

Company-Level Technological Innovation in DPR Korea: Focusing on Kumkhop General Foodstuff Factory for Sportspeople*

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Introduction

In the late 1990s, a severe food shortage in North Korea caused many people to suffer from starvation. The North Korean economic system was in a difficult situation due to severe natural disasters, the collapse of the socialist block, and the death of the supreme leader. Not only did some parts of the system cause problems, but the entire national economy was in danger of collapsing. It was the right moment for real innovation of the entire national economic system; partial innovation would not be enough.

Accordingly, North Korea adopted a new economic development strategy prioritizing science and technology.¹ North Korea began reconstructing the ‘National (Technological) Innovation System’ from its base. In particular, the development strategy clarified the sequence. Firstly, national security should be guaranteed by

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¹ There are a few researchers who have paid attention to science-technology policies or technological innovation policies in North Korea. They have some limitations in focusing on macro-policies. Micro-activities of individual companies were not analysed carefully. Hojye Kang 강호제, “An Analysis of Economic Development Strategy: Test-Launch of Satellite and Development of CNC Technology 북한의 경제발전 전략 분석: 인공위성 발사 시도와 CNC기술 개발,” *North Korean Studies Review* 19:2 (2015), 41-65; Byun Hak-moon 변학문, “The Development of North Korea’s Policy Line of the ‘Industrial Revolution of the New Century’ under the Kim Jong-Un Regime 김정은 정권 ‘새 세기 산업 혁명’ 노선의 형성 과정,” *The Korean Journal for the History of Science* 38:3 (2016), 485-508; Phillip H. Park 박후진, “The Evolution of North Korean Socialist Economic System: From Centrally Planned System to the ‘Socialist Enterprise Responsibility System’ 북한 사회주의경제체제의 진화과정에 대한 고찰: 중앙집권적 계획경제에서 사회주의기업책임관리제까지,” *Review of North Korean Studies* 21:2 (2018), 94-127; Lim Eul-Chul 임을출, “A Study on Changes of Enterprise Management Practices and Role under Kim Jong Un Era 김정은 시대의 기업관리방식과 역할 변화에 관한 연구,” *The Korean Journal of Area Studies* 37:1 (2019), 115-142; Stephan Haggard and Tai Ming Cheung, “North Korea’s Nuclear and Missile Programs: Foreign Absorption and Domestic Innovation,” *Journal of Strategic Studies* 44:6 (2021), 802-829.

developing defense science and technology. Following that, the circumstances of civilian life could be improved by transferring advanced military science and technology into the production of domestic goods.²

As a result, by the late 2010s, the North Korean economy was able to escape from the situation in which its survival was at risk.³ There are still many shortcomings in North Korea's economy, which means that talking about high growth or prosperity is not possible. However, the living conditions of ordinary people seem to be gradually improving. In 2019, cereal production surpassed the highest record of 6.65 million tons.⁴ The year of the lowest grain production since 2010 was 2018 at 4.95 million tons. Even this amount exceeded the minimum amount required for the food distribution system (4.2 million tons) by 18%.⁵ Accordingly, it indicates that North Korea had probably reached a level at which it could solve its own food problems.

Since the end of the 2000s, innovations related to food production and innovations in the food industry have been launched together. Food production enterprises have been modernized rapidly. New production systems, such as *International Organization for Standardization* (ISO) and *Good manufacturing practices* (GMP), were adopted, which meet international standards. Despite the period of prioritizing the military sector, the food industry also became a significant focus for national support and intensively pursued innovative policies. The emphasis on company-level innovation activities from Kim Jong Un also greatly influenced this change. As a result, it was said that domestic products outpaced foreign products when it came to food sales.⁶

² Seo Jae Young 서재영, Park Je Dong 박제동 and Jung Su Woong 정수웅, *Commentary on Our Party's Economy Ideology in the Songun Era* 우리 당의 선군시대 경제사상 해설 (Pyongyang: The Workers' Party of Korea Publishing House, 2005).

³ Benjamin Katzeff Silberstein, "North Korea's Food Situation: Bad but Not Catastrophic," 38 North, 29 May 2019.

⁴ Government of the DPRK, (*Democratic People's Republic of Korea*) *Voluntary National Review on the Implementation of the 2030 Agenda for the Sustainable Development* (Pyongyang: State Planning Commission, 2021). The same data was used in the reports of *World Food Programme and UN. Democratic People's Republic of Korea (DPRK) - FOA/WFP Joint Rapid Food Security Assessment* (World Food Programme, 2019); *2020 DPRK Needs and Priorities Plan* (UN, 2020).

⁵ In a documentary directed by Sung-Hyung Cho, it is said that the distribution of food for the employees of the Factory in Wonsan was 14 kg/month per person in 2013. As the population of North Korea was about 25 million, 4.2 million tons is needed (under the condition that everyone is distributed the same amount as an adult worker). Sung-Hyung Cho, "Meine Brüder Und Schwestern Im Norden (My Brothers and Sisters in the North)" (Documentary Film, 2016).

⁶ Kwangbok Area Supermarket 광복지구상업중심 was jointly established with China in 2012. The ratio of domestic products to imported products which were sold in the supermarket, was 4:6. In 2017, the ratio changed to 7:3. Kim Ji Young 김지영, "Competition between Department Stores for Higher Level of Service (in Korean)," *Choson Sinbo Pyongyang Branch (CSPB)*, 30 December 2017; "Under the Wise Direction of Our Supreme Leader, Comrade Kim Jong Un, the People's Struggle to Ignite the Flames of Localization in All Sectors of the People's Economy (in Korean)," *Science of History* 역사과학 3 (2017), 46-47.

In this paper, the effort is made to depict the changes in North Korea's economic policies through the activities of 'a company' – which is a real agent of economic activities. Such effort avoids the mistake of focusing only on macroscopic national policies and thereby losing a sense of reality due to excessive abstraction. It is also an effort to secure 'verifiable data' and use it as a starting point for inference. Some information about individual companies, such as production facilities and products, could be verified by simple fieldwork called 'verifiable data.' More verifiable data rather than unverifiable claims were collected in order to infer rationally, and to understand reasonably.

It is tough to clearly understand the reality through literature research because of the limitations of North Korean materials, all of which could be published only with the permission of officials. However, if we try to distinguish between the detailed information and the opinions even in official publications, it could be possible to produce some meaningful research results. As long as distance from their logic could be kept, the analysis of North Korean literature could be reasonable.⁷ According to a study analyzing doctoral dissertations focusing on North Korea written in English, a research climate emerged which excluded North Korean publications.⁸ It eliminates even the opportunity to understand North Korea's logic from their perspective. In contrast, North Korean studies in South Korea have been trying to understand their logic and concerns by intensively analyzing North Korean literature since the 1990s.⁹

This paper looks in detail at innovative activities introduced in the food industry of the 2010s, focusing on the '*Kumkhop (Golden Cup) General Foodstuff Factory for Sportspeople* 금컵체육인종합식료공장 (hereafter, *Kumkhop*).'⁹ In the case of *Kumkhop*, an effort is made to discover some of the innovation policies which could be applied to the food industry sector and analyze how company activities and national development strategies were combined. *Kumkhop*, founded in 2010, became a kind of 'model and standard factory' in the food industry.

⁷ Contrary to the commonly accepted notion that there can be no dissent or inconsistencies in North Korean publications, we could find some different voice in them. Rachel Minyoung Lee and Robert Carlin, "Understanding Kim Jong Un's Economic Policymaking: Project Overview," 38 *North*, 28 May 2021.

⁸ Hojye Kang, "Research on North Korea: An Analysis of Doctoral Theses Registered in the ProQuest Dissertations and Theses Database," *Korea Europe Review: An Interdisciplinary Journal of Politics, Society, and Economics* 1 (2021).

⁹ Among them, the following works are recommendable. Lee Jong Seok 이종석, *Research on the Workers' Party of Korea* 조선로동당연구 (Seoul: Yuksabipyungsa, 1995); Lee Tae Seob 이태섭, *Research on the Leadership of Kim Il Sung* 김일성 리더십 연구 (Seoul: Dulnyouk, 2001); Seo Dong Man 서동만, *The History of the Formation of North Korea's Socialist System, 1945–1961* 북조선 사회주의 체제 성립사 1945-1961 (Seoul: Sunin, 2005). For the history of science and technology, Hojye Kang 강호제, *The History of Science and Technology in North Korea 1* 북한 과학기술 형성사 1 (Seoul: Sunin, 2007). For research on East Germany, Peter C. Ludz, *The Changing Party Elite in East Germany* (MIT Press, 1972).

The relative abundance and variety of available materials is the other reason why the case of *Kumkhop* was focused on. Sometimes, some articles about the enterprise contain more verifiable data than others. Two articles have been published by outsiders after personal fieldwork of *Kumkhop*, visiting and interviewing. Also, many articles on *Kumkhop* were released by *Chosun Shinbo*, which dispatched special correspondents to North Korea to make these reports.¹⁰ In addition, the acquisition of some articles and videos including an interview with the chief executive officer which unusually contains his thoughts, made more intensive analysis possible.¹¹

In conclusion, small but continuous changes in North Korean society were found by combining micro-field activities with macro-political orientation. In 2009, North Korea began to transfer the achievements of the defense science and technology sector, including CNC (Computerized Numerical Control), to improve the civilian economy. A new production system consisting of computer-controlled machines was actively introduced into production sites. Onwards, it also accelerated the changes of individual companies in the food industry. *Kumkhop* was established rapidly growing into North Korea's representative food company. Two central policies supported the changes of *Kumkhop*; strengthening the autonomy of individual companies and encouraging technological innovation at the company level.

¹⁰ Comparing the two texts quoted in note 6, the characteristics of *Chosun Shinbo* are clearly revealed. Both of them deal with the theme of "Localization(국산화)." The article of *Science of History* 역사과학 focuses on the meaning of policy and the changes. The article of *Chosun Shinbo* describes the changes based on numeric data.

¹¹ Until now, there has been no research focusing on *Kumkhop*. However, there are many reports and interviews in the newspapers, journals and Youtube. Chunr Li 李春日 (Vice-President of China-Asia Economic Development Association) and Pak Jaehun 朴在勲 (Collaborative Researcher of the Economic Research Institute for Northeast Asia), who live in China and Japan respectively, published detailed records after visiting there. Both are scholars in economics, so their writings contain a lot of interesting information. Pak Jaehun said that he had visited and investigated North Korea almost every year from 1995 to 2019, staying more than a month at a time. The interview with Pak Jaehun was conducted over several sessions between January and June 2022. Chunr Li said that he had visited North Korea almost every month from 2007 to 2019. The interview with Chunr Li were taken on July 2022. Pak Jaehun 朴在勲, "(New Series: Visit to North Korean Companies) Mecca of Confectionery 'Kumkhop General Foodstuff Factory for Sportspeople' (新連載:朝鮮企業探訪) 製菓メーカー「金カップスポーツマン総合食品工場」)," *An East Asia Economic Information* 東アジア経済情報 2:43 (2020), 30-34; Chunr Li 李春日, "Kumkhop General Foodstuff Factory for Sportspeople 金杯运动员综合食品厂," in *Manlima Speed - North Korea's Economy in the Era of Kim Jong Un* 万里马速度-金正恩时代朝鲜经济 (河北省: 澳门时间全媒体传播有限公司, 2021), 82-91; Ri Jong Ho 리정호, "The Secret to Success Lies in Setting the Corporate Strategy Right and Conducting Business Innovatively (in Korean)," *Geulloja* 근로자, April (2015), 57-60; "(Interview) Director of Kumkhop Trading Company, Ri Jong Ho (in Korean)," (Youtube-Choson Sinbo, 2016.04.25).

The New Development Strategy was Implemented into the Food Industry since 2009

Kumkhop is a newly established company in 2010 on Chongchun street in Mangyongdae District, Pyongyang, where the sports training centers are located. The company's name shows that it was initially built as a general food company for athletes. It was created to provide exceptional food for athletes, such as nutrition supply, functional recovery, and fatigue relief. However, in just a few years, it has grown into a famous company that produces general foodstuffs that are well-received by the public. Moreover, the area of the factory's business was not limited to the food industry. To overcome the seasonal fluctuations of the food industry, *Kumkhop* expanded its business areas into wood processing industry, fishery industry, trading industry, and hospitality industry.¹² *Kumkhop Trading Company* is the parent company, and various subsidiaries such as a foodstuff company, a wood processing company, and three restaurants are affiliated with it. So, it operates as a kind of 'group.'

The primary food products of *Kumkhop* are bread, rice cake, candy, cookies, soda, and processed meat products. It is evaluated by Pak Jaehun that the company's most significant differentiation lies in the variety and number of products. In 2020, it produced about 30 types and 600 kinds of food. Some products similar to Shrimp crackers and Choco Pie, produced in South Korea, are also produced. Along with *Sonhung Foodstuff Factory* 선홍식료공장 (hereafter, *Sonhung*), which has become the most famous foodstuff factory since the middle 2000s, *Kumkhop* is evaluated to have played an essential role in pushing foreign products out of the market in North Korea.¹³

Kumkhop was created in 2010. It was the execution of the development Strategy, which was designed by Kim Jong Il, "to put the defense industry firmly in the lead and to develop light industry and agriculture at the same time to improve people's lives dramatically."¹⁴ *Kumkhop* was prepared for the development of the light industry, especially the food industry. It was 2010 when the company began to be operated. The new company began operation in 2010, and October 2011 when all the new facilities were installed and operation began in earnest.¹⁵ It was two months before the death of Kim Jong Il.

¹² Ri Jong Ho, op. cit., 57-60.

¹³ Ri Young Dok 리영덕, "Sonhung Foodstuff Factory, Produced 5 of the Best Domestic Products / Dare to Challenge the World Level (in Korean)," *CSPB*, 28 January 2016.

¹⁴ Seo Jae Young, Park Je Dong and Jung Su Woong, op. cit.

¹⁵ "Food Production for Sportspeople - Established Factory on Chongchun Street (in Korean)," *CSPB*, 9 November 2011.

In January 2015 and January 2016, Kim Jong Un consecutively gave two field guidance to *Kumkhop* and directed to support the company's expansion actively.¹⁶ According to Chunr Li 李春日, the total construction cost was more than 9 million dollars, and among this, 1 million dollars and some materials (cement and steel) were provided by Kim Jong Un.¹⁷ With this opportunity, the company's building area tripled, and production capacity increased by 1.5 times, without stopping the existing production plan.¹⁸

Kim Jong Il changed the development strategy from 2009. Production plants in the steel and coal chemical industries, which had stopped work for more than ten years, returned to normal operations. To celebrate the achievement of new technological advances beyond simply putting plants 'into operation, Kim Jong Il invited and welcomed workers, scientists, and technicians involved in the plants to Pyongyang in December 2009 and November 2011, respectively.¹⁹ Furthermore, in August 2009, North Korea announced the decision to speed up economic development based on cutting-edge technology while announcing the strategy of 'Breaking through the Cutting Edge 첨단돌파.'²⁰ The core of cutting-edge technology was CNC technology, which combines mechanical technology and IT. CNC is an essential technology for making advanced weapons made of metal, such as ICBM. It is also a core technology for automation 자동화, intellectualization 지능화, and unmanned systems 무인화, which are the final goals of product innovations. Therefore, the cutting-edge breakthrough strategy was a declaration to actively utilize CNC technology which was highly developed in the advanced weapon manufacturing sector, for innovation in the civilian sector.

An earlier change in the food industry occurred at *Sonhung*, the leading company from the early-2000s. In March 2010, there was a news report that 'computer-con-

¹⁶ North Korea has a tradition of treating 'the field/the production site' as important. Guidance is also preferred to be conducted at the production site rather than in the office room. The 'On-site research activities' have been recommended for scientific research in order to reflect the condition of the production site. It is said that this tradition had been formed in the process of seeking and promoting the North Korean-style technological innovation movement in the late 1950s. Hojye Kang, *The History of Science and Technology in North Korea 1*.

¹⁷ Chunr Li, op. cit., 82-91.

¹⁸ "(Interview) Director of Kumkhop Trading Company, Ri Jong Ho (2016. 4. 25)" (cit. n. 11).

¹⁹ Hojye Kang 강호제, *Reading North Korea through Science and Technology 1 과학기술로 북한읽기 1* (Seoul: RPSscience, 2016), 249-255.

²⁰ "Break through the Cutting Edge (in Korean)," *Rodong Sinmun*, 11 August 2009.

trolled automatic flow production process' and 'computerized numerical control system' were introduced.²¹ Kim Jong Il gave field guidance to *Sonhung* in December 2010 to confirm the results of production innovation, adopting CNC.²²

In order to accelerate innovation in the food industry, which can massively affect people's daily life, the 'Products Exhibition of Provincial General Foodstuff Factories' started to be held every year since 2011.²³ Moreover, 2012 was designated as the 'year of the great efforts for improving the light industry.'²⁴ Focusing on the development of the light industry, especially the food industry, was prioritized in order that people could easily feel their daily life quickly improved by using innovation developed in the defense industry and heavy industry first. In this circumstance, *Kumkhop* started its operation in October 2011. However, since Kim Jong Il died on December 17, 2011, Kim Jong Un implemented this policy.

Normally North Korea, which implements a planned economy, announces a one-year plan in the form of a joint newspaper editorial or a New Year's address. In this case, the order of sectors mentioned can be interpreted as their priority order of execution. Under Kim Jong Il's leadership, the sectors of the heavy chemical industry were mentioned first, followed by sectors related to daily life, such as agriculture and the light industry. However, during the first two years under Kim Jong Un's leadership, the priorities changed unusually. In 2013 and 2014, agriculture, livestock, fisheries, and light industries were placed first. In 2013, Kim Jong Un emphasized agriculture and light industry as 'the central front of economic construction in this year in his New Year's Address.'²⁵ The fact that the 'National Meeting of Light Industry' was held in March 2013 meant that policies supporting the light industry were ready to be implemented fully.²⁶

Therefore, the Kim Jong Il era and the Kim Jong Un era are often interpreted as discontinuous and different. In contrast to this, continuity and succession seem to be highlighted in the food and other light industries.

²¹ "Foodstuff Factory with Increasing Number of Kinds of Product - Improving Production Efficiency by Introducing a Computerized Numerical Control System (in Korean)," *CSPB*, 12 December 2010.

²² "The Great Leader Kim Jong Il Gave Field Guidance to Renovated and Expanded Pyongyang Wheat Flour Processing Factory, Sonhung Foodstuff Factory, and Hyangmanru Restaurant (in Korean)," *Rodong Sinmun*, 12 December 2010.

²³ Joo Chang Son 주창선, "Strong Men of Faith Who Create Great Achievements While Singing the Song of the Revolution - the Struggles of the Officials and Employees of the Susongchon Foodstuff Factory of the Twice (in Korean)," *Rodong Sinmun*, 6 June 2011.

²⁴ Kang Myong Chon 강명천, "More People's Favorite Foodstuff - At Sonhung Foodstuff Factory (in Korean)," *Rodong Sinmun*, 23 January 2012.

²⁵ "New Year Address of Supreme Leader Kim Jong Un," *Korea Central News Agency (KCNA)*, 1 January 2013; "New Year Address of Supreme Leader Kim Jong Un", *KCNA*, 1 January 2014.

²⁶ "Speech of Comrade Kim Jong Un at the National Meeting of Light Industry (in Korean)," *Rodong Sinmun*, 19 March 2013.

Company Operation with Priority of Technological Innovation

In the late 1990s, while restoring the collapsed economic system, Kim Jong Il established the economic development strategy emphasizing science and technology. Especially, information technology was mainly emphasized. In March 2001, he defined the 21st century as the age of the information industry and formulated policies focused on technological innovation using a computer. In addition, informatization 정보화, intellectualization, and automation cause which replace human labor, so it has become a goal not only to improve production efficiency, but also to liberate labor.

The strategy of Breaking through the Cutting Edge, which fully promoted from August 2009, brought a qualitative change in technological innovation at production sites in the food industry. CNC technology began to be actively utilized in the production sites. Beyond replacing some production facilities with new ones, the focus has been shifted to a new way to build an entirely automated and unmanned system controlled by a computer. It is called ‘Integrated Production (Management) System, the Computer Integrated Manufacturing (Management) System 통합생산(관리)체계’ in North Korea.²⁷

The changes in technological innovation can be seen clearly in the case of *Sonhung*, which *Kumkhop* considered to be a model to follow and ultimately tried to catch up with.²⁸ As a leading company, *Sonhung* was the first to innovate production facilities using CNC technology in the food industry. This innovation was promoted by ‘automatic flow line, computerization, and auto-control.’ Due to these, *Sonhung*, where the production capacity was increased tenfold during the previous eight years, from 1999 to 2007 (an average increase of 33% per year), produced double the amount in just one year (an increase of 100%). From 2009 to 2010, it was evaluated that ‘the production capability was dramatically increased by realizing CNC conversion of the company and automating all production processes.’²⁹ If the information is correct, the annual growth rate of production capacity has tripled after adopting new technology.

Kumkhop was not fully equipped with advanced technological facilities when it was first established in 2010. It is said that for about eight months in 2011 ‘hundreds

²⁷ Kim Ji Young 김지영, “Optimizing the Activities of Socialist Companies - Rapidly and Widely Introduced Integrated Production System (in Korean).” *CSPB*, 16 October 2017.

²⁸ Kang Jin Hyong 강진형 and Oh Chong Ryong 오철룡, “Until It Became the ‘Golden Cup’ of Our Country’s Food Industry - Based on the Business Results of Ri Jong Ho and Other Officials Who Turned Kumkhop Foodstuff Factory For Sportspeople Into a Famous Factory All Over the Country (in Korean).” *Rodong Sinmun*, 18 March 2015.

²⁹ “‘Sonhung’ Brand Food Products That Respond to People’s Needs - All Employees Are the Masters of Product Development (in Korean).” *CSPB*, 13 November 2008; “Foodstuff Factory That Has Doubled in Production - Popular Products Under the ‘Gyonghung’ Brand Such as Cookie and Bread (in Korean).” *CSPB*, 2 December 2010.

of advanced food processing facilities were installed, and an Integrated Production System was realized.’³⁰ At that time, it was said that research facilities such as a ‘Technological Preparation Room’ were carefully equipped to support the invention of functional foods and beverages.³¹

After Kim Jong Un’s field guidance in January 2015, *Kumkhop* production facilities were again upgraded. At the time, Kim Jong Un suggested, “Let us transform *Kumkhop General Foodstuff Factory for Sportspeople* into a model and standard factory for our country’s food industry, just like the advanced food factories of the People’s Army.” In addition, he gave specific instructions on “the problem of normalizing food production and increasing the number of kinds of product” and “the problem of realizing automation, unmanned systems, sterilization and dust-prevention of production processes at a high level.”³² It could be a clear statement of the policy to make *Kumkhop* a model and standard factory in the food industry, which was directly connected to the people’s everyday life, following the new economic strategy of prioritizing the civil sector by transferring the advanced technology, resources, and workforce of the military sector. More precisely speaking, it was a request for innovations benchmarking the successful case of the *February 20 Factory of the Korean People’s Army*, which had just completed the upgrade of the production site.³³

The *February 20 Factory* is a company that supplies essential daily foods such as soy sauce, soybean paste, butter, and oil, as well as instant rice, candy, and cookies to soldiers. The *February 20 Factory*, which has been operating since the Kim Il Sung era, was evaluated as “successfully transformed into a model and standard factory for the food industry” after Kim Jong Un gave field guidance in May 2013 and

³⁰ “Food Production for Sportspeople - Established Factory on Chongchun Street” (cit. n. 15).

³¹ Oh Chong Ryong 오철룡, “A Modern and General Foodstuff Processing Base for Sportspeople - From *Kumkhop General Foodstuff Factory for Sportspeople* (in Korean),” *Rodong Sinmun*, 9 November 2011; “Achievements in the Sports Science Research Projects (in Korean),” *Rodong Sinmun*, 29 November 2013.

³² “Comrade Kim Jong Un Gave Field Guidance to *Kumkhop General Foodstuff Factory for Sportspeople* (in Korean),” *Rodong Sinmun*, 18 January 2015; Kim Chung Song 김충성, “The Turbulent Times Call for Officers With Extraordinary Creative Spirit and Power of Execution - Based on the Activities of Ri Jong Ho, Director of *Kumkhop Trading Company* (in Korean),” *Rodong Sinmun*, 5 May 2016; “The Great Love for People Is Also in *Kumkhop General Foodstuff Factory for Sportspeople* - Visiting *Kumkhop* Which Has Traces of Leadership of the Great (in Korean),” *Chollima 천리마* 5 (2015), 93.

³³ “Comrade Kim Jong Un Gave Field Guidance to the *February 20 Factory of the Korean People’s Army* Which Has Transformed into a Model and Standard for Our Country’s Foodstuff Factory (in Korean),” *Rodong Sinmun*, 15 November 2014; Han Young Min 한영민, “Created a Fever of Leading, Learning, and Exchanging Experiences to the Whole Country (in Korean),” *Rodong Sinmun*, 27 November 2016.

November 2014.³⁴ It was an acknowledgment that it had become the highest level of automation and unmanned factory suitable for the era of a knowledge economy. According to the characteristics of the food factory, the *February 20 Factory* has even completed the system of ‘sterilization 무균화 and dust-prevention 무진화.’ In particular, Kim Jong Un evaluated its Integrated Production System as excellent, encompassing not only production activities and quality control but also business activities. It was evaluated to be the best in North Korea in terms of scale as well as the function of automation and intellectualization.³⁵

Moreover, in the process of improvement in 2015, *Kumkhop* developed an ‘Integrated Management System’ which included the analysis of buyers’ demand and adjusted production activities according to demand forecast. By using the system, the production volume of individual products could be determined according to the sales data of each product which were collected nationwide.³⁶ In North Korea’s planned economic system, it was a rare case where information on the consumption side rather than the production side was designed to control production activities.

The level of goals focused on the automation of food factories pursued during this period can be seen in more detail by examining the process of improving the system of ‘Twisted Korean Doughnuts’ in the *November 2 Factory of the KPA*.³⁷ It was said that the *November 2 Factory* succeeded in automating all processes except the input of raw materials in 2014, referring to the *February 20 Factory*. As the production sites could be monitored and controlled remotely with the Integrated Production System, workers were only asked to be put into the sites when problems happened. It was called ‘the unmanned system’ in North Korea.

Kim Jong Un gave on-the-spot guidance to the *November 2 Factory* in short intervals, November 2013, February 2014, and August 2014.³⁸ At first, only the main processes were automated, and manual labor remained for connecting between processes. In response, Kim Jong Un demanded full automation from the input of raw materials to the packaging of final products. For the confirmation of the report that his instructions were completed, Kim Jong Un revisited the *November 2 Factory*

³⁴ “Comrade Kim Jong Un Gave Field Guidance to the February 20 Factory of the Korean People’s Army Which Has Transformed into a Model and Standard for Our Country’s Foodstuff Factory” (cit. n. 33).

³⁵ Ri Byong Chun 리병춘, “Create Modernization Standards That Our Party Wants (in Korean),” *Rodong Sinmun*, 5 December 2014.

³⁶ Kim Ji Young 김지영, “Development of New Products Based on Objective Numerical Values (in Korean),” *CSPB*, 7 November 2017.

³⁷ “A Factory to Be Proud of - Visiting the *November 2 Factory* of the Korean People’s Army (KPA) (in Korean)” (Korea Central TV, 2014).

³⁸ “Respected Supreme Commander Kim Jong Un Gave Field Guidance to the November 2 Factory of KPA (in Korean),” *Rodong Sinmun*, 13 November 2013; “Respected Supreme Commander Kim Jong Un Once Again Gave Field Guidance to the November 2 Factory of KPA (in Korean),” *Rodong Sinmun*, 20 February 2014; “Respected Comrade Kim Jong Un Gave Field Guidance to the November 2 Factory of KPA (in Korean),” *Rodong Sinmun*, 24 August 2014.

once more and demanded that it automate the only remaining non-automated process, twisting the doughnut dough process. Although no factory has yet completed such technology in North Korea, there was a proposal to develop a fully automated or unmanned system that does not require manual labor. Additionally, the order sought to increase the level of hygiene by minimizing contamination by humans. Therefore, Kim Jong Un pointed out that windows open for ventilation could cause sanitation problems, such as dust and germs, and demanded the creation of a dust-free and sterile environment in every production site. Accordingly, on *November 2 Factory* created a new air circulation system, divided the twisting process into several parts, and fully automated it with the help of the Defense Department, the *111 Factory of National Academy of Sciences*, *Kimchaek University of Technology*, and *Pyongyang Machinery College*. The production process rooms were sealed entirely with glass, and people could only enter through the air room. Until all these processes were completed, Kim Jong Un made three consecutive visits within a year to check in detail. Rather than simply checking the instructions, these visits were to confirm whether the process of generalizing models was reasonable.

The improvement work of *Kumkhop* in 2015 was more advanced than that of the *November 2 Factory*. Just by examining the appearance in the video, *Kumkhop* was much more sophisticated and up-to-date.³⁹ Integrated Production System used a large multi-vision made by connected 9 LCDs, rather than two slightly larger LCD monitors. In particular, the production facilities were installed to use a narrow space efficiently, and the operating speed seemed to be faster. It was also unique that the entire production process could be viewed through the glass window in the hallway leading to the control room. After the second completion in 2016, *Kumkhop* was promoted as one of the three model factories in 2016, with an evaluation that it was a factory that realized modernization at the highest level.⁴⁰

³⁹ “The Famous ‘Kumkhop’ Food Items (in Korean),” (2015. 4. 20) (Youtube-Elufatv, 2016), Accessed on 2022. 5. 15; “(Interview) Director of Kumkhop Trading Company, Ri Jong Ho” (cit. n. 11).

⁴⁰ Oh Pyong Suk 오평숙, “Shining Its Name ‘Kumkhop’ (in Korean),” *Minju Choson*, 15 March 2016.



Figure 1. Company-Level Technological Innovation in DPR Korea (2016. 9. 10, image courtesy of Pak Jaehun)



Figure 2. The Hallway Leading to the Control Room of Kumkhop (2016. 9. 10, image courtesy of Pak Jaehun)

In the 21st century, North Korea’s (technological) innovation strongly emphasized science-technology education. The logic was that the speed and level of technological innovation would improve if workers’ scientific and technological capabilities were improved. In order to support the ‘Industrial Revolution of the New Century 새 세기 산업혁명’ proposed by Kim Jong Il in 2011, Kim Jong Un proposed the ‘Educational Revolution of the New Century 새 세기 교육혁명’ in 2012 after North Korea’s declaration that it had successfully developed its nuclear.

In March 2018, focus on education, science, and technology have emerged as a critical strategy to develop the economy.⁴¹ In 2016, about 100 workers of Kumkhop

⁴¹ “The 3rd Plenary Meeting of the 7th Central Committee of the Workers’ Party of Korea Held in Presence of Kim Jong Un,” KCNA, 21 April 2018.

were studying as distance college students at Kim Il Sung University and Light Engineering College. It was emphasized that the workers should continue to receive science and technology education through re-education and remote education, with the goal of ‘Training All People as Scientific and Technological Talents 전민과학기술인재화.’ To this end a ‘Science-Technology Distribution Room 과학기술보급실’ equipped with computers connected to the national communication network was set up at all production sites. In addition, tablets with Wi-Fi functions were distributed individually to every worker.⁴² North Korea started developing public wireless communication services and devices in 2016, so *Kumkhop* was the first to utilize the latest system.⁴³ It was said that by improving the workers’ skills, they could develop and install some new products and facilities on their own without any external help.

Pursuing Technological Innovation Based on Company Autonomy

After barely overcoming the economic difficulties of the 1990s, North Korea has struggled to develop a new economic system to cope with the changing environment. Attempts at reform have been refined since the early 2010s as they were called ‘Our-style Economic Management Methods,’ more specifically, ‘Socialist System of Responsible Business Operation 사회주의기업책임관리제 (hereafter, SSRBO).’⁴⁴ It was an attempt to find an appropriate system that guaranteed the maximum degree of autonomy of the company without breaking the basic rules of unified guidance of the state, a planned economy, and social ownership of the means of production.⁴⁵ The change in *Kumkhop* was the process of pursuing Maximum ‘profit’ as much as possible while keeping these conditions.

Since SSRBO is not published an organized form of literature, it is difficult to grasp the detailed contents. However, if we look at North Korea’s ‘Company Law’ created in 2011 and revised in 2014, we can see the direction of changes which has been tested. The Company Law shows that some previously unauthorized rights were granted to companies. Also, there are many duties that companies must do on their own. For the first time, a company has the rights to planning 계획권, financing

⁴² Chunr Li, op. cit., 82-91.

⁴³ “Improving the Learning Environment for All People Through Wi-Fi - Tablet PCs with Wi-Fi Become Popular (in Korean),” *CSPB*, 31 July 2018.

⁴⁴ Ri Tae Ho 리태호, “One Year After Implementation of Economic Management Improvement/Measures, Change of the Production Sites - Returning the Results of Increased Production and Profits to Workers (in Korean),” *CSPB*, 25 March 2014.

⁴⁵ Kim Jong Su 김정수, “Basic Demands for Establishing Our Style Economic Management Methods (in Korean),” *Rodong Sinmun*, 22 October 2014.

재정권, labor control 로력조절권, production organization 생산조직권, human resources management 인재관리권, product development 제품개발권, joint venture/operation 합영합작권, price setting 가격제정권, and sales 판매권.⁴⁶ It means that some rights of the state were transferred to the company. Now, the profit of an individual company depends on how efficiently it promotes production and management. The company manager/director's role in establishing and executing strategies has become more critical. When the case of *Kumkhop* was mentioned, Ri Jong Ho, Director of *Kumkhop Trading Company*, the parent company of *Kumkhop*, was regarded as significant.⁴⁷

The unique management strategy that contributed to the growth of *Kumkhop* was the pursuit of business diversification and the process of that diversification. *Kumkhop* started as a trade and food company but expanded its business areas, including into the timber industry, fisheries industry, and restaurants. Ri Jong Ho explained that various types of businesses were simultaneously promoted to ensure stable profits because raw foodstuff materials varied greatly depending on the season. In particular, he explained that he was able to decide to start the wood processing company after thoroughly analyzing and exploring the Party policies. He had forecast that a large-scale construction project would be launched. He found some reliable signals in the proposal to 'open a great period of prosperity in construction' of the 2014 New Year's address. Ri Jong Ho prepared a 'standardized and integrated timber factory' based on the signals. As a result, he said that it contributed significantly to the construction of 'Wisong Scientists Residential District 위성과학자주택지구' and he could earn much profit.⁴⁸ Perhaps the record of supplying to a national project would be helpful to increase the reliability of their products and thus increase sales volume. It could be said that the new management system, SSRBO, stimulated these strategies.

Operating the trading company also helped *Kumkhop* develop new products and learn new technologies. When Ri Jong Ho went on a business trip abroad, he bought as many new products as possible. He gave them to employees, telling them to use the products to develop new products. Additionally, to learn the technology to make new products, they sent employees to France for training and invited foreign engineers.⁴⁹ As a result, some of *Kumkhop*'s products were made similar to products popular in foreign countries including even their packaging design. The strategy was to accept good things in order to reach the 'world's best level as soon as possible, even if it was developed in a foreign country.'⁵⁰ It could be said that the concept of 'Self-sustenance/Juche-orientation 자립화/주체화' had been applied flexibly. Even

⁴⁶ "Execution Regulations of the Company Law Were Adopted (in Korean)," *Minju Choson*, 3 August 2011; "Company Law 기업소법 (Revised on 2014. 11. 5)," in *Law Book of DPRK* (Pyongyang: Law Publishing House, 2016).

⁴⁷ Kim Chung Song (cit. n. 32).

⁴⁸ Ri Jong Ho, op. cit., 57-60.

⁴⁹ "(Interview) Director of Kumkhop Trading Company, Ri Jong Ho" (cit. n. 11).

⁵⁰ Ibid.

though the source of products and technology were imported at first because they were foreign, if native workers could learn the technology and produce it by themselves, it was recognized as ‘Juche-orientation.’

In order to maximize profits, *Kumkhop* utilized the factory facilities for various profit programs. When they opened the sauna and swimming pool, which were created during the building extension for the welfare of employees, a separate fee was charged to users. They also developed the experience of a food factory and ran three unique restaurants.⁵¹ Unlike in the past, these were possible because the company’s autonomy was significantly increased.

The number of *Kumkhop* products has increased to more than 600 kinds because of the ‘New Product Development and Fair’ held every week. At *Kumkhop*, all employees were asked to propose one new product weekly. Moreover, if possible, the staff carried out the appropriate manufacturing methods, equipment modifications, and installations.⁵² This system could be operated without interruption because research facilities made for research and development of functional foods and an analysis room introduced for quality control had been prepared from the beginning.

The SSRBO is mainly concerned with loosening the constraints of companies, giving them authorities which they did not have before. Contrary to these general trends, some direction has been forced, such as the strengthening of science-technology and education. In order to obtain maximum benefits with the same raw materials and the same labor, production efficiency must be increased. The idea was that the best way to increase production efficiency would be technological innovation and improvement of workers’ productive capabilities, and this was reflected in the 2014 revision of the Company Law.⁵³

The Company Law explicitly states that companies should actively accept ‘the achievements of advanced science and technology and support them to continuously raise the level of ‘Juche Orientation, Modernization, and Scientification’ (Article 6) as a basic duty of the state. The company’s duty was to actively promote the ‘development of new technologies and new products to transform into a company that integrates science-technology and production’ and a ‘technology-intensive company’ (Article 34). The law also stipulated that this must be implemented through the pop-

⁵¹ Pak Jaehun, op. cit., 30-34.

⁵² Kim Chung Song (cit. n. 32).

⁵³ “Company Law (Revised on 2014.11. 5)” (cit. n. 46). There are no research results showing that technological innovation had been strengthened by the Company Law. However, there is a MA thesis suggesting that the company’s authority has been strengthened in comparisons between the Company Law and other laws. Lee Hyowon 이효원, “A study on North Korea’s ‘Socialist Enterprise Responsibility Management System’ in the Kim Jong Un era : Focusing on the management rights of the enterprise 김정은 시대 북한의 ‘사회주의기업책임관리제’ 법제도 연구” (Ewha Womans University MA Thesis, 2022).

ular technological innovation movement (Article 41). In addition, it required companies to pursue ‘technology renovation’ and ‘self-supporting based on modern technology. It had to be directed to earn economic ‘profit’ (Article 42).

In the end, it can be evaluated that *Kumkhop* was a company that thoroughly implemented the company management policy outlined in the Company Law. Furthermore, it can be evaluated that it was a place where innovation was pursued by the ‘our-style economic management methods’ and the ‘SSRBO,’ based on the company’s autonomy. Conversely, it can be said that *Kumkhop*’s achievements proved that the Company Law is not just a set of good words, but sufficiently feasible policies.

Conclusion

It was in the 1990s that North Korea requested some food aid from the outside due to its challenging economy. More than 20 years have passed since then, but the real GDP per capita of 2019, announced by the North Korean government, still did not exceed \$1,400. However, they have overcome the difficulty of relying on external food aid, and their economy is growing by more than 4% annually. It cannot be said that the North Korean economy has been entirely free from poverty, but it would be unreasonable to say that it is still at the level of 20 years ago. Little by little, small but steady changes have taken place in the North Korean economy.

In addition, North Korea has succeeded in developing nuclear warheads and ICBMs, which few countries have developed independently. At least, it can be said that the level of the defense sector has reached the highest in the world. It is bizarre that the level of the defense sector and the civilian sector are so far apart. The one ahead tends to pull the one behind. In the 21st century, North Korea’s economic development strategy was aimed at the ‘Spin-off Effect.’ The defense sector was developed first and then advanced science-technology was applied to the civilian sector to support the development of the economy.

Changes in the economic development of North Korea have been prominent since 2009. These changes are found in North Korea’s published documents. As discussed in this paper, it was possible to find detailed changes in the food industry, which are closely related to daily life. CNC developed to make advanced weapons began to be actively used in the civilian sector. *Sonhung*, which is the most famous in the food industry, adopted CNC and started renovating its facilities. Beyond automation, intellectualization, and unmanned systems, sterilization, and dust prevention were pursued. Constructing the Integrated Production System made it possible to monitor and control together remotely. In order to increase productivity, old technologies and facilities were abandoned, and technological innovations were strongly promoted.

Kumkhop, which started its operation at full scale in 2011, concentrated its efforts on technological innovation from the beginning. In addition to producing functional food and beverages for athletes, which was the original purpose of its establishment, it began to produce general foodstuffs. It has become a technology-intensive company to produce various products of the highest quality. Moreover, under the management's judgment that the food industry alone could not generate stable profits, it carried out wood processing, fishery, restaurant business, and trading business. Kim Jong Un, who visited *Kumkhop* in January 2015 and supported its changes directly, accelerated these changes. The late started *Kumkhop* became a rising star in the food industry, and the Director of the company Ri Jong Ho, and his management strategy were introduced as the best one in various factories.

In order to rebuild the collapsed economy, North Korea has been seeking 'our-style economic management methods' since the time of Kim Jong Il. North Korea had been struggling to find new business management methods for a long time, and *Kumkhop* was allowed to use technological innovation and new management strategies with autonomy. Kim Jong Un refined it as Socialist System of Responsible Business Operation. The results were explicitly summarized in North Korea's Company Law, which was first enacted in 2011 and revised in 2014. Companies had to operate to be thoroughly 'Profitable' while actively promoting 'Technological Innovation.' For this purpose, the Company Law reflected the strategy of guaranteeing the company's autonomy and significantly strengthening its authority without departing from the basic principles of socialism.

Ultimately, *Kumkhop* became a leading company in the food industry due to vigorously pursuing technological innovation at the company level. It was a policy direction prepared by Kim Jong Il's leadership and implemented under Kim Jong Un's leadership. It can be said that *Kumkhop* is a representative company that realized the Spin-off Effect of developing the defense sector first and transferring the results into the civilian sector. *Kumkhop* could be regarded as an excellent example of the strategy and goal of North Korea's economic development at the company level, the smallest economic unit, which was invisible at the macro level.

How quickly the North Korean economy develops depends on how quickly a case like *Kumkhop* spreads and whether this succeeds in other sectors. Of course, if this case could not be generalized, North Korea would not be able to escape from its position of being a developing country with advanced weapons.

Abstract

The ‘Kumkhop General Foodstuff Factory for Sportspeople’ has launched technological innovation policies in North Korea’s food industry since 2010. The policies have been connected to the national development strategies, which means transferring military resources to civilians. This study examined how the economic development strategy emphasizing science and technology was implemented in individual companies in the food industry. It included automation and changes based on IT and CNC technology. In addition, it was confirmed that the rights of individual companies are being strengthened in the economic system that North Korea is developing, the Socialist System of Responsible Business Operation. Small but continued changes in the North Korean economy are shown by depicting some micro-activities of individual companies, corresponding to macro-policies. It could be possible that North Korea has been moving toward a technological innovation-friendly society.

Keywords: North Korea, technological innovation, the autonomy of company, food industry, Kumkhop General Foodstuff Factory for Sportspeople, integrated production system