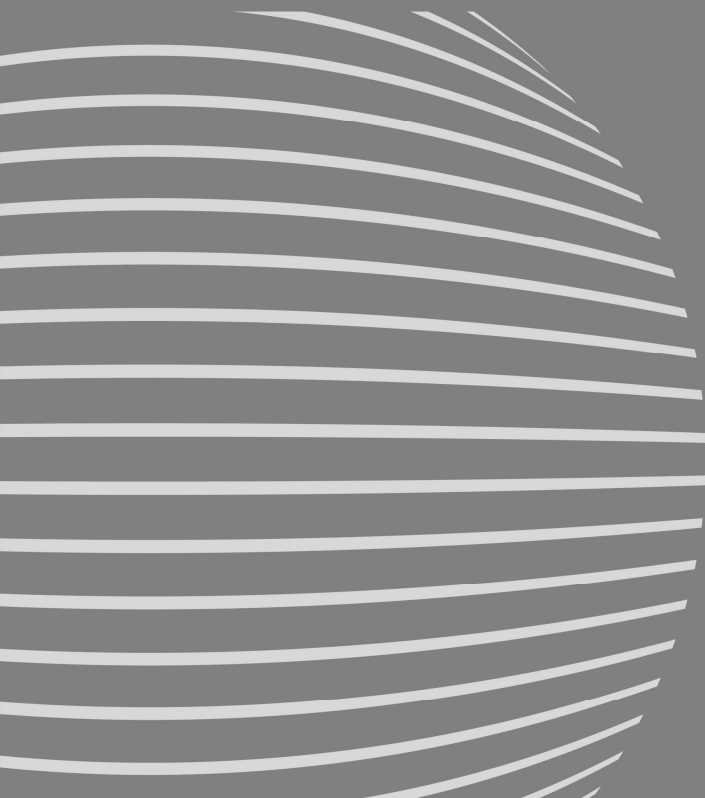


Abstract





Abstract

- This study has the ultimate objective of establishing KOICA's overseas emergency relief item stockpiling system and proposing improvement measures to strengthen stockpile management capacity. The specific objectives are as follows.
 - Establishment of an overseas emergency relief item stockpiling system: Based on demand forecasting for in-kind humanitarian assistance and an analysis of the economic feasibility of stockpiling, this study seeks to establish a strategic foundation that enables systematic support across the entire process—from identifying core stockpiled items and defining detailed specifications, appropriate standards and scales, and inventory replenishment, to demand forecasting, supply chain management, and disposal management.
 - Strengthening management capacity for overseas emergency relief stockpiled items: By establishing Standard Operating Procedures (SOPs) for the stockpile management of overseas emergency relief items, this study aims to ensure consistency and timeliness at the implementation stage, thereby enhancing stockpile management and emergency response capacity.
- The scope of this study consists of: ① a preliminary analysis of the economic feasibility of stockpiling in-kind humanitarian assistance and the identification of core stockpiled items and item-specific criteria; ② the preparation of standard specifications for each stockpiled item and the review of their conformity; ③ the establishment of Standard Operating Procedures (SOPs) for the stockpile management of overseas emergency relief items; and ④ other additional proposals, including the presentation of partnership-based cooperation models for overseas warehouse operations.

- As this study focuses on KOICA's stockpile management of overseas emergency relief items, it seeks to define the conceptual scope specifically for those overseas emergency relief items that require management by KOICA.
 - The types of items that KOICA is required to manage as overseas emergency relief items in the context of overseas emergency relief operations can be broadly categorized into: ① items distributed to disaster-affected populations at overseas relief sites through in-kind assistance; and ② items that are requisitioned for the deployment of the Korea Disaster Relief Team (KDRT) and subject to management reporting (broad definition).
 - In this study, with a primary focus on category ①, core stockpiled items were selected from among the in-kind assistance items managed by KOICA, for which standard specifications were developed and conformity assessments were conducted. In addition, stockpile management Standard Operating Procedures (SOPs) were proposed to allow for broad application encompassing both categories ① and ②.
- This study is structured as follows: Chapter 1 provides an overview of the study; Chapter 2 reviews the current status of overseas emergency relief item stockpile management at both the domestic and international levels; Chapter 3 analyzes the economic feasibility and expected effects of overseas emergency relief item stockpile management; Chapter 4 addresses the selection of core overseas emergency relief stockpiled items and related support strategies; Chapter 5 presents the development of standard specifications for each core overseas emergency relief stockpiled item; Chapter 6 outlines the establishment of Standard Operating Procedures (SOPs) for overseas emergency relief item stockpile management; and Chapter 7 proposes measures for improving and advancing the stockpile management of overseas emergency relief items.
- Chapter 1, as an overview of the study, briefly presents the purpose of the research, the scope of the study, and the research methodology.

◦ Chapter 2 examines the current status of overseas emergency relief item stockpile management in Korea and, for comparative purposes, reviews the stockpile management practices of Japan's JICA and Australia's DFAT, which are representative aid agencies in the Asia region. In addition, among international organizations, it analyzes the stockpile management practices of UNHCR and the International Federation of Red Cross and Red Crescent Societies (IFRC), both of which maintain internationally recognized standards for overseas emergency relief items, and derives key implications.

- Based on a comparison of stockpile management systems among overseas aid agencies, the following implications were derived:

① **Stockpile management systems:** In Korea, as in Japan, overseas aid agencies manage stockpiled items while logistics companies are responsible for transportation. In contrast, in Australia, designated logistics providers operate the entire process—from stockpile management to transportation—under the Humanitarian Logistics Capability (HLC) program. In this regard, KOICA needs to explore a diversified management framework, including the use of private-sector specialized logistics providers for the stockpile management of items requiring a high level of technical expertise.

② **Criteria for determining stockpile quantities and item selection:** JICA sets a target of supplies for 20,000 people per disaster, while DFAT sets a target of supplies for approximately 11,500 households (serving 57,500 people), with both targets established based on their respective past assistance experiences. Item selection criteria are also determined based on these targets, with a focus on items required immediately after a disaster. In particular, DFAT prioritizes items that align with international humanitarian standards, including those aimed at protecting vulnerable groups such as women and children and promoting dignity, and periodically evaluates and selects innovative new items.

By contrast, Korea determines the scale and types of assistance primarily in response to requests from recipient governments, and therefore flexibly decides stockpile quantities and item composition within the limits of the annual available budget. (However, for items

corresponding to category ②—those required for KDRT deployment—rescue and medical teams currently identify and request necessary items for stockpiling based on past experience.) Accordingly, KOICA, in consultation with the Ministry of Foreign Affairs, needs to predefine per-disaster assistance targets prior to disaster occurrence, based on past experience and objective data, and to secure corresponding stockpile quantities, item portfolios, and budget requirements.

- Based on a comparison of stockpile management systems with those of international organizations, the following implications were derived:
 - UNHCR defines core relief items and maintains a catalog with detailed technical specifications, which is regularly updated. It also has quality management regulations that recommend compliance with UNHCR's technical standards. In order to ensure that stockpiled items can reach affected areas within 48 hours, UNHCR has established standards for warehouse capacity, as well as Standard Operating Procedures (SOPs) for warehouse and inventory management. Unless there are exceptional circumstances, stockpiled items are managed in accordance with the First In, First Out (FIFO) principle.
 - The International Federation of Red Cross and Red Crescent Societies (IFRC) operates a distributed stockpiling system centered on four strategic hub warehouses—Dubai, Panama, Nairobi, and Kuala Lumpur—designed to enable emergency dispatch within 48 hours. Similar to UNHCR, IFRC maintains an emergency relief item catalog to ensure that relief items are procured and utilized based on unified standards, reflecting alignment with the Sphere Standards and international specifications. IFRC also maintains SOPs for warehouse and inventory management and applies the First Expired, First Out (FEFO) principle to achieve strategic inventory management.
 - KOICA, while serving as Korea's dedicated agency for grant-based official development assistance, has development cooperation as its primary mandate and performs only limited functions in humanitarian assistance as a subsidiary implementing body under the Ministry of Foreign Affairs. As a result, compared to UNHCR and IFRC—whose core mandates center on humanitarian assistance—KOICA faces

inherent limitations in managing large-scale relief items and operating a distributed stockpiling system. Accordingly, it is necessary to benchmark selected key functions of the relief item catalogs and warehouse and inventory management SOPs (particularly warehouse capacity standards and inventory management principles) utilized by these international organizations as international quality standards and operational references, and to present them to relevant domestic stakeholders. Follow-up improvement measures are derived and presented in Chapter 6.

- Chapter 3 focuses on establishing eligibility criteria for stockpiling overseas emergency relief items and developing a stockpile eligibility assessment framework for the selection of core stockpiled items. The stockpile eligibility criteria were formulated based on supply chain stability and versatility, reflecting the characteristics of overseas emergency relief items. Given the limitations in the completeness of historical assistance data and the specificity of existing stockpiling criteria, the stockpile eligibility assessment framework was applied through an expert Delphi survey to ensure consistency and validity.
 - The assessment was conducted by distinguishing between (i) a stockpile eligibility assessment using a five-point scale and (ii) an importance assessment reflecting the specific conditions of humanitarian assistance operations, including disaster type, disaster scale, risk attributes, and time-criticality (golden time). Based on these evaluations, a total of nine core stockpiled items were ultimately selected: jerry cans, family tents, multipurpose tents, water purification tablets, hygiene kits, water bladders, blankets, solar charging lamps, and household solar panels.
 - A stockpile utility value analysis was conducted focusing on the core stockpiled items. This analysis was based on the assumption of providing assistance to 20,000 people within 72 hours per disaster event and applied stockpile management criteria including continuous supply availability, in-and-out inventory decisions according to the service life of each item, and maintenance costs relative to new procurement costs.

Based on these criteria, stockpile threshold limits were derived for the nine items.

- The stockpile management threshold limits established annual inventory management benchmarks for items with frequent demand and rapid turnover within one year, such as tents, water purification tablets, hygiene kits, and water bladders. For items where new procurement unit costs exceed maintenance costs—such as tents, solar charging lamps, and household solar panels—inspection and management cycles of three to four years were established, taking into account component replacement cycles.
- o Chapter 4 builds on the stockpile utility value analysis of the nine core stockpiled items conducted in Chapter 3 and narrows down the items requiring priority standardization by KOICA to five items—family tents, hygiene kits, water bladders, blankets (sleeping mats), and household solar panels. For each item, optimal support strategies were proposed, and optimal support strategies and package options were also derived according to different disaster scenario types.
- Optimal support strategies for each of the five core stockpiled items were derived as follows.

〈Table (Abstract-1)〉 Support Strategies Based on Stockpile Management Thresholds
(Benchmarks) for Core Stockpiled Items

Item	Distribution Unit	Baseline Quantity	Stockpile Management Threshold	Support Strategy	
				Recipient Request < 20,000 people	Recipient Request ≥ 20,000 people
Family Tent	4-person	5,000 units	Semi-permanent; inventory management every 6 months	In-kind assistance	In-kind assistance up to available stock; emergency procurement
Hygiene Kit	Per person	20,000 kits	Annual management of components; individually packaged		In-kind assistance up to available stock; individual procurement by component
Water Bladder	Per person	20,000 units (10 liters)	Annual inventory management based on depletion of shortages		In-kind assistance up to available stock; support through international organizations

Item	Distribution Unit	Baseline Quantity	Stockpile Management Threshold	Support Strategy	
				Recipient Request < 20,000 people	Recipient Request ≥ 20,000 people
Sleeping Mat	Per person	20,000 units	Annual inventory management based on depletion of shortages		In-kind assistance up to available stock; support through international organizations
Household Solar Panel	Per household	5,000 sets	Inspection every 4 years in accordance with statutory inspection cycles	In-kind assistance of the product; installation coordinated with international organizations	In-kind assistance up to available stock; emergency procurement

Scope of in-kind assistance: limited to the baseline quantity per single disaster event.

- Family tents and household solar panels, which are prioritized for initial distribution upon recipient country requests, should be designed with mutually compatible specifications. To ensure stable supply even under emergency procurement conditions, it is recommended that KOICA introduce and manage its own relief item Multiple Award Schedule (MAS) system, enabling emergency procurement through prequalified suppliers capable of manufacturing in accordance with standardized specifications within the domestic manufacturing sector.
- Hygiene kits should be managed in a manner that allows procurement suppliers to deliver fully packaged kits while also enabling individual component-level inspection, management, and supplementary configuration. To this end, it is proposed that emergency supply capacity be ensured through designated agency consignment arrangements with organizations such as the RI Korea(Rehabilitation International Korea), which oversees severely disabled production facilities engaged in the manufacturing and supply of hygiene kit components within the domestic procurement market.
- In addition, package options were proposed for the nine core stockpiled items according to disaster scenario types (drought, earthquake, flood, typhoon, wildfire, infectious disease, war/conflict, and complex disasters), and for each package, appropriate stockpile quantities and supply criteria were derived as outlined below.

〈Table Abstract-2〉 Appropriate Quantities and Supply Standards by Disaster Scenario Relief Package

Supply standard: based on a community unit of 10 persons and a 4-5 person household

Scenario No.	Package Name	Shelter				WASH					Energy			Tools	
		Tents / Tarpaulins	Sleeping Mats	Blankets	Kitchen Set	Water Tank (5,000 L)	Water Containers (10 L)	Water Purification Tablets (100 tabs)	Hygiene Kits	Dewatering Pump	Solar Charging Lamps	Household Solar Panels	Batteries	Shovels	Ropes
1	Drought Kit	Family tents (2 units)	10		2 sets	2 tanks	10		10 sets						
2	Earthquake Kit	Family tents (2 units)	10	10		2 tanks	10		10 sets		4	2 sets	2 sets	2	2 sets
3	Flood Kit	Family tents (2 units), Tarpaulins (2 units)	10	10		2 tanks	10	2 boxes	10 sets	1	4	2 sets	2 sets	2	2 sets
4	Typhoon Kit	Family tents (2 units), Tarpaulins (2 units)	10	10		2 tanks	10	2 boxes	10 sets	1	4	2 sets	2 sets	2	2 sets
5	Wildfire Kit	Family tents (2 units), Multipurpose tent (1 unit, isolation)	10	10		3 tanks	10	3 boxes	10 sets		8	4 sets	2 sets	2	2 sets
6	Infectious Disease Kit I (Small-Medium Scale)	Family tents (2 units), Multipurpose tent (1 unit, isolation)	10	10		3 tanks	10	3 boxes	10 sets						
7	Infectious Disease Kit II (Large Scale)	Family tents (2 units), Multipurpose tent (1 unit, isolation)	10	10	2 sets	3 tanks	10	3 boxes	10 sets						
8	War/Conflict Kit	Family tents (2 units)	10	10	2 sets	3 tanks	10	2 boxes	10 sets		4	2 sets	2 sets	2	2 sets
3+4	Typhoon + Flood (Complex) Kit	Family tents (2 units), Multipurpose tent (1 unit), Tarpaulins (3 units)	10	10		3 tanks	10	3 boxes	10 sets	1	8	4 sets	2 sets	4	4 sets
2+5	Earthquake + Wildfire (Complex) Kit	Family tents (2 units), Multipurpose tent (1 unit)	10	10		3 tanks	10	3 boxes	10 sets		8	4 sets	2 sets	4	4 sets
3+6	Flood + Infectious Disease I Kit	Family tents (2 units), Multipurpose tent (1 unit), Tarpaulins (2 units)	10	10	2 sets	3 tanks	10	3 boxes	10 sets	1	8	4 sets	2 sets	4	4 sets

- The optimal support strategy for each disaster scenario-based package does not aim to meet all needs in the affected area. Rather, it sets a strategic objective of concentrating the supply of core items that are essential for survival and the maintenance of basic living conditions within the golden time, by leveraging Korea's comparative strengths and available stockpiled resources.
 - (Selective focus: utilization of core stockpiled items) KOICA prioritizes in-kind assistance of the five core items under its routine management—family tents, sleeping mats, water bladders, hygiene kits, and household solar panels—to ensure rapid response and reinforce brand identity.
 - (Flexible supplementation: local and emergency procurement) Supplementary materials beyond the core items are flexibly addressed through support via international organizations (cash-based assistance) or through domestic and international emergency procurement, depending on local market conditions.
 - (Expertise-based collaboration: NGOs and local partners) Through collaboration with Korean NGOs deployed on the ground and local partners, efforts are made to ensure that in-kind assets provided by Korea can be immediately installed and operated in the field.
- o Chapter 5 develops standard specifications for the five core stockpiled items by comparing existing KOICA specifications with those of international organizations (UNHCR and IFRC), benchmarking internationally accepted standards, and focusing on items for which testing and certification can be conducted domestically. Through this process, the study proposes the designation of specialized testing and certification institutions dedicated to overseas emergency relief items.
 - In the bidding and contracting process for overseas emergency relief items, KOICA is required to verify whether bidders possess appropriate certification test reports that comply with internationally accepted technical standards, to assess whether the tolerance values specified in those reports fall within acceptable domestic ranges, and to conduct

inspection and acceptance procedures, including installation and performance tests of delivered samples. However, due to limited expertise in testing and certification across different item categories, KOICA faces constraints in carrying out these tasks in a timely manner.

- Accordingly, just as designated logistics providers are selected to handle the transportation of overseas emergency relief items, it is also necessary to consider selecting specialized testing and certification bodies to professionally support the testing, certification evaluation, and installation testing required during the bid evaluation and inspection processes for overseas emergency relief item stockpiling.
 - The need for designated testing and certification bodies arises from the requirement to rapidly and simultaneously verify both expertise in internationally accepted standards (e.g., UNHCR and IFRC specifications) and the consistency of certification values with domestically recognized acceptance ranges. To enable frequent and timely evaluations, it is necessary to designate specialized institutions that can be engaged on a standing basis for testing and certification assessments.
 - When specialized institutions are selected through individual service contract bidding procedures, the completion of such procedures prior to each bid evaluation for overseas emergency relief items results in recurring delays in task execution.
 - Therefore, to enable routine requests and inspections for testing and certification evaluations of overseas emergency relief items, it is necessary to establish a standing framework through designation and entrustment for a minimum period of two to three years.
- Chapter 6 conducts a case study and benchmarking analysis of stockpile management Standard Operating Procedures (SOPs) for overseas emergency relief items, focusing on practices in the United States, Japan, UNHCR, and IFRC, and proposes a KOICA-tailored stockpile management SOP framework.

〈Table (Abstract-3)〉 Proposed SOP Objectives for KOICA’s Overseas Emergency Relief Item Stockpile Management

Relief Implementation Phase	Core Value	KPI Focus (Objectives for Maximizing Performance)	Strategic Alignment and Activity Focus
I. Initial Response and Deployment Phase (Phase: Initial Response)	(Efficiency & Speed)	Minimization of lead time for essential resource deployment: Achieve rapid response by securing and delivering essential resources—including personnel, relief items, and funding—within the golden time following disaster occurrence, without delay to the affected country.	KOICA governance and logistics systems: Integration of policy and implementation; adoption of global and regional distributed stockpiling strategies; ensuring rapid execution of emergency budgets.
II. Relief Implementation and Protection Phase (Phase: Relief & Protection)	(Humanity & Appropriateness)	Maximization of life-saving outcomes and reduction of vulnerability: Minimize humanitarian harm by strictly adhering to humanitarian principles, with a focus on AGD (Age, Gender, and Diversity). Ensure the dignity of beneficiaries throughout all support processes and prioritize life-saving assistance.	KOICA support modalities and principles: Standardization of AGD-based NFI configurations; application of ethical procurement and environmental sustainability principles; utilization of support through international organizations and local procurement mechanisms.
III. Recovery and Capacity-Building Phase (Phase: Recovery & Resilience)	(Development Linkage & Sustainability)	Early restoration of self-reliance and enhancement of disaster preparedness in affected areas: Move beyond short-term relief by establishing foundations for self-sustained recovery through WASH, shelter, and livelihood-support items. In the long term, implement relief-to-development approaches that strengthen community-level disaster preparedness and resilience.	KOICA’s long-term outcomes and exit strategies: Strengthened linkage with development cooperation programs; formulation of sustainable recovery plans; capacity-building support for local partners (NGOs/governments).

- Chapter 7 presents disposal and handling measures corresponding to the expiration of each core stockpiled item, as well as partnership-based cooperation models for domestic and overseas warehouse operations.
- For handling measures upon expiration of core stockpiled items, the study proposes the introduction of a value-based disposal mechanism to enable circular management. Specifically, the three-stage SOP structure—inbound, circulation management, and outbound—constitutes a circular stockpiling framework through which KOICA’s logistics system seeks to simultaneously achieve the two competing objectives of waste minimization and rapid field response.
- Accordingly, domestic hubs are positioned to absorb risks that may arise from the operation of overseas hubs and to serve as strategic buffers (safety stock) that ensure the stability of the overall system. Securing overseas hubs and implementing decentralized inventory management are viewed not merely as an expansion of logistics networks, but as a core strategic task for KOICA to maximize the reliability and efficiency of emergency relief logistics. In this context, the study proposes candidate countries to serve as regional hubs by geographic area.
- For regional hubs, Singapore and Malaysia are proposed for the Southeast Asia region, while Dubai, Cairo (Egypt), and Addis Ababa (Ethiopia) are proposed for the Middle East-Africa region.
- As multilateral cooperation options for overseas warehouse operations, the study proposes: ① leveraging overseas partners and footholds (branch offices) of Korean specialized logistics companies as assets to enhance speed and mitigate risks in emergency relief logistics; ② consigning KOICA’s stockpiled items to existing strategic logistics hubs operated by international organizations to secure the golden time for emergency relief logistics; and ③ jointly establishing and operating KOICA-dedicated small-scale stockpile warehouses (mini-hubs) in disaster-prone regions in cooperation with logistics companies.
- This study presents an implementation-oriented foundation to enable more systematic and standardized management of overseas emergency relief items

through demand forecasting, economic feasibility analysis, standard specification analysis and updates, and the establishment of Standard Operating Procedures (SOPs). Its significance lies in providing guidance aligned with global standards by analyzing and benchmarking cases from other official development assistance agencies and international organizations.

- Nevertheless, despite the study's contributions, the stockpile management of overseas emergency relief items requires continuous improvement to enhance practical feasibility. For the study's proposals to be implemented as clearly defined action items, follow-up research is required, premised on policy-level consensus with relevant government ministries and agencies.