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A Study on the Designation of the Agricultural Sector as National Core Infrastructure and Political Direction for Food Security in Korea

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Abstract: This study seeks to derive measures to promote Korea's food security by applying the concept of national core infrastructure. This paper designates the agricultural sector for food security through the functions, systems, and facilities of national core infrastructure and presents policy directions. The results of the analysis show that the functions of national core infrastructure can be implemented by establishing a food security manual. Due to the lack of relevant manuals in Korea, it is necessary to strengthen the response system on a regular basis through the designation of a department dedicated to food security and the task, rather than ad hoc measures. The system of national core infrastructure is a public stockpile. As in the case of Japan, Korea also needs to strengthen the public stockpiling system through public-private cooperation to maintain an appropriate stockpile. The national core infrastructure facility is a grain stockpile. It is also necessary for Korea to devise a comprehensive food complex by understanding the characteristics and economic feasibility of grains in the future.

Keywords: food security; national core infrastructure; agricultural sector; crisis management, Korea

1. Introduction

The crisis in the grain supply chain caused by the recent COVID-19 and Russia's invasion of Ukraine has shown the limits of Korea's excessive dependence on foreign agricultural product imports. In an emergency situation where borders are closed and logistics movement is restricted, Korea will have no choice but to fall into a food crisis. In addition, Korea's farmland is small, the agricultural production population is aging, and productivity in the agricultural sector is stagnant, so the food problem is intensifying[1–4].

Moreover, Korea's food self-sufficiency rate is about 45% as of 2023, the lowest level in the OECD, and the grain self-sufficiency rate is about 20%. Korea enacted the 'framework act on agriculture, rural community and food industry' in 1999 to implement policies to secure food stocks. However, the food self-sufficiency rate is gradually declining, raising questions about the effectiveness of the policy[5–7].

This paper derives policies for food security by applying the concept of national core infrastructure. A clear policy direction is presented by setting the agricultural sector as national core infrastructure and establishing policies after identifying elements for food security.

2. Food security and National core infrastructure

2.1. Food Security

There are about 200 definitions of food security, and the most officially used definition is the one adopted at the World Food Summit in 1996 like below.

“Food security exists when all people at all times have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life.”

Food security is the sum of a country's production and procurement capabilities. Production capacity is the process of expanding production at home and abroad. On the other hand, procurement capability is to have a stable supply chain to facilitate food imports[8–10]. In terms of production capacity, Korea has a highly advanced industrial structure, resulting in high land costs. It is virtually impossible to repurpose existing land for agriculture. Regarding the field of procurement capacity, considering the recent international situation, it cannot be asserted that Korea is absolutely safe[11–13].

2.2 The need for designation of national core infrastructure in the agricultural sector

National core infrastructure may include new elements according to social changes and sophistication of social development. Therefore, it is necessary to newly designate it to ensure national security[14–16]. The damage to agricultural production caused by disasters is not only a problem for those engaged in agriculture. Therefore, it is necessary to ensure the stability of the agricultural sector. Korea's response to food security is not systematic because it is urgently prepared before and after the international grain market crisis and promoted intermittently. Therefore, securing stability by designating the agricultural sector as a national core infrastructure can be a desirable alternative.

National core infrastructure includes not only facilities, but also systems and functions, and encompasses all environments surrounding facilities[17–19]. This study first examines the policy direction for food security based on the three elements of national core infrastructure: function, system, and facility.

3. National core infrastructure designation and policy direction in the agricultural sector

3.1 Function

The functions of the national core infrastructure in agriculture can be implemented through the establishment of a food security manual. Korea is also managing the self-sufficiency rate based on the 'Framework Act on Agriculture, Rural Community and Food Industry', but it is insufficient in many aspects such as manuals. Currently, there is an 'International Grain Crisis Response Action Manual' as a guideline related to food security in Korea, but a food security manual should be established and used as a national agenda. In addition, it is necessary to specify food security in the regulations of the Ministry of Agriculture, Food and Rural Affairs, and to strengthen the regular response system through designation of a dedicated department and dedicated work[20–24].

3.2 System

The system of national core infrastructure in the agricultural sector is a public reserve system. Korea, which has a grain self-sufficiency rate of only about 20%, has a markedly insufficient related system. In order to prepare for a food crisis in which borders are closed and logistics movement is restricted, public grain stockpiling is desperately needed. Japan and Singapore are strengthening public stockpiling systems to protect their grain industries. In particular, in Japan, when the private sector stocks more for food security reasons than it stocks for necessity, the government intervenes and subsidizes part of the cost of stockpiling. As such, Korea needs to strengthen the public-private partnership system to maintain an appropriate stockpile[25–28].

3.3 Facility

National core infrastructure facilities are facilities that are recognized as requiring continuous management for the performance of core national functions. In order to supply necessary food in case of emergency, it is necessary to secure an appropriate amount of stock in the grain storage complex. These grain storage complexes are public facilities that must be equipped for food security. Korea has economic problems with grain imports and processing. In order to overcome this, it would be a good idea to build a processing plant behind the port to envision a general food processing and distribution base, that is, a food complex, that can store and process raw materials within the complex[29–35].

Table 1. Policy direction for food security identified as a national core infrastructure element

Element	Policy Direction	Main Content
Function	Establishment of food security manual	<ul style="list-style-type: none"> ➤ Currently, the self-sufficiency rate is managed according to the law, but temporary measures are being taken. ➤ Designate a dedicated department for establishing and promoting manuals and strengthening the regular response system
System	Reinforcing public stockpiling	<ul style="list-style-type: none"> ➤ Insufficient system compared to Asian countries similar to Korea ➤ Designing a public stockpiling system through public-private cooperation to maintain an appropriate stockpile
Facility	Building a comprehensive food complex	<ul style="list-style-type: none"> ➤ The current grain stockpiling base focuses on stockpiling ➤ It is necessary to introduce a comprehensive food complex for grain characteristics and economic efficiency.

4. Conclusions

Considering the stagnation of agricultural productivity, narrow farmland, aging agricultural base, and high dependence on imports, Korea's current level of food security requires active and diversified responses. Moreover, climate change, population growth, and a rapidly changing world situation are putting our food security at extreme risk. Preemptive measures must be taken to prepare for food crises, and practical long-term and short-term plans must be implemented consistently without a hitch. It is reasonable to view food security as a value or system that is continuously being formed by the state. The food crisis is an important matter related to national security, and it needs to be approached from the perspective of security, away from economic logic, and an active response is required. This paper presented a direction for promotion by considering the perspective of food security as a national core infrastructure element. At present, food security is underdeveloped, and the national core infrastructure does not designate an agricultural sector. In this situation, if the two concepts are converged, they will complement each other institutionally and lead to better policies.

Author Contributions: Conceptualization, J.H.C. and D.K.L.; investigation, S.A.K.; writing—original draft, J.H.C. and D.K.L.; writing—review and editing, S.A.K. and J.E.L.; supervision, J.E.L. All authors have read and agreed to the published version of the manuscript.

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