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1. Introduction

Indigenous societies in Arctic North America have been rapidly changing under the influences of climate warming and economic globalization. They encounter significant problems related to the following: (1) political autonomy; (2) economic independence; (3) food problems; (4) language, culture, and identity; and (5) social and health issues. Although the problems are interrelated, this paper focuses on food problems.

In the Indigenous societies in the Arctic regions of North America, the diminution of regular subsistence activities is linked directly to food shortages, and this can endanger the existence of not only individuals but also of social groups. The following pages discuss subsistence activities in Alaskan Indigenous societies from the perspectives of “food security” and “food sovereignty; these two concepts have attracted increasing international attention, notably from the United Nations and international NGOs. In the next section, I examine features of food security and food sovereignty of the Iñupiat, an Alaskan Indigenous people residing at Utqiaġvik (formerly called Barrow)¹⁾ in north-western Alaska. Additionally, I demonstrate factors threatening their food security and food sovereignty and assess whale hunts from those perspectives.

2. Food Security and Food Sovereignty

One current aim of the Sustainable Development Goals (SDGs) is eradication of hunger. Regarded from a global perspective, we realize that food shortages in many parts of the world have been caused by population growth, conflicts caused by political unrest and their prolongation, and climate change and frequent extreme weather events. As of 2017, 124 million people in 51 countries worldwide faced food shortage. Food-related difficulties are global issues. For that reason, economically developed countries are supporting them financially (World Food Programme 2018). Such issues have been discussed internationally initially in terms of “food security” and “food sovereignty” more recently, in attempts to resolve the related issues.

The 1996 World Food Summit set the now-universal definition of *food security*, stating that “[food security exists when] all people, at all times, have physical and

economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life' (FAO 2006). Food security comprises four challenges. The first is *food availability*, which concerns whether there is enough food of appropriate quality. The second is *food access*, which concerns whether people are free of legal, political, economic, or social impediments to attaining nutritious food. The third is *utilization*, which concerns whether people can practically and effectively consume safe and nourishing food. The fourth is *societal stability*, which is necessary to ensure sufficient food availability, food access, and food utilisation. Attaining food security is a common goal of national governments and international organizations such as the United Nations.

The phrase "food sovereignty" was coined by La Vía Campesina, founded in 1993 as 'an international movement bringing together millions of peasants, small-and medium-size farmers, landless people, rural women and youth, Indigenous people, migrants and agricultural workers from around the world' (La Vía Campesina 2020). The well-known international NGO insists that the sovereignty of food production and distribution should belong to the people and communities that produce food locally. At the Nyéléni Forum 2007 in Sélingué, Mali, La Vía Campesina was among those who produced the Nyéléni Declaration, which included the six pillars that support food sovereignty: (1) Focuses on food for people; (2) Values food providers; (3) Localizes food systems; (4) Puts control locally; (5) Builds knowledge and skills; and (6) Works with nature (Food Secure Canada 2012). Over time, the idea of food sovereignty has been acknowledged internationally as a foundation for people to produce and consume food locally.

Although these concepts entail mutually overlapping ideas, food security differs from food sovereignty. Whereas food sovereignty concerns specific localities, food security concerns national or global communities. Shiaki Kondo (2018: 5) observed that "a difference in perspectives (exists) that food security tends to emphasize food production and distribution at the global level whereas food sovereignty respects decision making about food production at the local level". According to Gordillo and Méndez (2013), the concepts have a commonality in that they emphasize food production and the necessity to produce it to meet future demands. Their main issue is how to access food. They value nutritional quality and the necessity for the social protection of food production when temporary food crises occur. However, the two concepts differ greatly on the following points. The first difference is that food security only slightly addresses issues of who produces the food (e.g. if a multinational company with political and economic power produces it), to the degree that the food is secured; food sovereignty addresses power differences and who produces the food. The second difference relates to how the food is produced. Although food security does not emphasize the mode of food production, food sovereignty emphasizes how food is secured in small-scale units such as through non-industrial small-scale agriculture.

Although many studies have examined food security or food sovereignty for people residing in developing countries, there have been few studies on food security and food sovereignty among many Indigenous people and communities around the globe. However, since the beginning of the 21st century, several studies of Indigenous North Americans

have examined “food security” and “food sovereignty”.²⁾

3. Mixed Economy of the Iñupiat, Indigenous People in Alaska

Most Indigenous people in the Arctic regions of North America make their living by combining hunting, fishing, and gathering to obtain food with wage labors to earn an income. Their economic system is identified as a mixed economy (e.g., BurnSilver, Magdanz, Stotts, Berman, and Kofinas 2016; Ready and Power 2018; Wenzel 2019; Wolfe 1984; Wolfe and Walker 1987). The economy of Indigenous Alaskans is a mixed economic system; its market economy exists alongside its remarkably productive subsistence hunting, fishing, and gathering economy; the wild food gathered or caught in the Arctic regions of Alaska amounts to 4,657 tons annually, equivalent to US\$82 million (ADFG 2017).

3.1 Utqiagvik, a Community of Iñupiat People in Alaska

Utqiagvik is the United States’ northernmost community, facing the Chukchi Sea, located at 71° 29’ north latitude and 156° 79’ west longitude. The total population in 2015 was 5,315, 67% of whom (3,560) were Indigenous people. Most of them are Iñupiat, who are engaged in whaling in spring and autumn.

3.2 The Iñupiat Mixed Economy in Utqiagvik

In January 2015, 12 researchers of the Division of Subsistence in the Alaska Department of Fish and Game randomly extracted 259 households from the 1,584 in Utqiagvik (16%) to survey their subsistence activities (Ikuta 2018; Mikow and Ikuta 2016). In the following sections, I introduce the mixed economy of Utqiagvik in Alaska based on the results of that survey and my own field research. For descriptive convenience, I have divided the descriptions into their market economy and their subsistence economy.

3.2.1 Aspects of a Market Economy

All present Alaskan Indigenous communities are embedded in the globalized American economic system. Although the self-sufficient economies of hunting, fishing, gathering, and trading were once the basis of all Indigenous societies, Iñupiat people today also earn cash income from wage labor, dividends from Indigenous corporations, and various government grants. With that income, they pay for their housing (rents or mortgages) and utilities, and they buy food, hunting gear, tools, cars, snowmobiles, motorboats, and outboard motors for use in daily life. The economic base of the current Iñupiat community is a market economy in that their lives cannot be sustained without money income.

However, their lifestyles cannot be sustained solely by the market economy. The average annual income per household in Utqiagvik in 2014 was a considerably high amount of US\$107,000 (Mikow and Ikuta 2016: 305).³⁾ However, income differences attributable to their different careers and academic backgrounds have increased among households, so not all the Iñupiat have high incomes. Many villages are located in remote

areas of Alaska, and their supplies must be transported by air or ship, so their costs for goods and services are much higher than in Anchorage (Table 1). Moreover, the cost of living is much higher than in the “lower 48” US states. Consequently, they must supplement their sustenance with local animals and plants.

Table 1 Food prices in Anchorage and Utqiagvik in 2010 (USD)

Items	Quantity	Price in Anchorage	Price in Utqiagvik
Frozen milk	1 gallon	\$3.39	\$11.79
Beef steak	1 pound	\$3.99	\$7.79
Pork chops	1 pound	\$2.99	\$6.99
Eggs	1 dozen	\$2.59	\$5.19
Butter	1 pound	\$5.19	\$6.25
Sugar	5 pounds	\$4.39	\$8.99
Gas	1 gallon	\$3.83	\$5.75
Bananas	1 pound	\$0.89	\$2.99
Flour	5 pounds	\$3.45	\$12.75

(Source: North Slope Borough 2012: 33–34)

3.2.2 Subsistence Economy

Common features of the subsistence economy of Indigenous Alaskans are these: they must obtain a monetary income to maintain hunting and fishery activities; they are not legally permitted to sell commercially any edible parts of game animals (e.g., meat and fat) obtained from subsistence activities; and they may freely share or distribute edible parts among themselves according to their customs. The Iñupiat of Utqiagvik hunt bowhead whales in spring and autumn. The meat, fat, *maktak* (skin parts with fat), and internal organs make up a large portion of their food resources (Kishigami 2013a; 2013b).

In 2014, the average household in Utqiagvik obtained about 392kg of wild food annually⁴⁾ (Ikuta 2018; Mikow and Ikuta 2016: 270). The same year, 18 bowhead whales were landed there, and about 250 tons of meat was consumed (Mikow and Ikuta 2016: 273; 282). At the same village in 2014, about 463 tons marine animals were caught and the meat consumed, which is simply converted into an average share of 292kg per household or about 70kg per person. Table 2 presents a list of the main marine animals caught there.

Table 2 Main marine mammals harvested at Utqiagvik in 2014 by weight (kg)

Names of Marine Mammals	Total Weight	Per Household	Per Person
Bowhead whales	247,377 kg	156 kg	47 kg
Bearded seals	136,662 kg	87 kg	26 kg
Walruses	46,932 kg	29 kg	9 kg
Ringed seals	11,054 kg	7 kg	2 kg
Beluga whales	11,026 kg	7 kg	2 kg

(Source: Mikow and Ikuta 2016: 273)

As the table shows, the total weight of bowhead whales accounted for more than half of all the marine animals combined. Additionally, the survey team reported that marine animals accounted for 53% of all the food derived from subsistence activities (Mikow and Ikuta 2016: 277). As these data and Tables 3 and 4 also demonstrate, in the community, marine animals such as bowhead whales, bearded seals, and walrus are important food sources. Other significant subsistence food sources are land animals (e.g., caribou), birds (e.g., ducks and geese), fish (e.g., salmon, white fish, grayling), and berries (e.g., salmon berry) (Mikow and Ikuta 2016: 278).

Table 3 Wild foods consumed in Utqiagvik in 2014 by percentage

Examples of Wild Foods	Percentage
Marine mammals	53%
Land mammals	31%
Birds (and their eggs)	3%
Salmon	3%
Fish other than salmon	10%
Other	2%

(Source: Mikow and Ikuta 2016: 277)

Table 4 Wild food consumed per Utqiagvik household in 2014 by percentage

Animals	Percentage (Per Household)
Caribou	31%
Bowhead whale	29%
Bearded seal	16%
Broad whitefish	7%
Walrus	5%
White-fronted goose	2%
Ringed seal	1%
Beluga whale	1%
Sockeye salmon	1%
Chum salmon	1%
Other	6%

(Source: Mikow and Ikuta 2016: 285)

As Table 4 shows, caribou, bowhead whales, and bearded seals are important food sources in the community. Although this discussion does not address them specifically, caribou are popular as food; as many as 4,300 caribou are hunted annually. Their total weight amounts to 266 tons, which is the most among the wild animals, which converts simply to annual household consumption of about 160kg and 50kg per capita.

3.3 Significance of Wild Food Procured from Subsistence Activities at Utqiagvik

Commodity prices are relatively high in Utqiagvik, so the residents' lives are not always comfortable. However, they can take advantage of locally produced wild foods such as bowhead whales and caribou as food sources. Therefore, the importance of subsistence

hunting products in food must be emphasized (Mikow and Ikuta 2016). Currently, wild foods, as well as money, are necessary for the Iñupiat to survive. Further, surplus production (or consumption) can be converted into income (or loss), so their use may have economic effects (see ADFG 2017).⁵⁾ Fortunately, 91% of the surveyed households answered that they had no difficulty in securing food (Mikow and Ikuta 2016: 307).

Bowhead whales and caribou are traditional, culturally valuable food resources and food symbols for the Iñupiat culture; eating whale and caribou meat is part of their ethnic identity and provides cultural satisfaction. When a bowhead whale is killed, the edible parts (e.g., meat, *maktak*, internal organs, etc.) are brought into the village for consumption by the villagers through feasts or distribution. Eating together at such feasts and other forms of sharing helps them maintain their sense of community, ethnic identity, and social relationships (Kishigami 2012; 2014a). Whaling activities are deeply related to their hunting tools, techniques, methods and organization; to local knowledge of the physical environment in general and bowhead whales in particular; and to their world view. All these are maintained and promoted through the practice of whaling (Kishigami 2014a).

4. Crisis Situations of Acquisition and Use of Traditional Food

Wild food acquisition by subsistence activities is important to maintain and promote the culture and society of the Iñupiat. In the modern period, however, they have faced increasing difficulties in acquiring their traditional foods because of the following factors: (1) climate change; (2) human economic activities caused by climate change (e.g. encroachment of petroleum and natural gas drilling and the establishment of arctic northern sea passages); (3) regulations related to US laws and international treaties (e.g. catch quotas); (4) national policies and anti-whaling activism; (5) environmental contamination and pollution; (6) changing lifestyles among the Indigenous Alaskans (e.g. their increasing tendency to eat less traditional foods); and (7) the increasing need for cash income to finance their subsistence whaling, hunting, and fishing activities (Kishigami 2009; 2010a; 2014a). The next section introduces and examines these factors using the case of Iñupiat bowhead whale hunting at Utqiagvik.

4.1 Climate Change

The effects of global warming have become increasingly apparent since the beginning of the 21st century. Global warming has diminished the range of sea ice in the Arctic sea area, causing seawater to spread into wider areas and disrupting animal ecology and human activities. Here, I discuss some of the changes and causes, but the direct effects on the natural environment, including bowhead whales, are beyond the scope of this paper.⁶⁾

I will provide some insights into how climate change has intensified certain economics-driven human activities such as the expansion of petroleum and natural gas drilling into previously pristine areas of seabed and the extension of sailing routes through Arctic sea passages.

4.2 Human Economic Activities

4.2.1 Development of Petroleum and Natural Gas

The sea-beds of the Chukchi and Beaufort Seas are thought to contain significant oil and gas reserves. In summer, the sea ice recedes enough that ships can manoeuvre there. A leading oil company has leased those sea areas from the US government since 1979, and now that climate change has led to unprecedented melting, they can now start exploring and assessing the reserves. Global warming has accelerated the energy companies' activities. To date, Royal Dutch Shell plc, BP plc, Exxon Mobil Corp., and ConocoPhillips Co., some of the largest international oil companies, have entered into this development (Ikuta 2020: 97). As of October 1, 2018, they had leased as many as 40 sea districts in the Chukchi Sea and Beaufort Sea from the US government, and had three places from which they were extracting petroleum and natural gas. Today, the US government, the energy companies, and the Alaska Eskimo Whaling Commission have collaborated to manage the sea areas for petroleum and natural gas development (Lefevre 2013).

In pursuit of these activities, increasing numbers of research ships have been sailing through these sea areas. Research and icebreaker ships generate artificial noise with their engines and seismic pulsing tones, and ships engaged in dredging and drilling generate even more artificial noise. Additionally, more ships will mean an increased likelihood of ship-whale collisions, fuel leakage, and oil spills.

These factors all affect the ecology of the bowhead whales, which migrate seasonally through the areas. Increased adverse effects on Iñupiat whaling activities are highly probable. Further, when the full-scale extraction of petroleum and natural gas starts, spills seem inevitable, given recent history. If such accidents occur, especially in winter, emergency and cleaning crews would have difficulty responding because of the sea ice.

4.2.2 Development of Sea Passages in the Arctic

The Northeast Passage and Northwest Passage along the Arctic coasts connect the Atlantic Ocean and the Pacific Ocean. Critical parts of the routes are the Chukchi Sea, Bering Strait, and the Alaska coastal sea areas of the Bering Sea. These are also areas through which bowhead whales and grey whales migrate north in the spring and south in autumn.

For most of the Human Era (Holocene Neolithic, 10,000 BCE–2020 CE), the Arctic coastal sea areas have had so much sea ice year-round that large ships had difficulty navigating them, even in summer. However, since the beginning of the 21st century, advances in ship technology and worsening climate change have expanded the Arctic's navigable areas. European and Russian cargo ships and tankers have been using the Northeast Passage, and Canada and the United States use parts of the Northwest Passage. When the full use of both passages is activated, the resulting increase in ship traffic will pose serious problems for bowheads and other whales: artificial noise, ship-whale collisions, and contamination (ship fuel leakage, gas and oil spills), and increased human

activity. As a consequence, the increased use of both passages will have indirect and deleterious influences on Indigenous Alaskans' whaling activities.

4.3 Regulations: US Laws and International Treaties

Bowhead whales remain an important food and culture resource for the Iñupiat. However, whale populations around Alaska dwindled during 1848–1914 because of overexploitation by American and other whaling fleets. Consequently, protection of many whale species has been adopted on a global scale.

The Indigenous Alaskans, including the Iñupiat, are also currently subject to the regulation of whaling. Their whale catches are controlled internationally by the International Whale Commission (IWC) and nationally by US federal laws and Alaska state laws. Since 1981, the Alaska Eskimo Whaling Commission (AEWC), working closely with and reporting to the National Oceanic and Atmospheric Administration (NOAA), has managed bowhead whales to conduct subsistence whaling within the sustainable catch limits agreed to within the IWC (AEWC 2020). The harvest quota of bowhead whales for Alaskan Indigenous people and the Chukchi during the six years from 2013 through 2018 was 336 (IWC 2018).

The legal basis for catching bowhead whales was an exemption for Indigenous subsistence hunting from the 1972 Marine Mammal Protection Act and the Endangered Species Protection Act of 1973. If the US Congress were to largely modify or remove the exceptions, then Indigenous Alaskans would no longer be allowed to hunt the whales. In other words, their food sovereignty with respect to their reliance on hunting bowhead whales rests on a fragile legal foundation.

They are prohibited currently from selling or buying edible bowhead whale products such as meat, fat, *maktak*, and internal organs, under the Whaling Convention Act of 1949. They do not make any monetary profits from whaling. Consequently, they must buy gasoline, oil, or hunting tools using money that they earn by wage labor to fund their subsistence activities, including whaling.

4.4 National Environmental Policies and Global Anti-Whaling Activism

Since the 1970s, whales have become symbols of environmental protection. Many governments, international environmental protection groups, and animal protection groups have opposed whaling (Kawashima 2011). Most governments stand in opposition to commercial whaling only, but some governments and groups oppose all whaling activities (Kishigami 2017).

At this point, the bowhead whale hunts of Indigenous Alaskans fall under the classification of 'Aboriginal Subsistence Whaling,' and thus, they are relatively unaffected by anti-whaling activism—but not completely. The Makah, an Indigenous group in the US state of Washington, have had their grey whale hunts suspended more than once; they currently cannot resume their hunts pending the release of the results of an environmental impact assessment by the federal government, and they have faced repeated court challenges because environmental and animal protection groups have challenged the legality of their hunts and launched numerous legal battles (Hamaguchi 2013; Beldo

2019). This is just one example of how, whale hunting by Indigenous groups in the United States, including bowhead whale hunting in Alaska, have been influenced directly and indirectly by anti-whaling activism.

4.5 Environmental Contamination and Pollution

Since the 1980s, it has become an important issue that polar bears and other marine animals (e.g., ringed seals) in Arctic Canada have been contaminated by such persistent organic pollutants as PCB and DDT and by such heavy metals as mercury (Kishigami 2002). Particularly, large marine mammals such as bowhead whales, which are at the highest position on the food chain and have long life-spans, are highly likely to accumulate pollutants in their bodies. Consequently, the people who eat them also become vulnerable to health damage. In recent years, mercury has been detected in long-fin pilot whales around the Faroe Islands in the North Atlantic, and this has become a severe problem (Fielding 2018: 246–267). Further, even in far northern regions, concerns persist about environmental threats from plastic and microplastic waste.

Studies have found relatively low levels of organic and heavy metal contamination in the bowhead whales taken from the seas near Alaska, but since these pollutants are increasing elsewhere, this marine-mammal contamination remains a critical issue that must be monitored in the future (Hoekstra, Wong et al. 2002; Hoekstra, O'Hara et al. 2002; O'Shea and Brownell Jr. 1994).

4.6 Changing Lifestyles Among Indigenous Peoples

Since the beginning of the 20th century, Indigenous Alaskans have increasingly assimilated the wider culture. Among the changes in their lifestyles are their academic and career paths, which have become increasingly diverse in the Iñupiat communities. More Iñupiat are choosing wage labor as their primary earning activity, leading to less engagement in traditional subsistence activities. Once, practically all adult males in Utqiagvik participated in whaling in some way; now, an increasing number of adult men have never or have only marginally taken part in subsistence activities such as whaling. Additionally, the number of people (especially the young) who prefer Euro-American foods to their traditional foods is increasing (Kishigami 2014a; 2014b). Such changes negatively affect the continuation of Iñupiat subsistence activities, including bowhead whale hunting in the community.

4.7 Increasing Need for Cash Income

Monetary incomes are fundamentally important to maintain subsistence activities such as whaling. A whaling captain needs an *umiaq* (a large boat made of bearded seal skins) for spring whale hunts, an outboard engine, an ice cellar (underground natural ice storage), hunting tools, explosive harpoon heads, snow mobiles, gasoline and oil, and camping equipment. Procuring these supplies requires cash (Kishigami 2013a; 2013b; 2014a). As stated already, the Whaling Convention Act of 1949 prohibits the sale or purchase of the meat and other edible parts of bowhead whales from subsistence. The Iñupiat distribute the products for free according to their customs. In other words, they cannot earn cash

income through subsistence hunting or fishing, but they need to spend cash to engage in subsistence hunting or fishing.

Undertaking whaling as a captain in spring requires funds of more than US\$25,000. Thus, people cannot continue to hunt whales without being engaged in well-paying jobs or financial support from others, such as family members (Kishigami 2013a; 2013b; 2014a). Currently, the residents of Utqiaġvik are paid dividends (derived from oil production) through Indigenous Corporations and the Alaska state government. Most adult male and female residents have salaried jobs that provide income, so they have sufficient money to invest in whaling equipment, which enables them to continue whaling. If the dividends or monetary income decrease because of worsening economic conditions or declining oil production on Iñupiat lands, the frequency of their engagement in subsistence activities, including whaling, will likely decrease. If so, the total volume of land and marine animals brought into the village for food might also decrease. Households without sufficient cash income to purchase food might suffer privations. This situation threatens food security.

5. Iñupiat Whaling, Food Security, and Food Sovereignty

This section more closely examines Iñupiat whaling in relation to the concepts of food security and food sovereignty. Here, the former is abbreviated to security and the latter to sovereignty.

5.1 Iñupiat Whaling and Food Security

As stated earlier, security comprises four challenges: availability, access, utilization, and stability.

5.1.1 Food Availability

Food availability is related to whether there is enough food of appropriate quality. In terms of the current quotas decided through the AEWG and by the IWC, the Iñupiat of Utqiaġvik are allowed to catch up to 132 bowhead whales over six years (average 22 a year). The whales they kill must be used as food for Iñupiat villagers and their relatives outside the village through sharing or distribution according to their customs, including eating together at feasts (Kishigami 2012, 2013a, 2013b; Stephen R. Brand and Associates 2018). In terms of past performance, as Table 5 shows, the largest number killed in one year was 27, and the smallest was 18, with an average of 22, showing that the food availability has remained relatively stable.

Table 5 Number of whales caught at Utqiaġvik during 2010–2018

Year	2018	2017	2016	2015	2014	2013	2012	2011	2010
Spring hunt	8	8	12	9	7	2	14	7	14
Fall hunt	19	13	10	16	11	20	10	11	8
Total catch	27	21	22	25	18	22	24	18	22

(Source: IWC Records)

Iñupiat whaling in the spring is associated with whaling festivals such as the Nalukataq Festival, so the spring whaling is culturally and socially more important than the fall whaling. When the number of whales caught in spring is small, they hunt more whales in fall to reach their yearly maximum-allowable catch of 22 whales. The current food quality of caught whales presents no serious problems. Consequently, at this point, the Iñupiat face no major difficulties in terms of the food availability of bowhead whales under the current quota system; however, they would prefer to harvest more whales than the current quota allows.

5.1.2 Food Access

Iñupiat are permitted to hunt bowhead whales internationally within the quota system according to the IWC and nationally according to the articles of exceptions for Indigenous people in the Marine Mammal Protection Act of 1972 and the Endangered Species Protection Act of 1973. However, as described above, the whaling activities of Indigenous Alaskans, including the Iñupiat, are conducted based on fragile national laws. However, they still have legal rights as Indigenous people to access to bowhead whales as food.

5.1.3 Utilization

Bowhead whales' meat and fat are nutritious food (Reynolds et al. 2006). In addition, their food safety is not yet inordinately compromised by persistent organic pollutants or heavy metals, as reported by John Craighead George (Wildlife Management Bureau in NSB). Consequently, at this point, they have no particular difficulty using bowhead whales as food.

5.1.4 Stability

Because bowhead whales migrate seasonally, they are not always available in the Iñupiat hunting grounds. However, as Table 5 shows, the Iñupiat still manage to catch an average of 22 whales each year around Utqiagvik. The meat, fat, and *maktak*, which can be stored in underground ice cellars, community freezers, and household freezers, can be used as food throughout the year. This suggests that even though the number of bowhead whales caught might fluctuate seasonally, the whale food supply can be characterised at this point as stable.

In summary, the Inupiat's production, distribution, and consumption of meat and other products from the hunting bowhead whales meet the conditions of food security.

5.2 Iñupiat Whaling and Food Sovereignty

The Declaration Nyéléni named six pillars of food sovereignty (La Via Campesina 2007). In the following sections, I discuss bowhead whales as food from the perspective of food sovereignty and these pillars.

5.2.1 Food for People

The first pillar of food sovereignty is the perspective that food is for the people.

Bowhead whales' meat, *maktak*, and internal organs are local food that the Iñupiat choose to eat, not food that is commercially imported or exported to people outside the region. Thus, bowhead whales are food for the Iñupiat, Indigenous Alaskans.

5.2.2 Values Food Suppliers

The Inupiat who catch bowhead whales and provide them to villagers belong to about 50 whaling groups headed individually by a proportionate number of whaling captains in Utqiagvik.⁷⁾ The villagers value the captains, their spouses, and the whalers (crews) who catch and distribute the whale products. They support whaling activities in various ways, too, such as helping them butcher the whales and providing whaling supplies or funding to the whaling captains and groups.

5.2.3 Localizes Food Systems

Hunting bowhead whales is a subsistence activity conducted by the Indigenous people of eleven communities in Alaska. The whole process, from preparation to the consumption of marine mammals (and land game animals) is conducted by their community-based production, distribution, and consumption systems (Kishigami 2014a).

5.2.4 Local Control and Management

Although the Inupiat's whaling activities are subject to national and international regulations, bowhead whales and bowhead whaling are managed by the Alaskan Eskimo Whaling Commission, which works collaboratively with and reports to the US government's NOAA. Further, the opening and closing of the whaling seasons and the sustainable catch limits are managed by the whaling captains' associations of their respective communities. Thus, in terms of the hunting activities of bowhead whales, the local people plan and manage the production, although under certain conditions.

5.2.5 Builds Knowledge and Skills

Indigenous Alaskans' whaling is a traditional subsistence activity that they have carried out for over 1,000 years. Knowledge of bowhead whales, the natural environment, and whaling skills and technology has been accumulated and handed down through generations. In their whaling, they build on and practice their traditional skills and acquire new knowledge from outside sources, too.

5.2.6 Works in Harmony with Nature

Whaling cannot exist without bowhead whales and the healthy natural environment in which they live; therefore, the Iñupiat (and others) understand the need to avoid overfishing and marine contamination. Thus, bowhead whaling can only exist in a harmonious relationship between the environment and humans. The Iñupiat whaling culture expresses respect for whales and nature, as well as a strong commitment to harmonious coexistence with them. Whaling presupposes the co-existence with nature.

In summary, the Inupiat's production, distribution, and consumption of food from bowhead whale hunting, firmly rooted in the local community, meet the conditions to

establish their food sovereignty.

6. Conclusion: Iñupiat Whaling, Food Security, and Food Sovereignty

The concepts of food security and food sovereignty have gained increasing support among scholars, international organisations, and national governments tasked with identifying, investigating, and establishing policies and maintain healthy food-related practices. This paper examined food security and food sovereignty using the example of the Iñupiat hunt of bowhead whales.

Distributing, sharing, and eating as a group the meat, *maktak*, and internal organs of bowhead whale are ways for the Iñupiat to acquire not only to food resources but also reinforce their cultural identity. They can maintain and pass on their cultural traditions and social relationships through the practice of whaling and the consequent distribution of the edible portions as they share it among themselves and eat it together at communal feasts. The locally produced food gained from subsistence hunting and fishing in general, and bowhead whaling in particular, is a fundamentally important factor in the Inupiat's survival in their current mixed economic system.

The Inupiat's bowhead whaling and their use of its products in Utqiagvik meet the four challenges of food security. The Iñupiat whalers conduct their whale hunts under nationally and internationally recognized regulations; however, they actively practice their whaling, hunting, and fishing activities under their own regional management. This is consistent with the concept of food sovereignty. Thus, in the case of the Iñupiat, obtaining food by whale hunt fulfils the global standards for food security and food sovereignty. More importantly, the Iñupiat depend on whale hunts to achieve both food security and food sovereignty.

Important questions surround whether and how the Iñupiat will be able to continue their bowhead whale hunts in the future. I have described herein some factors that have a high probability of threatening the Indigenous Alaskans' continuation of their whaling. They must overcome these problems and deal with some unique challenges to securing food, such as remoteness and the need to protect the food sources from overexploitation.

As shown in Table 5, the Iñupiat in Utqiagvik landed about 22 bowhead whales every year in 2010–2018. Their whaling activities are closely linked to their monetary income; everything costs more in Alaska, including whaling supplies. Therefore, an urgent issue is how to raise the funds necessary to conduct whaling activities stably. They are not allowed to sell whale meat or *maktak* legally—but they can (and do, according to social customs) distribute and share it as a public activity involving entire villagers (Kishigami 2013b; 2014a). Therefore, I recommend that Ukeagvik Iñupiat (UI, the Indigenous Corporation at Utqiagvik) and the Arctic Slope Regional Corporation (ASRC, the Indigenous Corporation in the North Slope Borough) establish a subsidy system for Indigenous bowhead whaling. To do so, they can refer to the Hunter Support Program established and operated among the Inuit communities in Nunavik, Quebec, Canada (Kishigami 2000; 2005; 2010a; 2014b).

Iñupiat whaling is a local practice conducted at local sites. Simultaneously, it is

deeply related to global issues such as climate change and global warming, resource development, international and domestic whaling regulations, and international environmental conservation and animal protection campaigns. If they want to solve potential food security problems through whaling, a pursuit in which local issues and global issues overlap and are in conflict, the Iñupiat should negotiate (in collaboration with various stakeholders) based on agreements to maintain whaling resources and marine environments. In other words, the Iñupiat should obtain consensus from diverse actors and stakeholders from home and abroad, including oil companies, shipping firms, the US state and federal governments, environment protection groups, animal protection groups, the IWC, the residents of Alaska, other American citizens, foreign governments, and so on (Kishigami 2009; 2010b).

To resolve the attendant difficulties, cultural anthropologists can make contributions by providing various individuals and stakeholder groups with information about Indigenous cultures and their cultural and food-resource-based need to continue whaling. Additionally, cultural anthropologists can coordinate forums for the local Iñupiat people and other stakeholders inside and outside the local community to discuss problems and find solutions. In other words, cultural anthropologists and their methods should serve key roles for realizing and continuing the concepts of food security and food sovereignty in the Indigenous Alaskan communities.

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Notes

- 1) The City of Utqiagvik (formerly Barrow) is officially classified as a US city, but it could be described as a community or village because its population is less than 6,000.
- 2) Food security and food sovereignty in the Arctic region were discussed by Nilsson and Evengård (2015). Regarding food security in Indigenous societies of North America, there have been numerous studies, including Duhaime and Bernard (2002), Ford et al. (2016), Harder and Wenzel (2012), Kenny et al. (2018), Kishigami (2010a; 2014b), Lamalice et al. (2016), and Ready (2016). There have also been studies on food sovereignty, including those by Hill (2017), Hoover (2017), Katanski (2017), Kondo (2018), Miheshuah (2017), Ruelle (2017), Salmón (2017) and Zappia (2017).
- 3) It is noteworthy that the average income is higher than we expect because the data also include highly paid North Americans of European descent and immigrants from Asia (approximately 33% of the total). The Iñupiat residents’ income includes dividends from the Alaska state government and Indigenous Corporations.

- 4) In the community, 9% of all the households hunt and gather 70% of the total volume of wild food, and they distribute whale meat and *maktak* among their families, relatives, and other villagers.
- 5) To obtain food through hunting and fishing, the people of Utqiagvik must pay considerable amounts of money for such things as gasoline, rifle bullets, snow machines, or equipment repairs. Many anthropologists regard food obtained through hunting and fishing as richer in nutrients and cheaper in cost than beef and pork bought at a shop (Wenzel 1991). Others believe that when wild food is converted into cash, after subtracting expenses from profit, it is sometimes more expensive than beef or pork (Stewart 1995; 1996).
- 6) The seasonal migration routes of bowhead whales are thought to be correlated with the distribution of krill that serve as prey. Krill often range intensively under sea ice or drift ice, so their decrease or changes in their distribution caused by global warming are highly likely to influence the whale migration routes. However, the hypothesis has still not been proven with evidence. Global warming has made the spring sea ice unstable, and this has strongly affected the Iñupiat who camp out there and are engaged in whaling. Thus, global warming is expected to have direct deleterious effects on Iñupiat whaling in spring.
- 7) Several groups have co-captains.

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