

Food Security in the DPRK Since the Great Famine of the Mid-1990s

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B.A. in Economics and Politics, August 2011,
The Handong Global University

A Thesis submitted to

The Faculty of
The Elliott School of International Affairs
of The George Washington University
in partial fulfillment of the requirements
for the degree of Master of Arts

May 15, 2016

Thesis directed by

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Abstract of Thesis

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Since the Great Famine of the mid-1990s, the Democratic People's Republic of Korea (DPRK) has experienced significant socioeconomic and political changes. Most importantly, the ways in which North Koreans produce, distribute, and consume food, which shed light on food security, has changed in a great deal. Scholars have sought to understand whether and how food security has improved and why the regime stayed in power despite predictions of its likely demise. The paper examines trends among indicators of food security – food availability and nutritional status in the DPRK – that show overall improvement, while acknowledging that the DPRK still suffers from food insecurity in absolute terms. This paper argues that three factors account for this improved food security: unexpected acceptance of international food assistance, marketization from below, and a series of government policies adjusting to marketization. Based on the analysis of the literature investigating the three factors and their effects, the paper claims that international food assistance was necessary for pulling the country out of the Famine, but food assistance alone did not explain improved food security in the longer term. The paper found that the combination of marketization and government policies was the primary contribution to improved food security. The paper deepens the understandings of policymakers on why the DPRK is not collapsing despite the ongoing food shortages. It also suggests a need for studies of food security to theorize the interaction between state policies and individual agency or coping behaviors.

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Chapter 1: Introduction

Since the Great Famine in the Democratic People's Republic of Korea (DPRK) in the mid-1990s, the international community has paid attention to the hunger problems in the DPRK. International organizations have kept an eye on the people's food availability within the country so that they are not left starved to death as in the Great Famine. In contrast to predictions on the self-destruction of the regime due to the food shortages and the regime's failing to feed its own citizens, the regime is still thriving.

When rejecting the prevalent misconception about the DPRK, which claims that the DPRK government was starving the people as a choice of surviving the regime, Smith (2015) presented the clear evidence of nutritional status improvement in the DPRK. That is, if the government had let the population starve to die either by appropriating the budget for militarization instead of importing food or by diverting food aid to prioritized groups, as has been widely presumed and criticized by international media, the nutritional status in the country would have worsened. In contrast, both of the wasting and stunting rate, which are said to be an indicator of acute malnutrition and chronic malnutrition respectively, halved in 2012 compared to the rates in 1998, according to the sources of central bureau of statistics in the DPRK and nutrition survey carried out by EU, UNICEF, and WFP in cooperation with the DPRK government. While the evidence of nutritional status and its meaning will be discussed in more detail in the below section, Smith's argument is straightforward. The existing evidence does not uphold the claim that the DPRK government deliberately violates the population's rights to food (Smith, 2015, p.33-35).

Contrary to expected by international community, the regime is still thriving, and the people are not dying because of hunger. In this context, it is possible to assume that the state of food security in the country has improved in some degree. Then, what explains this improvement of the food situation?

This paper will delve into the potential factors explaining the alleviation of hunger problems in the DPRK, which are international food aid, marketization, and government policy. The paper draws on Amartya Sen's (1981) entitlement approach that people's access to food depends on their entitlement to private assets and exchange of them. Accordingly, the paper hypothesizes that the DPRK people's increased privatization of their assets and involvement in exchange activities through marketization have advanced food security in the country. As a result of the analysis, the paper concludes that the combination of marketization and government policies to address food security was the most important contributing factor to the improvement of food security in the DPRK.

In respect to nomenclature, "food security" here follows the definition of Food and Agriculture Organization of the United Nations (FAO) from the State of Food Insecurity in the World 2001, citing "food security [is] a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life" (FAO, 2003b). This definition is a refined version from the FAO's 1996 World Food Summit version, which had been the most popularly used definition. The DPRK's own UN Common Country Assessment (CCA) published in February 2003 also adopted the definition of 1996 FAO version to describe food security (Smith, 2007). The only difference between the definition of 1996 version and 2001 version is the word "social" that had been added to the 2001 version. This

was to emphasize the demand side of food security in terms of people's access to food (FAO, 2003b).

The analysis will focus more on “chronic food insecurity” which is more related to structural factors, opposed to “transitory food insecurity” which is mostly originated from natural disasters or economic collapse (Clay, 2002). The focus of this paper will be to analyze the state of food security during the last fifteen years since the Great Famine; to examine whether the country has undergone “chronic food insecurity” and with what degree the state of food security has improved.

The concept of food security has evolved so as to reflect a practical side. Even before the advent of the terminology ‘food security’, scholars would focus on food availability – or, food balance sheet in a country – to assess the needs or inadequacy of food at a national level. Upon Amartya Sen's pioneering work on hunger and deprivation, scholars started to pay attention to individuals' physical and economic access to food. Sen (1981) introduced the entitlement approach, in terms of physical and economic access to food. The main idea of the approach is that poor people may be deprived of food if the food price is too high and their wage is too low, even when the food supply at a national level is sufficient to cover the population (Sen, 1981). The discussion on food security has expanded more, given the recognition that the pattern of individual's access to food is also different within household, particularly in terms of age and gender. Also, depending on individual's health status and metabolic characteristics, the necessary amount of food per day for each individual is different. In this sense, utilization of food has become the new focus of analysis on food security. The 1996 World Food Summit adopted the definition of food security, well reflecting all these aforementioned three domains of food security – availability, access, and utilization (Jones, Ngure, Pelto, & Young,

2013). Jones et al. (2013) explained that the definition also included the fourth dimension of food security, “stability of food security over time” (Jones, Ngure, Pelto, & Young, 2013, p.483).

There are diverse ways to measure food security, depending on the purpose and available data sources. As the paper aims to investigate the macro-level trends in the DPRK’s food security states, the paper will mostly refer to national-level food security estimates, among which the prevalence of malnutrition in a country is the most widely used. As expounded in the below section, the analysis is based on the measurement of food security in the DPRK from as diverse sources as available, including, but not limited to FAO/WFP’s food security and nutrition surveys and Global Hunger Index by International Food Policy Research Institute (IFPRI).

As for the famine and chronic malnutrition in the DPRK, Haggard, Noland, Natsios and Smith have done the outstanding analyses. Haggard and Noland (2007, p.2-3) ascribed its chronic malnutrition to a systemic problem, which were the socialist economy and the failed economic and social policies of the government. Smith (2015) argued that the DPRK’s nutritional status has improved because of the marketization from below and emphasized the important roles of individuals as agencies of change. The details of their arguments are followed in the literature review section below. This paper will investigate three variables that seem to have affected the nutritional status in the DPRK – marketization, changes of government policy, and foreign food aid.

As confirmed in the FAO definition, food security is a long-term, developmental issue, rather than a short-term humanitarian aid. In this sense, although humanitarian aid has admittedly played a significantly important role in addressing food shortages, its role was not sufficient to allow the country stable food security in

the longer term. Therefore, through utilizing greater availability of information and accumulated research about the country, the paper attempts to explore the state of food security in the DPRK. By doing so, the paper found that the degree of individual command over food resulting from marketization and a few government policies are important factors that have affected food security of the country.

To do so, the paper firstly investigates the DPRK's general food system, including the conditions of agriculture industry, to understand that the food self-sufficiency is not a feasible option for the DPRK. Secondly, it briefly explains the Great Famine which engendered various coping behaviors that led to marketization and related government policies. Thirdly, the paper examines whether the state of food security has improved or not since the Great Famine, focusing on food availability and nutritional status in the country. Lastly, it explores the three factors – international food aid, marketization, and governmental policies – and their effects on food security in the DPRK.

Chapter 2: Literature Review

Since its partial opening to outside, the DPRK has been a research subject for scholars from many study fields, including politics, economics, and public health. Depending on scholars' perspectives and interests, there are diversified interpretations on one event or phenomenon. Likewise, there are many different explanations on the DPRK's food security. Therefore, in this section, the paper looks at existing discussions on the DPRK's food security – whether it has improved or not – and the explanatory variables that the scholars assume have affected food security in the country. As a starting point, it will briefly discuss the approaches to measure food security to appreciate the reasoning of scholars' inconsistent understandings on food security in the DPRK.

1. Analysis on Food Security

A great deal of scholars, organizations, and study fields have investigated the food security issue, including chronic and acute malnutrition and famine. Accordingly, varied approaches have been developed and applied to the food security studies. Burchi and De Muro (2012) explained five main approaches to food security from the United Nations Development Programme (UNDP) working paper, which are food availability, income-based, basic-needs, the entitlement approach, and sustainable livelihood. The most important approach this paper takes will be the entitlement approach, which will be applied to the analysis of the Democratic People's Republic of Korea (DPRK)'s nutritional status studies. The entitlement approach focuses on the endowment entitlement that is given to individuals (e.g. assets and labor), and

exchange entitlement through which individuals can access to food. The paper applies the entitlement approach to the DPRK's food security analysis, assuming that individuals in the country have become to be more entitled to both endowment and exchange, through marketization and government policies incorporating elements of market economies.

The caveat is that the five approaches are not mutually exclusive. Although the entitlement accompanied by capability approach will be the main approach for this paper, the other emphasis for food security analysis are more or less interconnected and affect each other.

The food availability approach, which is also called the Malthus approach, is indispensable in food security analysis. It focuses on the relationship between food availability and population, following Malthus's principle of population (Burchi & De Muro, 2012, p.2). The essential point of the approach is that if the growth rate of agricultural production is lower than the growth rate of the population, people will suffer from hunger and eventually starvation. Therefore, the analytic focus is the aggregate food availability of nations (Burchi & De Muro, 2012, p.2-3). Many studies of the DPRK's hunger and famine issue were carried out with this approach because it seemed obvious that the famine was due to the government's insistence on a quasi-closed, self-sufficient economy despite the lack of aggregate food availability.

The entitlement approach, on which this paper's analysis will be based, focuses on "each person's entitlements to commodity bundles including food" (Burchi & Muro, 2012, p.10). The entitlement can be divided into two categories, which are personal endowments and exchange entitlements. A person is entitled to his or her assets including house, land, and livestock, and non-tangible goods such as labor. Exchange entitlement is "the set of commodities that the person can have access to

through trade and production” (Burchi & Muro, 2012, p.10). People can consume food - or be entitled to food – either through producing their own using personal endowments such as land and labor or through trading food with other commodities produced by their labor. In line with this approach, especially exchange entitlement, the paper assumes that the DPRK people’s increased exchange entitlement that was made possible by marketization has contributed to food security in the country.

Dreze and Sen (1989) described more clearly the concepts required to investigate to diagnose the state of food security. They suggested four concepts be distinguished to make sure that all people in a country have command over an adequate amount of food and are in adequate nutritional status. The four concepts are 1) being self-sufficient in food, 2) food availability, 3) food entitlement, and 4) nutritional capability. The four concepts are intertwined with each other, showing a causal relationship. They make clear that the recognition on the distinctiveness of the four concepts and the gaps among them are crucial in combating hunger (Dreze & Sen, 1989, p.165). In the case of the DPRK, food self-sufficiency was not achievable. In addition to this, the lack of foreign currencies coming from exports made the food availability in the country inadequate given that they were not able to import enough amount of food. Accordingly, the absolute amount of food available within the country was far less than required for feeding the population, which made the DPRK citizens entitled to meager amount of food rations. The insufficient entitlement to food led to prevalent malnutrition. The paper analyzes the linkages and relationships among those four concepts in the DPRK case; meanwhile, it pays more attention to food entitlement and nutritional capability, presuming that the conditions for food self-sufficiency and food availability within the country was not as impactful as conditions for entitlement – marketization and governmental policies.

In relation to the entitlement and capabilities approach, Sen deepened the ideas while stressing that capabilities have an important aspect: freedom. Freedom plays a critical role in being able to have capabilities to consume the amount of given resources. Freedom not only has its intrinsic value that individuals enjoy, but also is instrumental to expanding opportunities and enhancing capabilities (Alkire, 2011). Again, related to exchange entitlement, the individuals in the DPRK have become able to – whether legally or illegally – be involved in market activities more freely since the onset of the Great Famine, albeit still limited.

In line with all the concepts elaborated above, Sen also emphasized the role of “agency.” Agency is the individual’s ability to pursue what he or she values or has reason to value. In this sense, Sen did not limit the analytic scope of deprivation to macro-level of society or politics. Rather, he centered on a complementarity between social arrangements and individual agency (Sen, 1999). Drawing on the concepts Sen developed, the paper tries to analyze the DPRK’s improvement in nutritional status while focusing on the potential factors that may have affected the improvement by allowing actors to have more command over food, specifically equipping agencies with more expanded sets of capabilities and freedom.

2. Scholarly discussion on food security of the DPRK

As for the DPRK’s hunger problems, many scholars studied the DPRK’s case, among which Haggard and Noland, Natsios, and Smith are leading. Haggard and Noland (2007) pointed out that the government policies trying to control markets made the functions of markets crippled, thus leading to chronic food insecurity in the country. Natsios (2013) also articulated that the government policies against marketization – especially currency reforms – aggravated people’s vulnerability to

food shortages. In contrast, Smith (2015) emphasized that food situation in the country were enhanced throughout the last 15 years thanks to marketization and the government's priority to address food security – with some unintended side effects, including regional inequalities.

1) Chronic malnutrition as a systemic problem

Haggard and Noland (2007) are consistent with Dreze and Sen's (1989) argument that chronic malnutrition is a systemic problem, beyond the aggregate food availability. According to them, the Great Famine and ongoing food problems in the DPRK are systemic; the authoritarian government did not offer adequate accountability to its citizens, and denied “political and civil liberties and property rights” (Haggard & Noland, 2007, p.220). The food shortage problems could have not deepened and widened if the population enjoyed a freedom to be involved in private production and trading of food (Haggard & Noland, 2007, p.220).

While Haggard and Noland (2007) took note of the emergence of marketization as a coping mechanism through which the people struck by famine strove to survive, they argued that the marketization was only to become a new source of vulnerability due to unsophisticated, vacillating government policies. In other words, they attributed the root cause of food insecurity in the country to its economic and political system of Socialism under which the government tried to curb free economic transactions among people (Haggard & Noland, 2007). In their 2011 book delving into political, economic, and social changes inside the DPRK based on refugee surveys, Haggard and Noland (2011) confirmed the active operation of market economies; however, the government's struggle to maintain the control over economic activities limited the scope of market economies' effects, a large portion of

the population not being able to enjoy the benefits, particularly those who were involved in illegal market activities and mostly the poorest (Haggard & Noland, 2011, p.65-79). Since the Great Famine, people have struggled to survive, forcing them to perform then illegal activities including bartering, selling belongings, and buying food. These coping behaviors increased the absolute number of operating markets, both official farmers' markets and informal ones. The government had to tolerate it due to the breakdown of the Public Distribution System (PDS).

Haggard and Noland (2007, p.210) considered it imperative for foreign exchange earnings to be increased so as to import the needed amount of food in a commercial basis to end the food insecurity in the DPRK. Resting upon Dreze and Sen's four distinct but interrelated concepts, Haggard and Noland diagnosed the fundamental cause of food insecurity in the DPRK. The climatic and topographical conditions in the DPRK are not suitable to be self-sufficient in food. The country has failed to meet the nutritional needs of all nationals through importing food, which is a means of increasing food availability (Haggard & Noland, 2007, p.210-211).

Moreover, the breakdown of the PDS led to the entitlement failure, resulting in people neither having access to food being distributed by the government nor having enough money or assets to buy food in a market. The failures in the above three concepts – being food self-sufficient, food availability, and entitlement – naturally led to limiting people's nutritional capabilities. In this context, especially focusing on the second concept of increasing food availability, they asserted that industrial development was required for the success of economic reforms as well as long-term food security (Haggard & Noland, 2007). Industrial development would bring about the expansion of foreign exchange earnings, and people, especially urban workers, would have more ability to purchase food in markets (Haggard & Noland, 2007, p.212-213).

Haggard and Noland's (2007) opinions regarding the status of food security in the DPRK were apparent; the country had had to endure chronic malnutrition, meaning that their nutritional status had not improved (Haggard & Noland, 2007). The marketization had worked in a limited scope, and the government's unsophisticated economic reform in 2002 led to the worsening of food security by causing intolerable inflation and making people more vulnerable to food price changes. Furthermore, the government policy in 2005, which aimed to rein the markets and revive the PDS, demonstrated that not only did the government still want to control the food market but also the actors in a market could not trust the market system, which may have impeded the establishment of a normally and soundly operating market system (Haggard & Noland, 2007). Intuitively, market economies may not function properly under the perception that markets could be cracked down on soon by the government as well as the expectation that currencies they are using may be of no use in the near future. Haggard and Noland pointed out those concerns, by arguing that the institutional and behavioral changes of individuals instigated by marketization was achievable not thanks to the government, but despite the government's policies (Haggard & Noland, 2007, p.215).

Natsios (2013) also blamed the government's policies for the chronic food problem in the DPRK, explaining it with three economic shocks: The Great Famine in the mid-1990s, the July 2002 economic reform, and the November 2009 currency reform (Natsios, 2013). The breakdown of the Public Distribution System (PDS) precipitated the Great Famine, which led to the advancement of farmers' markets. Natsios (2013) described that from 1999 to 2009 the farmers' markets in fact replaced the PDS as a leading mechanism of the DPRK population's access to food. In this situation, the government's 2002 reforms that engendered high inflation and 2009

currency reforms and other policies banning commercial markets eventually led the country to keep suffering from food problems (Natsios, 2013). This paper does not necessarily dismiss Haggard and Noland (2007; 2011) and Natsios' (2013) points that the governmental policies attempting to regulate private economies restricted the economic activities in markets to some extent. In spite of the aspects that negatively affected the growth of market economies, the paper tries to give more attention to the fact that the government allowed markets to expand, albeit grudgingly, permitted some extent of private production for farmers, and appeared to bring about some measures to address food security of vulnerable groups, such as children.

2) Improvement in food security by marketization as a social change

Smith (2015) put emphasis on individuals as agents of change. In this context, she argued that the DPRK has gone through irreversible social change induced by individuals, which was different from policy changes that Haggard, Noland, and Natsios (2013) claim have been the dominant factors exacerbating food security in the country. In other words, she emphasized that social change was not the same as policy change, and the DPRK's nutritional status after the great famine had improved partly because of marketization, which was the social change from below, and partly because of the government's intervention to address food security, especially targeting children. However, she also pointed out that the outcome had not been even among the population. The income earnings and the amount of food rations were dependent on occupations, regions, and gender (Smith, 2015). Her arguments that marketization is an irrevocable social change which led to improvement in nutritional status in the DPRK are in line with this paper's main argument that marketization is one important pillar explaining improved food security in the DPRK, along with government

policies.

As the preceding prominent scholars expounded, there are various discussions and interpretations on the DPRK's nutritional status and the fundamental factors affecting it. Haggard, Noland, and Natsios claimed that marketization failed to fix hunger problems in the country because of the government's policies that tried to keep control of its food markets. On the contrary, Smith argued that although the effect was unequal across the regions and demographic characteristics such as age and gender, the overall improved nutrition was achieved through the government's intervention under the perception that children must be nourished, as well as through marketization with which people had more access to food. As for assessing the state of food security indicated by nutritional status, while Haggard, Noland, and Natsios focused on the fact that the DPRK has been chronically malnourished, Smith centered more on the improvement of nutritional status in the country despite the fact that it is still widely undernourished and thus requires more humanitarian food aid. This difference in perspectives evaluating the state of food security led to different interpretations of the impact of food security factors among scholars.

With respect to the interpretation of food security in the country, the paper primarily follows Smith's perspectives that food security in the DPRK has been improving to some extent. The paper further develops the argument that increased individual command over food through marketization and the government policy favorable to addressing food security have been critical factors promoting nutritional status in the DPRK. Even though the population has been chronically malnourished, if the nutritional status in fact has progressed, there may have been some important causative factors. The three variables this paper focuses on – international aid,

marketization, and government policies – explain to some degree why the state of food security in the country has advanced over time. Therefore, this paper fundamentally investigates all the arguments of aforementioned scholars to answer the question of whether the nutritional status in the DPRK has improved or not since the Great Famine of the mid-1990s and which factors have affected it the most. As a result of the analysis, this paper asserts that marketization and government policies calibrated to address hunger problems have been conducive to reinforcing food security in the country.

Chapter 3: Food Security Assessment in the DPRK

1. The Food Systems in the DPRK

The DPRK had insisted on being food self-sufficient, before going through the Great Famine. Even after the Great Famine, although the government did not hold on to self-sufficiency in food anymore, it still put a high priority in agriculture industries. In this section, the paper probes the general agricultural conditions and food distribution systems in the country to understand why the country is not capable of being self-sufficient in food and how the country has evolved the policies to raise agricultural productivities. This comprehension on the general background of the agricultural system in the country will strengthen the understanding of why the government's policies to reconstruct a part of the system, such as farmers' cooperatives, helped food security in the country.

1) The conditions for agriculture

To maintain the regime without threat or interruption from outside, the government sought to be self-sufficient in food availability. Because of this reason, the government highly emphasized the agricultural industry and operated it through well-established farmers' cooperative systems and the Public Distribution System (PDS). However, food self-sufficiency was not achievable, mostly because of the environmental conditions of agriculture; the country has an inadequate amount of arable land compared to the population size (Noland, 2006, p.4-5). Specifically, FAO

(2013) explained that almost 80 percent of the country's land was mountainous area, which was not adequate for cultivation. Therefore, it has a limitation restricting the expansion of farming lands. Also, in terms of weather, it has an insufficient growing season. The winter is long and the summer is short and rainy. Droughts are frequent occurrences in spring, winter, and autumn (FAO/WFP, 2013, p.11).

The unfavorable environmental conditions for agriculture led the country to adopt the input-intensive agricultural production, by which it employed a high amount of chemical fertilizers and an irrigation system operated by a large amount of electricity. Before the collapse of the Soviet Union, the DPRK could import fertilizers and oil for electricity for very low-prices, or sometimes receiving a government grant. Some scholars (Noland, 2006, p.5) consider this relationship and the collapse of the Soviet Union as the principal reason for economic downturn, and thus, the Great Famine of the DPRK. As the Soviet Union fell down and was no longer able to provide necessary input on agriculture to the DPRK, the agricultural system in the DPRK also nearly collapsed.

2) The Public Distribution System

While restructuring the country's social, economic, and political systems as a whole following its unique socialist ideology right after the division of Korea into North and South, the DPRK established and implemented the Public Distribution System (PDS) as a national food system. Under this system, the rights to harvested food basically belong to the central government. Depending on each region's agricultural productivity based on the topographical conditions, the central government assigned the local authorities the amount, the kind of items to be

produced, and when these items are to be harvested. Then, the local authorities pass it on to local farm cooperatives. After harvesting, the cooperatives were able to sell the products only to the local Public Distribution Center (PDC), except the amount rationed to them. The procurement price from the government was very low, in order to supply the food to urban residents or industrial workers at a very low price. Instead, the cooperatives received the needed inputs, including seeds, fertilizers, and farm machines, from the government (Natsios, 2013, p.119-120).

Under the PDS, the government determined the amount allocated to individuals, according to occupation, gender, and age. The PDS classified the population into sixty-four categories, the top being the leader, Kim's family (Natsios, 2013, p.118)¹. When it was working normally, the industrial workers and laborers received approximately 700 grams of food per person a day. Since the 1970s, the amount of rations became smaller and smaller (Choi and Koo, 2009, p.110).

While the PDS dealt with staples, including rice and grains, for essential items such as salt, oil, and soy sauce, the government has operated State Shops at a county level. The allocated amounts of those items that can be sold at a State Shop vary depending on the county's availability of those items or accessibility to regions where the items are produced. People could buy the items with coupons distributed by the government or, in some cases, with cash. The State Shops sell meats only on major holidays (FAO/WFP, 2013, p.33).

Under the PDS, individuals had no entitlement to any food except what was allocated to them by the government (Haggard & Noland, 2007, p.22). Since they had neither freedom to travel across the country nor freedom to be involved in private economic activities, individuals could not secure the necessary amount of food

¹ Natsios (2013) asserted that the categories were established according to the importance to the survival of the regime.

without the PDS. However, after the breakdown of the PDS since the Great Famine, the government halfheartedly acquiesced to people traveling from county to county as well as to people being engaged in market economies, for the sake of the survival of the population. This shift in the scope of the social institution resulted in increased entitlement to their own endowment and exchanges to some extent at individual level.

3) Farmers' Cooperative Systems

Farmers in the DPRK had to belong to the cooperative farms administered by local governments. The cooperative farms were in charge of food production, distribution, and management. In addition, they distributed necessary inputs, including seeds and fertilizers, to farmers. The cooperative systems affected the productivity of farms by weakening farmers' incentive to produce more effectively and efficiently. Firstly, the central government assigned collective farms a food production outcome goal, that was always unattainable compared to the actual agricultural capacity. Moreover, the collective farms and individual farmers did not have autonomy regarding the operation of farms. Accordingly, they could not cope with a decrease of productivity or suggest and implement any innovation from their own expertise (Nam, 2007).

It is obvious that the system of cooperative farms curbed individuals' agency in boosting the effectiveness of agricultural production as well as of its consumption. As will be explored below, when the government allowed some extent of individual harvest in privatized lands, it seemed to increase national food availability through giving motivation to individual farmers. Therefore, the slight adjustment of the agricultural system, which left some room for individuals to pursue their own values,

including either their own consumption or selling harvests in markets, contributed to enhanced food security.

4) Kitchen Gardens

As the Public Distribution System (PDS) started to falter due to food shortages, there emerged kitchen gardens with which people could privately harvest their own foods – only non-staple foods, such as vegetables. This harvest was legal: the government permitted the private ownership of very small portion of land for harvests – albeit limited to hillside or sterile land at first. It was a breakthrough in food economies in the DPRK, in that the government started acquiescing to private produce and ownership of food. Moreover, these kitchen gardens became a stepping-stone for marketization in food economies, as people – probably illegally – expanded the size of kitchen gardens, and sold the produce in the markets, as will be explained in detail in the below section. Some analysis evaluated that after the Great Famine, more than 50 percent of the DPRK population have relied on the kitchen gardens as a primary source of foods (Kim, 2014, p.24). Therefore, kitchen gardens not only augmented food availability within the country, but also strengthened individual's access to food, as more people became entitled to their own assets, including small portion of lands.

2. The Great Famine of the Mid-1990s and Its Effects

1) The outbreak and the fundamental reason of the Famine

The food shortage began appearing in society way before the Great Famine, although scholars' discussion on precisely when it started to become a problem is diverse. However, it is safe to presume that lessening the amount of food rations is an indicator of national food shortages. The caveat is that lower amount of food rations is necessary but not a sufficient indicator for food shortages. For example, although food rations started to decrease since the 1970s, it was mainly to stock up on provisions in case the military needed it (Choi and Koo, 2009).

In the late 1980s, the government curtailed the amount of food ration for a person per day through the PDS, resulting in people getting 547 grams per day. In the early 1990s, the rations diminished again to 492 grams per day. In 1991, there was a government-promoted campaign, propagating "let's eat only two meals a day." To the international community, the government denied that it was experiencing food shortages during those times. However, in 1995 when a disastrous flood attacked the country and wiped out 17 percent of grain produced in 1994, the government made an unprecedented appeal for food assistance to the international community (Lee, 2005, p.7-10). Without a doubt, the food shortage was more severe among people who belonged to the lower class. For example, children and the elderly received reduced amounts of rations given that they were not working; workers needed more energy to do physical labor and were given larger rations. In addition, according to the DPRK's unique social strata, based on which the rations were decided, people who were in the

lowest class – politically wavering and non-working population such as children, the elderly, and disabled – were particularly more marginalized and were allocated absolutely inadequate amounts of food (Haggard & Noland, 2007, p.54). Under the PDS, people had no choice but to resort to the official distribution of food for their own subsistence – even when rationed foods were of inferior quality and less than the minimum amount required for survival. Consequently, the continued food shortages and following Famine led to diverse coping behaviors outside the realm of the PDS, increasing individuals' agency towards social changes that would bring about food security.

As for the cause of the Famine, many scholars have analyzed it and made diverse conclusions. The discontinuance of economic assistance from China and the Soviet Union was one reason that led to a downturn of agricultural productivity. The DPRK government mostly blamed bitter natural disasters, including floods and droughts. However, as elaborated above, the problem of food shortages was evident within the country way before the Great Famine. In this sense, there were criticisms against the government that it could have carried out some measures to prevent or at least address the Famine. In addition, although the country had similar floods and droughts since the Famine, there were no food problems to the degree caused by the Famine. That means, natural disasters, including floods and droughts, were not a fundamental factors causing hunger problems in the DPRK as the government asserted. Furthermore, the fact that the country has not went through another tragic famine under the same condition, such as severe natural disasters, suggests that some factors, according to the argument of this paper, government's policy and marketization, have played crucial roles improving food security within the country.

2) The response of the government, international community, and citizens to the Famine

Faced by severe hunger originated from absolute food shortages and few to no food rations distributed by the government, there emerged varied coping behaviors of the population in order to survive. Firstly, while it was illegal to move to other provinces without permission, many people started to travel across provinces to find food to eat through trading, or scavenge alternatives to food, such as barks and plants. Some people even started to cross the border to China to find food (Lee, 2005, p.11).

Smith (2015) emphasized that women's role was especially crucial in feeding a family as men were mobilized to military or industry works. Likewise, there exists much research (Smith, 2015; FAO/WFP, 2013) focusing on women's growth as an economic actor, starting from scavenging for food, and some women becoming traders at boarder regions.

Some people stole mineral products or idle machines in factories that were not operating after the economic depression in the country, and then they would illegally trade them for food of poor quality at the border region adjoining China (Kim, 2014, p.28).

While adjusting to the faltering PDS that could not deliver adequate amounts of food they needed, people started to produce their own food on small portions of privatized land. Furthermore, some people, particularly those living in cities, counted on the help from relatives who were farmers or had surplus food, or bartered their belongings, including livestock, for food (Kim, 2014, p.24).

In the case of the farming population, they used to illegally pre-harvest some portion of the products before they had to turn the products in to the local PDS. In the

Famine years, the rations for the farming population were also less than the minimum required to sustain a person daily. Therefore, the farmers pre-harvested either to feed themselves and their families or to sell the products to the markets. For instance, according to WFP, in 1996 corn harvests of 1.3 million metric tons that were estimated to be harvested that year were missing. From this fact, it is possible to assume that farmers illegally harvested the corn and diverted it for their own use (Natsios, 2013, p.122-123).

From the government's side, faced with the dire situation that it could not address on their own anymore, the government had to adopt a few changes that were not in line with its Socialist system. As expounded in the below section, the government embraced some elements of a market system. Specifically, it tolerated private economic activities of people across the country, such as trading and bartering. Given that the central government could not acquire necessary amounts of food supply for the PDS, it acknowledged private harvests in small portions of privatized lands or kitchen gardens. The tacit approval of privatized land – no matter how small they were – and kitchen gardens at individuals' houses may be interpreted as a partial acceptance of private property rights. In addition, the government legally allowed the citizens to travel freely across the country, although it consisted of multiple demanding processes, which required several certificates. Yoon (2009, p.53) argued that right after the Famine, when examining their travel, the authorities dealing with people's travel took into account people's circumstances; people had to seek foods in order to survive. These small policy shifts were beneficial to the development of marketization, through allowing individuals to have more freedom in terms of travelling across the country to seek food sources.

Essentially, through the experience of the Famine, the people, including those

from local governments who were in principal charge of feeding the villagers, learned that they could not rest solely on the government and its PDS for their own survival. In the case of local officials, their coping behaviors with increased autonomy led to two contrasting effects: corruption and local solutions for their own villagers. Although corruption of local officials became an emerging problem throughout marketization in the DPRK, Kim (2014) argued that the corruptly appropriated foods contributed the expansion of markets (Kim, 2014, p.27). Without doubt, corruption is a social problem that needs to be fixed. However, in this case, corruption of local officials and the expansion of markets reveal the increased individual agency – albeit used negatively – led to a social change that affected food security of the whole population.

The Great Famine attracted the international community's attention to the country, especially the organizations and individual actors who were doing humanitarian works and development projects. The DPRK government's appeal for food aid from the international community in 1995 opened the door of the country that had been voluntarily isolated (Lee, 2005). FAO (2003, p.1) assessed that since the Great Famine the humanitarian assistance helped about twenty percent of the population. Haggard and Noland (2011) explained that international aid has fed one-third of the population since its arrival in 1995 (Haggard & Noland, 2011, p.55). The instant response of the international community with a large quantity of food assistance has increased the national food availability. Therefore, it is not deniable that international food assistance has played a significant role in helping the DPRK people to find the way out of the miserable conditions of the Famine.

3. The Assessment of Food Security Since the Great Famine in the DPRK

Traditionally, the state of food security was measured mostly based on food supply – food availability – at a regional or national level. However, recognizing the fact that food availability did not necessarily translate into food consumption, scholars and organizations have paid attention to looking for appropriate indicators measuring food security at a household level². This paper adopts Burchi and De Muro’s framework, which is based on capability approach introduced by Dreze and Sen (1989). De Muro and Aurino (2011) explained that achievement of food security is a pseudo-production function of food availability, access to food, and utilization of food. Therefore, in order to measure food security, it is required to analyze each dimension: whether “there is sufficient availability of food (in quantity and quality); people can access to an adequate amount (and quality) of available food; and people are capable to utilize properly the food that they accessed” (De Muro & Aurino, 2011, p.3). As indicators of each dimension – food availability, food access, and food utilization, this paper reviews FAO’s analysis on food availability in the DPRK, the extent of market expansion in terms of access to food, and nutritional status resulting from food utilization. Although there is no specific, explicit indicator or statistics representing individual access to food, this current paper will instead investigate how marketization in the DPRK has increased individual access to food.

In the below section, the paper looks at the level of food availability through

² For example, see Frankenberger (1992) for the overview of how the focus of measuring food security has evolved. In his article, he introduced diverse types of indicators for food security, depending on which aspects to focus on: process (e.g. food supply and food access) and outcomes (e.g. consumption, household perception of food security, and nutritional status) of food security.

agricultural production and imports since the Great Famine, and statistics in relation to the nutritional status, obtained from diverse sources, including the Central Bureau of Statistics in the DPRK, UN, and IFPRI, which is a non-governmental research organization. The detailed analysis of marketization will follow in the section discussing the social, institutional changes in the DPRK.

1) The level of food availability since the Great Famine

a) Agricultural production

The White Paper on Human Rights in North Korea published by Korea Institute for National Unification (KINU) evaluated that the availability of food in the DPRK has increased in recent years. As shown in Table 1, food shortages in the DPRK have lessened. KINU (2015) attributed this improvement of availability to the enhancement of agricultural productivity with a governmental policy, which had encouraged a revolution in agriculture (KINU, 2015, p.235).

Table1. Food supply and demand in the DPRK from 2010-2014

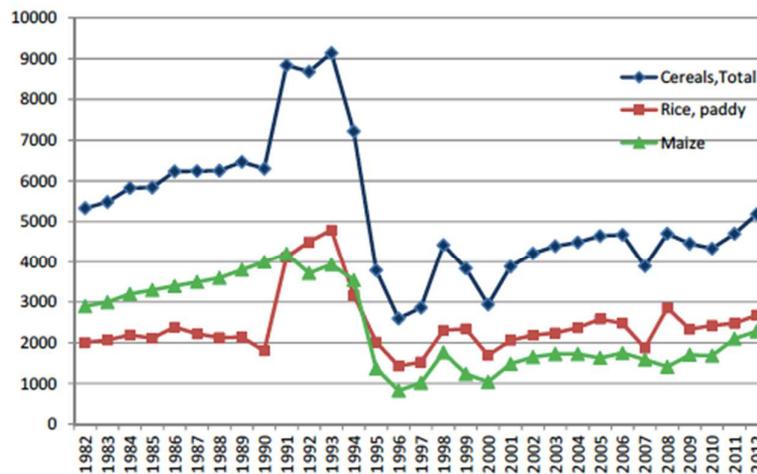
	2010	2011	2012	2013	2014
Unit: 10,000 tons					
Domestic production	450	469	441	492	503
Import	41	42	33	(30)	(30)
Demand	531	534	536	539	642
Supply	491	512	473	522	533
Shortages	40	22	63	16	9

Source: KINU (2015)

The assessment of food security from FAO/WFP (2012) showed a different interpretation on food availability in the DPRK, although it had data only until 2012. It argued that to have stable food security the DPRK would have to restore output levels of the 1980s, a period when the trade arrangement was favorably established

with cooperation of the Soviet Union. That being said, although the national level of cereal production had been increasing, it was not enough to ensure food accessibility for all. Figure1 displays the trend of the cereal production level, which indicates that the level of cereal production after the mid-1990s, the periods of the Great Famine, failed to return to the level of production before the mid-1990s. This trend upholds the argument of the FAO/WFP report that the cereal output level must be restored to the level of the 1980s for food security for all population (FAO/WFP, 2012, p.10).

Figure1. DPRK- Cereal Production 1981-2012 ('000 tonnes)



Source: FAO/WFP. (2012).

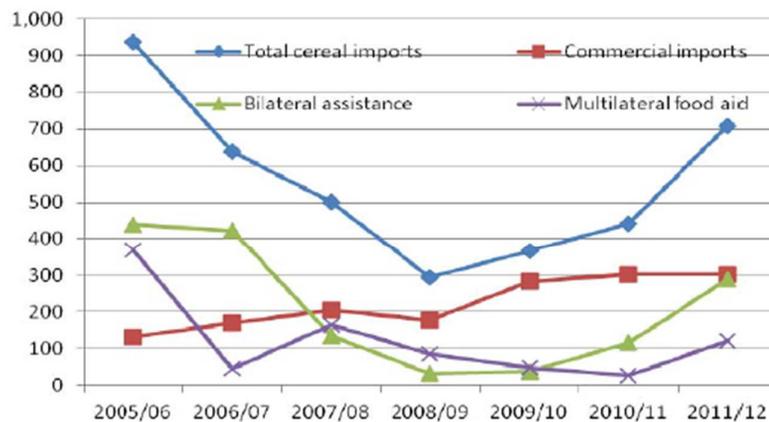
b) Food imports

There have been arguments (Haggard & Noland, 2007, p.10) that the DPRK government uses food aid, instead of importing food on their own, to counterbalance the national needs of food. However, the amount of imports in a commercial basis has been stable at a low level even when the amount of food aid was limited for economic and political reasons. Various factors have affected the country's capacity to import

foods, including international food prices, domestic economic situations, and international trade balances (FAO/WFP, 2013).

Figure 2 shows the trend of cereal imports, including imports with a commercial basis and food assistance from bilateral and multilateral assistance. As confirmed by the FAO/WFP 2013 Report (FAO/WFP, 2013, p.9), the commercial imports of cereal have been stable, albeit with a slight increase. Therefore, Figure 2 indicates that the total amount of food inflow depends a great deal on the amount of bilateral and multilateral food aid, rather than the commercial imports. However, the caveat is that the data is only available in terms of official statistics, thus having limitations to grasp a substantive sense of food availability, including informal forms of food imports, especially informal trading in the border regions adjoining China.

Figure2. The trend of DPRK cereal imports, 2005/06 to 2011/12 marketing years ('000 tonnes)



Source: FAO/WFP. (2012, p.8).

2) The nutritional status

a) The ways used to evaluate nutritional status

Across the organizations investigating and measuring nutritional status, there are multiple ways to evaluate this, as followed below. Depending on where to put a particular focus for measuring the state of food security, the methods measure a nutritional status at the individual level or national level differently. Therefore, this paper will briefly look at each measure's meanings.

Stunting and wasting

Stunting and wasting are indicators of a child's malnutrition. Wasting, low weight-for-height, usually signifies acute malnutrition, which occurs during short time periods. Therefore, wasting can be more easily addressed with food assistance. In contrast, stunting is related to chronic malnutrition. Stunting is usually measured from birth throughout the first two years of life, and it is resulting from the sustained inadequate food consumption. While stunting means low height-for-age of reference population, it usually accompanies physical debilitation followed by morbidity and mortality (WFP, 2016).

Being malnourished and being undernourished

Malnutrition happens when a person does not consume enough nutritious food necessary for living a day or does not have the abilities to digest consumed foods for energy. Malnutrition includes both under-nutrition and over-nutrition. Micronutrient deficiencies belong to the category of under-nutrition. Micronutrient deficiencies are related to the lack of micronutrients such as vitamins and minerals

that are necessary for physical growth (WFP, 2016).

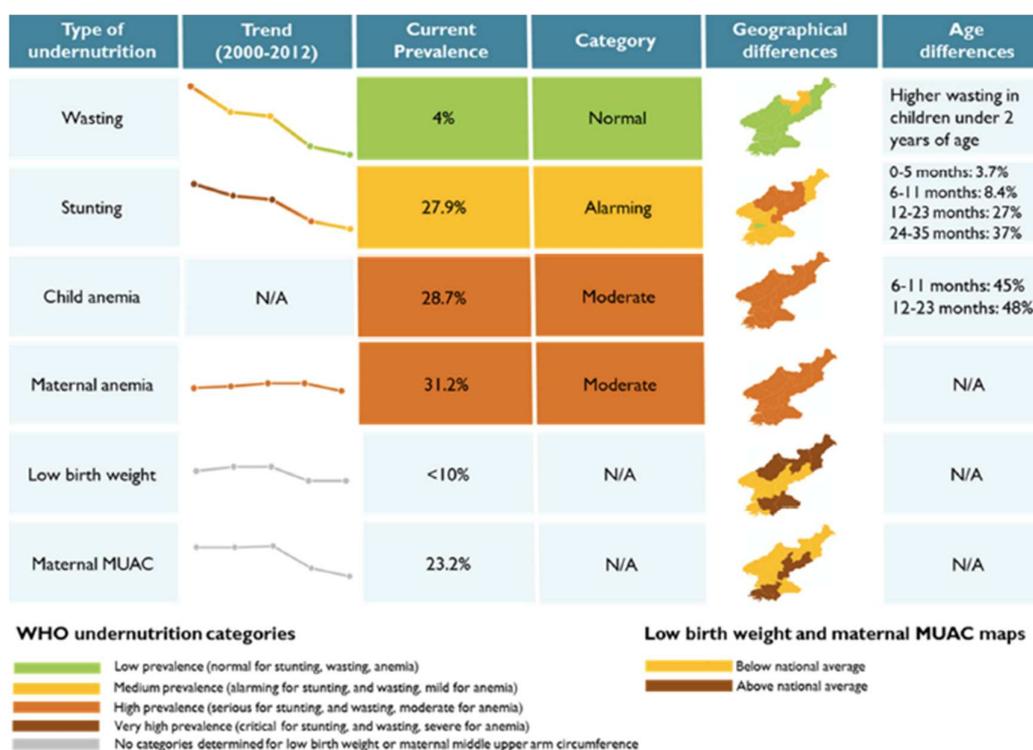
When evaluating hunger problems at a national level, FAO pays attention to “dietary energy intake” (WFP, 2016, p.1). FAO aims to measure a consumption level, compared to the minimum level of kilocalories. Methodologically, it essentially examines the supply and demand of food at a national level, through a national food balance sheet vis-à-vis the population level, in order to measure a national food availability. If a country falls short of food supply that is required to feed the country’s population level, then the country is evaluated as undernourished.

b) The estimation of nutritional status in the DPRK

FAO/WFP Nutritional surveys

FAO/WFP nutrition survey of the DPRK in 2013 clearly showed that the trends of wasting and stunting from 2000 through 2012 had been improving. Although the level of stunting was still high, being categorized as “alarming,” it is obvious that in terms of trend, it was continuously decreasing, as indicated in Figure 3. However, it is notable that geographic disparities in improvement of nutritional status still existed (FAO/WFP, 2013, p.38).

Figure3. Under-nutrition trends in the DPRK for selected indicators, 2000-2012



Source: FAO/WFP. (2013, p.37).

The DPRK National Nutrition Survey

The Central Bureau of Statistics (CBS) in the DPRK had carried out nutritional surveys as well, particularly concentrating on children's nutritional status, in 1998, 2000, 2002, 2004, 2009 and 2012. Although the CBS was principally in charge of those surveys, WFP, UNICEF, and WHO provided technical support, such as utilizing methodologies, training national staffs to implement surveys, and analyzing the results. Although there is a limitation in data credibility in that the surveys were done by the DPRK government, the surveys are also accepted as valid to a significant degree. This is because the staffs from the organizations – WFP, UNICEF, and WHO – monitored and analyzed the process of surveys. The surveys are targeting children aged from birth to six years and mothers who have children of less than two

years of age. As presented in Table 2, the rates of stunting and wasting were continuously decreasing.

Table2. Trends in child nutrition in 2002-2012 from UNICEF survey (unit: %)

	2002	2004	2009	2012
Stunting (low height for age)	38.8	37.0	32.4	27.9
Severe stunting	14.4	12.2	8.4	7.2
Underweight (low weight for age)	20.1	23.4		15.2
Severe underweight		8.1		
Wasting (low weight for height)	8.1	7.0	5.2	4.0
Severe wasting		1.8	0.5	0.6

Source: CBS (2013, p.7); UNICEF. (2002, p.21; 2005, p.42-43).

UN Statistics

To evaluate whether a country has achieved the Millennium Development Goals (MDG), the United Nations (UN) has accumulated data for MDG indicators. As one of the indicators for Goal 1 of eradicating extreme poverty and hunger, it provides data of the “proportion of population below minimum level of dietary energy consumption,” defined as a percentage of undernourished population.

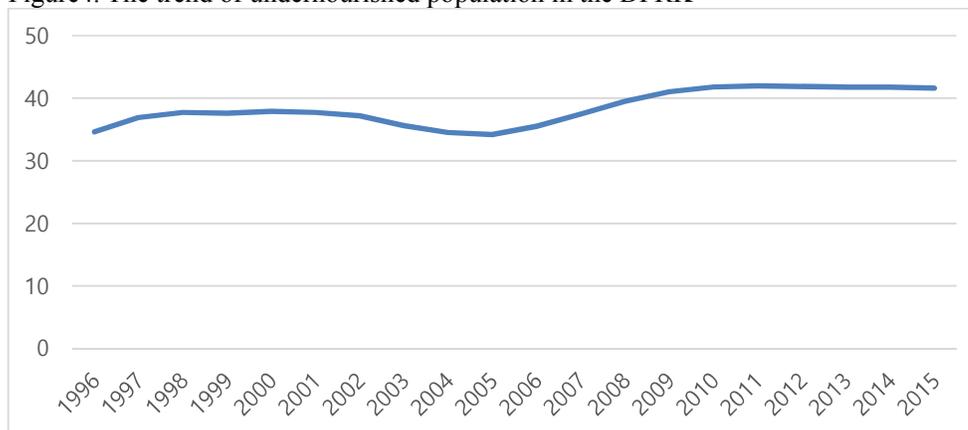
As Table 3 and Figure 4 shows, the percentage of the undernourished population in the DPRK has increased over time, which is opposite to the cases of children’s nutritional status. To understand the different trends, it is useful to comprehend the methodology of getting data. As briefly explained above, the computation of a undernourishment level in a country is based on average food availability from a national food balance sheet, population level, and the average amount of dietary energy required from the international standard. In this sense, the level of undernourishment shows the general trend of national food availability, missing the aspects of access to food and utilization of food. The increased undernourishment percentage is mostly attributable to population increases.

Table3. Population Undernourished, percentage

1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
34.6	36.9	37.7	37.6	37.9	37.7	37.2	35.6	34.5	34.2
2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
35.5	37.5	39.5	41.0	41.8	42.0	41.9	41.8	41.8	41.6

Source: United Nations Statistics Division, Millennium Development Goals Indicators.

Figure4. The trend of undernourished population in the DPRK



Global Hunger Index

The International Food Policy Research Institute (IFPRI), in cooperation with Concern Worldwide and Welthungerhilfe, came up with Global Hunger Index (GHI) to track national food security in terms of nutritional status. The index measures the hunger problems based on three dimensions, which are inadequate food supply, child under-nutrition, and child mortality, with each category weighing one-third, respectively. These dimensions have indicators under each category: under-nourishment for inadequate food supply; wasting and stunting for child under-nutrition; and under-five mortality rate for measuring child mortality. The mix of three dimensions is worthwhile in that it can address, in some degree, errors coming from the nutrition surveys based on random sampling (Grebmer et al., 2015). Most importantly, the GHI is an innovative way to measure hunger problems,

acknowledging the multi-dimensionality of hunger problems as explained in the above section: food security must be approached in terms of food availability, food access, and food utilization. In this sense, the GHI tries to combine the three dimensions – undernourishment, child wasting and stunting, and child mortality – into one index. The GHI included the indicator of child mortality into the index primarily because child mortality is presumed to reflect the aspect of micronutrient deficiency. As the GHI score is calculated by the sum of weighted rates of undernourishment and malnutrition rates³, the higher the score is, the more food insecure the country is (Grebmer et al., 2015).

The 2015 GHI shows that the DPRK ranks 78th among the 104 countries investigated, with the GHI score of 28.8, which indicates “serious” hunger levels. The rank and score reveal that the DPRK still stands as a food insecure country, in the global standard. However, as shown in Table 4, the trend of DPRK’s GHI score is obviously improving. It may be attributable to decreased stunting, wasting, and child mortality.

Table4. Global Hunger Index for the DPRK

1990	1995	2000	2005	2015
31.3	34.3	33.2	31.2	23.1

The analysis on the statistics of nutritional status in the DPRK

Recapitulating the analysis of nutritional status in the DPRK, the trend presents the improvement. Going back to De Muro and Aurino’s framework for measuring

³ GHI score = $(\frac{1}{3} \times \text{Standardized rate of undernourished population}) + (\frac{1}{6} \times \text{Standardized rate of child wasting}) + (\frac{1}{6} \times \text{Standardized rate of child stunting}) + (\frac{1}{3} \times \text{Standardized rate of child mortality})$. For specific calculation method and its meanings, refer to Grebmer et al., (2015).

food security, whether a country achieved food security or not must be measured based on the three dimensions – food availability, food access, and food utilization. This current paper looked at the dimensions of food availability and food utilization in the above section. In regards to food availability, the country is suffering from undernourishment, mostly owing to increasing population. In contrast, in terms of food utilization, the statistics show that less people have been malnourished over time. The Global Hunger Index (GHI), which evaluates national hunger problems in a multidimensional way, also tells that the DPRK’s nutritional status is progressing, although it is still under the “serious” level of hunger problems. Given that the three dimensions of food availability, food access, and food utilization are interlinked with each other, the improvement of nutritional status resulting from food utilization vis-à-vis decreasing food availability seems contradictory. That being said, the role of food access – mainly from marketization – was crucial in explaining this phenomenon; it is feasible to assume that with less or unchanging amount of available food nationally, the pattern with which people have access to food has changed so that less people are malnourished. In other words, people are more entitled to food or entitled to assets that can be exchanged with food over time. This increased entitlement was possible because of the enhancement of individual agencies through marketization and government policies adjusting to it. The below section investigates this argument further, through delving into institutional and socioeconomic changes in the DPRK since the mid-1990s.

Chapter 4: The Institutional and Socioeconomic Changes Since the Mid-1990s and The Effects on Food Security

To find evidence upholding the argument that the increased entitlement to food was the major reason of enhanced food security in the DPRK, this chapter examines the institutional and socioeconomic changes that the country has experienced since the Great Famine. The three main factors – international food assistance, marketization from below, and government policies – seemed to be the most noticeable institutional and socioeconomic changes that are related with food situation in the country. The paper hypothesizes that the increased entitlement to food contributes to enhanced food security in the DPRK, rather than food availability, and the improvement of entitlement to food was possible because of marketization and government policies adjusting to market systems. Therefore, in this chapter, the paper investigates the three factors in detail, thus verifying the hypothesis.

1. International food assistance

The inflow of food assistance and international agencies, including Non-Governmental Organizations (NGO), have both direct and indirect influences on the society of the DPRK in manifold ways. Directly, the food assistance increased the absolute amount of food that the citizens can have access to, although some scholars (Haggard and Noland, 2007, p.2) criticized that food assistance has been diverted to the government and to feed the military. The paper posits that international food assistance played some role in ameliorating food situation in the DPRK, even though

the role was not pivotal as the role of marketization and government policies was. Therefore, the investigation on whether food assistance was beneficial to food security as intended is followed below.

1) The diversion of food aid

To argue that food aid was not distributed to intended beneficiaries such as normal citizens – not the military, Haggard and Noland (2011) provided the refugee survey results as evidence as in Figure 5 below. The government did not conform to norms required by international assistance agencies, including transparency and accountability; thus, it was difficult for the international agencies to monitor and evaluate the flows and outcomes of food aid. As Figure 5 shows, the two surveys with refugees in China and South Korea present that many of them had not heard of nor received food aid. Only about half of the respondents knew about the existence of food aid being sent to the DPRK. Among those who knew about food aid, less than 5 percent of respondents residing in China and 33 percent of respondents in South Korea had received food aid when they lived in the DPRK. It may mean that the people who needed food aid to the extent that made them choose to escape the country were not receiving food aid because they lived in politically and geographically marginalized provinces (Haggard & Noland, 2011, p.56).

Figure 5. Perceptions of Food Aid to North Korea

Response	China survey	South Korea survey
Knowledge of food aid to North Korea		
Yes	56.5	43.6
No	43.5	56.4
Total	100	100
Have you received any food aid? (of those who knew of food aid)		
Yes	3.5	33.1
No	96.5	66.9
Total	100	100
Have you received any food aid? (urban subsample, of those who knew of food aid)		
Yes	2.7	14.4
No	97.3	85.6
Total	100	100

Source: Haggard and Noland. (2011, p.56).

However, Haggard and Noland gave a caveat which stated that this result did not necessarily corroborate that people did not receive any food aid. The multilateral and bilateral agencies had provided food aid that amounted to feed one-third of the population no matter who received them. Some (Haggard & Noland, 2007) criticized that the military and political elites were the primary beneficiaries of food aid as the food from international assistance was also managed under the PDS. It may be true to some extent. However, it is more persuasive that political and military authorities illegally and corruptly used food aid for making profits in the markets. In other words, they may be privileged in terms of access to food aid, but it is difficult to verify that the military diverted food aid to support its military system or feed the army itself. Furthermore, there is no solid evidence that food aid had been diverted to the military (Smith, 2005, p.25). The reason people could not hear or know of food aid was possibly because it flowed to the markets without being titled as “food aid.”

Haggard and Noland (2011) suggested three potential explanations of the

survey results that many percentages of people have not known and received food aid. The most positively interpreted is that the food aid is distributed via the PDS and organizations such as orphanages, child-care centers, schools, and hospitals. People did not recognize that it was from food aid, although they were receiving it. Secondly, the food aid may have been diverted to the markets in some way. Lastly, food aid may have mainly fed the privileged groups such as the military (Haggard & Noland, 2011; p. 57).

In relation to the diversion of food aid, some scholars, including Haggard and Noland (2007), deemed that this diverted food, not to military but to private markets illegally, built up the market systems in the DPRK. The illegally seized foods not only encouraged the establishment of some venues to trade them but also stimulated entrepreneurial inspiration so as to make the markets function; for instance, institutional infrastructures such as transportation services between markets and farms appeared and progressed (Haggard & Noland, 2007, p.121-124)

2) The increased information

As the other indirect ramification of international food aid, information about the DPRK became available to the international community through the strenuous work of the international humanitarian agencies inside the country. Conversely, the information about the outside world became also accessible to the people in the DPRK. The government officials in the DPRK especially obtained more sophisticated knowledge about the global economy, including foreign investment, as well as about more advanced farming methods (Lee, 2005)

While the social and economic elites were primary beneficiaries from more extensive availability of outside information, non-elites have been exposed to outside

information, through the means of word-of-mouth (Kretchun & Kim, 2012). The residing international workers were not the only source of outside information, but it is reasonable to assume that they consist of some portion of the sources of outside information, both directly and indirectly. This assumption is plausible given that some refugee interviews indicated that “non-official” information spread via word-of-mouth had come from a contact who was in a higher social position with which to be able to directly interact with foreigners (Kretchun & Kim, 2012; p.10). As a great deal of staffs from international agencies frequented the DPRK since the mid-1990s, they played an indirect, but meaningful role in increasing individual agencies – not only of local officials but also of ordinary people on the ground – to learn more about outside world, especially a system of market economies.

Without international assistance, the country may have had difficulty in addressing food shortages within the country. In addition, international agencies frequenting and residing in the DPRK affected the advancement of the society as well as food security in indirect ways. However, in any country, international assistance cannot be a fundamental, long-term solution. As in the DPRK’s case, the role of international assistance has been significantly important, but it could not fundamentally solve food problems alone. For the sustainable food security, the changes or actions towards food security must be from within a country. In this sense, the country’s radical, but steadfast social changes coming from marketization seem to have had a more extensive impact on food security in the DPRK.

Indeed, when many organizations, including NGOs and bilateral assistance, ceased to provide food aid in the late 2000s, there were concerns that the DPRK

would have another famine without an adequate amount of food aid. However, in contrast to those worries, the DPRK did not have another round of famine and rather, the rate of malnutrition has decreased (Kim & Yang, 2014, p.127). Kim and Yang (2014) assumed that improved food situation despite the decrease of food aid from outside would come from revitalization of food economies within the DPRK, through increased harvests in privatized lands (Kim & Yang, 2014, p.127-128). Smith (2015) also argued that the quantity of international aid has not been sufficient enough nor delivered in a regular basis so as to bring the current improvement of nutritional status (Smith, 2015, p.35). That means, other explanations than international food assistance in improved food security are required.

2. Marketization

The mechanisms of market economies – pursuing private profits and engagement in private economic transactions outside the state system – were inharmonious at all with a socialist system, to which the DPRK government adhered for the sake of maintaining the regime and its control over the society. However, after the collapse of the Public Distribution System (PDS), a market mechanism became an irreversible, core element in the DPRK society and economies so that individuals had to resort to it for survival. As a consequence, the government struggled to adjust to it, during which several attempts to suppress it failed. Although moving back and forth, the government sustained its regime in its own way, with a market mechanism, sometimes using it. Accordingly, individuals have become able to live everyday up to a market mechanism. The fact that the DPRK citizens could be involved in a market economy is very critical in terms of their food security, given that they now had a basic element of exchange entitlement with which they could have access to food through trading of their own assets and foods they required. Therefore, in this section, the paper looks into how a market economy has developed in the DPRK and its influences on food security in the DPRK. As the informal markets – although not officially confirmed – are a key component of market economies in the DPRK, this section deals with both formal and informal markets, based on diverse sources of evidence. The sources include reference to refugee interviews, the DPRK constitution, and analysis on satellite images of markets.

1) Marketization in the DPRK

Smith (2015) defined the term of marketization in the DPRK as “the institutionalization of market dynamics throughout the society” (Smith, 2015, p.12). Unraveling the definition, she further spelled out that institutionalization was “the establishment of a set of norms, practices and procedures that guide behavior.” In this sense, she argued that marketization in the DPRK had been a principle that governed people’s behavior, as well as a process that directed the economic activities of the country (Smith, 2015, p.12-13).

Marketization has been the most conspicuous change in the DPRK. The elements of a market system started to appear when the socialist economy was not functioning properly, as people sought their own way to survive. Yoon (2009) asserted that in 1998 the revised Constitution involved the concept of a market system, citing that “the State shall introduce a cost accounting system in economic management according to the demand of the ‘Daean’ work system, and utilize such economic levers as prime costs, prices and profits” (Yoon, 2009, p.48). The concepts of costs, prices, and profits, clearly stated in the Constitution, indicate the country’s transition toward a system incorporating characteristics of a market economy. While explaining Constitutional revision in 1998, Yoon (2009, p.50-51) also described that the scope of property available to individuals as well as social and cooperative organizations greatly expanded. Thus, the environment for marketization to prosper had been established, by enabling individuals to have entitlement to assets that could be used either to produce or to trade with food.

Since the confirmation of markets’ existence and their functions is a delicate issue for the DPRK government, it is difficult to fully understand how they have been formed and operated. Even as for the distinction between formal and informal markets,

discussions among scholars are not uniform. The titles of markets are varied as well. The farmers' market is one that the government officially designates to a formal market, and the market that was firstly established in the DPRK in the 1950s. Even though it was originally to complement the Socialist system when the PDS was working well, it started to replace the PDS in rural areas, thus transforming and expanding in diverse ways. When discussing "informal markets", some were evolved from pre-existing farmers' markets and some were total black markets, for which it was more complicated to verify their form of operation. Therefore, to examine marketization and its effects in the DPRK, this paper looks at existing discussions on formal farmers' markets, informal markets, and "Jangmadang," which is the expanded form of legal markets.

a) Government-Permitted Farmers' Markets

Until the 1980s, farmers' markets existed and played a supplementary role for the government-planned economy. The government permitted their operation, limiting their role as ancillary to the PDS, therefore legalizing those markets.

Historically, farmers' markets have existed since the 1950s when all the industries, including agriculture and manufacturers, were collectivized. To ensure that the markets were only supplementary to the planned economy, the government implemented several measures. The government regulated the items and amounts that could be traded at farmers' markets. As the Public Distribution System (PDS) was to be the fundamental food system by the government, it prohibited that staples such as rice and grain could not be traded at farmers' markets. Also, the urban residents could not participate in the transactions at farmers' markets (Choi & Koo, 2009, p.86-90).

Drawing on the cases studies of three cities, Choi and Koo (2009) explained

that each farmers' market showed few distinct characteristics and operation patterns, from the 1950s to the 1980s. Some market was closed during harvest season, meaning that it was not a permanent establishment. In some case, the government was precautionous about the expansion of markets, and decided to close some of the markets (Choi & Koo, 2009).

In 2003, the government permitted farmers' markets to be held three times a month on the 1st, 11th, and 21st of each month. In these markets, people could buy and sell non-staple foods, such as vegetables and potatoes that were harvested from kitchen gardens. The FAO/WFP food security assessment reports explained that these farmers' markets contributed to improving productivity and efficiency of distribution of non-staple foods. However, cooperative farms were not allowed to participate at those markets. They were obliged to sell their produce, whether staple or non-staple, to the State Food Procurement Agency, so that the Agency could sell the produce at State Shops. The FAO/WFP survey team considered it a main factor limiting farmers' incentives to produce foods exceeding the allocated amount (FAO/WFP, 2013; p.9).

Choi and Koo (2009) considered the officially permitted and expanded markets in 2003 as a significant indicator of the potential for marketization. As of 2003, farmers' markets were reorganized to general markets that sold items for daily use, such as clothes as well as food. According to the authors, the government declared that they would implement "more aggressive policy measures to ensure the functioning of the market as a venue for meeting the social demand" (Choi & Koo, 2009, p.76) Although the government kept emphasizing that the markets' roles and functions were under the management of the planned economy, Choi and Koo interpreted the legalization and expansion of farmers' markets as the government's grudging efforts to bring already expanding farmers' markets and black markets under

their control (Choi & Koo, 2009). This means that the government reacted to marketization from below, essentially only to acknowledge market activities on the ground, although followed by a few attempts to limit their expansions.

b) Informal Markets

The various coping behaviors used during the Great Famine ultimately led to the blooming of informal markets. The government tolerated the existence of informal markets because it could not distribute even the minimum amount of necessary food through the PDS. It is challenging to find a solid evidence of the existence and operation of informal markets within the DPRK due to limited available data and their characteristics of illegitimacy. Therefore, this section primarily draws on investigations of indirect evidence with which to speculate their existence and extent of operations.

Noland (2006) provided evidence of prevalent marketization through the emergence of department stores and varied venues that sold Chinese goods of uncontrolled prices. Noland also found the ground of the markets' functioning in the food price changes in response to supply, including an influx of international food assistance (Noland, 2006, p.8). Smith (2015) expounded that the form and degree of market activities were various, the pettiest being illegal street shops and peddlers who were usually the poorest (Smith, 2015).

The food sold at informal markets included privately produced food, food diverted from rations, and food informally imported from foreign countries, especially from China. Related to food diverted from official rations, a corruption emerged as a critically significant side-effect of marketization. Many high officials used their political status to divert and sell food rations to private markets; while these food

rations were supposed to be delivered to the lower level of the administrative district's PDS center (Kim, 2014).

However, many sources, which were mostly confirmed from refugee interviews, described that harvests on privatized land contributed a great deal to food security in the DPRK, most of which were assumed to be traded at informal markets. Although the legally allowed land that could be privatized ranged from 30 to 50 pyong (about 1,000 ft² to 1,800 ft²), refugees reported that they harvested on their own privatized land, as well as saw neighbors harvesting on land, that ranged from 100 to 2,000 pyong (about 3,600 ft² to 71,000 ft²) (Kim & Yang, 2014, p.128-129). The harvests at privatized lands, which were reported to be larger than legally allowed, may evidence the existence of illegal markets, in that there had to be some venues to trade illegally produced harvests. Surely, they were also the sources of individual consumptions.

People may have had the right to the foods harvested on those privatized lands, and decided whether to consume or to sell at the markets. As a result, those products were usually missing from the official statistics for agricultural production in the region. Understandably, the productivity of privatized land was much greater than that of cooperative farms because of different degrees of motivation. (Lee, 1997, p.11). The agricultural products from privatized land became the primary supply resource to markets, thus providing food resources to the people.

Although it is not possible to officially confirm the existence of informal markets, Haggard and Noland (2007; 2011) and the FAO/WFP reports (2013), which were based on refugee interviews and sample households' interviews within the DPRK respectively, implied the existence of informal markets. Haggard and Noland (2009) found out from the interviews with refugees that markets were still operating

despite the government's 2005 reform trying to control them (Haggard & Noland, 2009, p.12). Furthermore, the extensive refugee surveys carried out in South Korea and China validated that markets were people's primary source of getting food. In a survey completed in South Korea, the question of the share of total household food consumption that was bought from markets was worthwhile to refer to. According to the survey, 40 percent of respondents who lived in urban areas answered that they purchased all of their foods from markets. Also, 60 percent of respondents purchased at least 75 percent of their foods from markets. Likewise, albeit the limitation of the survey credibility that most of the respondents were from the northeastern area of the country, the survey result implies that a market mechanism existed, and was operating in the country (Haggard & Noland, 2011, p.48-51).

The FAO/WFP report (2013) also insinuated the functioning of a market mechanism by taking an example of the lean season when food rations by the PDS were inadequate. In those seasons, generally prior to the harvest season, households compensated the inadequacy with non-staple foods, such as potatoes and wheat, which the report assumed were obtained from sources other than the PDS. However, the report made clear that markets' role in food security was not significant because of the limited numbers of markets that the survey team could observe (FAO/WFP, 2013, p.35). This restriction to their observations may be because their survey was done with the cooperation of the government and under its monitoring.

c) Jangmadang

“Jangmadang” is a widely used terminology designating the markets in the DPRK, which include both formal and informal markets. As the term of “market” is translated into “Jangmadang” in North Korean language, the majority of research on North

Korean markets use the term “Jangmadang” to describe the markets in the DPRK with any forms. Therefore, this section refers to research about “Jangmadang,” for which it is not easy to have a clear-cut distinction between formal and informal markets.

According to an analysis by KINU (2015), the markets called Jangmadang seemed to be actively serving people’s economic activities, especially for food access. An interview was carried out with 221 refugees, in which only 132 responded; they were allowed to check multiple answers at once. It showed that 105 people bought their foods from the Jangmadang, as indicated in Table 5 (KINU, 2015). As the analysis is based on interviews with refugees, the percentage cannot be generalized for the whole population; it cannot represent the whole population’s pattern of acquiring foods. Rather, the result may have a bias because the survey was done by refugees who had to escape the country due to their vulnerable situation. However, it is meaningful to refer to the approximate trends that a somewhat high percentage of people resorted to Jangmadang for the purchase of foods, and the PDS was useless to them.

Table5. Channels to acquire foods

Channels	The number of responses	Percentage (%)
Purchase from Jangmadang	105	72.4
Public Distribution Center	0	0
State Shops	0	0
Pension	0	0
Helps from relatives	3	2.1
Harvest from privatized lands	24	16.6
Others	13	9.0
Sum	145	100

Source: KINU (2015)

Silberstein (2015) also investigated the expansion of the markets in the DPRK, through satellite images obtained from Google Earth. Despite the limitations of the research that it did not necessarily confirm whether the market was actually operating

or not, the observation on the buildings or facilities used as a market showed that the size of the markets has grown from the early 2000s to 2013 (Silberstein, 2015, p.15). This fact that the size of markets has expanded over time suggests that markets has functioned as a primary place for economic transactions in the DPRK, even though the government tried to curtail its functions and influences. Silberstein (2015) specifically presented that the markets, in terms of size, remained stable or in some cases even enlarged during the periods of government's retrenchment on the markets in 2009 (Silberstein, 2015, p.7-8). His research upholds the fact that marketization has been permanent, irrevocable phenomenon in the DPRK; thus, it is reasonable to presume that the markets have been people's primary channel for access to food.

d) Marketization and its effects

The government's response to marketization has been ambiguous throughout the years since the Great Famine. The government could not entirely prevent market activities from emerging because it failed to secure the necessary resources, including food, to distribute to the people. On the one hand, the government reluctantly reconciled with market mechanisms, sometimes making use of them to raise foreign investment. On the other hand, the government tried to maintain the command over social order for the sake of keeping the regime intact. The uncertain attitudes of the government towards marketization brought in a negative impact on functioning of a market system. The negative effects, as well as improved food security, must not be ignored in this analysis of marketization and its effects on the society of the DPRK.

While the above section tried to find evidence of how marketization – both legally and illegally – has evolved in the DPRK, the below section is followed by the analysis on its effects – newly emerging vulnerable classes resulting from

marketization, increased individual agencies of women, and improved food security in general.

New vulnerable classes

For ordinary people, it was not easy to be involved in market activities. The authorities, often times crack down on illegal market activities, especially peddlers on the streets. For women under forty years, the government prohibited them to carry out private market activities, so as to put them into their original workplaces run by the state (Fahy, 2013, p.85). The government's several attempts to crack down on the markets generated side-effects of marketization, aggravating the situations of the vulnerable.

Smith (2015) credited markets as a principal channel of feeding urban residents who did not have alternatives to prevent starving, when failing to secure food distribution. However, Noland (2006) criticized marketization for failing to address problems resulting from food shortages, such as malnutrition. The failure was because how access to food in the markets was determined by the capabilities to command resources to trade for food. In this marketization process, urban residents, who used to work in heavy industries and had to be mostly dependent on the PDS, became particularly vulnerable to food problems. Since the economic downturn that made the heavy industry in the DPRK obsolete in the 1990s, industrial workers earned little to no income, which made it difficult for them to purchase food at a market price (Noland, 2006; p.12).

KINU (2015) also pointed out that marketization had aggravated inequality in access to food among the population. Under the PDS, despite the difference in distributed amounts, ordinary people, who did not belong to the political or military

elite class, at least had access to food to some degree. Since the breakdown of the PDS, majority of people could not even get the minimal amount of food ration. In this process, the inequalities deepened among those ordinary people, depending on their economic capabilities (KINU, 2015).

Smith (2015) also admitted that marketization led to inequalities in society, because only those who had economic power to secure resources in a market economy could enjoy the benefits of marketization. As elaborated in the below section, Smith paid particular attention to the growth of women's role in marketization. However, she also provided the opposite argument; women may have become more vulnerable to economic inequalities engendered by marketization, for example, when they chose to be involved in prostitution.

In addition to women, those who could not command economic resources to get involved in a market economy, especially the elderly, the poor, the disabled, and children fell prey to inequalities engendered by marketization. In prosperous countries, governments usually provide safety nets to protect the vulnerable. However, in the DPRK, they have become more marginalized in a threefold way, according to Smith (2015). Smith studied the cases for vulnerable people who stayed in residential institutions, such as hospitals, orphanages, and facilities for those who do not have family members to resort to. Firstly, the marginalized population usually did not have any family members to seek help from. Second, those people who could not make a living on their own had to put themselves in the care of residential institutions, which are run by the government. Although the government was in primary charge of establishing those institutions, the central authorities did not deliver appropriate services with the necessary amount of resources. Local authorities were in charge of running and managing those institutions, but did not have access to enough resources,

including money and food, nor did have any autonomy to collect local taxes to run the institutions. Therefore, the institutions for the vulnerable were not able to secure necessary resources. Lastly, the marginalized population could not participate in market activities by themselves. As for the resources required to run those facilities, they mostly relied on international assistance (Smith, 2015, p.274-275). This deteriorated situation of the marginalized exposes the limitation of marketization in the DPRK; its impact was not evenly distributed among the population.

While marketization enhanced people's access to food, thereby causing improvement of nutritional status, the effects were not shared evenly in terms of the region and occupations as well. The FAO/WFP report also paid attention to regional variance in nutritional status. Figure 3 above shows that the northeastern area was particularly vulnerable in regard to nutrition (FAO/WFP, 2013). The most prominent reason causing the uneven distributional effects of marketization was the government's continuing efforts to control the markets, limiting people's accessibility to the markets.

The government's control was not the only factor affecting the operation of markets. As markets flourished, and foods officially and unofficially imported from foreign countries were traded in these markets, food prices responded immediately to the changes of international food prices. This food price fluctuation made the poor people – who had fewer assets to exchange for food – more vulnerable.

Women's role in economic activities

In the process of marketization, women's role was conspicuously crucial. As men were strictly mobilized to the workplaces assigned by the state, women had relatively more freedom to engage in private economic activities than men did. In this

sense, women's role has particular implication for both increased agencies of women and marketization in society. As leading actors in the markets, women may have obtained more capacities to deal with their own hunger problems, and thereby at the same time contributed to the growth of markets.

Smith (2015, p.327) put particular emphasis on women's growth as an economic agent. Traditionally and culturally, women have been primarily in charge of taking care of family members in the DPRK. Therefore, when the economic situation was experiencing a downfall, women went out to look for food to feed the family.

Although there was no work to do in idle factories, industrial workers had to show up to their workplaces. This was because the government was concerned that workers not going to work could lead to the formation of a group of reactionaries acting against the government who had failed to deliver the necessary foods. However, given that women's roles were primarily to manage household affairs, supervisors in a workplace would acquiesce to women's absences in the workplace. As a result, women initiated participation in private economic activities, including trading and commerce, mainly to secure the necessary amount of food for a household. Women's roles in private economic activities were essential; they were sometimes the sole sources of household food security when there was a political crackdown on market activities. However, Smith (2015) makes it clear that women's increased economic activities did not necessarily mean an enhanced economic and social status. Instead, it could be interpreted that women had a little more flexibility than before in travelling across the country and in decision-making in a household (Smith, 2015).

Kretchun and Kim (2012) also paid attention to women's role in market activities. In particular, women who had connections with the military or authorities in charge of security affairs were important actors in the markets, possibly because

they could easily travel across the border by making use of those connections. Moreover, based on refugee interviews, they argued that women organized “business networks” with other women (Kretchun & Kim, 2012, p.54-56). This case reveals how women have contributed to social changes, using their increased individual agencies.

While women became active in the markets, their responsibilities may have remained primary in feeding their family members. In this context, women’s increased individual agencies through engaging in market activities have particular implications in household food security. Women may have obtained more freedom and capacities to look for more sources of food, to feed their own family.

Improved food security

In spite of the inexplicit attitude of the government toward markets, and the resulting negative aspects of a market mechanism, marketization definitely affected food security positively. Despite some portion of population who failed to be entitled both to necessary amount to foods and assets to be involved in market activities, marketization generally enlarged the scope of individuals’ access to food. In addition to more opportunities to engage in trading foods, marketization in the DPRK affected individuals’ thinking and behavioral patterns, so that they became accustomed to a market mechanism and concepts, such as profits and private properties. In this section, this paper looks for the evidence of causal relationship between marketization and improved food security.

Since the Great Famine, the PDS could not properly function, as food supply fell short of the amount required to meet the needs of rationing. Despite several attempts of the government to recover the PDS over the last decade, the main channel

of sourcing food had become the markets. The daily ration had lessened in quantity per person as well as in range of beneficiaries, but the nutritional status in the country had improved, as illustrated in the above section.⁴ Therefore, the markets, which replaced the PDS as a primary channel of acquiring food, can be interpreted as a key factor that enhanced nutritional status of the population.

As Kim (2014) argued, some defectors gave testimony that the market system was a contributing factor to their survival after the Great Famine, given that the markets functioned as the only source to find foods for some people who could not receive even the minimum amount of rations. In addition to this, she considered the improved nutritional status as indirect evidence that the markets in the DPRK had increased the population's accessibility to food. She asserted that the reason for this was that the nutritional status in the country had improved despite the level of food availability, which was similar to the level during the Great Famine period (Kim, 2014).

Referring to existing literature, Kim (2014) suggested that in the DPRK, at a regional level, the individual's nutritional status relied more on the accessibility to markets, rather than on the productivity of agriculture in the region they lived in (Kim, 2014). Smith (2015) corroborated this point through the cases of North Hwanghae province and South Hwanghae province, where the residents' nutritional status had been inferior in spite of the decent agricultural productivity, because of distance to the markets (Smith, 2015). These cases prove that it is an engagement in market activities that is more related with an enhanced nutritional status, rather than food availability. While they are the cases confirmed only in the regions that had a restriction on access

⁴ From the late 2000s, the PDS focused on feeding "key workers" which amounted to two million people. The detailed categorization based on occupation, gender, and age did not exist anymore. Those key workers, regardless of demographic characteristics, were supposed to receive 700 grams of grain per day as flat-rate rations (Smith, 2015).

to markets, the cases support the current paper’s argument that augmented entitlement to food through marketization contributed the most to improved food security in the DPRK.

Assuming that marketization had a positive effect, elevating the food situation in the DPRK, Kim (2014, p.39) also suggested that improved health indicators demonstrated this effect as shown in Table 6.

Table6. The changes of health indicators of the DPRK people

Health indicators	1995-1996	1999 - 2002	The late 2000s
Population	22,114,000	23,149,000	24,050,000 (2008)
Life expectancy	70.1	67.13	69 (MoPH, 2006)
The mortality rate	6.8/1,000	9.3/1,000	8.8/1,000 (MoPH, 2006)
The child mortality	186.6/1,000	23.5/1,000	14.9/1,000 (MoPH, 2006)
The mortality rate over 5 years old	39.3/1,000	48.8/1,000	38.7/1,000 (MoPH, 2007)
Severe malnutrition	16.8%(1998)	8.1%(2002)	7%(MoPH, 2007)
The maternal mortality	105/100,000	103/100,000	90/100,000 (MoPH, 2008)

Source: Kim. (2014, p.39).

These indicators show the DPRK’s status of a broad range of health issues than the indicators this paper adopted as food security indicators as declared in the former chapter. These indicators also can be interpreted as indirect evidence of advanced food situations in the DPRK, because a consumption of required amount of food is a necessary – albeit not sufficient – condition for improvement in health indicators as above.

The FAO/WFP report (2013) also considered the markets as one of the contributing factors that improved nutrition in the DPRK. As presented in Figure 3 above, the report acknowledged that the nutritional status in the DPRK had improved,

even though stunting remained a concern. It stated that they could not debunk an explicit reason for improved nutrition, but reckoned that international food aid and marketization within the country played crucial roles. Specifically, the report focused on women's engagement in market activities, such as bartering and trading. Given that children were the major beneficiaries of food aid from both the government and international aid, the report posited that women's market activities had contributed to dietary diversity and nutrition of adults, particularly women (FAO/WFP, 2013). The noticeably reduced maternal mortality rate shown in Figure 3 and Table 6, and recently reduced maternal anemia as in Figure 3, uphold the FAO/WFP report's supposition acknowledging rising women's participation in market activities and it may have benefited nutrition of women.

3. Government policy changes

Marketization is an important, but insufficient explanation alone for improved food security, because a state government's roles and influences expand in a whole series of places in society in an authoritarian regime as in the DPRK. A full understanding of improved food security requires analyzing the impact of state policy in that individuals performing economic activities in the markets reacted to government policies, and the government also responded to individuals' changing behavioral patterns on the ground. These interactions generated dynamics between marketization and the government policies. Not only that, the government implemented policies to directly address food problems – for example, to stimulate agricultural productivity. Therefore, this paper hypothesizes that the combination of marketization and government policies adjusting to it – albeit not supporting it – is the primary contributing factor for improved food security in the DPRK. Followed is the analysis on several government policies associated with food security and their impacts.

1) Agricultural reforms

During the Famine years and onwards, the government introduced a series of new incentive systems to increase agricultural productivity. For farmers' cooperatives, the government instituted the “new sub-team contract system.” Under this system, the farmers could privately own surpluses after meeting the requirement of fixed quotas, which were delivered to the PDS. Before this reform, on the contrary, farmers were obligated to give all the harvest to the PDS except their allocated amount of rations,

under which they had no rights to the food produced. In addition, the government gave cooperative farms some degree of autonomy; farmers could choose which crops to grow and how to utilize the produce – whether to eat or sell it. In the past, the government decided and allocated the kind and amount of crop to cultivate as well as designated the leader of the cooperative farms. Now cooperative farms were also able to establish leadership on their own. The new system, after this agricultural reform, increased the extent of freedom at the local level (Lee, 2005).

The government also introduced an experimental measure of officially leasing a small amount of land to individual farmers. The measure was limited to North Hamgyeong province, a mountainous area with low agricultural productivity (Nam, 2007, p.116). However, it was a meaningful experimental reform that allowed individuals to pursue their own agricultural production choices.

In the late 2000s, the government brought about another incentive system, a subsidy to the production of major cereals, including rice, maize, wheat and barley. The FAO/WFP report (2012) speculated the existence of this subsidy through the comparison between the procurement price of the government and the selling price of the PDS. The report assumed that the subsidy may have been an incentive for farmers, contributing to the productivity of those kinds of cereals (FAO/WFP, 2012).

As explored above, the government's attempts to boost agricultural productivity – through allowing more autonomy for cooperative farms and experimentally permitting harvests on privatized lands – resulted in enriched individual agencies of individual farmers, no matter whether the government wanted or not. This small shift in government policy would have encouraged individuals either to expand those harvest patterns or to learn from neighbors who were already under the influence of those policy changes. As presented in the example of refugee

interviews stating that there were much larger areas of privately harvested lands than legally allowed, the government's policies would have encouraged or stimulated the behavioral pattern changes of individual farmers.

2) Economic reforms

Since the blossoming of market systems within the country, the DPRK attempted several economic reforms, such as those in 2002, and 2009. There are different interpretations of the intention and effects of the reforms. Some scholars (Haggard and Noland, 2006; 2007; 2011; Lee, 2009; and Natsios, 2013) asserted that the government implemented those reforms to restore its Socialist order. In addition, they argued that those reforms were to be blamed for worsening food security.

However, this paper assumes that the economic reforms are a proof that the government was adjusting to marketization from below, which means that the government reacted to coping behaviors of individuals – albeit in an unsophisticated way. These reforms responding to marketization on the ground show that the government was not totally rough as described by international media, and their acquiescence to marketization, as evidenced in the reforms, built up food security in the country, through letting people make use of the market systems for their food consumptions.

a) Economic reforms in July, 2002

Although it is undeniable that marketization emerged and flourished from below, the government has also struggled to acquiesce, adjust to, and incorporate it under their own socialist system. The economic reform in 2002 is widely interpreted

among scholars as evidence of the government's willingness to introduce a market mechanism into the country.

Noland (2006) explained that the 2002 reform had four components: microeconomic reforms such as adjustment of prices and wages, macroeconomic reforms, introduction of special economic zones, and aid-seeking. Lee (2009) offered a more detailed explanation about the reform, with the emphasis on adjustment of price changes. According to Lee (2009, p.198-199), the government let the domestic rice price be tied to international rice price, which may have had two contrasting effects. On one side, it may have encouraged farmers and people who harvested in kitchen gardens to produce effectively. However, on the other side, this price may have made poor people more vulnerable in terms of access to food because of unstable prices.

Pricing Policy

Since the 1960s, the government had maintained a dual pricing system as for the agricultural products. Under this pricing system, the government purchased farm products at a much higher price than the price at which industrial workers could buy. It had a characteristic of subsidy so as to encourage the growth of an industrial economy. However, through the 2002 reforms, the government gave up on upholding this pricing policy. As a result, the prices soared as Table 7 shows, following the market signals. Furthermore, it is evident that the difference between state purchase price and sales price is slight, and sales price is even higher than state purchase price, indicating that the government does not subsidize industrial workers anymore (Nam, 2007, p.115).

Table7. State Purchase Prices and Sales Prices Before and After the July 2002 Economic Reform

	Before July Reform		After July Reform		Difference
Rice	State purchase price	82 chon/kg	State purchase price	40 won/kg	50 times
	Sales price	8 chon/kg	Sales price	44 won/kg	550 times
Maize	State purchase price	60 chon/kg	State purchase price	20 won/kg	33 times
	Sales price	8 chon/kg	Sales price	24 won/kg	500 times
Beans	Sales price	8 chon/kg	Sales price	40 won/kg	500 times
Flour	Sales price	6 chon/kg	Sales price	24 won/kg	400 times

Source: Nam (2007, p.115); Chosun Shinbo, July 26, 2002; field work in North Korea in November 2002; interviews with North Korean defectors

Note: 100 chon = 1 won.

As for this change of pricing policy, Haggard and Noland (2011) offered a slightly different interpretation. The aim of the policy, in addition to two subsequent policies in 2005 and 2009, was basically to restore the PDS and the government's command over national food supplies. Through the 2002 reform, the government intended to enhance the amount of food flowing into the PDS from farmers by adjusting procurement prices to the level that induced farmers to sell harvests to the PDS. However, as the market price rose at a faster pace than the procurement price from the government as shown in Table 7 above, the policy failed to secure a high enough amount of food supply so as to reconstruct the PDS (Haggard and Noland, 2011, p.63).

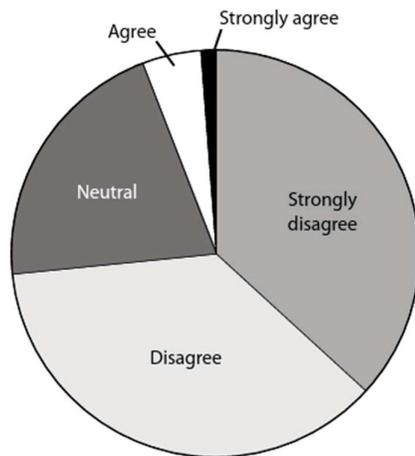
The Effects of the 2002 Reforms

Haggard and Noland (2011) essentially argued that the reform of 2002 had little influence on marketization. They paid attention to the fact that marketization in the DPRK was the process from below, being developed as coping behaviors of individuals, households, communities, small-scale enterprises, and local parties. Therefore, the government's reform could not achieve the intended outcome, which was for the government to have command over the economic system, especially

market systems, in the country (Haggard & Noland, 2011; p.65-79).

Regarding people's access to food, the refugee surveys from Haggard and Noland (2011) illustrated respondent's recognition on food availability since the introduction of the 2002 reform. It may be easily assumed that increased food prices led to the increment of supply, according to the elemental economic principle of supply and demand, but the perception of people toward food availability was contrasting. As Figure 6 presents, almost 75 percent of respondents who had lived in the DPRK after the 2002 reform before leaving the country disagreed or strongly disagreed that food availability had improved since the reform (Haggard & Noland, 2011, p.66).

Figure 6. China survey response to "food availability has improved in North Korea." (percent)



Source: Haggard & Noland. (2011, p.66).

Haggard and Noland (2007, p.215; 2011, p.63) put more focus on inflation brought about by the reform and its adjustment on price and wages. As discussed above, they blamed this inflation for rendering people vulnerable to access to foods in a market system, as many people did not have economic power to purchase food at a

market price. Natsios (2013) described that the inflation rate since the 2002 reform was about 100 percent annually until it was stabilized in 2007. He argued that the impact of the 2002 reform and the inflation was, to the most vulnerable people, similar with that of the Great Famine. In particular, the urban workers, who had no alternatives, such as harvesting their own foods in a kitchen garden, were especially vulnerable because the price rose too rapidly for them to adjust to it (Natsios, 2013).

However, Park (2009) explained that the 2002 reform made price changes follow market signals and that wages also increased substantially. That being said, the government's reform was to reflect the food price that was already set in black markets, signifying that the government tacitly acknowledged the markets as a distribution channel for foods. Furthermore, the adjustment of wages enabled wage workers to have purchasing power to buy foods at a market price (Park, 2009, p.30). Kim and Yang (2014) discussed that "self-rehabilitation through marketization (SiJangUil TongHan JaRyuckGangSang)" became a new creed among the people in the DPRK since the 2002 reform with which the government somewhat encouraged people to survive through market activities (Kim & Yang, 2014, p.42).

b) The Reform in November, 2009

The government kept trying to have a command over the country's economies and societies, faced with a rapid and irrevocable stream of marketization. In 2005, the government enforced a series of retrenchment policies, abolishing some markets, as well as evicting some international agencies for food assistance. However, individuals on the ground went back to the markets – as a place to gather around to trade requisite items, including food. In 2009, the government undertook the other reform to regain its control on the economies. While Haggard and Noland (2007), and Natsios (2013)

denounced this reform as making people vulnerable to hunger problems, the noticeable of this reform is that the government recognized the policy's failure, and revoked it, followed by the execution of the person in charge of designing the reform. This unprecedented event, a revocation of government policy, demonstrates the dynamics between the state and individuals on the ground. Although the policy exacerbated hunger problems in the short term, the repeal of the policy may be another evidence of the government's efforts to adjust to marketization, which has built up food security again since then.

As another effort to restrain marketization prevalent in the country and revitalize the Socialist order, the government reintroduced the policy of currency revaluation in 2009. Contrary to the government's intention, the reform ended up exasperating the population as it literally wiped out the savings of the population (Natsios, 2013; Smith, 2015, p.244-247).

Specifically, the government declared three economic reforms, with the purpose of addressing the high inflation rate. The first was to revalue the currency rate so that the old currency of 100 won became 1 won under the new currency system. Secondly, the government officially forbade a possession of foreign currency, while people were widely using Chinese, Japanese, and U.S. currency in the markets then. Lastly, the government tried to restrict the private economic activities by closing down the general markets except for those selling a few non-staple food products. (Natsios, 2013, p.132).

As a result of the 2009 reform, food shortages became an imminent concern again, and access to food came to be challenging to vulnerable people. Natsios reported that starvation occurred in this period right after the 2009 reform in some regions (Natsios, 2013, p.132).

Some source (38 North, 2010) discussed that unlike other dictatorial governments, the DPRK government at least did not insist on ineffective policies just for the sake of maintaining the regime. Indeed, unlike other authoritarian governments, the DPRK government responded to changing behavioral patterns of the public, in a very astute way, to maintain its regime. This may be the reason the regime is still thriving despite the ongoing food shortages – by letting people seek a way to feed themselves inside the reign of the regime.

c) Social safety net

In the PDS especially, when the national food availability was not adequate, children would receive smaller amount of rations for the reason that they were not workers who needed energy to do a physical labor. On the other hand, the government started to put priority on the nutrition of children since the international assistance agencies brought the agenda of children's nutrition with them. Smith (2015, p.260) asserted that since the Great Famine, the government put a policy priority in food security, especially children's.

The FAO/WFP report (2013) also revealed that the DPRK government prioritized feeding children as a policy. According to their observation, the amount and diversity of food distributed at institutions, including baby homes, nurseries, and kindergartens, was below the international minimum recommended for child nutrition. However, children there at least obtained regular distribution of food (FAO/WFP, 2013).

As explained above, there is a little, but not dismissible evidence that the government prioritized children's nutrition. This suggests that the government is putting some efforts to address hunger problems on their own, in addition to the

policies for agricultural productivity and adjustment to marketization.

Chapter 5: Concluding Remarks

While there are many ways to evaluate food security, this paper adopted De Muro and Aurino's (2011) framework, which incorporated Sen's (1999) capability approach into analysis on food security. With this framework, food security is measured based on food availability, access to food, and food utilization; the three dimensions are analyzed respectively by national food balance, individual entitlement to food, and nutritional status. Even though it is essential to analyze each dimension separately, the three dimensions are interlinked with each other. In the DPRK, food availability has become worse since the mid-1990s, because of rapidly increasing population level against the available food in a stable level. In contrast, the general trend of nutritional status in the DPRK proves to be improving. Given this disparity, this paper hypothesized that access to food through increased entitlement to food is an explanatory variable of improved food security. The enhancement of entitlement to food was possible as a result of widespread marketization since the Great Famine. However, in an authoritarian regime as in the DPRK, the intentions and effects of the government policies are also a significant factor affecting every aspect of society, including marketization and food security. In this context, the paper assumed the combination of marketization and government policies adjusting to it as the primary contributing factor in improved food security.

In terms of increasing food availability, the role of international food assistance was admittedly crucial. With the limitations of promoting agricultural productivity due to the unfavorable topographical and meteorological conditions on agriculture, international food assistance had been conducive to making the DPRK not have

another round of famine. The hunger problems in the DPRK would have worsened without international food assistance, in that the increment of population level has been expeditious. However, the help from outside cannot be a fundamental solution fixing any national problem. Likewise, in the DPRK, while international food assistance has been of critical importance in increasing food availability, the more important role in improving food security has been on marketization and government policies, given that national food availability vis-à-vis population level has been decreasing.

The research found out that marketization and the government's policies in the DPRK has been intertwined with each other in many ways. Marketization from the below led the government to adopt series of policies to incorporate some elements of a market mechanism into the society. These policies also affected the operations of market mechanisms. This interaction between marketization and government policies – in other words, between individuals on the ground and the state – ultimately led to the enhancement of individual agencies in the DPRK, albeit still in limited degree. In other words, the primary contributing factor in improved food security since the Great Famine was the increased access to food, through reinforced entitlement to food in the process of marketization, and the government policies aiming at adjusting to marketization from the below, as well as at addressing national hunger problems on their own.

[Bibliography]

- 38 North. (2010). *Internal Developments in North Korea: The Economy*. Retrieved from http://38north.org/wpcontent/uploads/2010/08/38North_SR5_Int_Econ3.pdf
- Alkire, S. (2011). *Introduction to the Capability Approach* [video clip]. Retrieved from: <http://www.ophi.org.uk/introduction-to-the-capability-approach-2/>
- Burchi, F., & De Muro, P. (2012). *A Human Development and Capability Approach to Food Security: Conceptual Framework and Informational Basis*. New York: United Nations Development Programme.
- Central Bureau of Statistics of the DPRK (CBS). (2013). *Democratic People's Republic of Korea: Final Report of the National Nutrition Survey 2012, September 17th to October 17th, 2012*. Retrieved from http://www.unicef.org/eapro/DPRK_National_Nutrition_Survey_2012.pdf
- Choi, B.D., & Koo, K.W. (2009). The Development of Farmers' Markets in North Korean Cities. In P.H. Park (Eds.), *The Dynamics of Change in North Korea* (pp.75-134). Seoul: Institute for Far Eastern Studies.
- Clay, E. (2002). *Food Security: Concepts and Measurement*. Retrieved from http://ieham.org/html/docs/food_security_concepts_and_measurement.pdf
- De Muro, P., & Aurino, E. (2011). Issues in Food Security Measurement. [PowerPoint slides]. Retrieved from http://www.fao.org/fileadmin/templates/ess/pages/rural/wye_city_group/2011/documents/session3/DeMuro__Aurino_-_Presentation.pdf
- Dreze, J., & Sen, A. (1989). *Hunger and Public Action*. New York: Oxford University Press.
- Fahy, S. (2013). Making Sense of Daily Life in North Korea. In S.H. Choe, G.W. Shin, & D. Straub (Eds.), *Troubled Transition: North Korea's Politics, Economy, and External Relations* (pp. 77-95). Stanford, CA: Stanford University.
- Food and Agriculture Organization of the United Nations. (2003a). *Fertilizer Use by Crop in the Democratic People's Republic of Korea*. Rome: Food and Agriculture Organization of the United Nations.
- Food and Agriculture Organization of the United Nations. (2003b). *Trade Reforms And Food Security: Conceptualizing the Linkages*. Rome: Food and Agriculture Organization of the United Nations.
- Food and Agriculture Organization of the United Nations/World Food Programme. (2012). *FAO/WFP Crop and Food Security Assessment Mission to the Democratic People's Republic of Korea*. Retrieved from <http://www.fao.org/docrep/016/al994e/al994e00.pdf>

- Food and Agriculture Organization of the United Nations/World Food Programme. (2013). *Special Report: FAO/WFP Crop and Food Security Assessment Mission to the Democratic People's Republic of Korea*. Retrieved from: <http://www.fao.org/docrep/019/aq118e/aq118e.pdf>
- Frankenberger, T. R. (1992). Indicators and Data Collection Methods for Assessing Household Food Security. In S. Maxwell & T. R. Frankenberger (Eds.), *Household Food Security: Concepts, Indicators, Measurements* (73-134). New York: UNICEF.
- Grebmer, K., Bernstein, J., De Waal, A., Prasai, N., Yin, S., & Yohannes, Y. (2015). *2015 Global Hunger Index: Armed Conflict and the Challenge of Hunger*. Bonn, Washington, DC, and Dublin: Welthungerhilfe, International Food Policy Research Institute, and Concern Worldwide.
- Haggard, S. & Noland, M. (2007). *Famine in North Korea: Markets, Aid, and Reform*. New York: Columbia University Press.
- Haggard, S. & Noland, M. (2009). *Reform from Below: Behavioral and Institutional Change in North Korea*. Peterson Institute for International Economics, Working Paper 09-8. Washington, DC: Peterson Institute for International Economics.
- Haggard, S. & Noland, M. (2011). *Witness to Transformation: Refugee Insights into North Korea*. Washington, DC: Peterson Institute for International Economics.
- Jones, A.D., Ngunjiri, F.M., Pelto, G., & Young, S.L. (2013). What Are We Assessing When We Measure Food Security? A Compendium and Review of Current Metrics. *Advances in Nutrition*, 4, 481-505.
- Kim, S. & Yang, M. (2014). *The Growth of the Informal Economy in North Korea*. Seoul: Korea Institute for National Unification.
- Kim, Y.H. (2014). The Research on Relationship Between Marketization in North Korea and Rights to Food. In Book Han In Kwon Center [North Korean Human Rights Center] (Eds.), *The Interrelationship Between Marketization in North Korea and Human Rights* (pp.9-54). Seoul: Korea Institute for National Unification.
- Korea Institute for National Unification. (2015). *White Paper on Human Rights in North Korea 2015*. Seoul: Korea Institute for National Unification.
- Kretchun, Nat., & Kim, Jane. (2012). *A Quiet Opening: North Koreans in a Changing Media Environment*. Retrieved from http://www.intermedia.org/wp-content/uploads/2013/05/A_Quiet_Opening_FINAL_InterMedia.pdf
- Lee, J. (2009). The Pseudo-Market Coordination Regime. In P.H. Park (Eds.), *The Dynamics of Change in North Korea* (pp.181-213), Seoul: Institute for Far Eastern Studies.

- Lee, K. (1997). *The Road to the Market in North Korea: Projects, Problems and Prospects*. World Institute for Development Economics Research, Working Paper No. 139. Helsinki: UNU World Institute for Development Economics Research.
- Lee, S. (2005). *The DPRK Famine of 1994-2000: Existence and impact*. Seoul: Korea Institute for National Unification.
- Nam, S. (2007). Chronic Food Shortages and the Collective Farm System in North Korea. *Journal of East Asian Studies*, 7(1), 93-123. Retrieved from <http://www.jstor.org/stable/23418720>
- Natsios, A. (2013). North Korea's Chronic Food Problem. In S.H. Choe, G.W. Shin, & D. Straub (Eds.), *Troubled Transition: North Korea's Politics, Economy, and External Relations* (pp. 117-138). Stanford, CA: Stanford University.
- Noland, M. (2006). *Transition from the Bottom-Up: Institutional Change in North Korea*. Institute for International Economics. Retrieved from: <http://www.iie.com/publications/papers/noland0306.pdf>
- Park, H. P. (2009). Introduction: Economic Reform and Institutional Change in the DPRK. In P.H. Park (Eds.), *The Dynamics of Change in North Korea* (pp.3-41). Seoul: Institute for Far Eastern Studies.
- Sen, A. (1981). *Poverty and Famines: An Essay on Entitlement and Deprivation*. New York: Oxford University Press.
- Sen, A. (1999). *Development as Freedom*. New York: Random House, Inc.
- Silberstein, B. K. (2015). *Growth and Geography of Markets in North Korea: New Evidence from Satellite Imagery*. Retrieved from <http://uskoreainstitute.org/wp-content/uploads/2015/10/USKI-New-Voices-BKS-Markets-Oct2015.pdf>
- Smith, H. (2005). *Hungry for Peace*. Washington, DC: United States Institute of Peace.
- Smith, H. (2007). Food Security: The Case for Multisectoral and Multilateral Cooperation. In H. Smith (Eds.), *Reconstituting Korean Security: A Policy Primer* (pp.82-102). Tokyo: United Nations University Press.
- Smith, H. (2015). *North Korea: Markets and Military Rule*. Cambridge: Cambridge University Press.
- The United Nations Children's Emergency Fund (UNICEF). (2003). Nutrition Assessment 2002 D.P.R Korea. Retrieved from http://www.unicef.org/dprk/nutrition_assessment.pdf

- The United Nations Children's Emergency Fund (UNICEF). (2005). DPRK 2004 Nutrition Assessment Report of Survey Results. Retrieved from: http://www.unicef.org/dprk/dprk_national_nutrition_assessment_2004_final_report_07_03_05.pdf
- United Nations Statistics Division. (2016). Millennium Development Goals Indicators. Korea, Democratic People's Republic of. [Data file]. Retrieved from <http://mdgs.un.org/unsd/mdg/data.aspx>
- Yoon, D.K. (2009). Economic Reform and Institutional Transformation: A Legal Perspective. In P.H. Park (Eds.), *The Dynamics of Change in North Korea* (pp.43-73). Seoul: Institute for Far Eastern Studies.
- World Food Programme. (2016). *Hunger Glossary*. Retrieved from <https://www.wfp.org/hunger/glossary>