts of the "stork-friendly" agricultural method. These events are especially popular with children, many of whom have never seen a rice paddy and many of the organisms displayed during the event. My co-workers hope is that while the children are distracted by the various organisms, the parents might also become more interested in the rice and the values behind the production method. Along with aiding in the sales of *Stork Natural Rice*, these events help the city use consumption as a way to raise awareness about the environment and the various environmental impacts of agriculture, as well as help attract potential future visitors to Toyooka.

The city government and JA Tajima have also partnered with Ito-Yokado, a popular Japanese chain grocery store, to implement a sweepstakes that gives those who buy “Stork Natural Rice” a chance to win a trip to Toyooka that includes an opportunity to go into the rice fields and help with harvesting or planting, depending on the season. Toyooka City includes Kinohaki Onsen, a popular and well known hot spring town, so many consumers are attracted to the possibility of winning a free stay at a traditional hot spring hotel as well as the complimentary dinner that includes the region’s specialities - the famous Matsuba snow crab and Tajima beef. Through this pragmatic and involved approach, the city government is able to simultaneously increase the sales of “Stork Natural Rice” and increase tourism and overall interest in Toyooka.

One Step at a Time - Positive rather than restrictive environmentalism

As the city government represents the views of all the residents of Toyooka they cannot take on a project without there being a demand for it in the community. Additionally, even if there is proven support for the city’s initiatives, they cannot simply ignore those who do not agree or refuse to participate. The mayor of Toyooka often eloquently expresses to interviewers that his mindset towards all of Toyooka’s efforts is represented in the phrase, “one step at a time”. When the city government first started to promote and implement “stork-friendly farming” in Toyooka, there were only a handful of participating farmers who were looked at skeptically by other local rice farmers. Instead of trying to convince other farmers to change their ways, the city instead focused on the farmers who had initially asked the city government to aid them in their ecological endeavours. Eventually, as the city government worked to address the various concerns participating farmers brought to them, the project grew larger, and today there are over

800 acres of “stork-friendly” rice being cultivated in Toyooka.

The city distributed a survey to farmers who are not currently using the “stork-friendly” method in an effort to understand what was keeping certain farmers from participating in the city’s agricultural initiatives. The responses to the first question, “do you want to participate in stork-friendly farming” (fig. 4), indicate that around 37% of respondents showed interest in participating in the city’s efforts. Acknowledging that they would not likely be able to immediately change the minds of those are simply not currently interested in pursuing ecological methods of farming, the city focused on eliminating the barriers preventing the participation of farmers who said they were interested but could not due to various logistical and economic reasons.

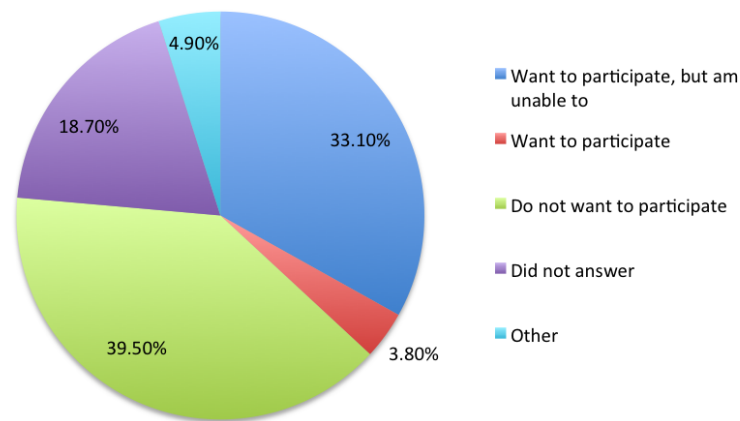


Fig. 4 Pie chart showing responses to the question: do you want to participate in “Stork-friendly farming?” (Toyooka Municipal Government’s survey results, used with permission)

Especially given the current state of the agricultural economy in Japan, it is unrealistic to expect farmers to take on additional tasks and complicate their growing season without any economic reward. In order to increase participation in the city’s ecological certification program, my co-workers attempt to make the “stork-friendly” farming method more appealing, not only through the promotion of the subsidy program, but also through their own experimentation with

new techniques and technologies that would allow farmers to increase their yields of rice grown ecologically while reducing the labor involved. Because rice paddies are artificial wetland ecosystems that require frequent human intervention and maintenance, promoting farming itself as an economical viable choice for Toyooka's residents is imperative to the stork reintroduction efforts. Making farming profitable again also helps keep these agricultural lands in use and helps the city avoid further agricultural abandonment.

Many farmers fear the economic costs they would have to endure would outweigh any environmental benefits that could result if they shift to "stork-friendly" farming methods. There exists a prevalent idea throughout the world that ecologically-minded methods of farming, as well as environmentalism as a whole, represent anti-progress constraints to economic development (Christie 2010, 36). However, instead of hindering progress, Toyooka attempts to innovate ways to develop their local economy through more environmentally sound methods. Innovating new ways to allow farmers to maintain sufficient yields without the use of agrochemicals is a part of Toyooka's pragmatic approach to sustainable agriculture and creating an environmentally sound community. In contemplating various ways to help farmers efficiently and easily carry out agriculture without the use of agro-chemicals, the city government is finding solutions that are similar to what the farmers in pre-agrochemical period also found to be the most effective ways of cultivating rice. However, my co-workers are not going back into the archives of Japanese agricultural history for specific techniques. It is only afterwards that my co-worker became interested in reading about how people farmed before the introduction of agrochemicals, and found many parallels between traditional methods and the methods Toyooka is pursuing today.

During the Edo period, farmers grew clusters of rice seedlings in one paddy before

transplanting them by hand one by one into evenly spaced rows in another paddy once the seedlings were of a sufficient size (Brown 2009). Today, in conventionally grown rice paddies, rice seedlings are grown in clusters in flat boxes in greenhouses and then upon transplantation, they are ripped apart by the roots by tractors and then planted into the rice paddies. This process, used to increase the efficiency and speed of rice planting, weakens the plants, but the synthetic fertilizers and herbicides allow them to grow regardless of their roots being initially damaged. Realizing that this method would not work without the use of agrochemicals, Toyooka's city government and some local farmers have looked for ways to increase yields by experimenting with ways to grow the seedlings individually as plugs, as is often done by organic vegetable farmers and gardeners, instead of in clusters. In order to implement this technique in the rice paddies, Toyooka has partnered with an agricultural technology company, Minoru Sangyo, who designed a tractor that allows farmers to mechanically transplant seedlings grown individually as plugs, as well as weed-whacking tractors that allow farmers to easily weed in between rows of planted rice crops while simultaneously applying locally sourced organic fertilizer (fig. 5). For



Fig. 5. A weed-whacking tractor designed by Minoru Sangyo (photo taken by author, 2016)

Toyooka City, the “stork-friendly” farming methods are not an attempt to go back to a more antiquated way of farming, but rather to find ways to increase the efficiency of rice farming.

Even those farmers who have expressed their unwillingness to try “stork-friendly” farming often support the city’s larger stork reintroduction efforts because the project has helped revive Toyooka’s dying agricultural economy. Agricultural and rural abandonment have had devastating effects on the economy not only of Toyooka, but many similar rural municipalities in Japan (Feldhoff 2013, 101). When employees of JA Tajima expressed their optimism for the new young farmers in the region, many of whom are interested in “stork-friendly” agriculture, they mentioned that these new farmers are mostly in their forties and fifties. In many other contexts, people within this age range may not be considered “young”, but for the agricultural community of Japan, within which the average age of a farmer is 66.8 (Basic Data Related to Agriculture, Forestry and Fisheries, 2017), anyone under the age of around 55 is often labelled a “young farmer”. Because of this increasingly aging agricultural population, while not all farmers may agree with or want to participate in the “stork-friendly” method, there is an appreciation for how the Toyooka City’s efforts concerning stork reintroduction have helped pique the interest of younger people and returned life, both human and animal, back to the rice paddies of Toyooka.

Passionate workers

While I have mentioned how the “stork-friendly” farming method itself was an idea that originated from the farming community, I cannot emphasize enough how crucial the city government’s involvement has been for the success of the overall effort to reintroduce storks to Toyooka. In particular, the passion and enthusiasm towards the stork reintroduction project exhibited by the government employees has been instrumental in engaging both residents and

corporate and governmental entities to participate in and support the stork reintroduction efforts. While we were out in the field one day, my co-worker, Okinaka, sticking a waterproof camera into the water with an almost incomprehensible amount of excitement, called me over to the rice paddy he was looking at. “Look!” he said, as he showed me a picture of what, to me, just looked like some mud with rice seedlings growing in it. “Those are all sludge worms! This is incredible!” As I mentioned earlier in this chapter and as I learned throughout the course of my internship, sludge worms are a significant factor in the success of the “stork-friendly” farming method. At the time, I was still in the first week of my internship and could only smile and nod in slight confusion. His enthusiasm, however, was contagious and I found myself staring in awe at what just a few seconds ago looked to me like plain old mud.



Fig. 6 My co-worker not resembling the typical Japanese government worker stereotype (photo taken by the author, 2016)

Instead of making policy decisions from behind a computer at their desks in the city hall, my co-workers and supervisor routinely shattered the typical image many Japanese people have of the rigid, uncompromising government worker by getting out into the field on a near daily basis and engaging directly with various government initiatives (fig. 6). Toyooka’s efforts exemplify how the increased autonomy of local governments can help aid environmental efforts

in Japan. Since the Tokugawa shogunate unified the nation during the Edo period, Japan has been a highly centralized nation. However, in more recent years, there has been an emerging trend of the decentralization of Japan. The Heisei mergers, a project that began in 1999 (Heisei 11 in the Japanese dating system) and was completed in 2010 (Heisei 22), resulted in the decrease in number of municipalities in Japan from 3232 to 1727 (Rausch 2015). While Rausch notes the discrepancies in the impacts of the consolidation of municipalities, in some cases, the mergers have led to the increased presence of local governments. Before the Uniform Decentralization Law of 2000, the local municipal governments acted as executive branches of the federal government, and had regulatory power delegated to them (Kimura 2016). After the implementation of the new law and the completion of the numerous municipal mergers, many local governments became more autonomous from the central federal government.

In the year that I interned at Toyooka City Hall, there had been many scandals in Japan involving regional and local government employees abusing taxpayer money on personal expenses. In 2014, Toyooka's own Kinosaki onsen, the hot spring resort town located within the municipality, received some publicity when the former Hyogo Prefectural Assembly member Ryutaro Nonomura infamously went viral after wailing uncontrollably during a press conference in which he was apologizing for spending taxpayer money on 195 days' worth of "business trip" expenses to the hot spring town. Within this particular context of increased scrutiny of government workers, many of the residents, farmers, JA Tajima workers, and others that my co-workers worked with throughout Toyooka and the larger region felt proud that their own city representatives were actively and passionately working to improve the economic and environmental situation of their hometown. Seeing the government officials working so diligently in rice paddies, grocery stores, and in governmental procedural meetings has also

motivated many farmers and other institutions to help support the city's efforts. This kind of enthusiasm and commitment on the part of the municipal government itself has been a very significant contributor to the success of Toyooka's stork reintroduction efforts.

Conclusion

E.N. Anderson claims that as a global society, we already have the technology, knowledge, and resources required to address the various impending environmental challenges that exist in the world today. The issue has been the inability on the part of various parties to make appropriate compromises and unite in order to achieve the common goal of guaranteeing the maintenance and progression of human civilization. In this chapter, I have articulated how Toyooka has started to successfully implement a rather radical shift in agricultural methods within the local community by cultivating cooperation and understanding amongst a wide variety of individuals and institutions. This cooperation has been made possible due to the passionate and diligent nature of the government workers of Toyooka City Hall, as well as a synthesis of bottom-up initiatives on the part of local farmers, and top-down initiatives enacted by the city hall. These pragmatic methods have allowed Toyooka to begin to normalize environmentally sound agricultural techniques within the community. Amongst the endless literature available on case studies of our world's various environmental failures, it is my hope that this chapter has illuminated ways in which ethnographic inquiry of relatively successful ecologically minded initiatives can help shed light on the possibilities of establishing cultures of sustainability within the contemporary economic and political contexts. In addition, I hope that this chapter has illuminated how local government can play an instrumental role in supporting and promoting sustainable agriculture as a way to boost the local economy and the local natural environment.

Chapter 3

Japan's Changing Landscapes and Values: Culturally Contextualized Environmentalism

Encultured Nature in Japan

While it is common for people to rely on public transportation in Japan's larger cities, in smaller towns like Toyooka, a personal car is indispensable for getting around. My not having a car or knowing how to drive meant that my experience of Toyooka on my days off from my internship were limited to the concentrated and built up central area surrounding my apartment building. I lived on the 3rd floor of a ten-story apartment building, just a three-minute walk from my internship at the city hall. Within a mile radius, I had access to convenience stores, a mall with a large grocery store, food court and shops, many bars and restaurants, as well as all the basic institutions like banks, clinics, and a regional train station.

One day, a woman who works in the Section for Coexisting with Storks at the city hall offered to drive me to a restaurant called *Amita* for lunch. Located just outside Toyooka's urban center, *Amita* is well known in the region for transforming locally sourced, seasonal products into delicious French-inspired dishes. From the large windows that make up the far wall of the restaurant, you get a great view of several rice paddies, backed by Toyooka's large, forested mountains. Even though the restaurant is just 3 miles away from where I lived in Toyooka, the scene was drastically different. I felt like I had been transported into the world of *My Neighbor Totoro*, the Miyazaki Hayao film that greatly popularized this kind of traditional Japanese landscape often referred to as *satoyama* (village-mountain) (Yokohari and Bolthouse 2011).

When the Toyooka City government states that their mission is to create “an environment

in which storks can *also* live”, they evoke the notion of the *satoyama landscape*, the cultural landscape within which humans had a harmonious relationship with the surrounding environment, as I briefly explained in Chapter 1. While the use of the term *satoyama* to denote these kinds of landscapes is a rather recent phenomenon (Knight 2010, 423), the term is usually employed today to positively represent landscapes within which humans could coexist harmoniously with non-human life (Knight 2010; Takeuchi et al. 2003). In these settings, people relied on closed-loop systems created between human residences, agricultural fields, forested woodlands, and, in some cases, the ocean (although landscapes that have been shaped by the prolonged interaction between people and the ocean are referred to as *satoumi*, or “village-ocean”) to effectively use the limited resources available within one’s close surroundings.

The reestablishment of Toyooka as a *satoyama* community forms a large part of Toyooka’s overall stork reintroduction efforts. While transforming aspects of Toyooka’s agricultural systems for the benefit of the storks alone could help stork populations persist in Toyooka, Toyooka’s municipal government hopes to regain more than just the natural environment that once existed in the region. They also want to establish a certain culture of sustainability within which the needs of non-human life are also considered and respected. The promotion of Toyooka’s *satoyama* landscape helps achieve this larger shift in public perceptions of human-nature relationships. However, Toyooka’s modern conception of *satoyama* does not rely on the existence of the traditional lifestyles that had originally created these kinds of landscapes. Instead, in keeping with the pragmatic philosophy behind all of Toyooka’s efforts, the municipal government attempts to make this kind of landscape relevant to Toyooka’s contemporary cultural, economic, and political context.

This chapter seeks to answer two main questions: how was Japanese culture influenced

by the shift from the various systems that existed during the Tokugawa period to the modern systems that exist today, and how does Toyooka's municipal government frame sustainable lifestyles and economic systems in a way that resonates with Japan's contemporary culture? In the first part of this chapter, I use the modern conception of *satoyama* as a starting point to discuss Japan's varying contemporary contexts and landscapes. Then, I analyze what Japan's changing landscapes and associated cultural norms and values means for the possibility of sustainability in Japan. By contextualizing the aims and results of Toyooka's project described in the previous chapter, I hope to pinpoint the cultural and social reasons why Toyooka's project has taken the form that it has, and what sustainability should mean within the specific cultural context of Japan. In this chapter, I also emphasize the connections between societal practices, including agriculture, and societal values and morality and argue that the former largely impacts the later.

Japan's Cultural Ecology

“No other race with which we are acquainted have the love of Nature so strongly inborn and widespread in them. It pervades their whole life, and colours the entire range of their religion, art, and poetry, as well as their daily pursuits and their holiday recreations.” (Weston 1923, 106)

A pervasive myth about Japan that appears in both scholarly and popular realms is the supposed innate Japanese “love of nature” (Morris-Suzuki 1991, 81). Citing religion, books, artwork and customs, people often praise Japan for realizing a society that seeks to live in harmony with nature (Watanabe, 1974). But as several scholars, notably Pamela Asquith and Arne Kalland (1997), have noted, this romantic myth of a nature-loving Japan is a simplistic and

shallow representation of the realities of Japanese life. If the myth were true, then how can one explain the significant impact Western influences, urbanization, and modernization in general have had on Japanese ways of life that currently do not seem to resemble harmony with nature? Surely, if a love of nature is a deeply embedded characteristic of Japanese people, Japanese society would not have so quickly and rapidly adapted to the materialistic, consumer-driven, and often unsustainable culture that exists in the nation today.

This chapter borrows its theoretical methodology from cultural ecology, a term first coined by anthropologist Julian Steward (1955), which views the environment as the extracultural factor that shapes culture. Within this framework, human adaptations to their local environments create certain geographically determined cultural characteristics. The development of the *satoyama* landscape and associated cultural norms can also be understood through Japan's geographic and geological context. In many ways, the *satoyama* landscape represents how Japanese people adapted to the nation's often hostile environment. Historian Tessa Morris-Suzuki (1991, 86) explains how, for many intellectuals working in the Edo period, humans formed an integral part of the natural order because of their ability to "perfect" nature. According to Suzuki, it is precisely this notion of "human beings as parts of a wider whole, but parts who have a special role to play in the survival and growth of the whole", in which the "wider whole" is represented by nature, that lead to the more environmentally destructive practices that evolved in Japan in the Meiji period and beyond. Citing one particular Meiji entrepreneur who explained that "industry itself is an instrument for achieving the moral principles of nature" (Morris-Suzuki 1991, 96), Morris-Suzuki illustrates how the same ideas that lead to the creation of seemingly sustainable and environmentally sound ways of life also lead to more environmentally destructive practices later on in Japan's history. As Japan's physical environment grew to also

incorporate lands beyond their borders, the limits of morally acceptable practices were also transformed.

Species Reintroduction and Defining *The Wild*

This Japanese breaking down of the nature/culture divide is evident in many aspects of Toyooka's stork reintroduction efforts. Something that stood out to me when I was first introduced to Toyooka's stork reintroduction efforts is the name of the project itself - stork reintroduction to the wild. Species reintroduction is defined as "an attempt to establish a species in an area which was once part of its historical range, but from which it has been extirpated or become extinct" (IUCN 1995 quoted in Emslie et al., 2009). However, in the U.S., for example, species reintroduction projects usually involve the release of a species from captivity into national parks or other protected "wild" areas. In these cases, there is a clear distinction between "nature" and the realm of human activity. Animals, whose ability to live in certain environments were significantly diminished due to human activity, are raised in captivity and then released into areas within their historical habitat range in which they will be free from the threat of direct human activity as well as invasive predators that were introduced to the animals' native environments because of human activity.

Thinking of Toyooka's stork reintroduction efforts, we can see clear differences in the meaning of reintroducing a species into the "wild". The five storks released from captivity back in 2005 were not reintroduced into protected "natural" spaces, and there are no efforts to attempt to contain the birds. Instead, the birds create nests on artificial "nest towers" built and maintained by the city government, find prey in rice paddies, and are free to roam throughout Toyooka and migrate to other parts of Japan and abroad. When my coworkers at the Toyooka City Hall talk

about the reintroduction of storks into the “wild”, they clearly mean the release of the birds from captivity and back into the environment in which they once lived freely, in and amongst people and their rice paddies.

In many ways, agriculture and conservation efforts stand at opposite ends of the spectrum when it comes to the relationship between humans and the rest of the world. Especially within today’s increasingly industrialized landscape, the latter often attempts to rectify the negative effects of the former, such as environmental degradation, erosion, pollution, and decline in biodiversity. Scholars frequently cite the inception of agriculture as the first instance in which humans began to actively manipulate the earth’s natural ecosystems for their own benefit (Sage 2011, 68). However, in Toyooka, the preservation of the region’s *satoyama* landscape, of which agriculture and human intervention constitute a significant part, is imperative to the success of the stork reintroduction and conservation efforts.

In his article, “The Trouble with Wilderness” (1995), historian William Cronon discusses the consequences of considering certain spaces “wilderness”. Envisioning a “wilderness” that is completely separate from human activity allows people to separate in their minds the spaces that should be protected and unaffected by human activity, and those we can continue to exploit and use to our own benefit. As a solution to the issues he presents regarding the concept of wilderness, he urges the reader to find “wilderness” in our daily lives. This solution seems similar to the solution Toyooka found in trying to keep their promise to the stork to release them once again into the “wild”. Instead of finding a far-off *wilderness* to preserve and protect in a culturally constructed state of *naturalness*, Toyooka City instead hopes to recreate a domesticated landscape, *satoyama*, within which human activity is not completely detrimental. This conception of *the wild* originates from the Japanese conception of nature and can be

understood in relation to the idea found within Edo period literature that humans occupy a special role within the natural order. The rice paddies that are important to the *satoyama* landscape are a perfect example of how human intervention within the natural order benefitted non-human life.

Agriculture and Human Values - The consequences of agricultural change

“Like many in this country, and sooner than most, Mr. Fukuoka has understood that we cannot isolate one aspect of life from another. When we change the way we grow our food, we change our food, we change society, we change our values.” (Berry in Fukuoka et al. 2010)

As urban areas continue to grow in popularity and size, rural abandonment has become an increasingly prominent issue throughout Japan. The agricultural sector in particular is impacted significantly by this urban migration. While there exists a growing minority of young farmers that have decided to take up agriculture, often after leaving other jobs, the majority of Japan’s agricultural population is still constituted primarily by older farmers, with the average age of farmers being 66.8 as of 2016 (Basic Data Related to Agriculture, Forestry and Fisheries, 2017). “Young” within the Japanese farming community can denote anyone younger than their mid-40s. Throughout the world, farmers constitute a declining demographic especially because farming is difficult and unpredictable. (UN FAO, 2014). Bad harvests, inclement weather - these are all things out of any person’s control. Specifically in Japan, these uncontrollable elements may seem unattractive to a society that emphasizes a good work ethic, and teaches that hard work will pay off.

The representative from a company that purchases abandoned farmland for cultivation

told me in my interview that he was surprised that many of his employees had been able to get married and have kids. Rice farming in particular is a profession known not to be conducive of a comfortable life. Not only is the work difficult and unpredictable, the profit margin, especially in recent years, is incredibly small. The representative from Nakanotani commented that the price of rice declined to half of what it was when their cooperative farming company started. In addition to the decline of rice consumption in Japan, foreign imports of cheaper rice also negatively impact the economic viability of Japanese rice farmers. In Japan, the rice paddies remain small and individualized especially when compared to the vast rice fields of the U.S. that are sprayed with pesticides and herbicides by helicopters flying overhead. When the fields are larger, a relatively small number of people can tend to these lands through the use of large machines. In Japan, however, since the rice paddies are much smaller, large tractors and combines cannot be used. Instead, a larger number of individual farmers are needed to maintain rice production in a smaller area.

The decline of rice farming in Japan has various environmental and societal impacts. In the next few sections, I will illustrate how changes made to the landscape have influenced Japanese culture and, in particular, Japanese perceptions and values related to the natural environment. In the first chapter, I described how the urbanization of Edo, modern day Tokyo, during the reign of the Tokugawa government led to the demand for monoculture-crop agriculture. Hayami (2015) describes how this shift to cultivating crops for profit led to a creation of a new work ethic that persists in Japanese culture to this day. With the added incentive of making a profit, farmers were more motivated to improve methods of production in order to either increase the quality or quantity of yields (Hayami 2015). This agricultural transition influenced both the way Japanese people viewed nature and their overall morals and

values. As mentioned previously in this chapter, many scholars describe Japan as being a “nature-loving” society. From this perspective, many of Japan’s environmental crises of the 20th century are often seen as a direct consequence of the importation of Western ideals and ways of life into Japan. However, looking at how Japanese society, and specifically Japanese agriculture, changed throughout the Edo period, it is clear that the urbanization of Edo had already begun to influence a shift in human values, morality, and perceptions of nature. In particular, the creation of urban market centers in Edo and castle towns throughout Japan led to the commodification of agriculture.

Similarly, the switch from labor intensive to capital intensive agriculture that occurred with the increased mechanization of agricultural methods following World War II had various societal implications. In particular, in order to accommodate the need to invest capital in their agricultural production, farmers began to find other work to supplement their agricultural income. This phenomenon was accompanied by the fact that many of the former tenant farmers who gained access to land ownership because of MacArthur’s post-war land reforms were now responsible for the entrepreneurial aspects of agricultural production - a role that was previously taken by the landowners. The societal impacts of this change in the nature of agricultural production in the post-war period has had lasting effects. The continuation of capital intensive agriculture has led to the increased presence of farmers who only farm part-time, and whose main sources of income are non-agricultural (Hayami 1988). These part-time farmers today benefit greatly from tax benefits and subsidies equal to those given to full-time farmers (van der Meer, Yamada 2005). My supervisor told me that he sees the presence of part-time farmers who do not rely solely on their agricultural income as a hindrance to improving the regional quality of rice and agricultural reform in general. Because these farmers are not as motivated to increase

their crop yields and because they benefit from the current political structure of Japanese agriculture, they are less likely to be interested in policy reform that helps increase agricultural productivity or favors structural change (van der Meer and Yamada 2005, 141).

The decrease in the number of full-time farmers in Japan has further distanced many Japanese people from the source of their food. Scholars have noted how the distance between someone and the source of their food can impact their food habits and choices (Weatherell, Tregear, and Allinson 2003). During my time in Toyooka, I had the opportunity to interview one young female farmer in her forties who explained that her food habits changed after becoming a rice farmer. After taking on rice farming as a profession and incorporating the “stork-friendly” farming methods, she now prepares much more rice for her family, and they now eat more rice than noodles. Stating, “now we exclusively eat chemical-free for meals”, she explained that since she can now serve her family the rice she grows herself and knows for sure to be safe, she would much rather have them eat that than noodles, whose origins are much more obscure. “If it’s something we deliver into our mouths, it has to be chemical-free for meals.” Considering the inverse situation, it is possible that the decline of agriculture as a prominent career, both in Japan and elsewhere, and the separation between people and the source of their food which ensues, has allowed for the use of agrochemicals and other environmentally degrading methods of farming. When people are more involved with the food production process and can see for themselves what it takes to produce food, it can become easier to justify eating food produced in environmentally sound ways.

Today, the satoyama landscape represents certain paradoxes that exist in contemporary Japan. While many Japanese people look at these landscapes admiringly, residents of rural regions of Japan are rapidly leaving for a more convenient and economically viable life in larger

cities with very few people replacing them. Although admirable, the way of life associated with the *satoyama* landscape seems antiquated for much of today's urban population. My city-born and bred mother noted that while the landscape was undeniably beautiful, she couldn't imagine living and working in such rural areas as the work would likely be difficult and the life incredibly inconvenient. Japan's urban setting has created a new set of cultural norms, within which convenience and efficiency are prioritized.

As I outlined in the first chapter of this thesis, Japan's landscape has changed drastically since the Edo period. Today, almost a quarter of the population lives in just 12 cities, each with a population of more than one million people (Statistics Bureau 2016). As of 2010, 51% of Japan's population resided in either the Kanto, Chukyo, or Kinki regions, the three major metropolitan areas of Japan. This embrace of urbanization may be a continuation of the Japanese pursuit of efficiency. Like a *satoyama*, the contemporary urban city provides everything one might need on a daily basis within close proximity. Successful environmental movements in Japan must embrace this urban sensibility. Any movement that encourages people simply to revert to antiquated and more laborious ways of life will most likely be unable to gain popularity. Toyooka's project represents one example of a pragmatic approach to incorporate environmentalism into contemporary Japanese life.

Ecological Agriculture in the Contemporary Japanese Context

Before the introduction of agricultural chemicals like pesticides, herbicides, and synthetic fertilizers, agriculture in Japan and throughout the world demanded certain levels of cooperation between people and the natural world. Vegetables cannot be grown, for example, without the aid of pollinators like bees and butterflies. In the carefully managed and maintained *satoyama*

villages, animals also flourished and adapted to the domesticated landscape. Toyooka's case serves as a clear example for how the elimination of rice paddies as a viable habitat led to the eventual local extinction of the storks. While I emphasized the impact of agrochemical use on biodiversity throughout this thesis, agricultural abandonment also significantly impacts the viability of wildlife. Within environmental studies, it is often noted that detrimental human activity such as excessive deforestation or resource mining can lead to a loss of biodiversity. However, in an area that had been maintained in a specific way by people over a longer period of time, the lack of human activity and management can actually lead to a decrease in biodiversity in those areas. Koyanagi and Furukawa (2013) discuss how depopulation in Japan has affected grassland biodiversity. In particular, they found that areas with high rates of agrarian depopulation were more at risk of experiencing a loss of grassland species than areas with larger losses of grassland areas (7). For agriculture to be sustainable in the holistic sense in Japan, there must be measures taken to ensure that people continue to reside in and tend to these lands.

While many organisms may have benefitted from the domesticated satoyama landscape, it is important to note that agriculture, and other human uses of the environment such as forestry and resource extraction, are utilitarian ways in which people use the land. Within this conception, "nature" may be observed solely for the commercial and valuable resources it can produce. (Scott 1998). When people had limited technology and resources to modify the landscape, a more harmonious relationship between people and their surrounding landscape was possible. Modern agriculture, however, has changed the dynamic of this relationship between people and the natural ecosystems. The desire to conduct agriculture in the most efficient and effective ways led to the creation of new agricultural technology including agrochemicals and large machinery like tractors and combines. From a utilitarian standpoint, there is a clear

distinction between what is considered a “crop”, what the farmer hopes to cultivate in order to gain a profit, and a “weed”, the other plants that could grow and which would encroach on the growth of the “crop”. In addition, “pests” are organisms that can potentially harm the growth of the “crop” by eating them or by carrying and spreading diseases that can affect the desired plant.

The cultural theorist Stuart Hall (2001) explains that discourse, in the sense that the philosopher Michel Foucault described it, “governs the way that a topic can be meaningfully talked about and reasoned about. It also influences how ideas are put into practice and used to regulate the conduct of others” (Hall 200, 72). The discourses that have appeared within agriculture, or the way in which people talk about and discuss agriculture, speaks to the culture surrounding agriculture, and how people are thinking about their surrounding landscape. These aforementioned agricultural concepts that describe the various relationships found within an agricultural landscape are culturally derived and were born out of the desire on the part of farmers to grow and harvest food in the most efficient ways. While these categories predate the introduction of modern industrial agriculture, the new technologies made the categories much more narrow and defined. In the past, since chemicals did not exist, all people could do was hunt certain animals that may eat the “crops”, or create fences to ward them off. In her book, *Just Enough - lessons in living green from traditional Japan* (2009), Azby Brown describes how Japanese farmers during the Edo period practiced mulching to help suppress weeds and composting to provide organic fertilizer for the rice crops. In recent years, however, these categories of “weed”, “crop”, and “pest” now justify the use of agricultural chemicals that can be harmful to both the environment and to human health. Manure, and other “green” fertilizers has been replaced by chemical fertilizers, and maximum profits are guaranteed through the use of pesticides that kill any organism that may hinder the growth of plants or carry diseases, and

herbicides that kill any plant other than what was planted. This mindset is detrimental to biodiversity within agricultural ecosystems. Pesticides and herbicides are usually indiscriminate, often killing more than just the targeted organism.

As a response to the negative impacts of modern agriculture, many ecologically minded farmers now opt for more low impact ways of farming. In his book *The One-Straw Revolution: An Introduction to Natural Farming* (1978), Masanobu Fukuoka, a Japanese farmer and philosopher, defends his “do-nothing” approach to farming by explaining, “Nature, left alone, is in perfect balance. Harmful insects and plant diseases are always present, but do not occur in nature to an extent which requires the use of poisonous chemicals. The sensible approach to disease and insect control is to grow sturdy crops in a healthy environment” (Fukuoka 1978, 33). Fukuoka’s “natural farming” has four main principles: 1. No cultivation - “no plowing or turning of the soil”, 2. No chemical fertilizer or prepared compost, 3. No weeding by tillage or herbicides, and 4. No dependence on chemicals. Immediately, it is clear that Toyooka’s “stork-friendly” farming method does not comply with this rather radical approach to farming, as plowing, turning of the soil, and weeding are all permitted.

However, the city’s use of the term “agriculture imagining the environment” and their desire to reestablish the natural food chains that once existed in rice paddies seem to reflect some of the ideological reasonings behind Fukuoka’s approach to farming. My co-workers, too, often emphasized that the biodiversity present within “stork-friendly” rice paddies, including the sludge worms, helps sustain the rice paddies without the use of pesticides and herbicides. Since Fukuoka, other Japanese farmers have attempted to follow the “natural farming” philosophy, including Yoshikazu Kawaguchi. Kato (2003) associates the philosophy behind Kawaguchi’s interpretation of “natural farming” with the old Japanese saying, *Shindo-fuji*, or “body and earth

are not two”. This phrase illustrates the idea that existed within Japanese traditional thought that our human bodies have a close relationship with the earth, and that you cannot separate the two. In other words, what is good for the human body and what is good for the earth are one and the same. Toyooka’s aim to create “an environment in which storks can *also* live” also reflects this idea that what is good for people and for non-human life is inherently the same.

What makes Toyooka’s project different than “natural farming”, however, is its practicality. While Toyooka City hopes to promote truly ecologically sound farming techniques, they do not claim that their method of agriculture is completely “natural”. My co-workers also see the necessity of making their project accessible and reasonable for many farmers. Although reintroducing storks is a key priority for Toyooka, the city government also hopes that their efforts will help to increase Toyooka’s dying agricultural population. As I have mentioned in this chapter, the artificial rice paddy wetland ecosystems demand human intervention and maintenance. In order for “stork-friendly” farming to be truly sustainable, it must help Toyooka combat agricultural abandonment by incentivizing rice farming. While Fukuoka describes his method of farming as “do-nothing”, it is actually a very involved process. Fukuoka himself describes in his book how, when he first tried his techniques on his father’s citrus trees, the entire orchard died due to his lack of intervention. Kawaguchi, too, when he first attempted Fukuoka’s approach to farming, was met with catastrophic failure, and harvested “no crops for two years” (Kato 2003, 24). Kawaguchi only started to succeed when he realized that what was important was not the specific techniques laid out by Fukuoka, but the principles behind them. In order to make Fukuoka’s conception of “natural farming” more practical and accessible to farmers, he made some small changes, such as eliminating the practice of “direct seeding” clay coated rice seeds directly to the rice paddy, and instead using the conventional method of growing the seeds

in a separate nursery before transplanting them into the rice paddy.

Toyooka's "stork-friendly" farming method can be seen as a way to make "natural farming" more practical. What makes the "stork-friendly" farming method unique within today's many approaches that aim for sustainable agriculture is the acceptance and promotion of technological innovation. While the "stork-friendly" method very much resembles rice cultivation methods that prevailed during the Edo period and also incorporates some philosophical elements of Fukuoka's "natural farming", it simultaneously embraces modern technology and innovation. As explained in the previous chapter, Toyooka's city government works closely with Minoru Sangyo, an agricultural technology company, to help introduce new technology to help make it easier for farmers to pursue chemical-free farming. It may seem ironic that the city relies on the innovation of new agricultural technology to reverse the impacts of the agricultural technologies that were introduced to Japan in the mid 20th century. As technology was the original culprit of the storks' disappearance from Japan, it may seem more logical to follow the path of "natural farming" or another low-impact agricultural method to recreate an environment in which human and non-human life can live harmoniously. However, because the rice paddy wetland ecosystem depends on the continued existence of farmers to cultivate the rice paddies, an embrace of technology and a willingness to cater to the logistical needs of the farmer are imperative to the sustainability of Japan's agricultural systems.

Japan's Consumer Culture and Environmentalism

Something that stands out in looking at Japan's more recent agricultural policies and trends is that, unlike the U.S. and parts of Europe, there is yet to be a widely prominent organic food movement. (Motomura for USDA , 2013). While the government's standards associated

with agriculture, JAS (Japan Agricultural Standards), also includes an organic label, *yuuki* “organic” JAS, it is much less prevalent within the Japanese mainstream than its counterpart, USDA Organic, is in the U.S. While terms like “organic” and “all-natural” are commonly seen in most grocery stores in the U.S., this is not the case yet in Japan. Organically grown products are mostly purchased in select shops and through specific services like *co-op shizenha*, “nature-inclined cooperative”, a national delivery service for organic products. While organic products do sometimes appear on the shelves of regular grocery stores, their comparatively high prices often deter customers. In order to competitively sell “Stork Natural Rice”, for example, my co-workers in the city hall often set up large events at grocery stores and department stores to educate customers about their product. In addition, there are two versions of “Stork Natural Rice” that are sold in Japan - chemical-free and reduced chemical. Overseas in places like Italy and the U.S., however, the chemical-free version is exclusively promoted. When first organizing their participation in the Milan Expo 2015, my supervisor was told that there would be no demand for “reduced-chemical” rice in Europe. In Japan, however, this slightly less expensive option is quite popular, despite its not being completely “organic”.

Having only studied sustainable agriculture within the U.S. context prior to going to Toyooka, one of the things that surprised me the most was the lack of tension between conventional and chemical-free or reduced-chemical farmers. In fact, in many cases, the same farmers often grew rice both conventionally and using chemical-free methods. The city hopes that the “stork-friendly” certification will allow farmers to diversify and augment their income made from rice farming, rather than cut into their profits. For farmers in Toyooka, the choice is not between being either conventional or organic, it’s how much of their land they want to cultivate conventionally or organically. When farmers first come to the city hall asking about the

“Stork-Friendly Farming” program, they want to know what it will take to convert some of their land. Nobody is coming in wanting to convert their entire operation to the alternative farming method. Responding to my surprise about this phenomenon, the young female farmer I interviewed pointed to the Japanese economic context and the need many people have for conventionally grown rice as a reason why she uses both conventional and chemical-free methods. “In Japan, rice is really safe, so there’s the aspect that even conventionally grown rice is probably pretty safe”, she responded, before continuing, “When it comes to chemical-free and reduced-chemical (produce), the price also becomes higher so the balance between supply and demand in that area means there’s a demand for conventional (produce) because the price is decent, it’s tasty and probably pretty safe.”

Anthropologist Nicholas Sternsdorff-Cisterna (2015) emphasizes that, in Japan, “food safety is both a question of science and of affective networks of trust” (456). These two related yet distinguished ideas are expressed by the use of the terms “*anzen*”, *safety*, and “*anshin*”, *providing peace of mind*. My internship supervisor also repeatedly emphasized that the “stork-friendly” farming method is one that simultaneously cultivates a wide variety of organisms as well as rice that is both “*anzen*” and “*anshin*”. It seems that for the Japanese consumer, one of the main reasons for purchasing more sustainable products is for the anthropocentric benefit of their being “safer”. However, the perceived “safeness” of Japanese rice in general, as pointed out by my female farmer interviewee, makes it more difficult to promote the consumption of products like *Stork Natural Rice*. My internship supervisor repeatedly emphasized the influence agrochemicals had on the eventual local extinction of the Oriental White Stork to emphasize how humans, too, could be impacted. In this emphasis, he recognizes that consumers will be unwilling to purchase *Stork Natural Rice* without believing that it will bring them more benefits

than conventionally grown rice, despite *Stork Natural Rice*'s added ecological value.

The juxtaposition of seemingly environmental aspects of traditional Japanese culture and the modernized, high-tech, consumption driven aspects of contemporary Japanese culture has often puzzled me. The most complicated and involved recycling schemes and the nearly spotless cities with very little littering and individual pollution starkly contrast the heavy use of plastic bags, unsustainable packaging, an almost excessive use of electronics and the prevalent culture of consumerism and materialism. In the past, people had no choice but to live in sustainable ways due to the limited resources available in Japan. In contrast, today, living harmoniously with nature is not absolutely necessary for survival. New technologies and industries now allow people to live lives comfortably and it can seem that there is an eternal abundance of resources. If it is possible to eat seemingly safe rice of decent quality at a lower price, then people will certainly choose that option. The modern forms of environmentalism that appear in Japan appeal to the Japanese preference for efficiency and cleanliness. People don't necessarily recycle out of a desire to be environmentally friendly. It is simply systematically difficult not to recycle in Japan. For example, a few weeks after my cousin moved into his apartment in Tokyo to live alone for the first time, my aunt got a call from his landlord complaining that my cousin had not complied to the trash separation rules of his district. The landlord had found my aunt's address and phone number on a package that my cousin had thrown away, and was able to identify the culprit. As summarized in this chapter and in the first chapter of this thesis, during the Edo period and today, top-down approaches to environmental management have been very effective in dictating individual behaviors in Japan. In order to achieve widespread popularity, organic food cannot be marketed simply as something people should buy out of a desire to help "save the environment". It must instead be presented as a logical option given various anthropocentric

concerns including health and food quality.

Decrease in Rice Consumption

Within the U.S. context, sustainable agriculture usually denotes farmers using environmentally sound farming methods, and increasingly also includes those social justice initiatives specifically working towards ameliorating food security and food access for those who are financially struggling (Alkon and Agyeman 2011). This latter trend is in keeping with the proliferation in recent years of the idea of holistic sustainability. This thesis contemplates sustainability in this holistic sense, considering economic, environmental, and social concerns related to pursuing alternative agricultural production methods. In Japan, achieving holistic sustainability must also respect the preservation of Japanese culture. Rice constitutes a significant part of Japanese identity and food culture. Because of its association with the “superior civilization of China” as well as the “relatively high production costs that its cultivation involved”, from the time rice was first introduced to Japan from China, the grain was given a “prestigious status” in relation to other cultivated food crops (Francks 2013, 102). In addition to its being used as a form of currency and a method of taxation in the Edo period, rice was also holds a special place within Japanese cosmology and rituals, as it is believed to be the only grain that has a “soul” (Ohnuki-Tierney 1994, 44).

While the word *gohan* means “cooked rice”, it is also often used to refer to meals in general. *Asagohan*, for example, means breakfast, combining the words *asa*, “morning”, and *gohan*, “meal”. The traditional Japanese breakfast constitutes miso soup, a protein (usually fish or fermented soybeans), a side dish (typically pickled vegetables), and, of course, plain, cooked rice. However, as discussed in the first chapter, Japanese food consumption habits have changed

drastically over the years due to the increased incorporation of other imported staple foods like bread, and an increase in consumption of red meats in the last century (Keene 1956). When you go to a breakfast buffet at a Japanese hotel, for example, you typically get a choice of a traditional Japanese breakfast, as described above, and a Western breakfast, including items like eggs, bacon, toast, and yogurt. The only times I ever eat a traditional Japanese breakfast are when I stay at a Japanese hotel, or when I'm visiting my grandparents at their traditional Japanese home. Like many other Japanese people today, I usually eat toast and yogurt with coffee, or another relatively simple, Westernized meal. The Japanese web-based surveying company, "MacroMill", conducted an online survey on people's various habits and opinions related to breakfast and found that 49% of those surveyed tend to eat bread compared to the 36% who tend to eat rice (Survey of the Current State of Breakfast, 2008). The same survey found that 59.6% of respondents agreed with the statement "I want to eat rice for breakfast", compared to the 50.1% of respondents agreed with the statement "I want to eat bread for breakfast". This suggests that the decline in the consumption of rice may not reflect a societal preference change, but rather the difficulties of preparing rice in the contemporary context.

Aside from the increased importation and appreciation of foreign foods, a significant reason for this change in diet has to do with convenience and lifestyle changes in Japan. As you might guess, preparing rice, fish and miso soup takes more time and effort when compared to frying eggs and toasting bread. When I asked one of my interviewees, the representative of Nakanotani Cooperative Farming Association, how often he ate rice in a day, he proudly told me that he eats rice three times a day. Seeing the surprised look on my face as I commended my interviewee, the female assistants in the office laughed, explaining that his wife is really the one to be commended. As more women have the opportunity to pursue higher-up roles within

Japanese companies and more permanent positions, fewer women choose the traditional role of the house wife. While women have become increasingly prominent in the workplace, the man's place in the household has only slowly started to change. As a result, women are often tasked with going to work, taking care of the kids, and doing household chores (Tsuya et al. 2006). Cooking rice alone can take around 30-45 minutes. In addition, rice must be left to "steam" for another 10-15 minutes to truly finish cooking. In comparison, it takes just 20 or so minutes to boil water and cook spaghetti. Taking into consideration the other chores that may need to be done, it is easy to see how cooking rice may not fit into the fast-paced and busy lives of contemporary Japanese women. One of my interviewees explained that before she took on agriculture as her main profession and she still worked for a company, by the time she came home from work her young children would be hungry so she often cooked noodles.

For Toyooka City's section for eco-friendly agriculture, the decline of rice consumption in Japan compounds the difficulties that are already involved in promoting a value-added product on the mainstream market. However, my co-workers also see opportunities within this shift in Japanese food culture. It would be difficult to convince a family to replace rice they eat for every meal with the pricier *Stork Natural Rice*. However, my co-workers hope that if a family is only eating rice every few meals, perhaps they would be more likely to spend a little more money on rice that has an added ecological value and is of higher quality. This is in keeping with trends in Japan that have made rice less of a staple food and more of a "luxury foodstuff" (Smil and Kobayashi 2012, 18). In order to market *Stork Natural Rice* as a specialty item rather than a staple food, Toyooka's city government is helping farmers innovate ways to improve the overall quality of *Stork Natural Rice* and find ways to increase its score on Japan's rice taste tests. One method of doing this has been the experimental cultivation of a new, particular cultivar of rice

that the city thinks will yield rice crops with larger grains and a richer taste. In addition, the city has worked to establish relationships between farmers and companies that produce food items like pastries and bread made from rice flour in order to further market *Stork Natural Rice* within the context of rice consumption decline. Instead of attempting to increase rice consumption in order to market their value-added product, Toyooka City works to find ways to promote *Stork Natural Rice* consumption within the constraints of Japan's contemporary food culture.

The Modern Satoyama Landscape

I want to conclude this chapter by returning to my anecdote about *Amita*, the farm-to-table restaurant. Biting into a bread roll made from *Stork Natural Rice* flour and gazing out into the agricultural landscape of Toyooka that surrounds the restaurant, I thought to myself, *maybe this is the modern conception of satoyama*. In many ways, *Amita* epitomizes the goals of Toyooka's efforts. The farm-to-table aspect of the restaurant is reminiscent of *satoyama* in that agricultural products are being locally consumed. However, the restaurant blatantly recognizes the sensibilities of contemporary Japanese society. From its modern architecture to the French cuisine it serves, *Amita* embraces Japan's place within today's globalized world.

The purpose of this thesis is not simply to describe and contextualize Toyooka City's stork reintroduction, but also to offer ways in which to evaluate environmental efforts based on their ability to tune in to the cultural context. Looking beyond the perceived notion that Japanese people have a unique love of nature, I have outlined in this chapter how Toyooka's efforts have been able to take advantage of, whether deliberately or not, Japanese society's various contemporary and historical tendencies and contexts. Toyooka's efforts represent an effective way of incorporating sustainability into contemporary Japanese culture. Since it seems unlikely

that the deeply ingrained consumer and urban culture of Japan will change any time in the near future, it is necessary to create sustainability initiatives that cater to Japan's consumer society as well as the social issues specific to Japan such as depopulation and agricultural abandonment in rural areas. Toyooka's project has also successfully taken advantage of the current admiration and nostalgia for the old ways of Japanese life.

For any environmental movement, food-related or otherwise, to achieve success, cultural and social aspects of everyday life must be considered. The solutions that can be found through these means may not be completely ideal in the ecological sense. However, unless environmental options make sense within the way people live, they will not be viable long-term and sustainable solutions. Environmentalists often discuss the need of a paradigm shift in contemporary cultures that would radically change the way people think about the environment and their lifestyle. In my interview with JA, when I asked about any predicted challenges that could result from an increase in farmers choosing to farm using the "stork-friendly" method, one of the representatives told me that since we are dealing with something that *people* eat, there needs to be a change in the way people think. In order to address this issue, JA, in cooperation with the city government, has hosted many events that allow urban consumers to try out rice farming and get their hands dirty in the rice paddies in an attempt to close the gap between people and their food and relate to people who live away from nature why preserving these kinds of occupations is important.

Through the propagation of the satoyama landscape as something desirable and marketable even in Japan's contemporary urban context, Toyooka City is pragmatically initiating a paradigm shift that they hope, for their own municipal purposes, will allow for the beneficial coexistence of storks and people. A basic notion of the discipline of linguistics is that language

cannot be deliberately changed by any individual. Language evolves when individual changes in speech patterns happen in a uniform enough way that language systems need to be adapted (Saussure 1916). Similarly, cultural change that could lead to a paradigm shift cannot happen instantaneously due to the action of a single institution or individual. Collective change on a scale large enough to shift societal behaviors cannot be solely individually driven. Instead, the aggregation of various, unconnected efforts towards sustainability could lead to the societal normalization of sustainable behaviors.

Conclusions

Looking Forward

After spending over two months in Toyooka, I returned to my home city of Yokohama in the stifling heat of August. Disembarking from the bullet train, I felt rather perplexed by the sea of people that I found myself in. Back in the urban jungle of the Tokyo metropolitan area, I couldn't help but feel pessimistic about the impacts of projects like Toyooka's on the rest of Japan. Surrounded by towering skyscrapers and busy roads, I found myself wondering, "what does the future hold for Japan?" While the rice paddies in Toyooka are now teeming with life and increasing in ecological activity, Japan's large cities continue to expand and dominate the landscape, spreading with them unsustainable mindsets and lifestyles. Throughout this thesis, I have emphasized the importance of solidarity and inclusiveness within environmental movements, and that the solidarity the city government creates between various actors in Toyooka has been a large contributor to the city's successes. In concluding my account of Toyooka's stork reintroduction efforts, I want to return to this notion of solidarity by extending the discussion to Japanese society as a whole.

For Toyooka's project to have a larger societal influence, it is important that people throughout Japan see the connections between these kinds of local efforts towards achieving sustainability and their own lives. While the Japanese government has helped spark the revitalization of rural areas like Toyooka by disseminating idealistic and nostalgic images of *furusato* (hometown) and the traditional satoyama landscape, these recent efforts have also worked to further distance these idealized landscapes from the urban reality of many Japanese people. While visiting my relatives who live in Kyushu, the southwestern most main island of

Japan, I attempted to explain the significance of Toyooka's overall efforts but was met only with vague appreciation and interest. Although my relatives were impressed by my passion and commitment to the ideas that I encountered in Toyooka, it seemed that I wasn't able to clearly communicate the pertinence of Toyooka's project to the rest of Japan. "Oh, that's nice. It's nice that governments in the *inaka* (countryside) are doing that." It was clear that although my relatives could understand the merit of the stork reintroduction project, they did not think it was something that affected them as residents of a large city hundreds of miles away from Toyooka.

People often ask me what the point of studying anthropology is. It is easy for many people to view case studies used within anthropological research as distant, exotic, and not having much to do with their own lives and the contexts within which they live. How is anthropology at all relevant to everyday life? What I have tried to show through my interpretation of Toyooka's stork reintroduction project is how ecologically sound community development can be possible within today's various economic, political and societal contexts of Japan. Before completing my internship in Toyooka, I was often very critical of environmental movements that aimed to work within the current conception and confines of capitalism. The capitalistic ideal of unfettered accumulation of wealth has led to many of today's environmental problems, and the idea that the solution could come from the source of these issues seemed unrealistic. The catastrophic way in which environmental issues were often presented to me led me to believe that true environmental change would not be possible without a radical and drastic reorganization of our global society. Throughout my time in Toyooka, however, my mind started to change. Talking to farmers about how the switch to ecological influenced their own perceptions of the environment, playing in the rice paddies and catching organisms with children who grown up in urban settings, seeing my co-worker and workers from Japan Agricultural

Cooperatives dressed in full agricultural attire, knees deep in a rice paddy calculating the growth of the rice crops, seeing numerous storks flying around and perched upon residential rooftops - all these experiences instilled in me a sense of optimism about the future of our environment. Although Toyooka does not attempt to radically alter the various political and economic systems at play, they are succeeding in initiating a change in behaviour and attitudes towards the environment and in reintroducing storks to the lives of Japanese people. Although Toyooka's case relies, in many ways, on Toyooka's specific geographic, historical, and economic context, the fact that around 90 storks now fly free in the skies of Japan gives me hope that truly sustainable initiatives are an actual possibility.

Despite my personal worries about the possibilities of sustainability outside the specific context of Toyooka, the stork reintroduction project has already had significant impacts across Japan. Since Toyooka's experimental release of the five storks back in 2005, several prefectures are now working to implement "stork-friendly" agriculture to attract Toyooka's storks to their own regions. In addition, other cities have started to release storks to the wild. In 2013, two storks were released in Asago, another rural municipality in Hyogo Prefecture. In 2015, storks were released for the first time outside of Hyogo Prefecture, in Chiba, a prefecture that neighbors Tokyo, and then later on in the year in Fukui Prefecture. In the same year, the mayor of Toyooka visited Korea to participate in the first release of storks into the wild outside of Japan. When my supervisor first laid out Toyooka's project to me when I visited Toyooka in the spring prior to my internship, he mentioned that, among the various other goals they wanted to create a cultural environment in Toyooka in which people could think "isn't it lovely to have storks around?" As the population of storks living in the wild grows and spreads throughout Japan, it will be important to simultaneously propagate this cultural environment to the rest of the country. The

increase in number of storks flying free throughout Japan symbolizes the spread of municipalities that are prioritizing life in harmony with the natural environment.

What I also want to reemphasize in concluding is that, for Toyooka, the stork reintroduction project is not a luddite effort to shift people back to a bygone time and lifestyle. While the project takes place in the rural setting of Toyooka, where the remnants of the traditional satoyama landscape still exist, it does not assume that people will willingly give up the comforts of modern life they have grown accustomed to, and the societal norms and expectations by which they have to abide. While technology may have played a role in the original disappearance of stork populations from Japan, thoughtful implementation of technology can help make ecological endeavours more accessible to people whose primary concern may not be the abstract conception of *the environment*.

Through the overall stork reintroduction efforts, Toyooka hopes to address the various problems they face as a rural municipality in Japan within today's context of rice consumption decline, population aging, rural and agricultural abandonment, and increased skepticism towards the role of government officials. My co-workers are not, however, attempting to fight or thwart these national developments. As a small rural municipality with limited capacities, it would be unrealistic to believe that Toyooka's municipal government alone could combat these larger societal problems. Instead, Toyooka focuses on working within their means as a small municipal government, and within their responsibilities associated with supporting and improving the quality of life of their residents. Instead of looking for ways to promote an increase in rice consumption, for example, my co-workers address this national phenomenon of rice consumption decline by finding ways to increase the market viability of rice-based products, like cakes and noodles made with rice flour, and by marketing *Stork Natural Rice* as a specialty item

rather than a staple food.

By looking for pragmatic and realistic ways to support stork populations in the wild, Toyooka has been able to successfully begin shifting existing agricultural and societal paradigms. The term biodiversity, *ikimonotayousei*, in Japanese, is now known and utilized by farmers, children, and other residents of Toyooka who have not had formal education in environmental studies. Many of the farmers that began to implement the “stork-friendly” farming method for economic purposes now appreciate the importance of having biodiverse landscapes. For many people in Toyooka, a future in which society benefits from the well-being of other organisms and the surrounding environment is becoming more of a reality.

This thesis has challenged the existence of the idea that environmental movements must be either pragmatic or idealistic, and that it is impossible to simultaneously and effectively address both economic and environmental concerns without having to compromise one or the other. Environmental movements can successfully initiate paradigm shifts in the way people view the natural environment by first putting emphasis on the human implications. Many scholars explain that environmentalism is an example of a post-material value, and that people only become concerned with the state of the natural environment once their own material needs, such as economic viability, have been met. Toyooka’s case presents the possibility of incorporating environmentalism into process of helping people achieve these material needs. Toyooka’s municipal government was able to help ameliorate deteriorating natural landscapes by first addressing local residents’ economic concerns and needs by making rice farming once again an economically viable profession.

Through this thesis, I have illustrated that our environments have been in constant flux. It is fruitless to try and achieve certain environmental goals and ideals outside of the ever-changing

societal context. What is important is to notice how life, both human and non-human, are being impacted by the way we are shaping and changing our landscapes, and to ask ourselves if these are impacts that we want to see and are willing to live with. In Toyooka, the disappearance of storks triggered a movement towards creating a community that is more ecologically sound. While many of the changes made in Toyooka to accommodate the storks may have seemed idealistic and unrealistic at first, today, an *environment in which storks can also live* is becoming the norm in Toyooka.

As my co-workers often emphasized to me, Toyooka is very much still *in the middle of the road* when it comes to their stork reintroduction efforts. While they recognize the various successes they have been able to achieve so far, they are by no means under the impression that their work is done. As the stork reintroduction project progresses and expands, Toyooka will undoubtedly have more barriers to overcome. One such barrier today is the need to increase the sales of *Stork Natural Rice* to accommodate the increase in production of rice grown using the “stork-friendly” method. In addition, as more regions begin to see the merits of propagating agriculture that supports biodiversity, Toyooka’s *Stork Natural Rice* will have to compete with other emerging ecologically grown rice brands. Just as Toyooka’s work is not yet complete, neither is the research presented in this thesis. As Toyooka’s efforts expand and spread to other regions, there will be need to recontextualize the topics and themes covered in this thesis to respond to the changing contexts and attitudes of Japanese society. Further documentation of how exactly Toyooka’s efforts will unfold in the future will be necessary to fully understand how societal and cultural factors influence the success of environmental movements, particularly in Japan. It is my hope that, through this thesis, even those who may not ever have the opportunity to visit the city where the storks fly or try *Stork Natural Rice* will be inspired by the city’s

endeavors and will find ways of relating the ideas emphasized throughout this work to their own lives and localities. This is my small contribution to the mayor's goal of making Toyooka a "small, global city".

Bibliography

- "Future Depopulation in Japan: A Cabinet Committee Report." 2015. *Population and Development Review* 41 (2): 369-372.
- "History of the Growth of Protection Efforts." Hyogo Park of the Oriental White Stork. Accessed May 01, 2017. <http://www.stork.u-hyogo.ac.jp/reintroduction/chronol/>.
- "How Sustainable is Organic Farming?" 2012. *Agriculture, Ecosystems and Environment* 150: 121-122. <http://www.sciencedirect.com/science/journal/01678809>.
- Akiyama, Y., T. Matsuoka, N. Yoshioka, S. Akamatsu, and T. Mitsunashi. 2011. *Pesticide Residues in Domestic Agricultural Products Monitored in Hyogo Prefecture, Japan, FY 1995-2009*. Vol. 36.
- Alkon, A. H. and J. Agyeman. 2011. *Cultivating Food Justice: Race, Class, and Sustainability* MIT Press.
- Anderson, E. N. 2010. *The Pursuit of Ecotopia: Lessons from Indigenous and Traditional Societies for the Human Ecology of our Modern World* Praeger.
- Anderson, Irvine H. 1975. "The 1941 De Facto Embargo on Oil to Japan: A Bureaucratic Reflex." *Pacific Historical Review* 44 (2): 201-231.
- Askins, Robert. 2008. "Protecting Biodiversity, from Flagship Species to the Global Environment." In *Saving Biological Diversity*, 213-219. Boston, MA: Springer US. doi:10.1007/978-0-387-09565-3_16.
- Asquith, P. J. and A. Kalland. 1997. *Japanese Images of Nature: Cultural Perspectives* Curzon Press.
- Babb, James. 2005. "Making Farmers Conservative: Japanese Farmers, Land Reform and Socialism." *Social Science Japan Journal* 8 (2): 175-195.
- Banerjee, Simanti, Silvia Secchi, Joseph Fargione, Stephen Polasky, and Steven Kraft. 2013. "How to Sell Ecosystem Services: A Guide for Designing New Markets." *Frontiers in Ecology and the Environment* 11 (6): 297-304.
- Banerjee, Subhabrata Bobby. 2003. "Who Sustains Whose Development? Sustainable Development and the Reinvention of Nature." *Organization Studies* 24 (1): 143-180.
- Basha, Mohamed Bilal, Cordelia Mason, Mohd Farid Shamsudin, Hafezali Iqbal Hussain, and Milad Abdelnabi Salem. 2015. "Consumers Attitude Towards Organic Food." *Procedia Economics and Finance* 31: 444-452.
- Behnassi, Mohamed, Gabrielle Kissinger, and Olaf Pollmann. 2013. *Sustainable Food Security in the Era of Local and Global Environmental Change. [Electronic Resource]* Dordrecht ; New York : Springer, 2013.
- Behnassi, Mohamed, Shabbir A. Shahid, and Nazia Mintz-habib. 2014. *Science, Policy and Politics of Modern Agricultural System. [Electronic Resource] : Global Context to Local*

- Dynamics of Sustainable Agriculture* New York : Springer Verlag, 2014.
- Bernard, H. Russell. 2011. *Research Methods in Anthropology : Qualitative and Quantitative Approaches (5)*. Blue Ridge Summit, US: AltaMira Press.
<http://site.ebrary.com/lib/conncoll/docDetail.action?docID=10465497&ppg=12>.
- Bhaskaran, Suku, Michael Polonsky, John Cary, and Shadwell Fernandez. 2006. "Environmentally Sustainable Food Production and Marketing: Opportunity Or Hype?" *British Food Journal* 108 (8): 677-690.
- Brkovic, C. and A. Hodges. 2015. *Rethinking World Anthropologies through Fieldwork: Perspectives on "Extended Stay" and "Back-and-Forth" Methodologies*. Vol. 21.
- Brumfield, Robin G., Arbindra Rimal, and Steve Reiners. 2000. "Comparative Cost Analyses of Conventional, Integrated Crop Management, and Organic Methods." *HortTechnology* 10 (4): 785-793.
- Chen, Xiaodong, Frank Lupi, Guangming He, Jianguo Liu, and Gretchen C. Daily. 2009. "Linking Social Norms to Efficient Conservation Investment in Payments for Ecosystem Services." *Proceedings of the National Academy of Sciences of the United States of America* 106 (28): 11812-11817.
- Chern, Wen S., Kimiko Ishibashi, Kiyoshi Taniguchi, and Yuki Tokoyama. 2002. *Analysis of Food Consumption Behavior by Japanese Households: Agricultural and Development Economics Division of the Food and Agriculture Organization of the United Nations (FAO - ESA)*.
- Christie, I. and D. Warburton. 2010. *From here to Sustainability: Politics in the Real World* Taylor & Francis.
- Chwalkowski, F. 2016. *Symbols in Arts, Religion and Culture: The Soul of Nature* CAMBRIDGE SCHOLARS PUBLIS.
- Daily, Gretchen C. and Pamela A. Matson. 2008. "Ecosystem Services: From Theory to Implementation." *Proceedings of the National Academy of Sciences of the United States of America* 105 (28): 9455-9456.
- de Ponti, Tomek, Bert Rijk, and Martin K. van Ittersum. 2012. "The Crop Yield Gap between Organic and Conventional Agriculture." *Agricultural Systems* 108: 1-9.
- Deal, W. E. 2005. *Handbook to Life in Medieval and Early Modern Japan* Oxford University Press.
- Dougill, Andrew J., Lindsay C. Stringer, Julia Leventon, Mike Riddell, Henri Rueff, Dominick V. Spracklen, and Edward Butt. 2012. "Lessons from Community-Based Payment for Ecosystem Service Schemes: From Forests to Rangelands." *Philosophical Transactions: Biological Sciences* 367 (1606): 3178-3190.
- Dower, J. W. 2000. *Embracing Defeat: Japan in the Wake of World War II* W.W. Norton & Company.

- Emslie, R., R. Amin, R. Kock, Survival Commission IUCN Species, IUCN/SSC African Rhino, Specialist Group, IUCN/SSC Wildlife Health, Specialist Group, Specialist Group IUCN/SSC Re-introduction, and Conservation Union IUCN--The World. 2009. *Guidelines for the in Situ Re-Introduction and Translocation of African and Asian Rhinoceros* IUCN.
- Escobar, Arturo. 1998. "Whose Knowledge, Whose Nature? Biodiversity, Conservation, and the Political Ecology of Social Movements." *Journal of Political Ecology* 5 (1): 53-82.
- Esham, Mohamed, Hajime Kobayashi, Ichizen Matsumura, and Arif Alam. 2012. "Japanese Agricultural Cooperatives at Crossroads: A Review." .
- Ezaki, Yasuo and Ohsako Yoshito. 2012. "Breeding Biology of the Oriental White Stork Reintroduced in Central Japan —Effects of Artificial Feeding and Nest-Tower Arrangement upon Breeding Season and Nesting Success—." *Reintroduction* (2): 43-50.
- Feldhoff, Thomas. 2013. "Shrinking Communities in Japan: Community Ownership of Assets as a Development Potential for Rural Japan?" *Urban Design International* 18 (1): 99-109. doi:<http://dx.doi.org/10.1057/udi.2012.26>. <https://login.peach.conncoll.edu/login?url=http://search.proquest.com/docview/1272011285?accountid=10255>.
- Fisher, William F. 1997. "Doing Good? the Politics and Antipolitics of NGO Practices." *Annual Review of Anthropology* 26: 439-464.
- Francks, Penelope. 2007. "Consuming Rice: Food, 'Traditional' Products and the History of Consumption in Japan." *Japan Forum* 19 (2): 147-168.
- Fuentes-George, Kemi. 2013. "Neoliberalism, Environmental Justice, and the Convention on Biological Diversity: How Problematizing the Commodification of Nature Affects Regime Effectiveness." *Global Environmental Politics* 13 (4): 144-163.
- Fukuoka, M., L. Korn, W. Berry, and F. M. Lappe. 2010. *The One-Straw Revolution: An Introduction to Natural Farming* New York Review Books.
- Fujie, Takeshi. 2015a. "Conservation Agriculture Adoption and its Impact: Evidence from Shiga Prefecture, Japan." *Journal of International Economic Studies* (29): 35-48.
- George Mulgan, Aurelia. 2016. "Much Ado about Something? the Abe Governments Reform of Japans Agricultural Cooperatives (JA)." *Japanese Studies* 36 (1): 83-103.
- Gilmartin, William M. and W. I. Ladejinsky. 1948. "The Promise of Agrarian Reform in Japan." *Foreign Affairs* 26 (2): 312-324.
- Glasby, Geoffrey P. 2002. "Sustainable Development: The Need for a New Paradigm." *Environment, Development and Sustainability* 4 (4): 333-345.
- Gu, Hongyan and Suneetha Subramanian. 2012. *Socio-Ecological Production Landscapes: Relevance to the Green Economy Agenda*.
- Haenn, N. and R. Wilk. 2006. *The Environment in Anthropology: A Reader in Ecology, Culture,*

- and Sustainable Living* NYU Press.
- Haila, Yrjö. 1999a. "Biodiversity and the Divide between Culture and Nature." *Biodiversity & Conservation* 8 (1): 165-181.
- Hancock, J. A., J. A. Kushlan, M. P. Kahl, A. Harris, B. Foundation, and D. Quinn. 1992. *Storks, Ibises and Spoonbills of the World* Academic Press.
- Hanegraaf, Marjoleine C., Edo E. Biewinga, and Gert van derBijl. 1998. "Assessing the Ecological and Economic Sustainability of Energy Crops." *Biomass and Bioenergy* 15 (4-5): 345-355.
- Harootunian, H. D. 1995. "Late Tokugawa Culture and Thought." In *The Emergence of Meiji Japan*, edited by Marius B. Jansen, 53-143. Cambridge: Cambridge University Press. doi:10.1017/CBO9781139174428.003. <http://ebooks.cambridge.org/chapter.jsf?bid=CBO9781139174428&cid=CBO9781139174428A016>.
- Hashiguchi, Takuya. 2014. "Japan's Agricultural Policies After World War II: Agricultural Land use Policies and Problems." In *Social-Ecological Restoration in Paddy-Dominated Landscapes*, edited by Nisikawa Usio and Tadashi Miyashita, 3-15. Tokyo: Springer Japan.
- Hayami, Akira. 2015. *Japan's Industrious Revolution. [Electronic Resource] : Economic and Social Transformations in the Early Modern Period* Tokyo : Springer, 2015.
- Hayami, Y. 1988. *Japanese Agriculture Under Siege* Palgrave Macmillan UK.
- Hayashi, Takashi and Yoshifumi Takahashi. 2015. "Market Internalized Value of Bio-Friendly Agriculture: An Evaluation of Impact of Stork-Friendly Rice Production on a Local Economy." *Universita degli studi di milano*, August 8-142015.
- Hazama, Hiroshi. 1976. "Historical Changes in the Life Style of Industrial Workers." In *Japanese Industrialization and its Social Consequences*, edited by H. T. Patrick, L. Meissner and Joint Committee on Japanese Studies, 21-51: University of California Press.
- Hokazono, Shingo and Kiyotada Hayashi. 2012. "Variability in Environmental Impacts during Conversion from Conventional to Organic Farming: A Comparison among Three Rice Production Systems in Japan." *Journal of Cleaner Production* 28: 101-112.
- Hong, Sun-Kee, Jan Bogaert, and Qingwen Min. 2014. *Biocultural Landscapes Diversity, Functions and Values* /, edited by Sön-gi Hong 1962- editor., J. (Jan) Bogaert 1964- editor., Qingwen Min editor. and SpringerLink (Online service). Dordrecht: Springer.
- Howell, D. L. 2005. *Geographies of Identity in Nineteenth-Century Japan* University of California Press.
- Huesemann, M. and J. Huesemann. 2011. *Techno-Fix: Why Technology Won't Save Us Or the Environment* New Society Publishers.

- Hyogo Prefecture. 2009. *Hyogo-ken kankyo sozogata nougou suishin keikaku: gai yo ban*. Hyogo Prefecture: Hyogo Prefecture Agricultural Policy Environmental Division.
- Hyogo Park of the Oriental White Stork. "Hogo zōshoku," *Hyogo Park of the Oriental White Stork*. Accessed on April 15th, 2017, <http://www.stork.u-hyogo.ac.jp/reintroduction/chronol/>
- Imura, H. and M. A. Schreurs. 2005. *Environmental Policy in Japan* Edward Elgar Publishing Limited.
- Jack, B. K., Carolyn Kousky, and Katharine R. E. Sims. 2008. "Designing Payments for Ecosystem Services: Lessons from Previous Experience with Incentive-Based Mechanisms." *Proceedings of the National Academy of Sciences of the United States of America* 105 (28): 9465-9470.
- Jones, Walter Daryl. 2016. "Natural Resource Enterprises: Payments to Landowners for Ecosystem Services from Forests and their Management in the United States of America (U.S.)." *Acta Silvatica Et Lignaria Hungarica* 12 (1): 47-54.
- Kasuya, Munehisa. 1991. "The Reconstruction and Stabilization of the Postwar Japanese Economy:"- 'possible Lessons for Eastern Europe?'
- Katayama, Naoki, Yuki G. Baba, Yoshinobu Kusumoto, and Koichi Tanaka. 2015. "A Review of Post-War Changes in Rice Farming and Biodiversity in Japan." *Agricultural Systems* 132: 73-84.
- Kato, Sadamichi. 2003. "'Body and Earth are Not Two': Kawaguchi Yoshikazu's NATURAL FARMING And." *Studies in Language and Culture, Nagoya University* 25.
- Keene, D. 1956. *Modern Japanese Literature: An Anthology* Grove Press.
- Khush, Gurdev S. 2005. "What it Will Take to Feed 5.0 Billion Rice Consumers in 2030." *Plant Molecular Biology* 59 (1): 1-6.
- Knight, Catherine. 2010. "The Discourse of 'Encultured Nature'in Japan: The Concept of Satoyama and its Role in 21st-Century Nature Conservation." *Asian Studies Review* 34 (4): 421-441.
- Kondoh, Kazumi. 2015. "The Alternative Food Movement in Japan: Challenges, Limits, and Resilience of the Teikei System." *Agriculture and Human Values* 32 (1): 143-153.
- Koyanagi, Tomoyo F. and Takuya Furukawa. 2013. "Nation-Wide Agrarian Depopulation Threatens Semi-Natural Grassland Species in Japan: Sub-National Application of the Red List Index." *Biological Conservation* 167: 1-8.
- Kuhn, T. S. and I. Hacking. 2012. *The Structure of Scientific Revolutions: 50th Anniversary Edition* University of Chicago Press.
- Kyodo. 2016. "Japan's Food Self-Sufficiency Rate Misses Target Again." *Kyodo News Service*, Aug 2., <http://www.japantimes.co.jp/news/2016/08/02/national/japans-food-self->

[sufficiency-rate-misses-target/#.WQikyIIVmi4](#).

- Ladejnsky, Wolf. 1959. "Agrarian Revolution in Japan." *Foreign Affairs* 38 (1): 95-109.
- Lassen, Jesper and Sara Korzen. 2009. "The Environment Overlooked?. the Role of Environmental Concerns in Organic Food Discourses." *Anthropology of Food* (S5).
- Light, Stephen S. and Treaty Organization North Atlantic. 2004. *The Role of Biodiversity Conservation in the Transition to Rural Sustainability*. Amsterdam: IOS Press.
- Lindstrom, David E. 1956. "Outlook for the Land Reform in Japan." *Rural Sociology* 21 (2): 164.
- Liu, Jianguo and Wu Yang. 2013. "Integrated Assessments of Payments for Ecosystem Services Programs." *Proceedings of the National Academy of Sciences of the United States of America* 110 (41): 16297-16298.
- Lockyer, J. and J. R. Veteto. 2013. *Environmental Anthropology Engaging Ecotopia: Bioregionalism, Permaculture, and Ecovillages* Berghahn Books.
- Loy, David. 1995. "On the Duality of Culture and Nature." *Philosophica (Belgium)* 55 (1): 9-35.
- MACA, LAURA. 2012. "Choosing a Field: How Graduate Student Choices of Field Sites Reflect Different Ideas of 'Real' Anthropology in Colombia and the United States." *Learning and Teaching: The International Journal of Higher Education in the Social Sciences* 5 (1): 10-31.
- Maniates, M. and J. M. Meyer. 2010. *The Environmental Politics of Sacrifice* MIT Press.
- Mason, K. O. and A. M. Jensen. 1995. *Gender and Family Change in Industrialized Countries* Clarendon Press.
- Matanle, P. and Y. Sato. 2010. *Coming Soon to a City Near You! Learning to Live 'Beyond Growth' in Japan's Shrinking Regions*. Vol. 13.
- McAfee, Kathleen and Elizabeth N. Shapiro. 2010. "Payments for Ecosystem Services in Mexico: Nature, Neoliberalism, Social Movements, and the State." *Annals of the Association of American Geographers* 100 (3): 579-599.
- Meek, David. 2016. "The Cultural Politics of the Agroecological Transition." *Agriculture and Human Values* 33 (2): 275-290.
- Meine, C. 2013. *Correction Lines: Essays on Land, Leopold, and Conservation* Island Press.
- Menton, L. K. 2003. *The Rise of Modern Japan* Curriculum Research & Development Group, University of Hawaii.
- Morimoto, Yukihiko. 2011. "What is Satoyama? Points for Discussion on its Future Direction." *Landscape and Ecological Engineering* 7 (2): 163-171.
- Morris, David Morris. 1956. "The Problem of the Peasant Agriculturist in Meiji Japan, 1873-

- 1885." *The Far Eastern Quarterly* 15 (3): 357-370.
- Mulgan, A. G. 2013. *The Politics of Agriculture in Japan* Taylor & Francis.
- Muneharu, Nakagai and Mayor of Toyooka. *Coexistence between the Human Community and the Oriental White Storks Challenge of Toyooka City*.
- Muramatsu, Naoko and Hiroko Akiyama. 2011. "Japan: Super-Aging Society Preparing for the Future." *The Gerontologist* 51 (4): 425-432.
- Muramoto, Joji, Hidaka Kazumasa, and Takuya Mineta. 2009. "Japan: Finding Opportunities in the Current Crisis." In *The Conversion to Sustainable Agriculture: Principles, Processes, and Practices*, edited by Stephen R. Gliessman and Martha Rosemeyer, 274-297: CRC Press.
- Naito, Kazuaki. 2014. "Role of the Oriental White Stork in Maintaining the Cultural Landscape in the Toyooka Basin, Japan." In *Biocultural Landscapes*, 44; 44.
- Naito, Kazuaki, Naoki Kikuchi, and Kei Ikeda. 2004. "Konotori no yaseika ni muketa torikumi to shisaku no tenkai." *Nouson keikaku gakkaiishi* 23 (3): 227-230.
- Nazarea, Virginia D. 2006. "Local Knowledge and Memory in Biodiversity Conservation." *Annual Review of Anthropology* 35 (1): 317-335.
- Nomura, Hisako, Mitsuyasu Yabe, Takeshi Nishio, Mari Izumi, Kazuo Hirai, and Tetsuji Kurokawa. 2013. "Framework for Improvement of Farmland Biodiversity in Japan." *Journal of Environmental Planning and Management* 56 (5): 743-758.
- Nonini, Donald M. 2013. "The Local-Food Movement and the Anthropology of Global Systems." *American Ethnologist* 40 (2): 267-275.
- Noss, Reed F. 1991. "Sustainability and Wilderness." *Conservation Biology* 5 (1): 120-122.
- Ockwell, David, Lorraine Whitmarsh, and Saffron O'Neill. 2009. "Reorienting Climate Change Communication for Effective Mitigation: Forcing People to be Green Or Fostering Grass-Roots Engagement?" *Science Communication*.
- Ohnuki-Tierney, Emiko. 1994. *Rice as Self: Japanese Identities through Time*. Princeton, US: Princeton University Press.
<http://site.ebrary.com/lib/conncoll/docDetail.action?docID=10031948&ppg=1>.
- Peters, Glen P., Jan C. Minx, Christopher L. Weber, and Ottmar Edenhofer. 2011. "Growth in Emission Transfers Via International Trade from 1990 to 2008." *Proceedings of the National Academy of Sciences* 108 (21): 8903-8908.
- Ramseyer, J. Mark. 2012. "The Fable of Land Reform: Expropriation and Redistribution in Occupied Japan." .
- Rennstam, Jens and Karen Lee Ashcraft. 2014. "Knowing Work: Cultivating a Practice-Based Epistemology of Knowledge in Organization Studies." *Human Relations* 67 (1): 3-25.

- Rhodes, Christopher J. 2015. "Permaculture: Regenerative--Not Merely Sustainable." *Science Progress* 98: 403-412.
- Ringel, Felix. 2013. "Epistemic Collaborations in Contexts of Change: On Conceptual Fieldwork and the Timing of Anthropological Knowledge." *Laboratorium: Russian Review of Social Research* (2): 36-55.
- Riverstone-Newell, Lori. 2012. "Bottom-Up Activism: A Local Political Strategy for Higher Policy Change." *Publius: The Journal of Federalism* 42 (3): 401-421.
- Sage, C. 2011. *Environment and Food* Taylor & Francis.
- Sakurai, Ryo. 2014. "Public Perceptions of Significant Wildlife in Hyogo, Japan." *Human Dimensions of Wildlife* 19 (1): 95; 95.
- Sharma, Sanjay and Audun Ruud. 2003. "On the Path to Sustainability: Integrating Social Dimensions into the Research and Practice of Environmental Management." *Business Strategy & the Environment (John Wiley & Sons, Inc)* 12 (4): 205-214.
- Shimizu, Mayuko. 2012. "Jizokukanou na chiiki hatten no bunseki wakugumi: Hyogo-ken Toyooka-shi Konotori to Kyosei suru chiiki zukuri no jireikennkyuu kara." *Kankyo-shakaigaku kenkyuu/ kankyo-sahkaigaku gakkai henshyu iinkai hen.* 18: 125; 125.
- Shu, Tassei. 2000 " <Ronbun> Nihon konotori no hogo to kankou no kanousei." *Osaka Meijo Daigaku Kiyaku*: 41-55.
- Smil, V. and K. Kobayashi. 2012. *Japan's Dietary Transition and its Impacts* MIT Press.
- Smith, Julia L. 2008. "A Critical Appreciation of the Bottom-Up Approach to Sustainable Water Management: Embracing Complexity rather than Desirability." *Local Environment* 13 (4): 353-366.
- Srinivasan, Sunderasan. 2015. "Economic Valuation and Option-Based Payments for Ecosystem Services." *Mitigation & Adaptation Strategies for Global Change* 20 (7): 1055-1077.
- Steiner, R. and G. Adams. 2004. *Agriculture Course: The Birth of the Biodynamic Method* Rudolf Steiner Press.
- Stepp, John R. and Thomas Abel. 2003. "A New Ecosystems Ecology for Anthropology." *Conservation Ecology* 7 (3): 12. <http://search.proquest.com/docview/220514349>.
- Sung, V. 2014. *Five-Fold Happiness: Chinese Concepts of Luck, Prosperity, Longevity, Happiness, and Wealth* Chronicle Books LLC.
- Suzuki, Nobuhiro. 2013. "TPP no honshitu to shiyoku no anzenzei." *Anzenkougaku* 52 (5): 291-299.
- Takeuchi, Kazuhiko. 2003. *Satoyama : The Traditional Rural Landscape of Japan* Tokyo ; New York : Springer, c2003.
- Thomas, J. A. 2002. *Reconfiguring Modernity: Concepts of Nature in Japanese Political*

- Ideology* University of California Press.
- Thompson, E. P. 1971. "The Moral Economy of the English Crowd in the Eighteenth Century." *Past & Present* (50): 76-136.
- To, Phuc Xuan, Wolfram H. Dressler, Sango Mahanty, Thu Thuy Pham, and Claudia Zingerli. 2012. "The Prospects for Payment for Ecosystem Services (PES) in Vietnam: A Look at Three Payment Schemes." *Human Ecology* 40 (2): 237-249.
- Totman, C. D. 1989. *The Green Archipelago: Forestry in Preindustrial Japan* University of California Press.
- Toyooka City Municipal Government. 2010. *Sustainable Strategy for Environment and Economy*. Toyooka City, Japan: Toyooka Municipal Government.
- Trewartha, Glenn T. 1950. "Land Reform and Land Reclamation in Japan." *Geographical Review* 40 (3): 376-396.
- Tsuya, Noriko O., Larry L. Bumpass, Minja Kim Choe, and Ronald R. Rindfuss. 2005. "Is the Gender Division of Labour Changing in Japan?" *Asian Population Studies* 1 (1): 47-67.
- Tucker, John A. 2003. "Japanese Views of Nature and the Environment." In *Nature Across Cultures: Views of Nature and the Environment in Non-Western Cultures*, edited by Helaine Selin, 161-183. Dordrecht: Springer Netherlands.
- Uggla, Ylva. 2010. "What is this Thing Called 'Natural'? the Nature-Culture Divide in Climate Change and Biodiversity Policy " *Journal of Political Ecology* 17: 79. <http://urn.kb.se/resolve?urn=urn:nbn:se:oru:diva-12468>.
- Usio, Nisikawa. 2014. *Social-Ecological Restoration in Paddy-Dominated Landscapes*. S.l.: Springer Japan.
- Vankeerberghen, Audrey and Pierre M. Stassart. 2016. "The Transition to Conservation Agriculture: An Insularization Process Towards Sustainability." *International Journal of Agricultural Sustainability* 14 (4): 392-407.
- Vargas-Cetina, Gabriela. 2013. *Anthropology and the Politics of Representation*. Tuscaloosa: University Alabama Press.
- Watanabe, Masao. 1974. "The Conception of Nature in Japanese Culture." *Science* 183 (4122): 279-282. <http://www.jstor.org/stable/1737600>.
- Weatherell, Charlotte, Angela Tregear, and Johanne Allinson. 2003. "In Search of the Concerned Consumer: UK Public Perceptions of Food, Farming and Buying Local." *Journal of Rural Studies* 19 (2): 233-244.
- Wegner, Giulia Irene. 2016. "Payments for Ecosystem Services (PES): A Flexible, Participatory, and Integrated Approach for Improved Conservation and Equity Outcomes." *Environment, Development and Sustainability* 18 (3): 617-644.

- Weston, Walter. 1924. "The Influence of Nature on Japanese Character." *The Geographical Journal* 63 (2): 106-119.
- World Commission on Environment and Development. 1987. *Report of the World Commission on Environment and Development: Our Common Future*: Oxford University Press.
- Yabe Mitsuyasu, Hayashi Takashi, Nishimura Bunei, and Sun Binhong. 2014. "Conservation of Biodiversity and its Value in Agricultural Products." *Journal of Resources and Ecology* 5 (4): 291-300. doi:10.5814/j.issn.1674-764x.2014.04.002.
<http://www.bioone.org/doi/full/10.5814/j.issn.1674-764x.2014.04.002>.
- Yokohari, Makoto and Jay Bolthouse. 2011. "Keep it Alive, Don't Freeze it: A Conceptual Perspective on the Conservation of Continuously Evolving Satoyama Landscapes." *Landscape and Ecological Engineering* 7 (2): 207-216.
- Yokomichi, Kiyotaka. 2011. "The Development of Municipal Mergers in Japan." *COSLOG Up-to-Date Documents on Local Autonomy in Japan no.1*.
- Young, T., M. P. Burton, and Food and Agriculture Organization of the United Nations. 1992. *Agricultural Sustainability: Definition and Implications for Agricultural and Trade Policy*. Food and Agriculture Organization of the United Nations.
- Zheng, Hua, Brian E. Robinson, Yi-Cheng Liang, Stephen Polasky, Dong-Chun Ma, Feng-Chun Wang, Mary Ruckelshaus, Zhi-Yun Ouyang, and Gretchen C. Daily. 2013. "Benefits, Costs, and Livelihood Implications of a Regional Payment for Ecosystem Service Program." *Proceedings of the National Academy of Sciences of the United States of America* 110 (41): 16681-16686.