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North Korea, Malnutrition

**A Starving Nation: Steps Toward a Self-Sustainable North Korea**

The Democratic People's Republic of Korea (DPRK) was a byproduct of the Cold War Era, specifically a result of the split of Korea into a communist North state and a Republic South state in 1945 (Savada, 1993). North Korea remains a communist state under totalitarian dictatorship of Kim Jong-un, part of the reigning Kim family. Bordering China and South Korea, North Korea is an East Asian country in the Korean Peninsula (Savada, 1993). 62% of North Korea's population can be classified as urban while the remaining 38% is rural ("Korea, North," 2018). Being part of the rural population poses difficulties due to North Korea's climate and geography. The winters are long and bitter, while precipitation is unpredictable with North Korean technology. Only about 18% of North Korea's total landmass is suitable for growing crops, creating obstacles in sustaining the nation's population of 25.6 million (Savada, 1993). Malnutrition in the regime has consistently been an issue due to the lack of arable land and frequent natural disasters.

With a quick glance, the North Korean regime may seem like any other developing nation. Family sizes are standard, with about five people in an immediate family household (Savada, 1993). Job opportunities are diverse, with professions ranging from taxi drivers to diplomats. A required 12-year education system is imposed to the people and free universal healthcare exists for all civilians in the regime. Local markets are abundant in the streets of North Korea. A deeper look, however, shows that the daily lives of North Korean civilians are primarily predetermined for them at birth, based on social status. Houses, for instance, are completely government-owned. Although the housing is provided free of cost, the government chooses what type of housing one will get, based on work performance and career (Teoalida, 2019). There is practically no way to rise up in rankings in terms of professions. For example, if you were born into a farmer family, you will not have be able to have a military career ("Life in North Korea," 2015). Since jobs in this sense are predetermined, housing is thus predetermined by relation. North Korean families rely on cheap, staple crops such as rice, potatoes, and cabbage, as well as meats uncommon to Americans, like dog, rabbit, and badger (Fullerton, 2016).

A classic communist characteristic, North Korea employs a Public Distribution System (PDS), of practically all goods from clothing to food, to the people (Tertitsky, 2018). The distribution of food is based on the yields of the farmers for the season. Typically, those of a higher social status receive more than others, although distribution is said to be equal across all civilians. Only farmers receive seeds and sprouts that are to be planted in a collective farm, in which crops are grown for latter surrender to the state. Although healthcare is provided, there are no human rights or freedoms in regard to it. The orders of physicians are mandatory, and civilians cannot refuse treatment (Savada, 1993). In addition, water supply systems are managed by the government. As of 2017, only about "61% of households have access to safely managed water services" (Nazer, 2017). The barriers presented by the strict regime hinder the pursuit of happiness and health of typical families.

According to BBC, 40% of the population is undernourished ("North Korea hunger," 2017). The nation has a history of famine due to destructive natural disasters, with past propaganda slogans such as, "Let's only eat two meals a day" (Weissmann, 2011). The predominantly self-sufficient nation even called out for international assistance in 2014, with "over $1.3 billion in assistance: slightly more than 50% for food" granted from the United States (Manyin & Nikitin, 2014). The United States was hesitant in providing aid, as equitable food distribution would not occur and North Korea was not cooperating in dismantling their nuclear program, which caused great alarm at the time. During the famine, "Farmers

stole their own crops. Elites stole the aid. Impoverished Koreans starved" (Blakemore, 2017). When food levels ran low, feeding the military became the priority and the civilians were left to fend for themselves. International food aid from nations such as China and the United States has minimized famine in the regime, and trends show that famine levels have dropped in recent years. The stunt rate of malnourished children has dropped from 28% to 20% from 2011 to 2018, but about a fifth of children in the regime are continuously affected by the preventative condition of malnutrition (Haas, 2018).

Further, the isolated country is prone to natural disasters, yet the North Korean government expects the country to produce enough food to feed their population of 25.6 million. To begin, the "harsh climate, mountainous terrain, and lack of farming mechanization" already is not suitable for farmland ("Democratic People's Republic," n.d.). In addition, droughts and floods frequently affect the harvests of North Korean farmers, destroying the few successful crops of farmers, and decreasing the amount of food each family is given based on the PDS. As stated earlier, the nation relies on staple crops, such as rice, wheat, and potatoes, yet in 2015, more than 30% of North Korea's rice paddies were "parched up" ("North Korea says," 2015). North Korea's mysteriousness and closed-offness to the world indicates that their willingness to show their agricultural struggles is a sign that the issue is of great magnitude.

North Korea presents itself as a developed, self-sufficient country, but evidence shows that they lack the farm production knowledge and infrastructure to protect themselves against natural disasters. Their farming methods are not sustainable and are destroying the already non-arable land. With diets centered around a few main crops, the lack of crop diversity is depleting the land of crucial nutrients. Furthermore, the regime's employment of double cropping has put intense stress on the soil, as two crops are grown on the same field at once (Ireson, 2012). As a result, the government gives "heaps of chemical fertilizer" to farmers in hopes of creating more fertile soil to compensate for the naturally unsuitable land and the destruction of it (Weissmann, 2011). The runoff from the heavy levels of fertilizer can pollute local waters, which is especially detrimental as the regime's water sanitation is not effective in producing clean waters. Also, post-harvest losses contribute to the issue of malnutrition in North Korea and "appear to remain significant" (Ireson, 2013). Ranging from attacks by pests to insufficient food handling infrastructures, post-harvest losses are wiping out the pre-harvest, arduous work of many farmers in the regime.

The regime's lack of knowledge on sustainable, effective farming is the main cause of their insufficiency to feed the nation. The creation of programs that teach farmers about sustainable farming practices could heavily increase the nation's agricultural yields, and in turn aid in the North Korean food crisis. Methods to be taught include crop rotation, low-tillage farming, and composting. The rotation of different crops planted in the soil restores nutrients that a previous crop depleted, unlike double cropping which depletes intensive amounts of nutrients at once. In addition, crop rotation can break insect cycles. As specific pests are attracted to specific plants, planting different crops every season will either attract different pests or none at all (Ireson, 2013). Degradation of the already small portion of fertile land can be minimized by the use of low-tillage farming. This form of conservation agriculture would "reduce soil erosion, save fuel, and improve soil quality" (Ireson, 2012). Moreover, composting and organic fertilizer could alleviate the stress on farmers to mass produce, as they have been proven to be more successful in yields in the long-run than chemical fertilizers (Ireson, 2013). Similarly, implementation of North-Korean specific land practices could pose to be beneficial in aiding the starving nation. North Korean land is largely made up of acidic soils. The soils bind with nutrients, thus reducing the availability of the nutrients to plants (Ireson, 2013). Applying sufficient amounts of lime could combat the acidification of the soil and "increase yields by 20-40%" (Ireson, 2012). The increase of yields would allow for more food per person in the PDS.

Besides teaching new farming methods, the regime can look at other nations that endure similar conditions as models for a future North Korea. South Korea, for example, located in the same area as

North Korea, faces almost-identical weather conditions; both nations are at risk from a variety of natural disasters. In 1960, the South Korean government prioritized building dams after years of floods and typhoons, to minimize the effects of the natural disasters (Sousounis, Louie, Kafali, & Butke, 2010). By 1980, South Korea had a 40% reduction of flood damage (Sousounis et al., 2010). South Korea also implemented techniques to prevent flooding by increasing sewer capacity, creating rainwater storage underground, employing flood forecasting/analysis models to observe where areas are in risk of flooding, and controlling water flow with dams (Sousounis et al., 2010). Utilizing South Korea's techniques of flood mitigation could help North Korea and the issue of malnutrition from an agricultural and an economical standpoint. Flooding frequently destroys crops, as crops essentially drown in the water, unable to retrieve nutrients. Infrastructure, such as buildings and houses, are also obliterated by floods and since everything is government own, floods are intensely costing the government. If these losses are minimized, more funds can be allocated to upgrading agricultural technology and research. Also, China, a neighboring nation that frequently provides aid to the regime, ranks first in global farm output and is self-sufficient enough to feed their overflowing population, largely due to their sustainable agricultural practices ("China at a glance," n.d.). China could play a role in implementing China's high-yield agricultural system into North Korea through incentives. For example, if North Korea refuses to change their current state of agriculture, China should threaten to cut off their aid supplies until North Korea shows some type of improvement, whether that be funds directed towards the agricultural sector or sustainable agricultural practices by North Korea.

A lack of access to high-technology machinery also contributes to the low-yield agriculture of North Korea. The regime is known for their large involvement in nuclear weapon development, despite sanctions from the United Nations and other powers (Shin, 2018). If funds that go towards the nuclear weapon program were allocated to effective harvesting equipment and storage facilities, for instance, North Korea could have a self-sufficient future. Randall Ireson of 38North, a website designed to provide updated information about North Korea, claimed that if agricultural losses were cut in half, North Korea "would be self sufficient in food production" (Ireson, 2013). Implementation of South Korea's flood mitigation techniques, such as building dams to control water flow, would be costly at first and would require a new budget from North Korea, but in the long run could sustain a happier, healthier nation.

The people of North Korea currently do not know of a better way of living. Their isolation from the rest of the world prevents them from questioning the priorities of their government. Thus, the rest of the world must take efforts to recognize the severity of malnutrition in the nation and make a change in the regime. Sustainable farming has proven to be a high-yield, long term form of agriculture to feed starving nations and it can work in North Korea too. Also, powerful nations should work towards helping the people of North Korea by means of funding the agricultural sector or forming incentives to get the government to prioritize agriculture and agricultural technology, for the greater good of the 25.6 million people.

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