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Food Aid Airdrop Strategy in the 2025 Joint Humanitarian Operation in Gaza

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Abstract

The prolonged conflict between Palestine and Israel has generated a severe humanitarian crisis, particularly in the Gaza Strip, where civilians face major difficulties in obtaining basic necessities due to the blockade and the intensity of Israeli attacks. In this context, food-aid airdrop operations have emerged as an effective alternative for reaching affected areas that are inaccessible through land routes. This study aims to analyze the strategy and operational constraints of food-aid airdrops conducted as part of the joint operation of the GARUDA Merah Putih Task Force in the 2025 Gaza humanitarian mission. The research adopts a qualitative case-study approach grounded in Arthur F. Lykke, Jr.'s strategic theory, Wassenhove's humanitarian logistics preparedness model, and NATO's military logistics framework. The findings indicate that the implementation of food-aid airdrops in the Gaza joint humanitarian operation involved a high level of complexity. Accordingly, the airdrop strategy was carried out through an integrated sequence of stages, encompassing planning, mobilization of personnel and equipment, execution of the drops, and post-operation evaluation and termination. The GARUDA Merah Putih Task Force successfully prepared and delivered 520 aid bundles (approximately 91.4 tons of food supplies) using the Low Cost Low Altitude (LCLA) method with a high level of delivery accuracy. Nevertheless, the operation encountered several challenges, including limited rigging equipment, shortages of qualified personnel, changes in flight clearances, and the absence of pre-deployment training. Based on these insights, the study recommends: (1) strengthening the stock of internationally standardized rigging equipment in each Army Logistics (Bekang) unit, (2) conducting internationally scaled joint training for cross-service humanitarian operations, and (3) developing TNI doctrine specifically for global humanitarian missions.

Keywords: Airdrop, Humanitarian Logistics, Food Aid, LCLA, and Garuda Merah Putih Task Force

INTRODUCTION

The protracted conflict between Palestine and Israel represents one of the most enduring and complex security challenges in modern international relations. Since its escalation in October 2023, the conflict has inflicted devastating consequences on civilian populations, particularly in the Gaza Strip. Extensive damage to critical infrastructure, combined with the disruption of supply chains and the imposition of a comprehensive blockade, has resulted in acute shortages of food, clean water, medical supplies, and essential services. International organizations have warned that Gaza is facing an unprecedented level of food insecurity, placing millions of civilians at risk of famine and severe malnutrition (Elmali, 2023; Amnesty International, 2024). In contemporary armed conflicts, humanitarian crises are no longer viewed solely as collateral consequences of warfare but as integral dimensions of security dynamics. Civilian suffering, displacement, and food insecurity increasingly influence regional stability and international responses. As a result, humanitarian assistance has become a critical component of defense and security policy, particularly in conflict zones where access constraints limit conventional aid delivery mechanisms (Manurung & Heriamsal, 2024). The Gaza Strip exemplifies such an environment, where land and maritime corridors are frequently obstructed by security restrictions, damaged infrastructure, and complex political negotiations.

Humanitarian logistics is central to addressing these challenges. Defined as the planning, implementation, and control of efficient flows of goods, services, and information to alleviate human suffering, humanitarian logistics requires adaptability, speed, and coordination under conditions of extreme uncertainty (Van Wassenhove, 2006). In Gaza, however, ground-based humanitarian logistics have proven insufficient. Aid convoys are routinely delayed or denied entry, fuel shortages disrupt distribution networks, and insecurity hampers last-mile delivery. These constraints have compelled the international community to explore alternative modalities for humanitarian access. One such modality is humanitarian airdrop operations. Airdrop refers to the delivery of supplies from aircraft to designated drop zones using parachute systems, enabling rapid access to areas that are inaccessible or unsafe for ground transportation. In emergency contexts, airdrops offer distinct advantages, including speed of delivery, operational reach, and reduced reliance on contested ground routes (Bin Xu & Chen, 2016). Consequently, airdrop operations have been employed in various humanitarian crises, including Iraq, Afghanistan, and Syria. Nevertheless, humanitarian airdrops remain controversial due to their limited payload capacity, high operational costs, accuracy challenges, and potential risks to civilian safety.

Within this operational and ethical complexity, Indonesia has positioned itself as an active contributor to international humanitarian efforts in Gaza. In 2025, the Government of Indonesia deployed the Garuda Merah Putih Task Force as part of a joint humanitarian operation involving cross-service coordination between the Indonesian Army, particularly the Army Logistics Corps (Pusbekangad), and the Indonesian Air Force. The mission employed C-130J Hercules aircraft to conduct food-aid airdrop operations using the Low Cost Low Altitude (LCLA) method, which emphasizes delivery accuracy and reduced risk to both aircrew and civilians. Through this operation, Indonesia successfully delivered 520 food-aid bundles, equivalent to approximately 91.4 tons of humanitarian supplies, to isolated areas in Gaza. From a strategic standpoint, humanitarian airdrop operations constitute more than a technical logistics activity; they represent a deliberate strategic choice shaped by objectives, methods, and available resources. Arthur F. Lykke Jr.'s Ends–Ways–Means framework provides a robust analytical lens for examining this dimension. In the Gaza operation, the strategic end was the rapid alleviation of food insecurity among besieged civilian populations; the way involved the execution of aerial delivery through humanitarian airdrop; and the means consisted of military airlift platforms, trained logistics personnel, international coordination mechanisms, and diplomatic clearances. The effectiveness of such operations depends on the balance among these elements and the ability to adapt strategy to evolving operational constraints (Lykke, 1998). Despite its operational success, the 2025 Gaza airdrop mission revealed significant challenges, including limited availability of internationally standardized rigging equipment, shortages of qualified airdrop personnel, changes in airspace clearance approvals, and the absence of comprehensive pre-deployment training. These challenges underscore the complexity of conducting humanitarian operations within contested airspace and highlight the need for systematic evaluation of airdrop strategies in joint military humanitarian contexts.

Research Gap and Novelty

Existing studies on humanitarian logistics and airdrop operations predominantly focus on technical performance, engineering systems, or single-agency humanitarian missions. There remains a limited body of research examining humanitarian airdrop operations as part of a joint military operation, particularly from the perspective of defense strategy and military logistics integration. Moreover, few studies analyze airdrop missions using a comprehensive strategic framework that integrates ends, ways, and means within real-world operational constraints.

This study addresses this gap by examining the Indonesian experience in the 2025 Gaza humanitarian operation, offering an original contribution that bridges humanitarian logistics, military strategy, and joint operations analysis. Accordingly, this study aims to analyze the strategy and operational constraints of food-aid airdrop missions conducted during the 2025 joint humanitarian operation in Gaza. By employing a qualitative case-study approach grounded in strategic theory, humanitarian logistics preparedness, and military logistics frameworks, this research seeks to contribute both theoretically and practically to the development of effective, ethical, and sustainable humanitarian operations in conflict-affected environments.

RESEARCH METHODS

This study employs a qualitative research design using a case-study approach to examine the strategy and operational constraints of food-aid airdrop missions conducted during the 2025 joint humanitarian operation in Gaza. A qualitative approach is considered appropriate because the research seeks to explore strategic processes, decision-making dynamics, and operational challenges within a complex humanitarian and security environment, rather than to measure variables quantitatively. The case selected for this study is the humanitarian airdrop operation conducted by the Garuda Merah Putih Task Force, involving cross-service coordination between the Indonesian Army particularly the Army Logistics Corps (Pusbekangad) and the Indonesian Air Force. This case was chosen due to its strategic relevance, operational complexity, and significance as Indonesia's contribution to an international humanitarian mission under conditions of access denial and ongoing armed conflict. Data collection was conducted through multiple qualitative techniques to ensure depth and credibility of analysis. Primary data were obtained through semi-structured interviews with key informants directly involved in the planning and execution of the airdrop operation, including logistics officers, aircrew, and supporting personnel. Secondary data were collected through document analysis, including official operational reports, mission briefings, policy documents, doctrinal references, and publicly available reports from international organizations related to humanitarian operations in Gaza.

To guide the analytical process, this study adopts three complementary theoretical frameworks. First, Arthur F. Lykke Jr.'s Ends–Ways–Means model is used to analyze the strategic alignment between objectives, operational methods, and available resources in the airdrop mission (Lykke, 1998). Second, Van Wassenhove's humanitarian logistics preparedness model provides a lens for assessing organizational readiness, resource management, coordination, and operational sustainability in humanitarian contexts (Van Wassenhove, 2006). Third, NATO's military logistics framework is employed to examine the operational phases of deployment, sustainment, and termination within a joint military-supported humanitarian operation (NATO, 2018). Data analysis was conducted through an interactive and iterative process involving data reduction, data display, and conclusion drawing. Interview transcripts and documents were systematically coded to identify key themes related to planning, mobilization of personnel and equipment, execution of the airdrop, and post-operation evaluation. Triangulation across data sources was applied to enhance the validity and reliability of findings, ensuring consistency between interview data, documentary evidence, and theoretical interpretations. Through this methodological approach, the study aims to generate a comprehensive understanding of humanitarian airdrop strategy as a component of joint military operations, while also identifying practical lessons and strategic implications for future humanitarian missions in conflict-affected environments.

RESEARCH RESULTS AND DISCUSSION

This section presents the empirical findings of the study derived from field data, official operational documents, and interviews with personnel involved in the 2025 Gaza joint humanitarian operation. The results are organized according to the main stages of the humanitarian airdrop operation: planning and preparation, mobilization of personnel and equipment, execution of the airdrop, and post-operation evaluation.

Planning and Preparation Stage

The research findings indicate that the planning stage constituted a critical foundation for the successful execution of the food-aid airdrop operation. Planning activities focused on determining humanitarian objectives, identifying drop zones (DZ), coordinating flight routes, and securing airspace clearance through diplomatic and military channels. At this stage, the Indonesian Army Logistics Corps (Pusbekangad) coordinated closely with the Indonesian Air Force, host nations, and international partners to ensure compliance with safety and humanitarian standards. Operational planning also involved determining the type of airdrop method to be used. Based on risk assessment and accuracy requirements, the Low Cost Low Altitude (LCLA) method was selected, as it allowed delivery from low altitude with higher precision while minimizing dispersion of aid packages. This decision reflected a strategic alignment between operational constraints and humanitarian objectives, particularly in densely populated and high-risk areas in Gaza

Mobilization of Personnel and Equipment

The mobilization phase involved the deployment of trained personnel, aircraft, and airdrop equipment to the staging area in Jordan and Egypt. Research results show that the operation was supported by two C-130J-30 Super Hercules aircraft, with a total of 32 aircrew members and 11 supporting personnel, including logistics, medical, and security elements. Personnel from Yonbekang 5/ARY and Sathar 72 TNI AU played a key role in rigging, loading, and safety checks of the aid bundles prior to deployment. However, empirical data reveal that mobilization faced notable limitations, particularly the shortage of internationally standardized rigging equipment and the limited number of qualified rigger personnel. These constraints required personnel to optimize available resources and adjust operational tempo without compromising safety standards.

Table 1. Implementation of the Garuda Merah Putih Airdrop Operation in 2025

Aspect	Description
Mission	Humanitarian assistance to Gaza, Palestine
Aircraft	2 × C-130J-30 Super Hercules
Crew	32 personnel (16 per aircraft)
Supporting Personnel	11 personnel (Pasgat, Information, Medical Team, Sathar 72)
Flight Routes	Halim–SIM–Colombo–Mumbai–Abu Dhabi–Jordan/Egypt–Return
Duration	±12 days per aircraft
Operational Focus	Food-aid delivery via LCLA airdrop
Task Force Commander	Colonel Pnb Puguh Yulianto
Deputy Commander	Lt. Col. Pnb Alfonsus F. A. D.

Source: Indonesian Armed Forces Operational Telegram No. ST/723/2024

Airdrop Execution Phase

The execution phase constituted the core of the humanitarian mission. Research results indicate that the Garuda Merah Putih Task Force successfully conducted multiple airdrop sorties using the LCLA method at low altitude. A total of 520 aid bundles, equivalent to

approximately 91.4 tons of food supplies, were delivered to designated drop zones in Gaza with a high level of accuracy. Field observations and operational reports show that the use of LCLA significantly reduced the dispersion of aid packages and minimized risks to civilian populations on the ground. Nevertheless, execution was challenged by dynamic airspace clearance conditions, weather variability, and security considerations, which required continuous coordination and real-time decision-making by the flight crew and mission command elements.

Post-Operation Evaluation

The post-operation evaluation revealed that, despite operational constraints, the humanitarian airdrop mission achieved its primary objectives. The operation demonstrated that airdrop delivery can serve as an effective alternative under access-denial conditions when ground routes are blocked. However, the findings also highlight systemic challenges, including the absence of pre-deployment training, limited logistics stockpiles, and dependence on diplomatic clearance mechanisms. These empirical findings form the basis for subsequent discussion and strategic recommendations, particularly regarding logistics preparedness, joint training, and doctrinal development for future humanitarian operations.

Discussion

The findings of this study demonstrate that the food-aid airdrop operation conducted during the 2025 joint humanitarian mission in Gaza represents a complex yet strategically adaptive response to access-denial conditions in conflict environments. The successful delivery of 520 aid bundles, equivalent to approximately 91.4 tons of food supplies, confirms that humanitarian airdrop operations can serve as a viable alternative when conventional land-based distribution routes are obstructed by blockade, security threats, and infrastructure collapse. From a strategic perspective, the results align closely with Arthur F. Lykke Jr.'s Ends–Ways–Means framework. The strategic end of the operation namely, the rapid alleviation of food insecurity among isolated civilian populations in Gaza was clearly defined and remained consistent throughout the mission. The way adopted was the execution of humanitarian airdrop operations using the Low Cost Low Altitude (LCLA) method, while the means consisted of military airlift assets (C-130J aircraft), trained logistics personnel, and diplomatic coordination mechanisms. The relative success of the operation indicates that, despite constraints, a functional balance between ends, ways, and means was achieved, supporting Lykke's assertion that strategic effectiveness depends on the alignment of these three elements (Lykke, 1998).

The choice of the LCLA method warrants particular attention in the discussion. Empirical findings show that LCLA significantly enhanced delivery accuracy and reduced the dispersion of aid packages, thereby minimizing risks to civilian populations on the ground. This outcome supports previous studies that emphasize the operational advantages of low-altitude airdrop techniques in humanitarian contexts, particularly in densely populated or high-risk areas (Bin Xu & Chen, 2016). However, the findings also reveal that the effectiveness of LCLA is highly dependent on the availability of standardized rigging equipment and qualified rigger personnel, both of which were identified as critical limitations during the operation. In terms of humanitarian logistics preparedness, the results highlight several structural challenges consistent with Van Wassenhove's model. While the operation demonstrated strong responsiveness and adaptability, gaps were evident in preparedness indicators such as pre-deployment training, logistics stockpiling, and personnel readiness. The absence of comprehensive pre-deployment training reduced operational flexibility and increased reliance on on-the-job adaptation, which, although effective in this case, poses sustainability and safety

risks for future missions. These findings reinforce Van Wassenhove's argument that humanitarian logistics effectiveness depends not only on rapid response capabilities but also on long-term preparedness and institutional learning (Van Wassenhove, 2006).

The discussion also reveals important insights regarding joint military operations in humanitarian contexts. The coordination between the Indonesian Army (Pusbekangad) and the Indonesian Air Force reflects a practical application of joint operations doctrine, as outlined in NATO's Allied Joint Doctrine for Logistics. The operation followed a structured sequence of deployment, sustainment, and termination phases, demonstrating doctrinal compatibility with international military logistics standards (NATO, 2018). Nevertheless, the reliance on dynamic airspace clearance approvals and diplomatic negotiations underscores the vulnerability of humanitarian airdrop missions to external political and security factors beyond purely military control. When compared with humanitarian assistance delivered through land corridors, the findings suggest that airdrop operations should be viewed as a complementary rather than substitutive mechanism. While airdrops provide speed and access under extreme conditions, their limited payload capacity and high operational costs constrain their ability to meet large-scale humanitarian needs independently. This observation is consistent with international humanitarian assessments that emphasize the primacy of land-based aid delivery whenever feasible, with airdrops serving as an emergency or bridging solution (Amnesty International, 2024). Overall, the discussion confirms that Indonesia's 2025 humanitarian airdrop operation in Gaza constitutes a meaningful contribution to both practical humanitarian action and academic discourse on defense-supported humanitarian operations. The integration of strategic theory, humanitarian logistics preparedness, and military logistics doctrine provides a comprehensive analytical framework that can inform future joint humanitarian missions. Moreover, the findings underscore the need for doctrinal development, enhanced training, and improved logistics readiness to ensure that humanitarian airdrop operations can be conducted more effectively, safely, and sustainably in future conflict-affected environments.

CONCLUSION

This study concludes that the food-aid airdrop strategy implemented during the 2025 joint humanitarian operation in Gaza constituted an adaptive and strategically relevant response to access-denial conditions in a complex conflict environment. The prolonged blockade, deteriorating security situation, and destruction of infrastructure in the Gaza Strip significantly constrained conventional land-based humanitarian logistics, necessitating alternative delivery mechanisms capable of reaching isolated civilian populations in a timely manner. The findings demonstrate that the humanitarian airdrop operation conducted by the Garuda Merah Putih Task Force was strategically aligned with Arthur F. Lykke Jr.'s Ends–Ways–Means framework. The strategic end of alleviating acute food insecurity among besieged civilians was pursued through the way of Low Cost Low Altitude (LCLA) airdrop operations, supported by military airlift assets, trained logistics personnel, and international diplomatic coordination as the means. Despite operational constraints, this alignment enabled the successful delivery of 520 food-aid bundles, equivalent to approximately 91.4 tons of humanitarian supplies, with a high degree of delivery accuracy. From a humanitarian logistics perspective, the operation highlights both strengths and limitations in preparedness. While responsiveness, adaptability, and inter-service coordination were evident, critical gaps remained in pre-deployment training, standardized rigging equipment availability, and personnel readiness. These findings reaffirm Van Wassenhove's assertion that effective humanitarian logistics requires not only rapid response capabilities but also sustained institutional preparedness and learning mechanisms (Van Wassenhove, 2006).

Moreover, the operation underscores the importance of joint military coordination in humanitarian missions conducted within contested airspace. The integration of the Indonesian Army Logistics Corps (Pusbekangad) and the Indonesian Air Force reflects the practical application of joint logistics principles as outlined in NATO's military logistics doctrine. Such coordination proved essential in managing operational risks, ensuring flight safety, and maintaining mission effectiveness under dynamic security and diplomatic conditions (NATO, 2018). In conclusion, humanitarian airdrop operations should be understood not merely as technical logistics activities, but as strategic instruments that bridge defense capabilities and humanitarian objectives. While airdrops cannot fully replace land-based humanitarian corridors, they remain a critical complementary option in extreme access-denial environments. This study contributes to the literature by providing empirical and strategic insights into joint military humanitarian airdrop operations, offering practical lessons for future missions and reinforcing the need for doctrinal development, joint training, and logistics preparedness in global humanitarian engagements.

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