

EXECUTIVE SUMMARY

A Study on the Management Plan for Seafood Supply–Demand Considering Food Security

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1. Background and Purpose

1) Background

- Despite the significance of seafood as a food source, concerns about food security have escalated
- Global concerns about a 'food crisis' have increased since the Russia-Ukraine crisis in 2022.
- Seafood accounts for over 10% of the food supply, and is gaining increased importance for sustainability due to its relatively low greenhouse gas emissions during production.
- However, despite an average annual increase of 2.9% in fish and seafood consumption over the last decade, a decline in domestic

production has led to a decrease in the self-sufficiency rate of seafood.

- Insufficient management of seafood supply in terms of food security
 - Discussions on seafood food security are inadequate as food security policies are predominantly centered around staple foods.
 - In the internationally accepted concept of food security, 'food' constitutes a vital aspect of an active and healthy lifestyle, highlighting the need for discussions on seafood food security, a major source of protein in South Korea.

2) Relevance to National Projects

- Utilization within the framework of national objectives: 'Securing Food Sovereignty and Strengthening Farm Stability' and 'Prosperous Fishing Villages and Vibrant Oceans'
 - Deriving strategies for seafood supply management considering food security, thereby contributing significantly to securing food sovereignty on a broader scale.
 - Establishing a resilient response foundation in times of seafood food crises to enhance the competitiveness of the fisheries industry. Effectively managing seafood crises enables the alleviation of supply fluctuations, leading to long-term benefits such as increased average income and revenue for fishermen.

3) Purpose

- The objective of this study is to assess the significance of seafood in terms of food security and establish stable seafood supply management strategies. Specific objectives include:
 - First, evaluating the role of seafood from a food security perspective.
 - Second, analyzing the level of seafood food security and identifying crisis factors.
 - Third, proposing initiatives to ensure seafood food security.

2. Methodology

1) Academic methodology

- The primary research methods include a review of prior studies, statistical surveys and analysis, and the derivation of a seafood food security index
 - Review of prior studies on the concept of food security and global trends, analysis of research materials and papers related to deriving the food security index, development of supply control measures, and manuals.
 - Statistical analysis for diagnosing seafood food security levels, reviewing statistics related to detailed food security indicators.
 - Expert consultations for deriving specific seafood indicators and calculating the food security index using Analytic Hierarchy

Process (AHP) surveys and Z-score standardization.

- Utilization of a structural equation-based comprehensive model, KMI-FOSiM, within the seafood sector for scenario analysis of crisis repercussions.

2) Policy-making methods

- The key approaches identified for policy formulation include the activities of the Fisheries Current Affairs Support Group and expert consultations
- Convening expert advisory meetings to understand food security definitions and relevant policy trends.
- Exploring strategies for securing seafood food sovereignty through the activities of the Fisheries Current Affairs Support Group.
- Initiating inter-agency discussions for establishing strategies to manage seafood supply.
- Organizing policy forums aimed at exploring strategies to secure seafood food sovereignty.
- Driving expert advisory meetings to strategize the policy-driven utilization of the seafood food security index.

3. Result

1) Summary

- Reviewing the concept of seafood food security and global trends, analyzing the correlation between seafood and food security to derive the definition of seafood food security
- The concept of food security has continuously expanded, encompassing nutritional aspects and individual food preferences in terms of availability and accessibility.
- The FAO categorizes the core elements of food security into physical food availability, economic and physical accessibility, food utilization, and stability.
- Presently, South Korea's food security policy remains focused on basic food supplies, lacking policies suitable for the expanded concept of food security. Although the "Fisheries and Coastal Development Basic Act" provides a basis for food security policies, concrete policy measures for implementation are inadequate.
- Seafood significantly contributes to food availability, accessibility, and utilization in forms such as food supply, employment, and income. Thus, seafood food security is defined as follows:

〈Summary Table 1〉 The Definition of Fishery Food Security in This Study

Definition of 'Fishery Food Security'
"When all individuals have access, physically, economically, and socially, to the nutritious and fresh fishery products they desire, as much as they want, fishery food security exists."

Source: Prepared by the Authors

- Analysis of fishery self-sufficiency rate trends and derivation of Fishery Food Security Index for a food security level diagnosis
 - The self-sufficiency rate of fishery products has experienced a long-term decline due to an increase in imports, especially for seafood like salmon and shrimp, which are difficult to replace with domestic products.
 - To derive the Fishery Food Security Index, expert consultations were conducted to select specific indicators for availability, accessibility, utility, and stability as sub-factors.
 - The Fishery Food Security Index from 2010 to 2022 exhibited a decline in food security levels, especially after 2020 due to factors such as the COVID-19 pandemic and geopolitical events like the Russia-Ukraine conflict.
 - A comparison between recent 5-year and 10-year averages revealed consistently lower levels across various elements, suggesting the appropriate selection of the Food Security Index components.
 - For immediate crisis assessment during fishery food crises, short-term indices for fishery food security were calculated up to August 2023 based on monthly data availability, indicating

recovery from the deteriorated indices observed in the latter half of 2022 starting from the first half of 2023.

- Analyzing short-term and long-term crisis factors for fishery food security and deriving implications from crisis scenarios
 - Short-term crisis factors for fishery food security include changes in foreign and domestic supply conditions and input factors.
 - Long-term factors encompass climate change, aging fishery workers, and the reduction of resources in adjacent waters.
 - An analysis was conducted, combining crisis factors, leading to scenarios involving production decrease, reduced imports, and escalating global oil prices. The impact was assessed at 10%, 20%, and 30% intervals over the last decade.
 - Each scenario demonstrated effects such as reduced supply, increased prices, and diminished reserves. Considering these outcomes applied to the Food Security Index, scenarios indicating reduced production and imports showcased deteriorating food security compared to the baseline projection.
- Aiming to achieve 'Stable Supply of Fishery Products Desired by Citizens' as a goal of fishery food security-oriented supply management policies
 - In formulating fishery food security-oriented supply management strategies, the distinct characteristics of both fisheries and aquaculture should be considered. Contingency plans need to be devised for crisis situations, but it's crucial to design mid-to-long-term measures considering stability to reinforce

food security.

- Therefore, the foundational approach involves establishing an emergency response mechanism during crises to secure fishery food security and reinforcing mid-to-long-term fishery food security through supply management from a strategic perspective.

2) Policy recommendations

- Establishing gradual fishery supply management measures for crisis situations
 - To devise strategies for fishery supply management based on different crisis stages, it's essential to define crisis stages for fishery food security, develop a fishery supply control manual, and set up a fishery supply control committee.
 - Categorizing crisis stages involves utilizing the mean and standard deviation of the Short-Term Fishery Food Security Index, distinguishing between stability, caution, alert, and serious stages.
 - The fishery supply control manual details responsible entities and actions per crisis stage.
 - The provisional Fishery Supply Control Committee aims to aid decision-making by diagnosing supply situations and evaluating responses. Establishing this committee requires legal basis amendment through revisions in the Fishery Products Distribution Act.

- To achieve stable and sustainable fishery supply, it's crucial to develop indicators for fishery supply management, attract young and middle-aged individuals to engage in fishing, and create a responsive system for the fishing industry amid climate change predictions.
- The development of indicators for fishery supply management requires deriving and managing self-sufficiency rates centered on major consumer species. This initiative should focus on subdividing self-sufficiency targets based on key consumer species under the Fishery Industry Development Act.
- Developing and managing fishery food security indicators outside of supply requires amendments to include food security within the basic plans under the Fishery Industry Development Act.
- To incentivize the influx of young and middle-aged individuals into the fishing industry, tailored information on relocation and programs like 'A Month in Fishing Villages' should be introduced.
- Developing a climate change prediction system for the fishing industry involves analyzing fluctuations in fishery resources and adapting aquaculture to environmental changes, while predicting their social science implications.
- Considering feasibility, urgency, and foundational research, establishing short-term, mid-term, and long-term implementation plans

〈Summary Table 2〉 Detailed policy tasks and action plans by pursuit strategy

Pursuit Strategy	Supply Management Measures	Policy Tasks	Action Plans			Implementing Bodies
			Short – term	Medium – term	Long – term	
Crisis-Responsive Seafood Supply	• Crisis-stage seafood supply management	• Setting stages for seafood food security crisis	●			Ministry of Oceans and Fisheries, Korea Maritime Institute
		• Development of seafood supply regulation manual		●		
		• Crisis committee installation		●		
Stable and Sustainable Seafood Supply	• Development of seafood supply management indicators	• Derivation of self-sufficiency rates focusing on major consumption species	●			Ministry of Oceans and Fisheries, various related agencies
		• Development and management of seafood food security indicators		●		
Stable and Sustainable Seafood Supply	• Youth and middle-aged incentives for fishing villages	• Customized information for those want to return to fishing villages		●		Ministry of Oceans and Fisheries, Korea Fisheries Infrastructure Public Agency, local governments
		• Introduction of rural living programs for a month	●			

Pursuit Strategy	Supply Management Measures	Policy Tasks	Action Plans			Implementing Bodies
			Short – term	Medium – term	Long – term	
	• Development of climate change prediction seafood industry response systems				●	Ministry of Oceans and Fisheries, National Institute of Fisheries Science, Korea Maritime Institute

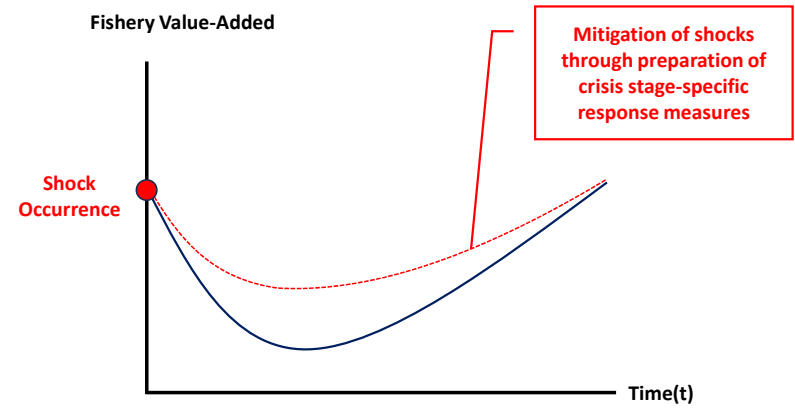
Note: The table outlines pursuit strategies, supply management measures, policy tasks, action plans, and implementing bodies for short-term (until ~2025), medium-term (until ~2027), and long-term (until ~2030) periods.

Source: Prepared by the Authors

4. Expected Outcomes

- By examining the relevance between seafood and food security, this study provides foundational material for policymaking in food security and food-related policies, including seafood.
- The derived Seafood Food Security Index aids in diagnosing the level of seafood food security and stands as fundamental data for future calculations and operations of the index.
- The creation of crisis-level management plans for seafood supply helps ensure immediate responses during crises, potentially shortening the recovery period from their impact.

〈Summary Figure 1〉 Expected Effects of Preparation of Crisis Stage-Specific Response Measures



Source: Prepared by the authors