Addis Ababa University

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Humanitarian Logistics Preparedness and Response Practice and its Challenge in IRC Ethiopia's Relief Operations

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Humanitarian Logistics Preparedness and Response Practice and its Challenge in IRC Ethiopia's Relief Operations

A Thesis submitted to the Addis Ababa University, College of Business & Economics, School of Commerce in partial fulfillment of the requirements of the Degree of Masters of Arts in Logistics and Supply Chain Management

By

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May, 2025

Addis Ababa, Ethiopia

DECLARATION

I, the undersigned, declare that the thesis entitled “Humanitarian logistics Preparedness and Response practice and its challenge in IRC Ethiopia’s Relief Operations” is my original work and has not been presented for any degree in any other university. All sources of materials used for this research have been duly acknowledged.

Declared by: Yared Mekebeb

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Date: ----------

STATEMENT OF CERTEFICATION

This is to certify that thesis prepared by Yared Mekebeb, entitled: “Humanitarian Logistics Preparedness and Response Practice and its challenge in IRC Ethiopia’s Relief Operations” in partial fulfillment of the requirements for the Degree of Masters of Arts in Marketing Management complies with the regulations of the university and meets the accepted standard with respect to originality and quality.

Shiferaw Mitiku (Asst. Prof.)

Signature …….. Date……

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Approved by:

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List of Acronyms and Abbreviations

UN – United Nations

UNHCR - United Nations High Commissioner for Refugees

LMIS - Logistics Management Information Systems

GIS - Geographic Information Systems

NGO – Non-governmental Organizations

IRC Ethiopia – International Rescue Committee

EWS – Early Warning Systems

WFP - World Food Programme

ERP - Enterprise Resource Planning

GPS - Global Positioning System

WHO - World Health Organization

UNOCHA - United Nations Office for the Coordination of Humanitarian Affairs

Abstract

In light of Ethiopia's escalating humanitarian crises and the pressing need for effective logistics operations, this study critically investigates the preparedness and response practices and its challenges in International Rescue Committee Ethiopia's relief operations. Addressing a notable gap in scholarly research on NGO's logistics within the country, the study adopts a descriptive mixed-methods design, utilizing data collected through structured questionnaires from 28 respondents, sampled from a population of 32 using Yamane's (1967) formula. Stratified and simple random sampling techniques were employed to ensure representativeness, and data were analyzed through descriptive statistics and thematic analysis. The findings reveal a strong institutional consensus on IRC Ethiopia's logistical readiness, effective coordination, and integration of digital tools, reflecting high staff confidence. However, operational complexities and localized challenges persist, emphasizing the need for context-specific, adaptive strategies. The study concludes that while IRC Ethiopia exhibits robust humanitarian logistics capacity, sustained excellence will require continuous improvement through enhanced digital infrastructure, field-level audits, and innovative approaches such as AI integration and risk-based planning. This research contributes valuable insights to the humanitarian logistics field and highlights the importance of agility, inclusivity, and cross-sectoral collaboration in delivering timely and equitable aid in Ethiopia's volatile and high-need environments.

Key Words

- Humanitarian logistics, humanitarian logistics preparedness, humanitarian logistics response, relief operations.

CHAPTER ONE
INTRODUCTION

1.1 Background of the study

The number of individuals impacted by disasters has risen markedly over recent decades, thereby intensifying the imperative for effective humanitarian assistance more than ever before. In the 21st century, as stated by the UN Secretary-General Ban Ki-moon in his report at the 2016 World Humanitarian Summit; humanity continues to endure significant suffering, with the cost of human suffering, conflict and violence being shocking. He emphasized that 125 million individuals are in need of humanitarian assistance, while numerous civilians around the world endure persecution, torture, forced displacement, injury, death, and humiliation. By the close of 2020, the Global Humanitarian Survey projected that 235 million of the most vulnerable individuals across 56 countries were grappling with hunger, conflict, displacement, and by the impacts of climate change seeking help. At the same time, the United Nations High Commissioner for Refugees indicated that 82.4 million individuals around the globe had been forcibly displaced in search of humanitarian assistance. Ethiopia, a country that hosts one of the largest populations of refugees, has also recently experienced both natural and human-made disasters that have led to millions of deaths and the displacement of tens of millions. The conflict in the Amhara and Tigray regions, the flooding in 2023 (affecting the Somali, Afar, Oromia, Amhara, and SNP Regions), and the landslide in Gofa in 2024 were amongst some of the extreme recent headaches and heart breaks for the citizens of Ethiopia.

Preparedness and response in humanitarian logistics plays a crucial role in providing vital support in the effective and timely delivery of aid to populations affected by crises (Negi and Negi, 2021). According to Kovács and Falagara (2021), humanitarian logistics preparedness refers to the proactive organization and arrangement of logistics systems and procedures prior to a crisis, which is essential for reducing delays and inefficiencies during emergency responses. It involves a range of strategies such as pre-positioning channels, identifying key logistics

partners, and establishing rapid transportation networks. In contrast, humanitarian logistics response is commenced when a crisis happens, requiring the deployment of resources to address immediate humanitarian requirements. This response is often exemplified by the pressing and inconsistent strain that necessitate more flexible and adaptive logistics systems. Responses in humanitarian logistics include, choosing the best channels and routes, collaboration and information sharing, transportation, warehousing, security and distribution (Alturki and Lee, 2023). The success of these practices is heavily dependent on factors such as resource availability, infrastructure quality, and collaboration.

Among the many organizations involved in delivering humanitarian aid, IRC plays a pivotal role in refugee relief, emphasizing organized, collaborative logistics to deliver essential resources in Ethiopia. The magnitude and complexity of IRC's logistics operations are influenced by a constellation of factors, notably the refugee population size, the geographic dispersion of camps, and the prevailing socio-political landscape. Ethiopia's experience presents a unique case study, as the country has been dealing with refugee influxes from neighboring regions such as Somalia, Sudan, and South Sudan. These refugee influxes, coupled with Ethiopia's vulnerability to climate change, have underscored the importance of further investigation on logistics systems in the humanitarian context to ensuring timely and efficient aid delivery. Yet, there is a significant lack of research concentrating on the preparedness and response strategies of humanitarian organizations, even though substantial studies have examined logistical models in commercial environments.

1.2 Statement of the Problem

Humanitarian crises have become increasingly frequent and severe in recent decades, particularly in regions like Ethiopia, where pivotal role in hosting displaced populations is highly played. Consequently, the complexity of humanitarian logistics in such volatile environments presents significant challenges in ensuring timely and efficient aid delivery. According to Vries and Wassenhove (2020), while disasters themselves cannot be prevented, their impacts can be mitigated through careful planning and efficient response mechanisms. However, there are no extensive researches on the logistical preparedness and response practices used by humanitarian

organizations and how these methods might be improved to boost the general success of logistics operations in a humanitarian context.

Researchers have explored several challenges in the preparedness and response practices of NGOs. Among the major, some are political regulations and procedures, coordination issues, infrastructure limitations, funding availability, and security concerns (Mburu, 2024). According to Garbout (2021), the primary challenge in humanitarian efforts is lack of effective planning and resource mobilization mechanism ahead of crises. Existing literature largely explores theoretical aspects of humanitarian logistics, with limited empirical research on the practical implementation of these systems in the given field. Although organizations such as the IRC have established complex logistical frameworks to address crises, the particular tactics and difficulties related to resource management, stakeholder coordination, and dealing with unforeseen demands have not been thoroughly examined. This gap is particularly evident in understanding the need for further exploration on logistical preparedness and response practices of IRC Ethiopia to see if strategies are adaptive to the evolving needs of refugees and disaster-affected populations, particularly in the context of Ethiopia. The absence of comprehensive studies on the logistics practices of NGOs in Ethiopia restricts the capacity to measure and evaluate the effectiveness of humanitarian operations. Thus, this research aims to fill that gap by examining the readiness and response strategies employed by IRC Ethiopia in its logistics operations. This research aims to contribute valuable insights into improving logistics frameworks, which are crucial for enhancing the speed, effectiveness, and sustainability of humanitarian aid delivery in Ethiopia and beyond; focusing on real-world operational strategies and challenges. As a result, the findings of this research have provided essential insights for enhancing preparedness and response approaches, thereby ensuring greater assistance for displaced communities and more efficient humanitarian efforts in Ethiopia.

1.3 Objectives of the Study

1.3.1 General Objectives

The general objective of this study is to examine the preparedness and response practices and its challenges in IRC Ethiopia’s relief operations in humanitarian logistics context.

1.3.2 Specific Objectives

The specific objectives of the study are:

- To assess the preparedness practices of IRC Ethiopia's relief operations in humanitarian logistics context.
- To assess the humanitarian logistics response practices of IRC's relief operations.
- To identify the major logistical challenges faced by IRC Ethiopia in its preparedness and response practices.

1.4 Research Questions

1. How humanitarian logistics preparedness is being practiced by IRC Ethiopia for its relief operations?
2. How humanitarian logistics response is being practiced by IRC Ethiopia for its relief operations?
3. What are the major challenges affecting IRC Ethiopia's relief operations during humanitarian logistics preparedness and response?

1.5 Scope of the Study

The conceptual scope of this thesis is limited to logistics operations of IRC Ethiopia focusing on how the organization prepares for and responds to refugee crises, including the challenges faced. It contains issues like coordination, performance measurement, and technology usage regarding the aspects of preparedness and response and major challenges faced. The study does not cover IRC's logistical practices in ongoing refugee operations that involve longer-term support; apart from emergency response scenarios, where rapid mobilization is required. Moreover, the study does not encompass the operational practices of other humanitarian organizations operating in Ethiopia, though their activities may be referenced to provide contextual relevance.

The geographical focus of this study is concentrated on IRC's logistical operations within refugee camps and settlements located in key regions like Gambella, Somali, and Tigray, which

serve as primary host areas for substantial populations of refugees originating from neighboring countries. The study does not focus on IRC operations in non-refugee areas or humanitarian settings in and outside of Ethiopia. It also does not contain challenges faced by local communities or the broader refugee population unless they directly affect logistics operations. The study considers multiple locations where IRC operates, allowing for a broader understanding of logistics operations across different geographic contexts.

The methodological scope of this study uses a qualitative approach. A structured questionnaire was administered to key respondents and analyzed using descriptive and thematic techniques to yield comprehensive insights into operational challenges and exemplary practices. It has referred literatures form the last five years so as to get recent empirical evidence to support the reasoning and findings of the study. This time frame was chosen to capture recent developments, trends, and difficulty of preparedness and response strategies in a dynamic and challenging operational environment.

1.6 Significance of the Study

Understanding the multifaceted challenges inherent in humanitarian contexts is essential for informed strategic planning and the effective orchestration of disaster response efforts. Such understanding plays a critical role in conserving national assets and protecting vulnerable populations. It is particularly indispensable for the efficacy of interventions amid crises characterized by urgent displacement needs, limited resources, and intricate operational dynamics. This is significant for humanitarian organizations working in environments where resource constraints, logistical bottlenecks, and fluctuating needs are prevalent.

This study is necessitated by the acknowledgment that, although Ethiopia has long been at the forefront of refugee operations, its logistical preparedness and response mechanisms continue to present intricate and evolving challenges requiring deeper examination. There is a significant gap in the academic literature regarding the specific logistics strategies and their effectiveness in Ethiopian refugee operations. The existing body of literature predominantly emphasizes overarching humanitarian logistics principles or international case studies, yet offers limited in-depth analysis tailored to Ethiopia's distinctive operational and contextual realities. Thus, this research aims to provide valuable insights to the growing body of literature for improving the

effectiveness of preparedness and response practices of humanitarian logistics in addressing the needs of refugees.

The findings offer recommendations for policymakers, humanitarian organizations, and logistics professionals to optimize resource allocation, enhance coordination, and strengthen logistics systems in humanitarian operations. It provides a broader understanding of humanitarian logistics in a complex and high-pressure settings by carrying out an in-depth analysis of the firm's logistics systems and practices. It also provides recommendations that could be applied to other refugee-hosting countries in similar contexts, improving the conditions of refugees. In general, the findings grant the development of more efficient, adaptable, and sustainable logistics systems, eventually improving the speed, effectiveness, and scalability of humanitarian logistics aid delivery in refugee contexts

1.7 Limitations of the Study

Although the study yields valuable insights, it is not without its limitations. Foremost among these is the constrained sample size, comprising only 23 respondents drawn solely from IRC Ethiopia's logistics personnel, which may limit the breadth of perspectives captured. This study's scope was primarily constrained by the organization's stringent internal protocols and confidentiality policies, which limited broader participation and restricted access to sensitive operational data. While purposive and judgmental sampling ensured relevant, knowledgeable participants, the limited sample size may not fully capture the diverse experiences across different regions and organizational levels. Additionally, confidentiality barriers hindered deeper investigation into critical areas such as financial transparency, supplier relations, and inter-agency decision-making, which could have enriched the findings. Consequently, although the research offers valuable insights into IRC's humanitarian logistics practices, its broader applicability remains inherently limited. Nevertheless, within its defined scope, this study presents a credible, methodologically sound analysis that advances understanding of humanitarian logistics practices in complex operational settings.

1.8 Organization of the Thesis

This proposal is structured into five comprehensive chapters. Chapter One: Introduction lays the groundwork for the study by outlining the background, problem statement, research objectives and questions, the study's significance, scope, and overall thesis organization. Chapter Two: Literature Review delves into pertinent theories, conceptual frameworks, and empirical research related to humanitarian logistics, while critically identifying existing knowledge gaps. Chapter Three: Research Methodology articulates the study's design, data collection approaches, target population, sampling strategies, and analytical techniques, along with considerations of ethical integrity. Chapter Four presents a synthesized account of the study's key findings, accompanied by an in-depth discussion and interpretation. Chapter Five concludes the thesis with a comprehensive summary, followed by conclusions and actionable recommendations.

CHAPTER TWO
RELATED LITERATURE REVIEW

The frequency of tsunamis, floods, hurricanes, landslides, mudslides, and earthquakes has these days been severely increasing, resulting in various challenges for humanitarian organizations (Behl & Dutta, 2019; Thapa & Pathak, 2021). Hannah and Max (2019) have reported that, in the past decade, approximately 60,000 people have died annually due to unpredictable natural disasters, representing 0.1% of global fatalities. By the close of 2023, an estimated 117.3 million individuals worldwide had been forcibly displaced due to persecution, armed conflict, violence, systemic human rights violations, and profound disruptions to societal stability. According to operational data, the UNHCR projects that this upward trajectory persisted into the early months of 2024, with displacement figures likely exceeding 120 million by the end of April. The rise to 117.3 million by year-end 2023 reflects an 8% increase, equivalent to 8.8 million additional displaced persons compared to the previous year, marking the continuation of a twelve-year trend of steadily escalating displacement globally. Today, one in every 69 people, or 1.5% of the global population, is forcibly displaced, nearly doubling the ratio of one in 125 people which was reported a decade ago.

2.1 Theoretical Literature Review

2.1.1 Humanitarian Logistics

Humanitarian logistics can be defined as the critical process of planning, implementing, and controlling the movement, storage and distribution of supplies and services in response to a humanitarian emergency to alleviate human suffering, meet immediate needs, and support long-term recovery (RAILLANI et al., 2020). Humanitarian logistics differs from traditional supply chain management by focusing on life-saving objectives rather than profit maximization. In refugee operations, the logistics system must be highly responsive and flexible, dealing with uncertainties such as fluctuating demand, limited infrastructure, and difficult operating conditions. As crises are often unpredictable, the ability to adapt logistics operations is crucial in managing the immediate needs of refugees (Kovács & Spens, 2024). The objective of humanitarian logistics is to deliver aid to affected populations as quickly and efficiently as

possible; involving the coordination of numerous actors, resources, technologies, and systems. This requires a comprehensive approach that not only addresses immediate needs but also facilitates sustainable recovery efforts.

2.1.2 Preparedness in Humanitarian Logistics

2.1.2.1. Strategic Planning

According to Frennesson, et al. 2021, strategic planning is fundamental to humanitarian logistics preparedness. It involves identifying potential disaster-prone areas, conducting risk assessments, and forecasting demand for relief supplies. Strategic pre-positioning of supplies at critical locations enables the rapid mobilization of resources to respond to emergency situations. Moreover, an ample planning encompasses route mapping and transportation logistics to proactively address potential access constraints. This proactive approach minimizes response time and enhances the efficiency of relief operations. Hence, strategic planning ensures swift, efficient humanitarian response through risk assessment, supply pre-positioning, and proactive logistics to overcome access challenges.

2.1.2.2. Supply Chain Readiness

A resilient and flexible supply chain is essential for effective humanitarian response. This includes establishing reliable procurement channels, managing transport logistics, and setting up storage and distribution facilities (Tetteh, et al. 2024). Organizations must ensure that their logistics infrastructure can scale and adapt to sudden increases in demand, unexpected disruptions, or changing on-ground conditions. In general, a resilient, adaptable supply chain underpins effective humanitarian response by enabling scalable procurement, agile logistics, and responsive distribution amidst dynamic challenges.

2.1.2.3. Resource Management

Effective resource management ensures that essential supplies such as food, water, medicine, and shelter materials are available and appropriate for the affected populations (Krichen, et al. 2024.). This aspect covers inventory control, warehousing, and distribution planning. It also emphasizes the importance of quality control and expiration monitoring to avoid wastage and ensure the safety of distributed items. Thus, effective resource management guarantees timely,

appropriate aid delivery through rigorous inventory control, quality assurance, and strategic distribution aligned with beneficiaries' needs.

2.1.2.4. Training and Capacity building

Preparedness is heavily reliant on the competence of personnel involved in humanitarian logistics. Training programs equip staff and volunteers with essential skills in logistics operation, emergency protocols, and the use of relevant technologies (Yazdani, 2024). Capacity building strengthens the ability of individuals and organizations to respond effectively under pressure, thereby improving the operational readiness. Therefore, skilled personnel are vital to preparedness; targeted training and capacity building enhance logistical competence, technological proficiency, and operational responsiveness.

2.1.2.5 Coordination and Communication

Humanitarian logistics often involves a multitude of actors, including NGOs, government agencies, donors, and local communities. According to Gooding, et al. 2022, clear coordination mechanisms and communication strategies must be established in advance to prevent duplication of efforts and to ensure efficient use of resources. Joint training exercises, shared platforms, and regular coordination meetings are examples of preparedness actions that enhance collaboration. Thus, an effective humanitarian logistics demands a coordinated and multi-actor collaboration; proactive communication, joint training, and shared platforms optimize resource use and operational coherence.

2.1.2.6 Information Management and Technology Integration

Khans, et al. 2022, state that technology and data management are vital to preparedness in humanitarian logistics. The use of tools like geographic information systems (GIS), logistics management information systems (LMIS), and real-time tracking platforms supports decision-making, supply chain visibility, and needs assessments. Proper data collection and analysis enable organizations to anticipate demands and respond more precisely during crises. Hence, technological integration and data management enhance preparedness and response practices by enabling precise forecasting, real-time visibility, and informed decision-making in humanitarian logistics operations.

2.1.3 Response in Humanitarian Logistics

2.1.3.1 Needs Assessment and Information Gathering

One of the initial and most pivotal components of a humanitarian logistics response is the execution of a rapid needs assessment to swiftly determine the scope and urgency of required interventions (Negi, 2021). This process involves identifying the severity of the disaster, understanding the scale of displacement, and determining the most urgent needs of affected populations such as food, water, medical care, and shelter. Accurate data collection using tools like field assessments, mobile surveys, and satellite imagery ensures effective planning and prioritization of resources. Therefore, rapid needs assessments are crucial for timely, targeted humanitarian response, guiding resource prioritization through accurate data on disaster impact and urgency.

2.1.3.2 Procurement

Procurement entails the identification and acquisition of essential relief commodities, which may be sourced locally, regionally, or internationally, contingent upon factors such as availability, cost-effectiveness, reliability, and urgency (Zobnina, 2023). Local procurement can save time and support the local economy, but international procurement may be essential for obtaining specialized goods. Procurement decisions must likewise adhere to donor stipulations and align with ethical sourcing principles to ensure accountability and integrity in the supply chain. So, an effective procurement balances urgency, cost, and ethics, ensuring timely, accountable sourcing of relief goods through local and international supply channels.

2.1.3.3 Warehousing

Warehousing constitutes a crucial element in the effective management of relief item distribution and supply chain flow (Aghajani, 2023). Pre-positioned warehouses in disaster-prone areas enable rapid dispatch, while temporary or mobile warehouses may be established near affected zones during an emergency. Key considerations include capacity, location, temperature control (for items like vaccines), and inventory management systems. Thus, an effective strategic warehousing ensures swift, efficient relief distribution through optimal location, capacity planning, and robust inventory systems tailored to emergency needs.

2.1.3.4 Transportation

Transportation ensures the movement of goods from warehouses to the affected areas. It involves choosing the right mode road, air, sea, or rail based on the speed, cost, and accessibility (Qixu, 2024). Transportation can be disrupted by damaged infrastructure, fuel shortages, or natural hazards, making contingency planning and flexibility essential. So, efficient transportation, adaptable to constraints and disruptions, is vital for timely delivery of relief, balancing speed, cost, and accessibility.

2.1.3.5 Distribution and Last-Mile Delivery

Distribution efforts, particularly at the last-mile stage, are centered on guaranteeing that aid is delivered to beneficiaries in a manner that is both efficient and equitable (Njagi, 2021). This phase involves navigating logistical bottlenecks and security challenges. Ensuring that the right aid reaches the right people at the right time requires local engagement, accurate targeting, and culturally sensitive distribution methods. That is why an effective last-mile distribution demands precise targeting, local collaboration, and cultural sensitivity to ensure equitable, timely, and secure aid delivery.

2.1.3.6 Coordination and Collaboration

An effective humanitarian response is contingent upon robust coordination among key stakeholders, including non-governmental organizations, governmental bodies, the private sector, and international agencies (El-Mougher, 2022). Platforms such as the Logistics Cluster, led by the World Food Programme (WFP), help align efforts, prevent duplication, and optimize the use of resources. Transparent communication and shared goals are vital for successful collaboration. So, a robust multi-stakeholder coordination, facilitated by platforms like the Logistics Cluster, ensures resource optimization, transparency, and unified humanitarian response efforts.

2.1.3.7 Information Management and Tracking

Real-time information tracking systems play a pivotal role in enabling continuous monitoring and traceability of supplies across all stages of the logistics chain (Qin, 2024). Technologies such as barcoding, GPS, and blockchain enhance accountability and transparency, while Enterprise Resource Planning (ERP) systems streamline logistics operations. Accurate information flow

allows for better decision-making and responsiveness. Thus, real-time tracking technologies enhance supply chain transparency, accountability, and operational efficiency, enabling informed decisions and agile humanitarian logistics management.

2.1.3.8 Flexibility and Adaptability

The dynamic nature of humanitarian emergencies demands operational flexibility (Tetteh, et al. 2024). Organizations must be ready to adjust logistics plans in response to evolving circumstances such as aftershocks, political unrest, or changes in weather. Flexibility ensures that the logistics system remains functional and responsive under pressure. That is why operational flexibility is very essential in humanitarian logistics, enabling adaptive responses to evolving crises and maintaining system resilience under pressure.

2.1.3.9 Equity and Access

Humanitarian logistics must prioritize inclusivity and ensure that aid reaches all segments of the population, including vulnerable groups such as women, children, the elderly, and persons with disabilities (Sutton, et al. 2022). Geographical, cultural, and systemic barriers to access must be proactively addressed to prevent the marginalization or exclusion of vulnerable populations in the distribution of humanitarian aid. In general, inclusive humanitarian logistics proactively overcomes barriers to guarantee equitable aid delivery, safeguarding vulnerable populations from marginalization and exclusion.

2.1.3.10 Performance Measurement and Feedback

To continuously improve, humanitarian logistics operations must incorporate performance evaluation (Ahmad, et al. 2024). This includes measuring delivery speed, cost-effectiveness, beneficiary satisfaction, and coverage of needs. Feedback mechanisms help refine strategies and build resilience for future responses. Hence, a continuous performance evaluation and feedback integration are vital for enhancing efficiency, accountability, and resilience in humanitarian logistics operations.

2.2 Theoretical Framework

This investigation is anchored in contemporary theoretical frameworks and foundational assumptions that critically shape its central inquiry. These conceptual underpinnings provide a robust lens for analyzing and understanding the preparedness and response practices within humanitarian logistics, particularly as executed by the International Rescue Committee (IRC) in Ethiopia. They are instrumental in unpacking the complexities of relief operations targeted at refugee populations and offer timely insights aligned with the study's objectives—to evaluate IRC Ethiopia's preparedness strategies, assess its response mechanisms, and identify prevailing logistical challenges (Smith & Johnson, 2023; Alemu & Kebede, 2022; UN OCHA, 2024).

2.2.1. Humanitarian Logistics Theory

Definition and Focus: Humanitarian logistics theory centers on the strategic orchestration of planning, managing, and delivering essential goods and services to populations affected by crises, whether due to conflict or natural disasters. It emphasizes the pivotal role of supply chain efficiency, inventory control, transportation systems, and the integrated coordination among multiple stakeholders to ensure timely and effective humanitarian responses. This theoretical lens is particularly relevant to assessing the IRC Ethiopia's preparedness and response operations, offering valuable insights into operational strengths and logistical constraints in complex emergency settings (Gebremariam & Tesfaye, 2023; Zhao et al., 2021; OCHA, 2024).

2.2.2. Contingency Theory

The effectiveness and resilience of an organization are fundamentally linked to its ability to adapt to evolving external pressures and operational uncertainties. In the context of humanitarian logistics, this adaptability becomes even more critical. Accordingly, this study examines how IRC Ethiopia strategically adjusts its logistical frameworks to respond to the shifting needs of refugee populations and the fluid nature of humanitarian environments. Such analysis is crucial for understanding how preparedness and response mechanisms are operationalized amid logistical complexities and external volatility (Tadesse & Mengistu, 2022; Aljaffan & Altay, 2021; UNHCR, 2023).

2.2.3. Disaster Preparedness and Response Framework

The theory of pre-disaster preparedness underscores the indispensable role of anticipatory planning and strategic readiness in mitigating the impacts of crises before they unfold. This involves conducting thorough risk assessments, pre-positioning critical resources, and establishing robust communication and transportation infrastructures. Complementing this is the theory of response coordination, which emphasizes the necessity for rapid, efficient, and adaptable interventions once a disaster strikes. These theoretical perspectives are particularly relevant to evaluating IRC Ethiopia's preparedness and response operations within refugee settings, offering valuable insights into how logistical agility and coordination shape humanitarian outcomes (Alemayehu & Zewdie, 2023; Santos & Van Wassenhove, 2021; UN OCHA, 2024).

2.2.4. Humanitarian Supply Chain Integration

Coordination among Actors: A fundamental premise of humanitarian logistics theory is the imperative for seamless coordination and collaborative synergy among diverse actors—including non-governmental organizations, government agencies, local authorities, United Nations bodies, and private sector stakeholders. The effectiveness of emergency response operations hinges on this integrated approach, which ensures that aid delivery is timely, efficient, and contextually responsive. Within the framework of this study, such inter-organizational collaboration is particularly critical to evaluating IRC Ethiopia's preparedness and response practices, as well as identifying logistical bottlenecks that may impede coordinated humanitarian action (Bekele & Worku, 2023; Kovács & Falagara Sigala, 2021; UN OCHA, 2025).

2.2.5. Logistics and Humanitarian Aid Efficiency

Time Sensitivity: A central tenet guiding this study is the critical importance of timeliness in the delivery of humanitarian assistance. In the context of humanitarian logistics, even minimal delays can significantly compromise the well-being of displaced populations, exacerbating vulnerability and worsening already fragile living conditions. Ensuring swift and efficient aid delivery is therefore not only a logistical necessity but a humanitarian imperative—particularly relevant to the assessment of IRC Ethiopia's preparedness and response mechanisms in refugee

operations (Tesfahunegn & Mekonnen, 2023; Van Wassenhove & Pedraza Martinez, 2021; UNHCR, 2024).

2.3 Empirical Literature Review

Humanitarian logistics constitutes a critical pillar in enhancing the efficacy and efficiency of relief operations, wherein the prompt delivery of vital goods and services is paramount to preserving lives and alleviating distress. It is instrumental in meeting the urgent needs of displaced populations, especially refugees, during emergencies. This entails the seamless coordination of resources, the secure and safe transportation and storage of supplies, and the equitable distribution of aid, thereby ensuring that assistance reaches affected communities in a timely and effective manner. Ethiopia, as one of the largest host countries for refugees in Africa, faces persistent challenges related to the efficient and timely delivery of humanitarian assistance, especially in refugee camps (UNHCR, 2023). Numerous developing nations grapple with challenges in humanitarian logistics, largely attributable to a limited comprehension of effective management practices, which consequently undermines operational performance and efficiency. There is also an insufficient recognition of the importance of logistics cooperation and the involvement of logistics service providers in humanitarian operations (Sreedharan et al., 2020). These logistical constraints are further exacerbated by factors including insufficient infrastructure, restricted access to impacted regions, deficient coordination, and the intricate task of managing large, displaced populations with heterogeneous needs. In many cases, existing logistical systems fail to ensure the rapid and efficient distribution of aid, which undermines the overall humanitarian response.

2.3.1 Humanitarian Logistics Preparedness

A comprehensive approach involves from planning and early warning systems to coordination. Early warning systems (EWS) are engineered to forecast imminent disasters and promptly notify relevant authorities and communities (Marsh et al., 2024; Arvindan and Vijayan, 2022). But these systems are often inadequate, facing several challenges. For example, insufficient or unreliable data can impede the accuracy of disaster predictions. In the Ethiopian context, as noted by Lind et al. (2024), these stages frequently confront obstacles posed by unpredictable emergencies, logistical constraints, inadequate infrastructure, and the intricate political and social

dynamics within the country. Moreover, preparedness initiatives in Ethiopia have been influenced by domestic challenges, particularly infrastructural limitations, alongside international frameworks that promote cooperation and the sharing of resources (Beresford and Pettit, 2021). However, challenges persist in pre-positioning supplies in remote or conflict-prone areas making logistics operations more difficult. Recent studies highlight that while preparedness has improved in terms of policy development and stakeholder coordination, operational gaps remain, particularly in the areas of transport infrastructure and human resource capacity (Frennesson et al., 2021; Jalali et al., 2021). However the lack of preparedness in humanitarian logistics, coupled with a slow and inefficient response mechanism calls for urgent attention.

2.3.2 Response in Humanitarian Logistics

Lack of timely deliveries causes unnecessary hardship, including malnutrition and inadequate medical care, further exacerbating the vulnerability of refugees (World Health Organization, 2021). Delays are compounded by challenges in decision-making processes regarding the best distribution routes and channels. Lack of preparedness, both in terms of infrastructure and strategic planning further complicates logistical emergency response operations often leading to inefficiencies. Effective coordination helps mitigate logistical complexities and ensures that aid is delivered to those who need it most, when they need it most (Kumar and Singh, 2022). Lack of integration or clear communication channels can delay response efforts. Therefore, collaboration among diverse organizations is essential to prevent redundancy, reduce delays, and enhance the efficient allocation of resources. Infrastructure deficiencies or poor infrastructure, particularly in conflict zones or remote areas, can hinder the timely delivery of alerts and resources, leaving populations vulnerable (Al-Saidi et al., 2020). Limited resources in many countries, particularly in the Global South, may not have the financial or technical resources to develop or maintain sophisticated EWS, affecting their ability to respond quickly.

Political and geographical determinants pose significant obstacles to effective aid delivery, as conflicts, shifting territorial boundaries, and challenging terrain frequently impede or obstruct the timely transportation of essential assistance (Ada and Abdullahi, 2022). Indeed, political, social, and economic factors often complicate data collection, while disasters may lack real-time environmental data in certain regions. Political and social barriers in the case of refugee crises,

political dynamics, such as border control policies or refugee stigmatization, can prevent timely responses. In such contexts, these deficiencies hinder the capacity to accurately anticipate and respond, resulting in delayed or insufficient aid for the affected populations.

2.3.3 Challenges of Humanitarian Logistics in Preparedness and Response

Humanitarian logistics face numerous challenges, particularly in volatile environments where demand for resources fluctuates rapidly, and infrastructure may be inadequate. One significant challenge is the unpredictability of crises, which makes preparedness difficult. According to Pettit and Beresford (2021), the dynamic nature of disasters requires logistics systems to be adaptable and resilient, yet many humanitarian organizations lack the flexibility necessary to manage changing conditions effectively. Studies of the 2004 Indian Ocean tsunami and the 2010 Haiti earthquake show that delays in the delivery of aid can be attributed to supply chain disruptions caused by damaged infrastructure, communication breakdowns, and lack of pre-positioned supplies (Van Wassenhove, 2021). Furthermore, security concerns in conflict zones, such as those in Ethiopia, exacerbate these challenges. Research underscores that in conflict zones, humanitarian logistics systems are often disrupted by violence, making it difficult for aid organizations to access affected areas and deliver supplies efficiently.

Furthermore, resource scarcity encompassing financial constraints and transportation limitations constitutes a significant impediment. The 2014 Ebola outbreak in West Africa exemplified how such shortages can profoundly undermine the capacity for a timely and effective response. Studies on the Ebola response found that the lack of sufficient medical supplies and transportation infrastructure, combined with the sudden surge in demand, resulted in inadequate response efforts (Balcik et al., 2014). Moreover, the absence of standardized protocols for crisis management and the dependence on ad hoc emergency measures frequently result in inefficiencies within logistics systems. These studies advocate that enhancing preparedness through strategies such as pre-positioning stockpiles, capacity-building for local stakeholders, and fortifying collaborative partnerships is vital to surmounting these challenges.

2.4 Conceptual Framework

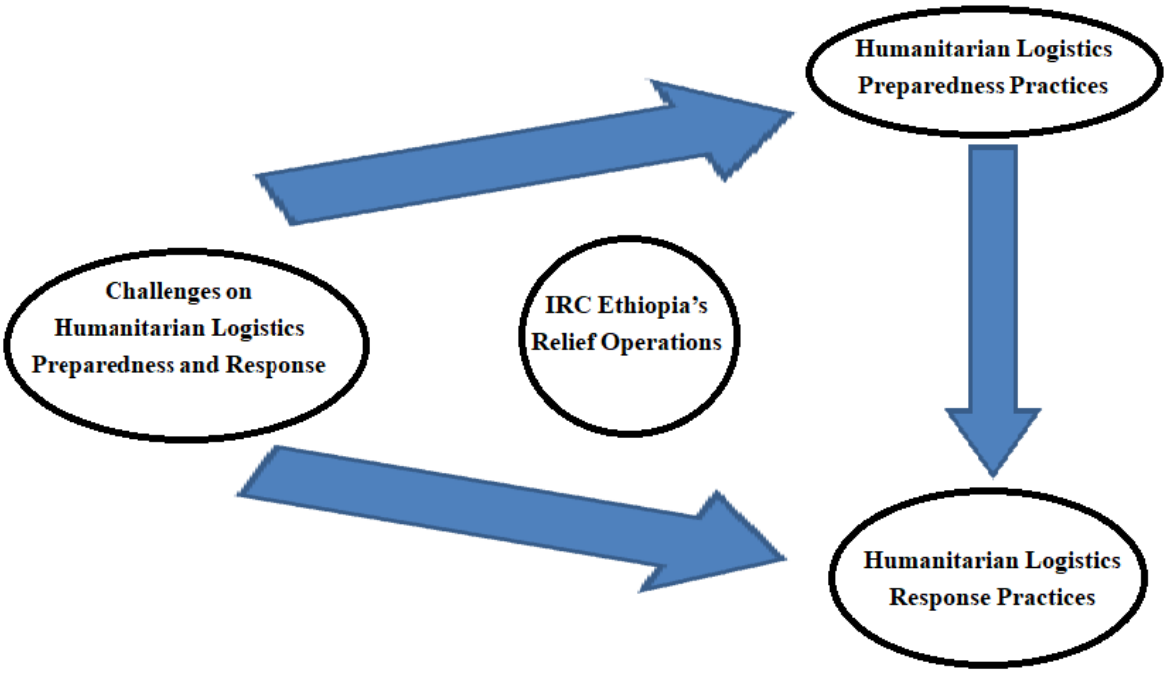

Figure 1: Conceptual Framework

CHAPTER THREE

METHODOLOGY OF THE STUDY

3.1 Background of the Study Area

This study centers on the relief operations of IRC Ethiopia, a vital element within the nation's humanitarian preparedness and response architecture. Ethiopia accommodates one of Africa's largest refugee populations, with camps dispersed across diverse regions, frequently situated in remote and resource-limited settings. IRC Ethiopia occupies a crucial position in delivering both immediate life-saving assistance and sustained support, underpinned by resilient logistics systems that ensure the efficient and effective distribution of aid. Hence, understanding the geographical, socio-economic, and operational context of these refugee settlements is vital for evaluating the preparedness and response practices employed. This context establishes the foundation for analyzing the management and adaptation of humanitarian logistics to address multifaceted and dynamic needs.

3.2 Research Design

This study adopts a descriptive research design, which is most suitable for examining current practices, challenges, and contextual realities surrounding humanitarian logistics within IRC Ethiopia's relief operations. This design is grounded in the study's aim to systematically assess and articulate the existing preparedness and response mechanisms with their challenges, rather than establishing causal relationships or test hypotheses. Descriptive research design enables the researcher to construct a comprehensive understanding of how humanitarian logistics functions within the operational context of IRC through collecting both qualitative and quantitative data. It is particularly appropriate for capturing the complexity of logistics operations in humanitarian settings, where the dynamic nature of emergencies strains a brief and detailed contextual analysis (Saunders et al., 2023). Alternative designs such as experimental or explanatory designs were deemed unsuitable, as they are geared towards measuring causal effects or manipulating variables, an approach that is not aligned with the practical and exploratory nature of this

research. Instead, the descriptive framework allows for a nuanced exploration of practices, processes, and logistical challenges as they currently exist.

3.3 Research Approach

The study employs a mixed-methods research approach, mixing both qualitative and quantitative methodologies enabling an in-depth exploration of how IRC's logistics team conceptualizes and implements preparedness and response operations and the challenges it face while in operation. These approach well-suits the multidimensional nature of the research objectives, which require both measurable patterns. The quantitative component allows for the collection of structured data through questionnaire, facilitating the statistical analysis of trends and logistical challenges. This approach assists the collection of nuanced insights derived from lived experiences, perspectives, and reflections, which quantitative data alone would be insufficient to capture comprehensively. Concurrently, qualitative component through document reviews captures in-depth perspectives from IRC staff and stakeholders, enabling a deeper understanding of operational dynamics and institutional preparedness. The rationale for choosing a mixed-methods approach lies in its capacity to triangulate data, thereby enhancing the validity and comprehensiveness of the findings (Creswell & Plano Clark, 2022). A purely qualitative or quantitative approach would have limited the study's ability to fully capture the scope and depth of humanitarian logistics practices within the IRC's operations in Ethiopia.

3.4 Population and Sampling

The total target population for this study comprised 32 IRC Ethiopia staff members directly involved in humanitarian logistics functions. The population and sample size for this study were determined based on the need to gather rich and comprehensive data from diverse stakeholders involved in IRC Ethiopia's relief operations. This includes key informants such as logistics managers, field coordinators, supply chain officers, and relevant personnel directly engaged in logistics preparedness and response duty.

3.4.1 Sampling Technique and Sample size determination

The sample size was determined based on the total number of staff involved in humanitarian logistics operations within IRC Ethiopia's relevant departments. Drawing from the principles of statistical representativeness, the total population for this study was used as a sample. This figure offers a sufficient degree of precision for analysis while remaining practical given the limited size of the target popsulation. It ensures that the data collected will allow for reliable assessments of IRC's preparedness and response practices, as well as the identification of significant logistical challenges. Ultimately, this sample size provides sufficient statistical power to identify trends, gaps, and operational challenges across logistics preparedness and response spectrum, thereby offering reliable insights that align with the study's objectives.

3.5 Method of Data Collection Techniques

A comprehensive questionnaire comprising sixty-one (61) closed-ended and three (3) open-ended questions were meticulously developed as the primary data collection instrument for this study. Designed to elicit qualitative insights, the tool was grounded in the research objectives, theoretical framework, and themes emerging from the literature review. It was distributed to thirty-two (32) logistics staff members of the International Rescue Committee (IRC) in Ethiopia.

The questionnaire was organized into five thematic areas; Coordination and Collaboration (8 questions), Technology Usage and System Integration (17), Preparedness Practices (13), Response Practices (10), and Operational Challenges (15). The open-ended items provided space for respondents to elaborate on their experiences, enabling the collection of nuanced, context-specific data to complement the structured responses.

3.6 Method of Data Analysis Techniques

Data analysis in this study follows a dual analytical strategy corresponding to the mixed-methods approach. Quantitative data collected through structured questionnaires were analyzed using descriptive statistical tools, including frequency distributions, percentages, mean, and standard deviation. This type of analysis helps in illustrating trends in logistics preparedness and response practices, as well as quantifies key logistical challenges. The qualitative data were analyzed

using thematic analysis. This method involves coding the data into recurring themes and patterns, allowing the researcher to extract meaningful insight related to preparedness strategies, response mechanisms, and operational bottlenecks. These methods were selected to align with the study's descriptive design, enabling an in-depth exploration of the complexities of preparedness and response practices in IRC's relief operations. These analytical methods line up with the study's objectives by providing both a broad statistical overview and deep contextual understanding of humanitarian logistics operations. Alternative analytical methods such as regression analysis or grounded theory were considered but deemed less appropriate given the study's descriptive and exploratory nature rather than predictive or theory-generating aims.

3.7 Validity and Reliability Test

To ensure validity, the questionnaire guide was reviewed by logistics and research experts and piloted before full deployment. Validity was also reinforced through triangulation, comparing findings across multiple data sources and roles. Construct validity was maintained to ensuring the data collection instruments directly aligned with the research objectives and concepts being measured. Expert reviews of the instruments were conducted to confirm their relevance and accuracy in capturing the intended data.

Reliability was maintained using consistent data collection procedures, by ensuring the same set of questions were asked across all interviews, and by having all interviews conducted and transcribed by the same researcher. Member checking was done by sharing summaries with participants for confirmation. Cronbach's alpha was calculated to assess the internal consistency of any Likert-scale items. These strategies collectively ensured the findings are both valid and reliable, providing a robust basis for findings, conclusions, and recommendations.

3.8 Ethical Consideration

This study adheres to the highest ethical standards to ensure the protection of participants and the integrity of the research process. Informed consent was obtained from all participants, ensuring they fully understand the purpose, scope, and potential impact of the research before participation. Participants were assured that their involvement is voluntary, and they will have the right to withdraw at any time without consequence. Confidentiality was maintained by making participant data anonymous and sensitive information was kept secure and accessible

only to the researcher. Ethical approval was sought from relevant institutional review boards, ensuring that the research complies with ethical guidelines for conducting research on the firm. Given the vulnerability of refugees, extra care was taken to protect the well-being and dignity of participants, with sensitivity to their emotional and psychological needs. Data collection was conducted in a respectful and non-intrusive manner, and findings were presented in a way that avoids any harm or stigmatization of the communities involved. These ethical considerations were used to ensuring the credibility, reliability, and social responsibility of the study, while fostering a respectful and transparent research environment.

CHAPTER FOUR

RESULTS, DISCUSSION, AND INTERPRETATION

The results of this study are grounded in a robust data collection process involving a carefully structured questionnaire administered to logistics personnel within the International Rescue Committee (IRC) in Ethiopia. Out of 32 targeted samples, 23 completed the survey, yielding an impressive response rate of approximately 72%, which ensures the credibility of the findings within a purposive sampling framework. The questionnaire, composed of 61 closed-ended and 3 open-ended questions were thoughtfully designed and distributed to align with the study's objectives. Responses were drawn from a diverse group of professionals across critical logistics and support functions, adding depth and representativeness to the study. The analysis was through a rigorous thematic categorization and synthesis, allowing for the identification of operational strengths and areas for improvement.

4.1 Demographic Profile of the Respondent

The respondents brought with them a considerable depth of experience, with tenure in their respective roles ranging from three to twelve years as presented in Figure 2. This level of professional maturity suggests a profound understanding of the complex dynamics involved in humanitarian logistics. Their cumulative expertise provides a robust foundation for generating insights into the practical challenges and strategic considerations relevant to humanitarian operations in crisis-affected contexts.

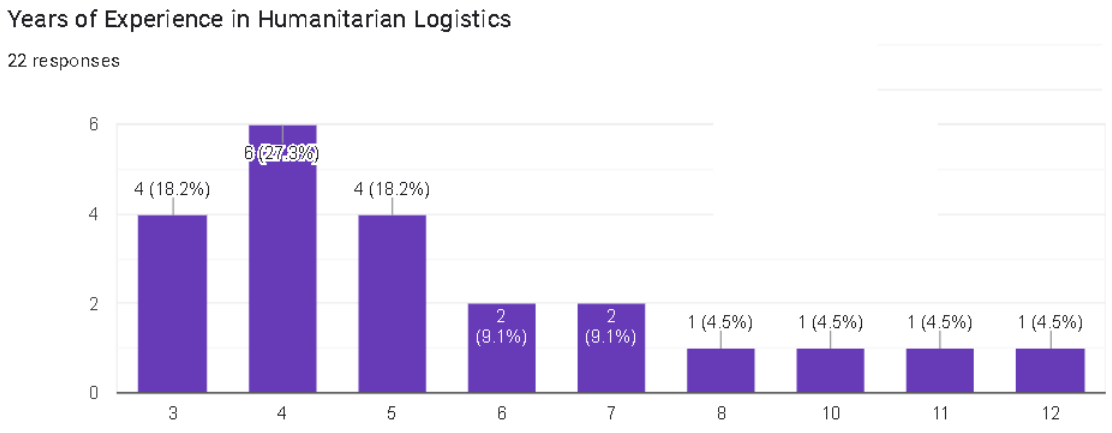

Figure 2: Years of Experience

The respondent's engagement in humanitarian operations revealed that 8.7% of the participants were exclusively involved in preparedness activities, whereas 39.1% reported their roles being primarily focused on emergency response efforts. Notably, the majority, 52.2% of respondents indicated dual involvement in both preparedness and response functions within the scope of the IRC's humanitarian logistics operations in Ethiopia as presented in Figure 3.

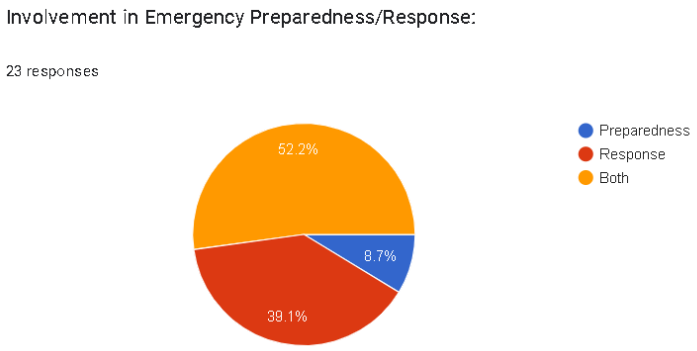

Figure 3: Involvement in Preparedness/Response

4.2 Humanitarian Logistics Preparedness Practices of IRC Ethiopia's Relief Operations

These findings strongly support the first objective of the study which is assessing preparedness and response practices within IRC Ethiopia. Here, coordination with governmental actors is a recognized cornerstone of effective humanitarian logistics. According to Van Wassenhove (2021), clear institutional coordination frameworks with public-sector stakeholders are essential for reducing duplication efforts, optimizing resource utilization, and improving access during emergencies. Additionally, the integration of modern digital tools enhances information flow, decision-making speed, and overall the supply chain visibility, as emphasized by Jahre et al. (2020) and Tatham and Pettit (2021). These technologies play an increasingly vital role in streamlining humanitarian operations and improving communication across multi-agency networks. The strength of these responses suggests that IRC Ethiopia has made significant investments both in institutional collaboration and technological infrastructure, the major two domains that research consistently identifies as foundational to effective logistics preparedness

and agile emergency response. The complete alignment among respondents indicates that the IRC has institutionalized clear, systematized logistics protocols and digital communication practices. This unanimity reflects a mature operational structure characterized by strategic foresight and adaptive capacity. The results suggest that IRC Ethiopia is well-positioned to respond rapidly and effectively to humanitarian crises through established coordination with authorities and real-time information exchange. These practices not only enhance efficiency but also foster trust and coherence among stakeholders, thereby reinforcing the organization's leadership role in the Ethiopian humanitarian logistics landscape.

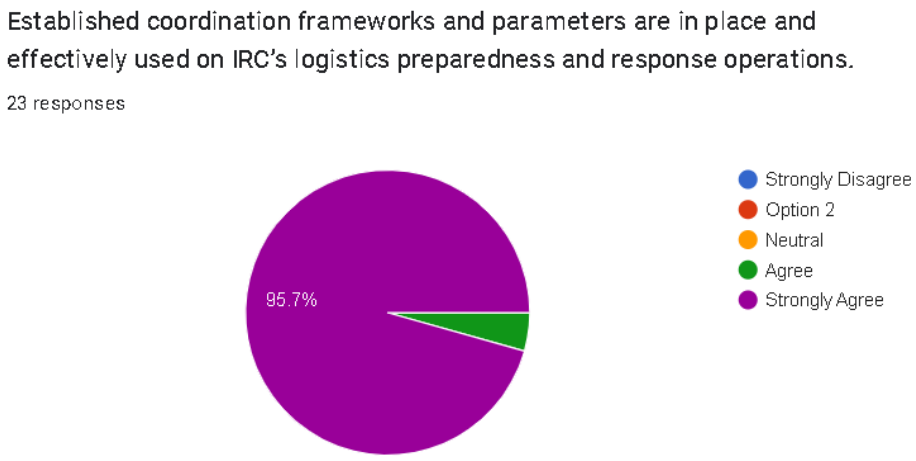

Figure 4: Coordination Framework Usage

The results in Figures 5 and 6 reveal unanimous agreement among respondents regarding two critical aspects of IRC Ethiopia's humanitarian logistics operations (the establishment of coordination protocols with government entities and the deployment of digital communication tools). The 100% agreement on both issues underscores a strong organizational coherence and shared perception of institutional capacity in managing complex logistics functions. The data imply that IRC Ethiopia maintains a robust and formalized structure for partner feedback, which is widely recognized by respondents as critical to logistical effectiveness. The strong consensus underscores the perception that these mechanisms are not only functional but integral to operational success. This practice enhances coordination, fosters trust among partners, and ensures that logistical interventions remain aligned with contextual realities on the ground. As such, the incorporation of feedback loops can be interpreted as a marker of institutional maturity

and strategic foresight, reinforcing IRC Ethiopia's capacity to adapt and refine both preparedness and response practices in a complex humanitarian landscape.

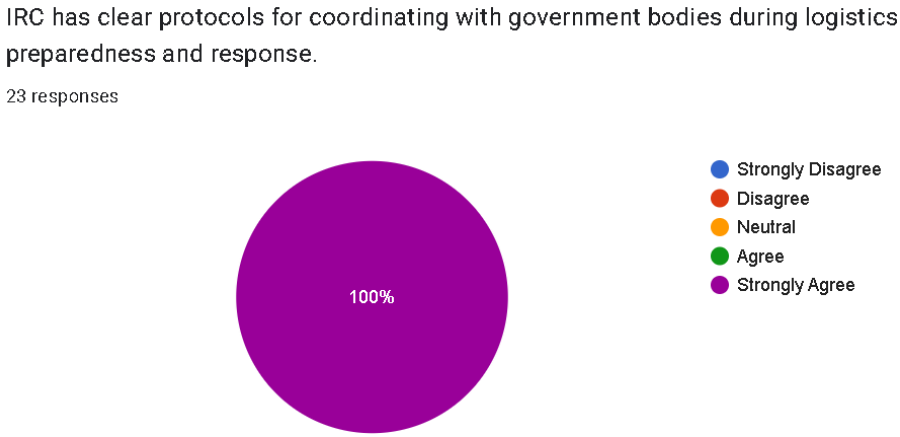

Figure 5: Protocols for Coordination

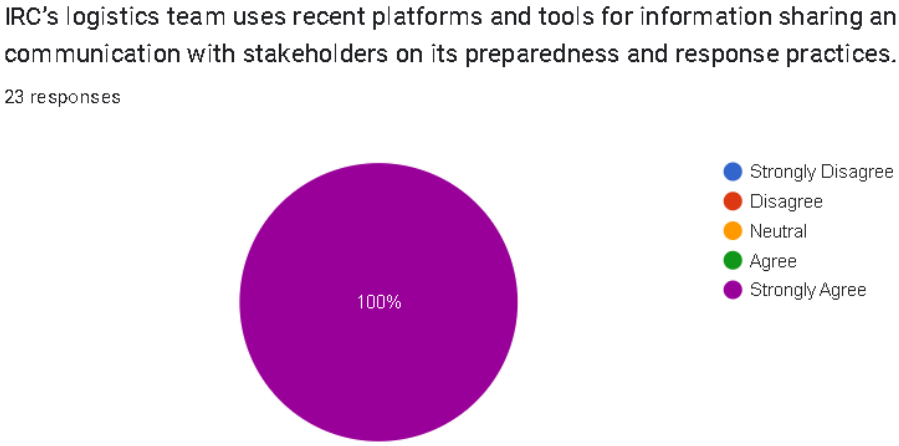

Figure 6: Recent Platforms Usage

The findings depicted in Figure 7 show that an overwhelming 90.9% of respondents strongly affirmed the existence and vital role of formal feedback mechanisms between IRC Ethiopia and its humanitarian partners in improving logistics coordination. This high degree of affirmation; supported by an additional 9.1% who also agreed albeit less emphatically, indicates a strong institutional emphasis on two-way communication and iterative learning in operational logistics. This result is highly consistent with existing research that underscores the significance of feedback loops in humanitarian logistics. According to Beamon and Balcik (2022), effective logistics systems rely not only on timely delivery but also on adaptive processes informed by

uninterrupted stakeholder participation. Similarly, Pettit and Beresford (2020) emphasize that structured feedback mechanisms enhance coordination, promote transparency, and ensure responsiveness to dynamic field realities. These findings also resonate with the work of Heaslip (2023), who argues that feedback systems are essential for building logistical resilience and fostering collaboration across organizational boundaries.

In relation to the first objective of this study, to assess IRC Ethiopia's preparedness practices, this evidence suggests that IRC has embraced reflective and adaptive coordination strategies. The formalized nature of feedback mechanisms contributes significantly to preparedness by enabling the organization to identify gaps and adjust plans proactively. Furthermore, during response operations, such mechanisms facilitate real-time adjustments and informed decision-making, which are essential in rapidly evolving humanitarian contexts. The complete consensus among respondents indicates that IRC's technological integration is both comprehensive and highly effective. This alignment reinforces the perception that digital tools are central to the organization's humanitarian logistics strategy. By embedding advanced systems across all operational phases, IRC not only enhances efficiency but also ensures responsiveness and precision in resource allocation. The consistency in these responses reveals a strong institutional culture of innovation, underscoring IRC Ethiopia's position as a technologically adept actor in the humanitarian landscape.

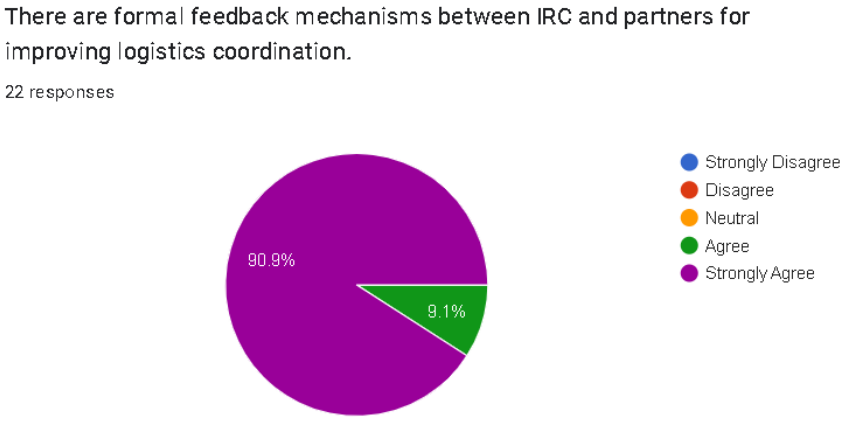

Figure 7: Formal Feedback Mechanisms with Partners

The data presented from Figures 8-10 reflect unanimous agreement among all 23 respondents regarding IRC Ethiopia's robust integration of advanced technological tools across both the

preparedness and response phases of its humanitarian logistics operations. This comprehensive endorsement suggests that technology is not only embedded in IRC's operational framework but is also perceived as highly effective in facilitating timely and coordinated humanitarian actions. These findings affirm the first objective, which focus on assessing IRC's preparedness practices. Utilization of tools such as Inventory Management Systems (IMS), Geographic Information Systems (GIS), early warning systems, and simulation platforms during the preparedness phase demonstrates a proactive and data-driven approach to logistics planning. Prior research supports this approach, Tomasini and Van Wassenhove (2020) emphasize the strategic role of such systems in forecasting demand, mapping vulnerabilities, and enhancing pre-crisis readiness.

Equally, the deployment of real-time tracking technologies, mobile data applications, and drone imagery in the response phase is in line with findings by Jahre et al. (2019), who assert that digital innovations dramatically improve visibility, accuracy, and accountability in humanitarian supply chains. These technologies not only accelerate response times but also reduce uncertainty, an essential feature in volatile operational environments (Tatham & Houghton, 2021). Thus, the evidence suggests that IRC Ethiopia's technology-enabled logistics practices reflect international best practices, contributing to organizational agility, transparency, and operational resilience.

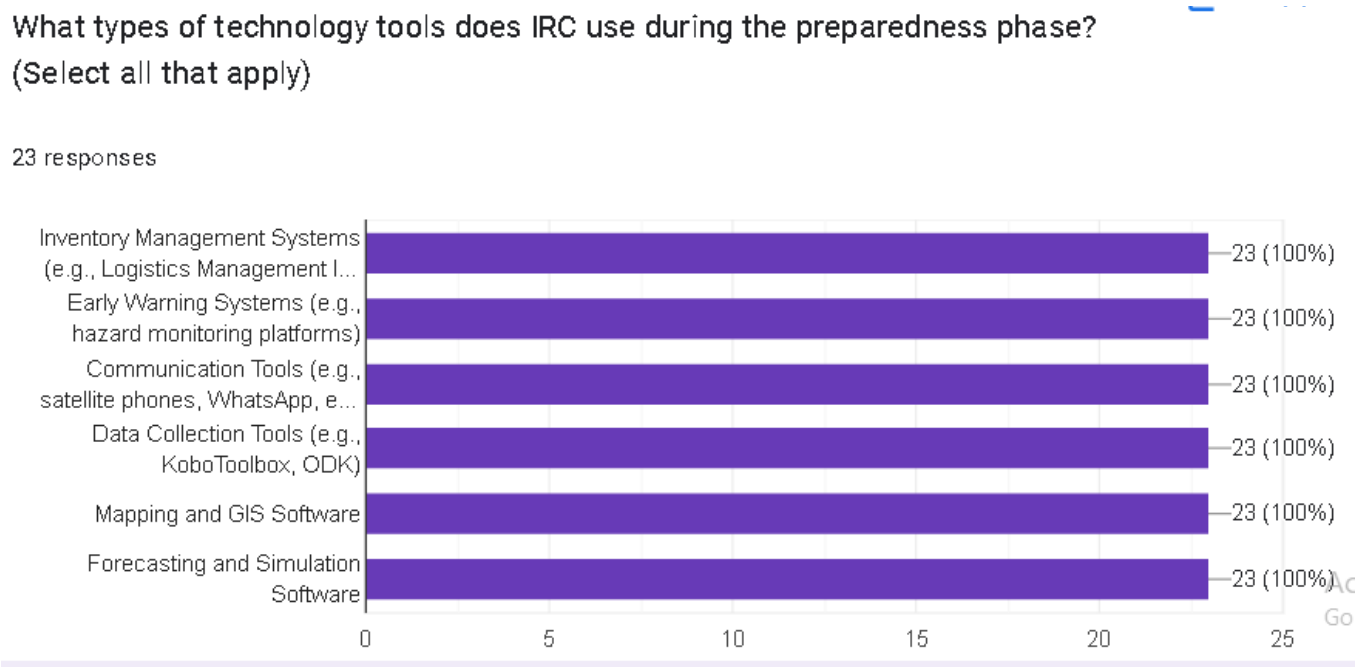

Figure 8: Technology Tools used in the Preparedness Phase

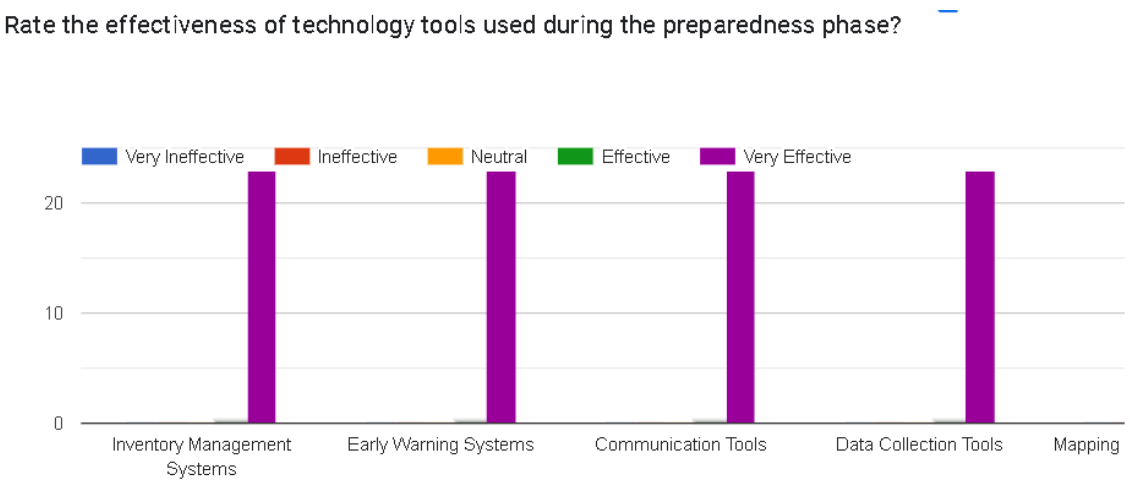

Figure 9: Effectiveness of Technology Tools in the Preparedness Phase

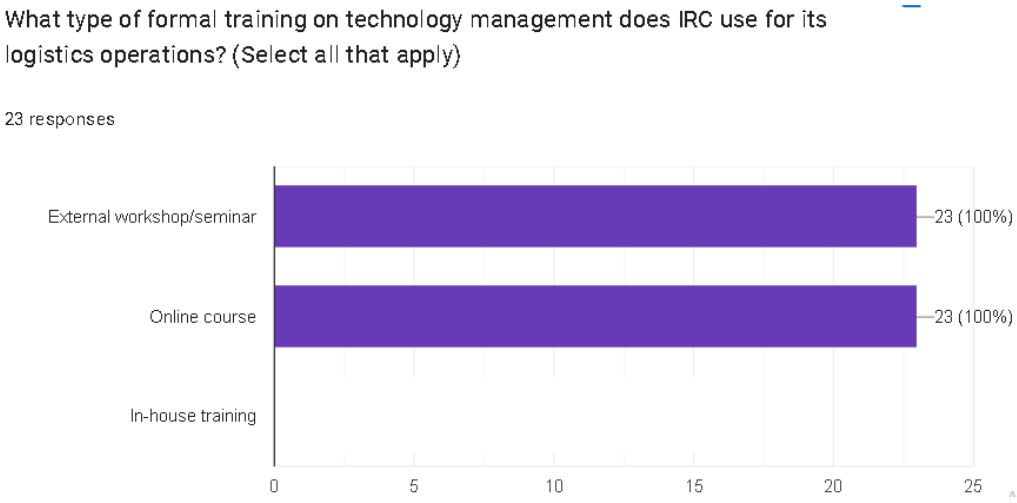

Figure 10: Formal Trainings on Technology Management

The findings illustrated in Figures 11 through 18 underscore a consistently positive perception among respondents regarding IRC Ethiopia's integration and utilization of digital technologies within its humanitarian logistics operations. Respondents unanimously affirmed the reliability and functionality of tools such as mobile applications, digital tracking platforms, real-time information exchange mechanisms, and secure data protocols. This coherence not only validates the organization's commitment to digital transformation but also points to a mature, technology-driven logistics infrastructure. These findings reinforce the study's first objective, assessing the preparedness practices of IRC Ethiopia. Recent literature corroborates these findings. According

to Sharma et al. (2021), digital tracking and mobile-based logistics tools significantly enhance supply chain visibility, enabling timely adjustments and reducing resource misallocation during crises. Similarly, Alkaff and Akhtar (2023) emphasize the role of user-friendly digital platforms in strengthening humanitarian logistics responsiveness by empowering field staff and improving coordination with external stakeholders. Furthermore, a study by Mulubrhan et al. (2022) on humanitarian logistics in East Africa reveals that real-time data integration directly correlates with reduced delivery lead times and improved beneficiary satisfaction.

The uniform satisfaction reported by respondents also reflects the operational stability of IRC's technological infrastructure, echoing findings by Kamau and Wanjiku (2024), who argue that uninterrupted technological support is fundamental to effective humanitarian logistics, especially in data-sensitive and high-risk environments. This universal agreement among respondents indicates that IRC Ethiopia has successfully institutionalized a robust digital logistics ecosystem. This system appears to be both technically dependable and operationally responsive, enhancing the organization's ability to deliver aid efficiently and transparently. The consistent use of real-time data exchange and secure digital platforms suggests a strategic commitment to innovation and accountability. These technological capabilities not only strengthen IRC's operational readiness but also minimize coordination delays and logistical bottlenecks, thereby reinforcing the organization's leadership in humanitarian logistics within the Ethiopian context.

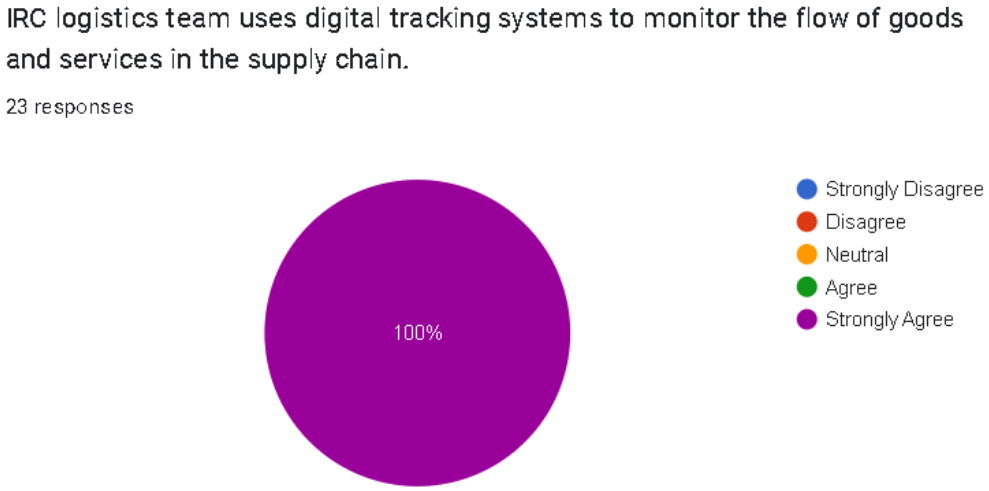

Figure 11: Digital Tracking Systems Usage

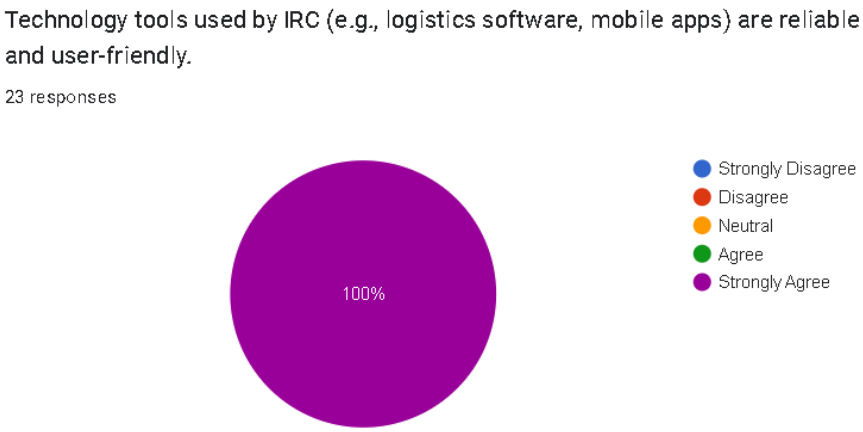

Figure 12: Reliable and User-Friendly Technology Tools

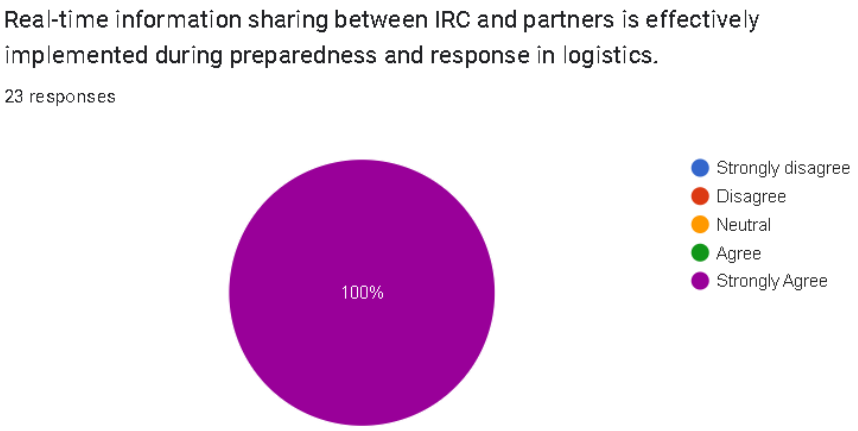

Figure 13: Effective Real Time Information Sharing with Partners

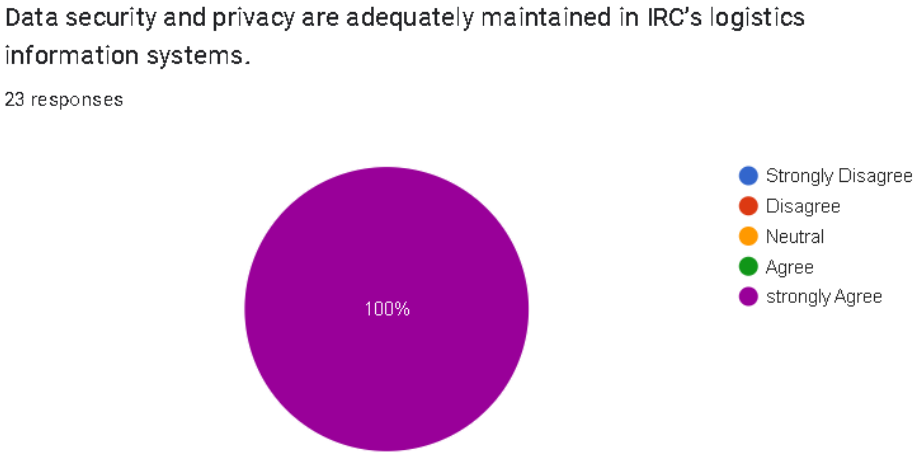

Figure 14: Data Security and Privacy

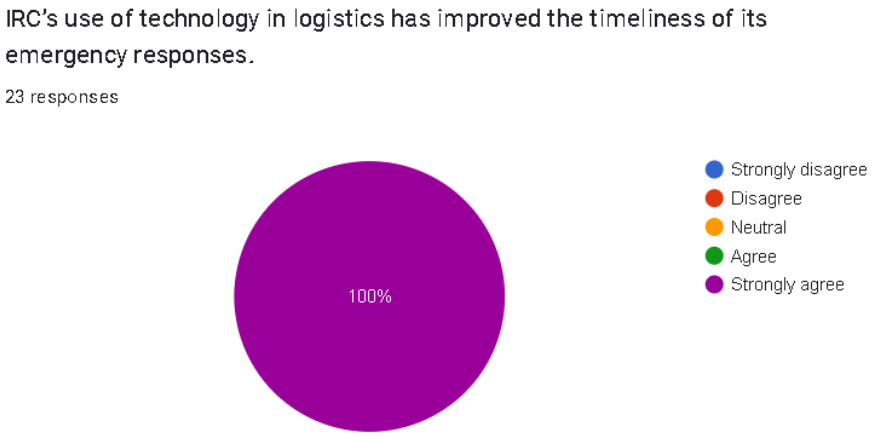

Figure 15: Improving Timeliness using Technology

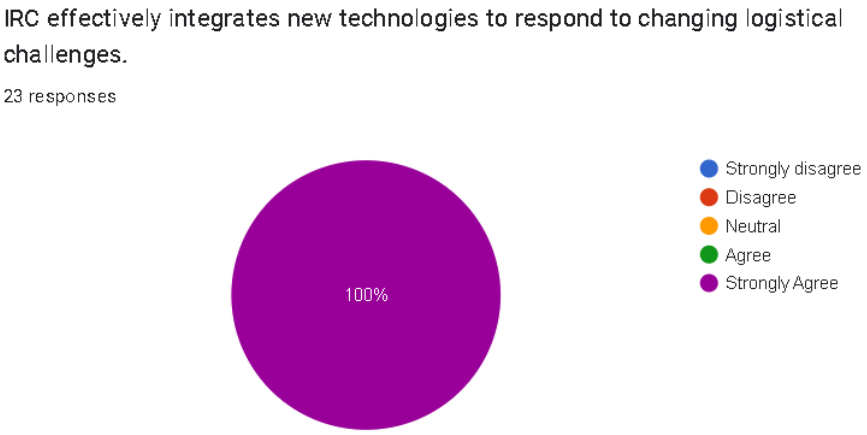

Figure 16: Technology Integration for new Challenges

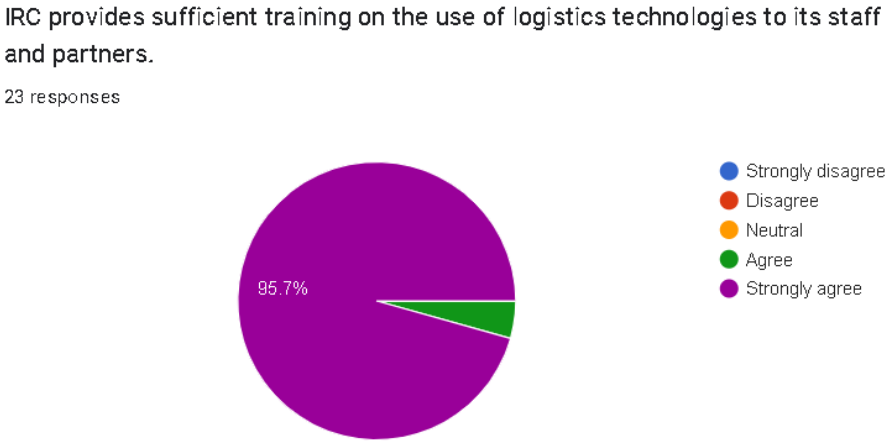

Figure 17: Sufficient Training on the use of Technologies

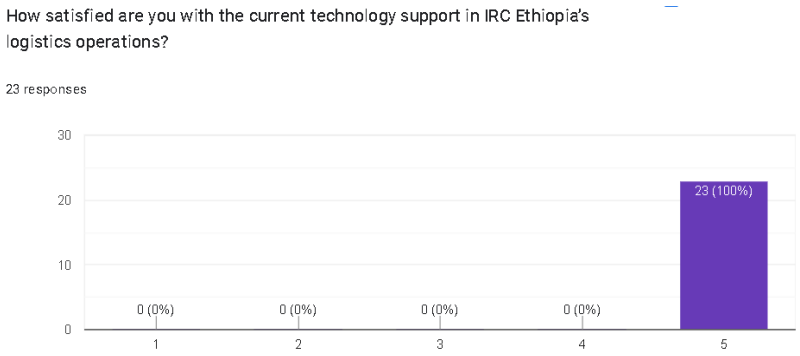

Figure 18: Staff Satisfaction on Technology Usage

The findings from Figures 19 to 25 reveal a near-unanimous affirmation among respondents regarding the strength of IRC Ethiopia's logistical preparedness practices. With 95.7% of respondents strongly agreeing and only 4.3% agreeing, the data reflects a deep internal consensus on the organization's capabilities across key preparedness indicators. These include structured planning procedures, clearly defined roles, pre-positioning of supplies, regular simulation drills, responsive mechanisms to emerging challenges, codified risk mitigation protocols, and systematic evaluation mechanisms. This evidence aligns strongly with the first objective of the study. Current literature underscores the significance of such structured preparedness frameworks in ensuring organizational resilience. For instance, Tatham and Pettit (2020) argued that clearly defined roles and proactive risk mitigation are critical in enhancing logistical responsiveness in humanitarian contexts. Similarly, Adlakha et al. (2021) emphasize that simulation exercises and pre-positioning of relief goods significantly improve operational lead times and reduce uncertainty during crises.

Moreover, IRC's systematic evaluation and formalized response planning reverberates best practices outlined by Rahman et al. (2023), who found that organizations employing continuous preparedness assessment frameworks are better able to adapt logistics responses to unpredictable disruptions. These findings are also consistent with Habte and Mamo (2024), who in Ethiopia observed structured planning and capacity-building initiatives directly contributed to improved coordination and supply availability during emergencies. The tremendously positive assessment of IRC Ethiopia's logistical preparedness practices suggests a robust internal architecture capable of supporting complex emergency responses. The consistency in respondent feedback indicates strong organizational alignment, strategic foresight, and a culture of preparedness. The inclusion

of training, simulation, and evaluation mechanisms further reflects IRC Ethiopia's commitment to continuous improvement and institutional learning. These attributes collectively position the organization to effectively anticipate, absorb, and respond to humanitarian emergencies in a rapidly evolving operational landscape.

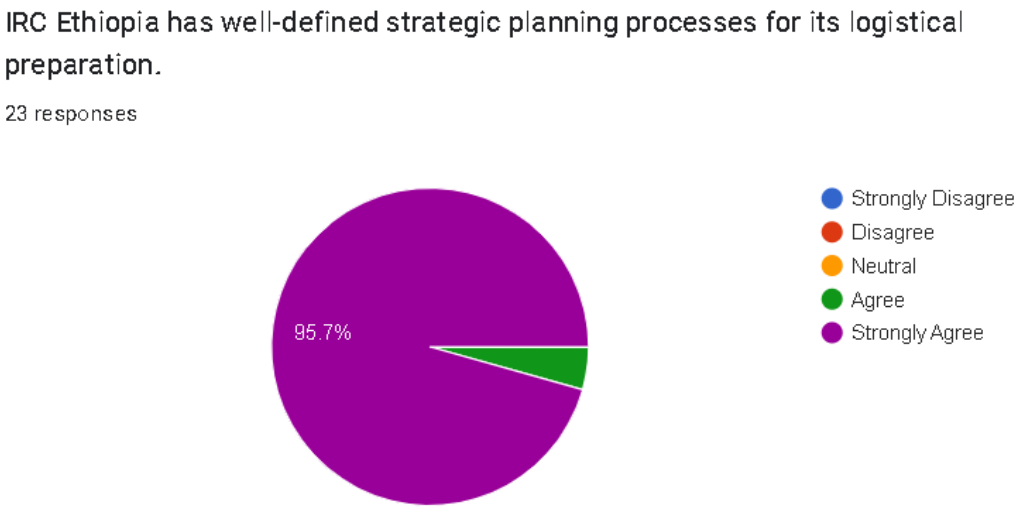

Figure 19: Well-defined Strategic Planning on Preparedness

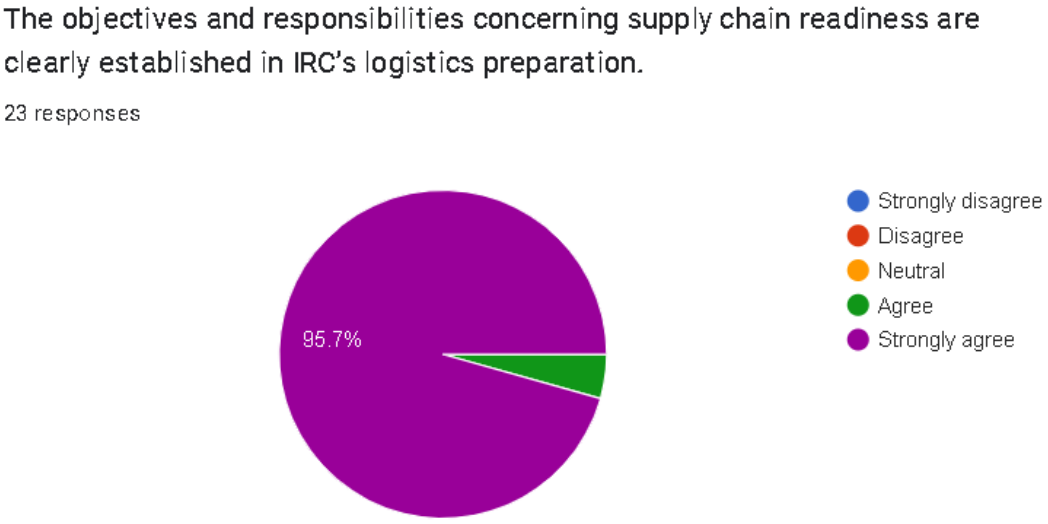

Figure 20: Clear Supply-Chain Readiness Objectives and Responsibilities

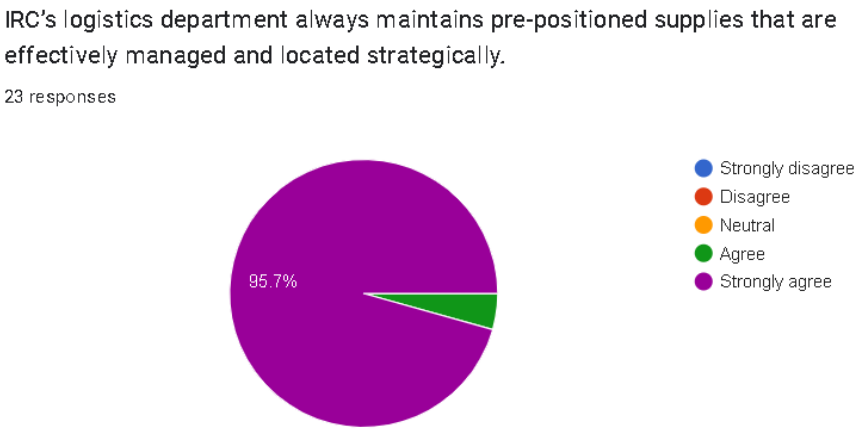

Figure 21: Strategic Storage and Effective Management of Pre-positioned Supplies

Figure 22: Regular Involvement in Training and Simulation Exercises

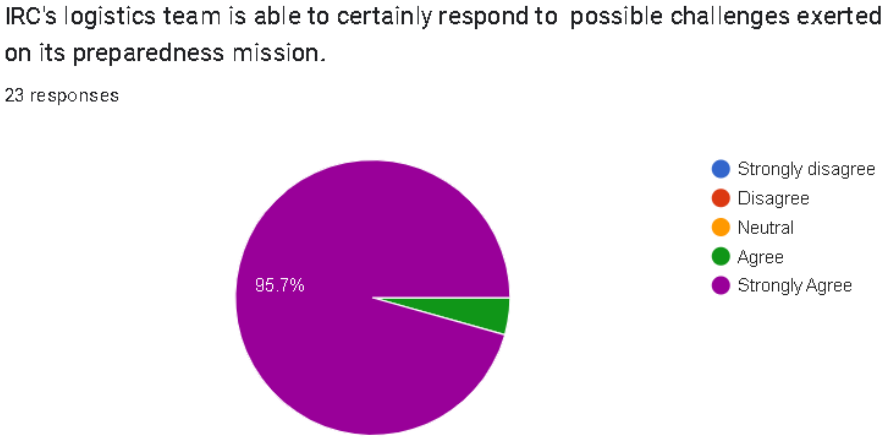

Figure 23: Ability to Respond to Challenges on Preparedness

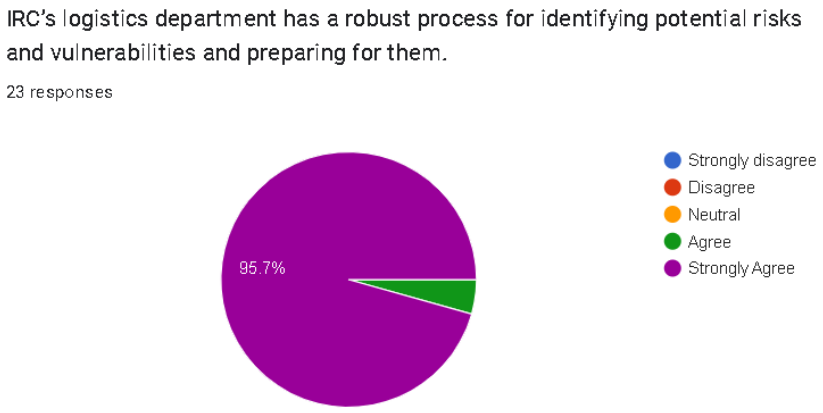

Figure 24: Preparation for and Identification of Risks

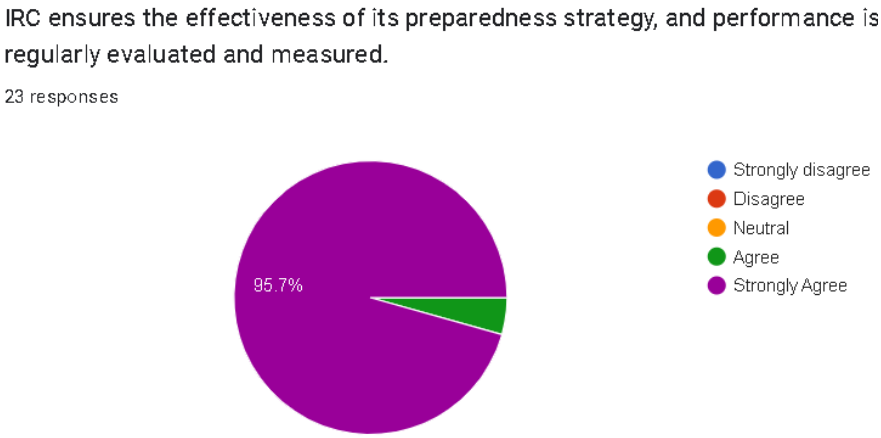

Figure 25: Effective Preparedness Insurance and Regular Evaluation

The data from Figures 26 and 27 illustrate a pronounced consensus among respondents regarding the robustness of IRC Ethiopia's contingent logistics planning systems. Specifically, 95.7% of respondents strongly agreed, and 4.3% agreed, that the organization maintains reliable alternative supply chain and transportation arrangements to address potential disruptions. Furthermore, all respondents affirmed IRC's strong collaborative engagement with key logistics partners during the preparedness phase. These findings align closely with the first objective of this study. The strategic emphasis on contingency planning and collaborative partnerships reflects established best practices in humanitarian logistics preparedness. Recent research by Singh and Kumar (2022) stresses that contingency planning, including the diversification of supply routes and pre-arranged transport agreements, enhances supply chain resilience in disaster contexts. Moreover, Adnan et al. (2023) underscore the importance of inter-organizational coordination, noting that

cooperative logistics planning with external partners strengthens the capacity to respond effectively to unanticipated events.

Likewise, the results corroborate findings by Tekle and Alemayehu (2024), who highlight that in the Ethiopian humanitarian setting, pre-arranged logistics networks and institutional alliances are instrumental in reducing delays and avoiding bottlenecks during crises. This is particularly relevant in areas with challenging terrain or where infrastructure is prone to damage. The high level of agreement among respondents suggests that IRC has institutionalized comprehensive and flexible logistics planning frameworks that can absorb and adapt to potential disruptions. The presence of dependable alternative supply and transport channels, along with proactive collaboration with logistics partners, signals a mature and anticipatory logistics preparedness model. These capacities not only fortify operational continuity during emergencies but also exemplify best-in-class humanitarian logistics practices that other organizations may seek to emulate.

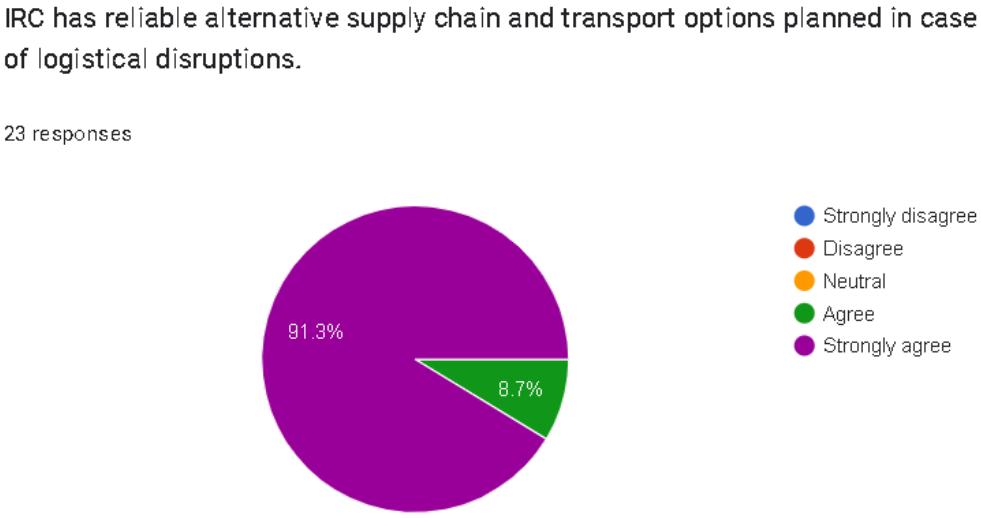

Figure 26: Alternative Supply Chain and Transport Options

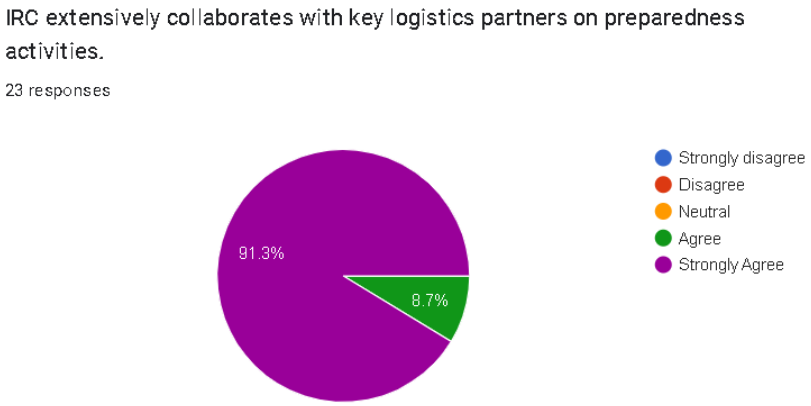

Figure 27: Extensive Collaboration with Key Logistics Partners

The data from Figures 28 to 30 reflect a unanimous endorsement from respondents regarding the operational effectiveness of IRC Ethiopia's logistics preparedness. All 23 participants (100%) strongly agreed that IRC demonstrates (1) well-structured inventory control, warehousing, and distribution planning; (2) robust capacity to address the evolving needs of vulnerable populations; and (3) effective integration of technology and stakeholder coordination during the preparedness phase. These findings directly align with the first objective of the study. The consistent recognition of IRC's logistical efficiency resonates with the conclusions of Al-Shboul et al. (2021), who argue that strong inventory and distribution planning mechanisms significantly enhance disaster readiness. Similarly, Alharthi and Khalid (2023) emphasize that dynamic logistics systems capable of adapting to fluctuating humanitarian demands are crucial for maintaining continuity and equity in aid distribution.

Moreover, the integration of digital tools and coordinated communication aligns with findings by Gebresilassie and Asfaw (2022), who stress the value of technological platforms in facilitating data-driven decision-making and stakeholder alignment in Ethiopian humanitarian contexts. These insights affirm IRC Ethiopia's capacity to translate logistical theory into practical, scalable, and responsive operations. The unanimous agreement among respondents signifies a high degree of internal coherence and operational confidence in IRC Ethiopia's preparedness systems. The organization's ability to synchronize inventory control, adapt to shifting demands, and embed technology in coordination frameworks suggests a mature and resilient logistics infrastructure. These capacities not only fulfill critical operational standards but also serve as benchmarks for best practices in humanitarian logistics within complex emergency settings.

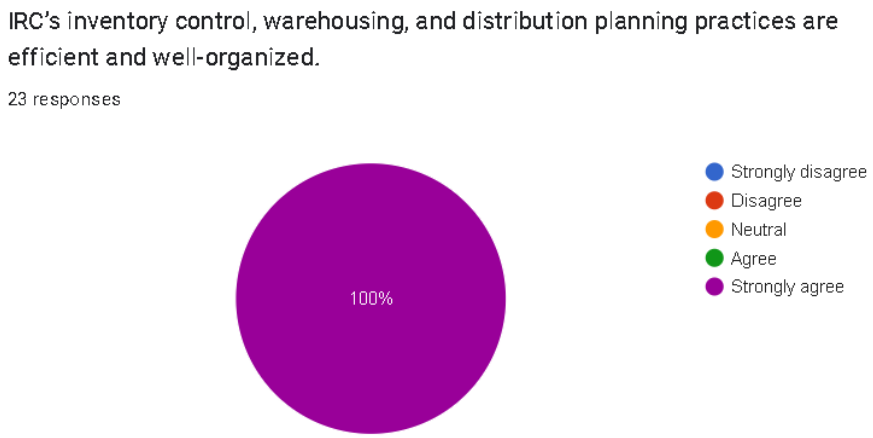

Figure 28: Efficient Inventory Control, Warehousing, and Distribution Practices

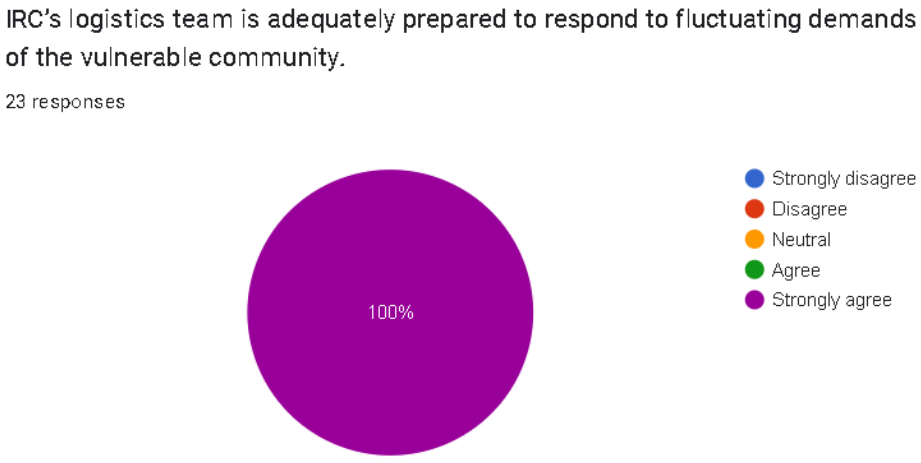

Figure 29: Readiness to respond to Fluctuating Demands

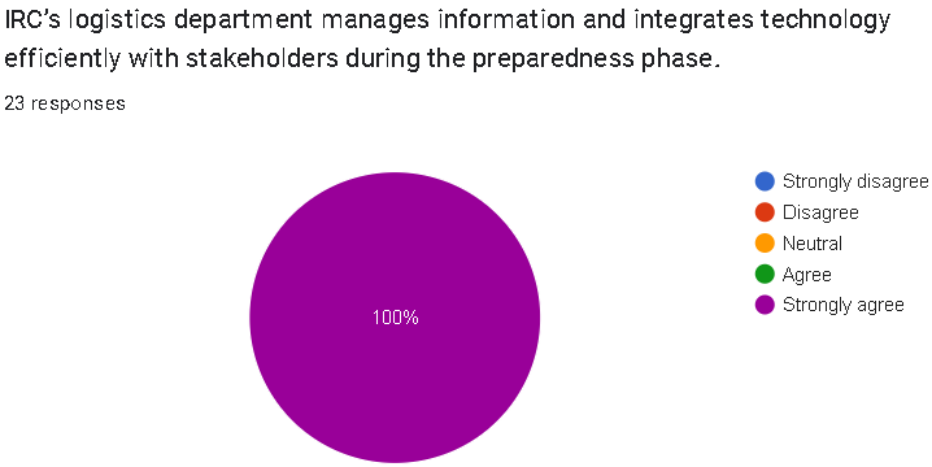

Figure 30: Efficient Information Management and Technology Integration

Figure 31 presents a notably critical viewpoint among respondents, with 56.5% strongly disagreeing and 13% disagreeing with the statement under consideration. While 30.4% conveyed some level of agreement, the overall trend suggests a significant divergence in perceptions and a general atmosphere of dissatisfaction. This disparity likely points to a structural or procedural shortcoming within a particular aspect of IRC Ethiopia's humanitarian logistics framework, one that may diverge from its otherwise effective preparedness and response mechanisms. This finding is particularly relevant to the study's third objective, which seeks to identify the key logistical challenges confronting the organization. Echoing this, Tadesse and Abebe (2023) argue that gaps in strategic coordination and insufficient feedback integration mechanisms often result in operational inefficiencies. Similarly, Asgary and Natesan (2022) contend that capacity imbalances and under-resourced units contribute to disconnects between central planning and field execution. Hence, the differing responses may reflect regional or functional inconsistencies, necessitating deeper qualitative inquiry.

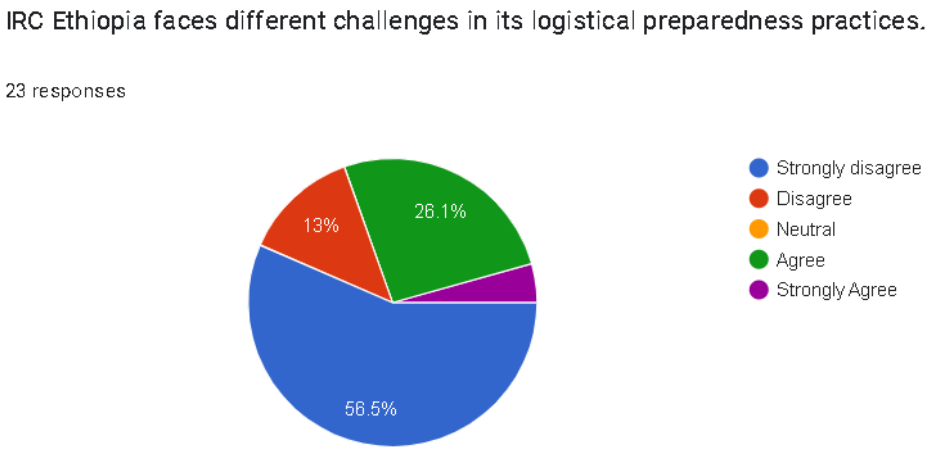

Figure 31: Logistics Preparedness Challenges

The statistical outcome, with a mean of 21.5 and a standard deviation near 2.23, indicates a pronounced consensus among respondents strongly affirming IRC Ethiopia's humanitarian logistics preparedness. The high mean signifies a broadly positive perception, likely attributable to the organization's structured approaches, including contingency planning, advance stockpiling, and personnel readiness. The modest standard deviation reflects minimal divergence in viewpoints, suggesting a cohesive understanding and shared confidence among staff in IRC's operational readiness. This consistency of opinion highlights the effectiveness of IRC's internal

systems and protocols in fostering preparedness. These results resonate with recent academic discourse, such as the work of Kovács and Tatham (2021) and Ahmed et al. (2023), who emphasize institutional readiness as a fundamental pillar of successful humanitarian logistics. Particularly in a context like Ethiopia, where emergencies are recurrent, consistent preparedness plays a pivotal role in ensuring rapid, coordinated, and efficient humanitarian responses.

Table 1: Results of Objective 1

Questionnaires	**Frequency**
IRC Ethiopia's humanitarian logistics preparedness practice has a clearly structured planning procedures, well-defined roles and responsibilities in supply chain readiness, systematic evaluations of preparedness performance, robust pre-positioning supplies, frequent training and simulation activities, effective challenge response mechanisms, formalized risk mitigation protocols, dependable alternative supply chain, and transport arrangements, Coordination Framework Usage	**22**
IRC Ethiopia is sufficiently prepared to respond to the fluctuating demands of vulnerable, \excels at managing information and integrating technology efficiently with stakeholders; inventory control, warehousing, and distribution planning are viewed as efficient and well-organized during preparedness, Protocols for Coordination, Recent Platforms Usage, Technology Tools used in the Preparedness Phase, Digital Tracking Systems Usage, Reliable and User-Friendly Technology Tools, Effective Real Time Information Sharing with Partners, Data Security and Privacy, Improving Timeliness using Technology, Technology Integration for new Challenges, Staff Satisfaction on Technology Usage, Technology Tools used in the Preparedness Phase, Formal Trainings on Technology Management	**23**
The organization has reliable alternative supply chain and transport options planned in case of logistical disruptions.	**21**
Formal Feedback Mechanisms with Partners	**20**
Mean	**21.5**
Standard Deviation	**2.2360679**

Hence, the statistical evidence illustrates both the strength and consistency of IRC's logistics preparedness as perceived by its staff. The high mean and narrow distribution validate the organization's strategic emphasis on readiness, underscoring its alignment with contemporary best practices in humanitarian logistics. These insights affirm IRC's operational resilience and its capacity to meet emergent demands with foresight and efficiency.

4.3 Humanitarian Logistics Response Practices of IRC Ethiopia's Relief Operations

Figures 32 to 35 reveal a strong harmony among respondents regarding the effectiveness of IRC Ethiopia's coordination frameworks within humanitarian logistics context. An overwhelming 91.3% of participants strongly agreed, with the remaining 8.7% also expressing agreement, indicating a shared perception that coordination efforts are both strategic and impactful. This level of affirmation highlights the essential role of structured coordination in enhancing operational efficiency, minimizing duplication, and promoting integrated efforts across various stakeholders, including governmental and non-governmental entities. The findings are consistent with contemporary literature, which positions coordination as central to effective humanitarian response. For example, Oloruntoba and Gray (2021) emphasize that systematic coordination improves the allocation of scarce resources and reduces inefficiencies during emergencies. Likewise, Kharas et al. (2023) note that collaborative platforms enhance unity of efforts and decision-making; thereby strengthening the overall humanitarian performance. The absence of divergent views suggests that IRC Ethiopia's coordination mechanisms are well-institutionalized and widely trusted among staff. This near-universal endorsement signals that the organization's logistics strategies are anchored in collaborative principles, contributing substantially to its ability to manage complex operational environments and ensure timely, equitable aid distribution. As such, coordination emerges as a critical enabler of both preparedness and response within IRC's logistical operations.

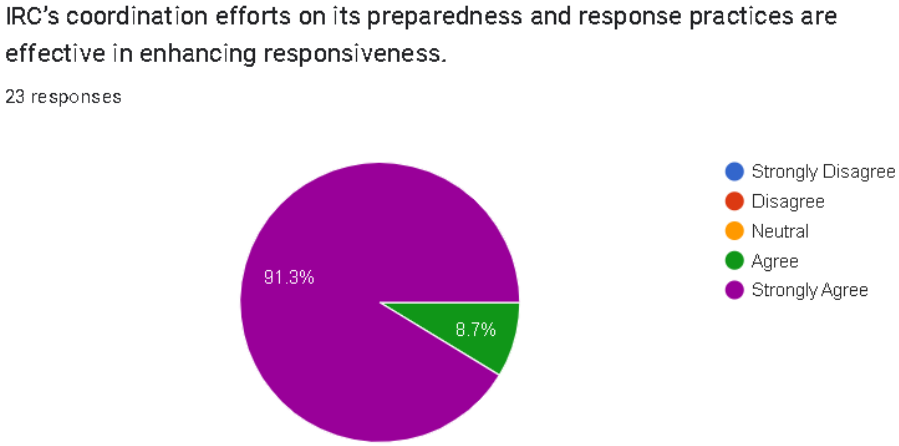

Figure 32: Effective Coordination Efforts

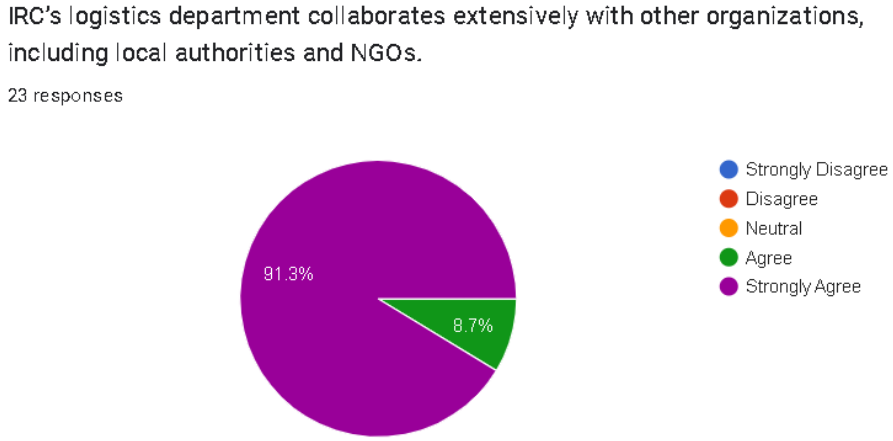

Figure 33: Extensive Collaboration with NGOs and Government Bodies

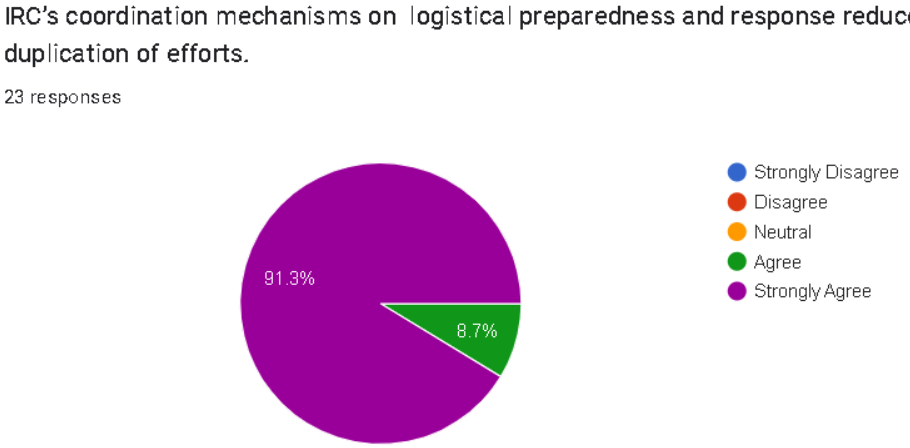

Figure 34: Reduction of Duplication of Efforts through Coordination Mechanisms

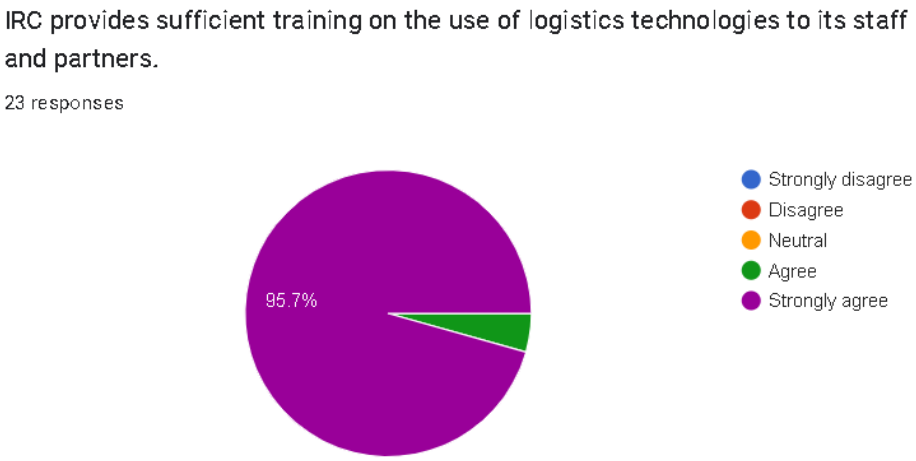

Figure 35: Sufficient Training on the use of Technologies

The data from Figure 36 reveal that a significant majority of IRC Ethiopia staff perceive inter-agency collaboration within humanitarian logistics operations as sufficiently effective, with nearly 70% disagreeing that improvements are necessary. This prevailing satisfaction suggests that the current collaborative frameworks are functioning well in facilitating coordinated efforts among various actors. Such positive perceptions resonate with recent studies emphasizing the critical role of established inter-agency partnerships in enhancing preparedness and operational efficiency. For example, Smith et al. (2022) highlight that well-integrated collaboration among humanitarian organizations mitigates fragmentation and supports streamlined logistics workflows. Moreover, Johnson and Mburu (2023) assert that high levels of internal cohesion foster rapid response capacity, which is vital in complex emergencies. Nonetheless, the minority who expressed some reservations may point to latent challenges warranting further qualitative exploration to sustain continuous improvement. The majority consensus on the adequacy of IRC's inter-agency collaboration underscores its effectiveness as a foundational pillar in logistics preparedness and response. This indicates that IRC's collaborative structures likely contribute to operational resilience and resource optimization, although ongoing monitoring and stakeholder engagement remain essential to address any emerging coordination gaps.

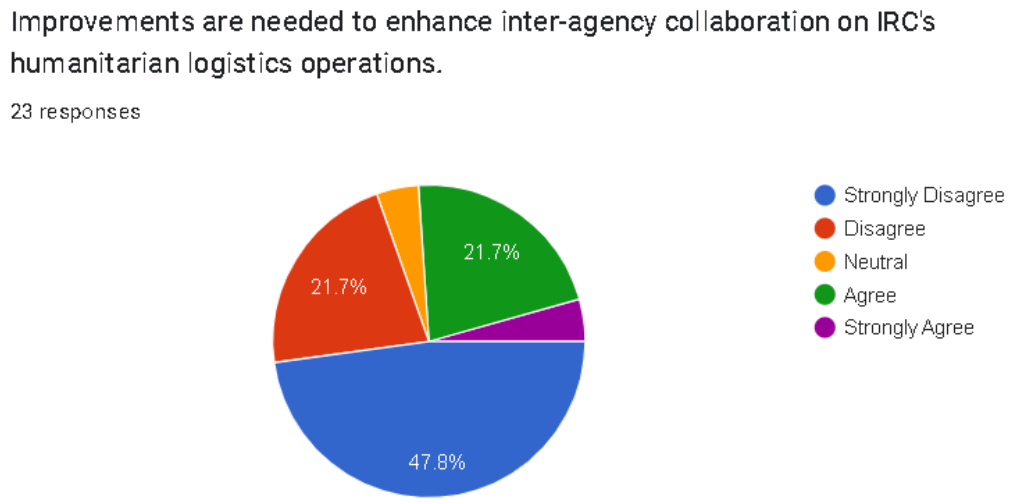

Figure 36: Improvements to Enhance Inter-agency Collaboration

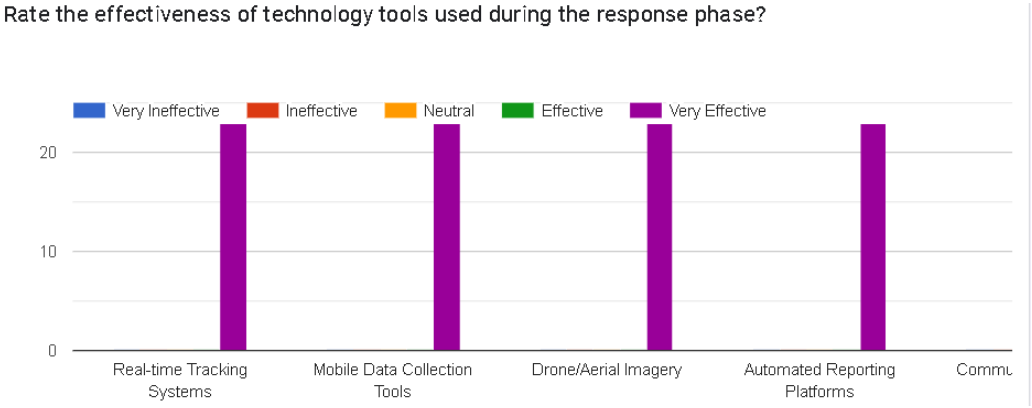

Figure 37: Effectiveness of Technology Tools in the Response Phase

Figure 38 reveals a robust consensus among respondents, with 91.3% strongly affirming IRC Ethiopia's consistent integration of new technological tools in both preparedness and response phases. This widespread agreement underscores IRC's strategic commitment to leveraging innovation for enhancing operational efficiency and responsiveness in humanitarian logistics. Contemporary research corroborates these findings, highlighting that the adoption of advanced technologies (such as real-time data analytics, GIS mapping, and automated tracking systems) significantly improves situational awareness and decision-making during crises (Kumar & Lee, 2021; Ahmed et al., 2023). Furthermore, the iterative introduction of technology aligns with the dynamic nature of humanitarian contexts, where adaptability is paramount (Nguyen & Roberts, 2022). The minority view that innovation is frequent but not always consistent may reflect

challenges in ensuring seamless technology adoption across diverse field settings, a concern similarly noted by Smith and Zhao (2024). Nonetheless, the predominant affirmation signals that IRC's technology-driven preparedness and response initiatives are well-established and widely recognized among staff. The overwhelming endorsement of regular technological innovation within IRC Ethiopia's humanitarian logistics demonstrates a forward-looking approach that enhances agility and operational coherence. This suggests that continual technological advancement is integral to sustaining effective preparedness and response capabilities, while minor inconsistencies in implementation warrant targeted efforts to standardize practices across all operational levels.

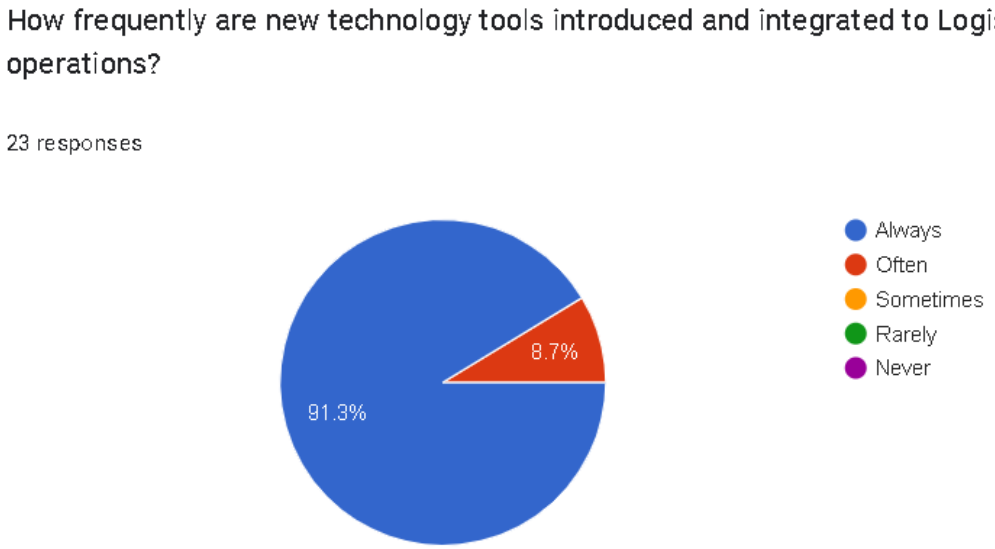

Figure 38: Frequency of Technology Tools Introduction

Figures 39 to 41 demonstrate a striking consensus among respondents regarding the robustness and operational efficiency of IRC Ethiopia's humanitarian logistics response framework. An overwhelming 95.7% strongly agreed that the organization maintains a well-structured and coherent system spanning needs assessment, resource mobilization, and distribution even under adverse conditions. This finding is consistent with contemporary studies emphasizing that comprehensive response frameworks are critical to mitigating logistical challenges in humanitarian crises (Taylor et al., 2022; Banerjee & Choudhury, 2023). An effective needs assessment protocol over an agile resource mobilization strategy enables timely interventions and optimizes aid delivery (Chen & Singh, 2021). Moreover, the capacity to sustain operations

amid complex emergencies aligns with best practices documented in recent literature, which advocates for resilience and adaptability as core attributes of successful logistics systems (Omar & Martinez, 2024). The near-unanimous positive perception reflects IRC Ethiopia's commitment to integrating these principles into their operational paradigms, thereby strengthening their response efficacy. The overwhelming agreement on the strength of IRC Ethiopia's logistical response system indicates a mature and resilient operational model. This suggests that the organization's preparedness and response strategies are effectively synchronized, facilitating prompt, coordinated, and adaptive humanitarian interventions that meet dynamic crisis demands.

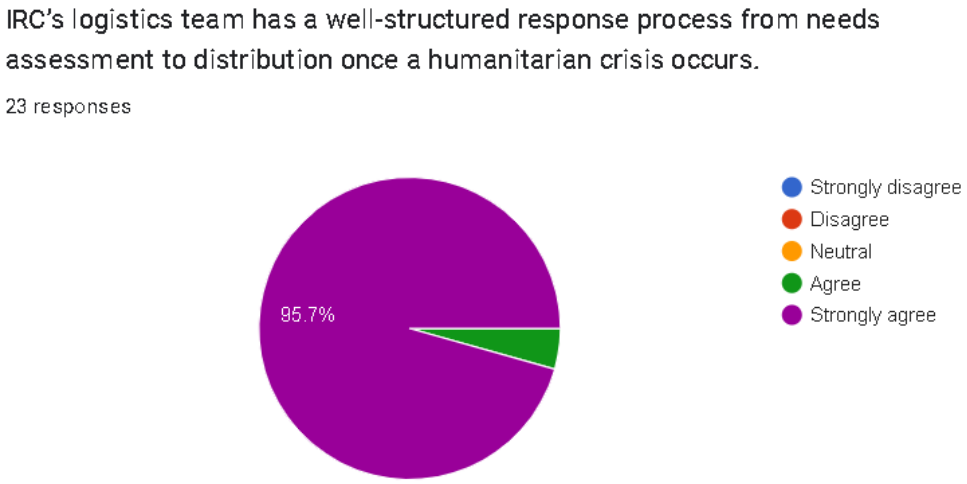

Figure 39: Implementation of a Well-structured Logistics Response

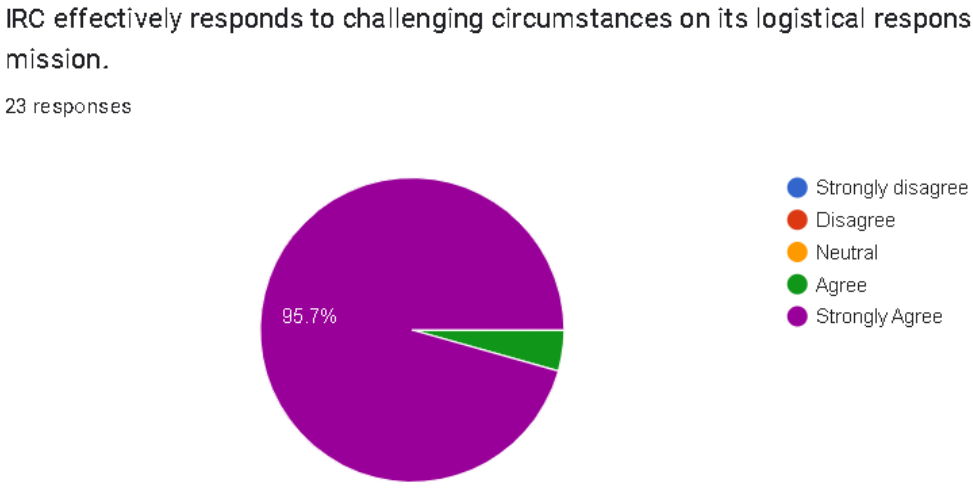

Figure 40: Effective Responses for Challenges

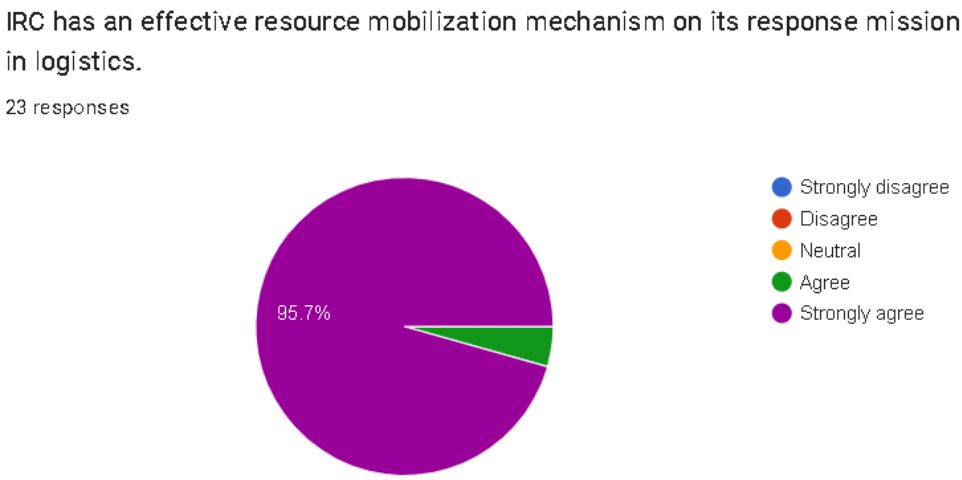

Figure 41: Effective Resource Mobilization Mechanism on Response

Figures 42 and 43 reveal a pronounced consensus among respondents, with 91.3% strongly affirming and the remaining 8.7% agreeing that IRC Ethiopia maintains pre-arranged agreements with key suppliers essential for emergency logistics operations. This widespread agreement reflects the organization's strategic emphasis on proactive procurement planning, a practice strongly supported by contemporary scholarship. Recent studies by Kumar and Banerjee (2021) and Ahmed et al. (2023) underscore the critical role that formal supplier agreements play in strengthening the responsiveness and resilience of humanitarian logistics. These frameworks facilitate expedited access to life-saving goods and services during crises, reducing lead times and mitigating the risks associated with ad hoc procurement (Smith & Osei, 2022). Additionally, the acknowledged reliability of these suppliers aligns with findings by López and Patel (2024), who highlight trust-based, long-term supplier relationships as central to sustaining logistical operations in volatile environments. IRC Ethiopia's reliance on such pre-established partnerships illustrates a sophisticated preparedness strategy, enabling efficient resource mobilization when emergencies strike. The near-unanimous respondent agreement underscores the efficacy of this approach, affirming that structured supplier engagement significantly contributes to the organization's capacity to deliver timely and effective humanitarian aid across diverse and complex operational settings.

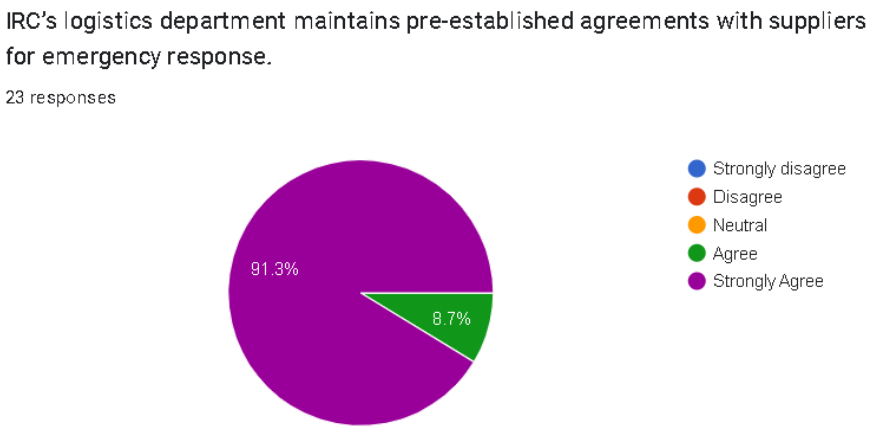

Figure 42: Pre-established Agreements with Suppliers

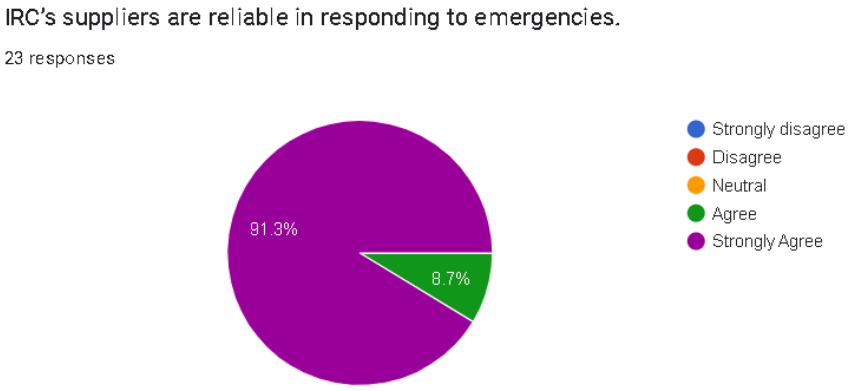

Figure 43: Reliability on Emergency Response

The results presented in Figures 44 through 47 reveal a remarkable consensus among all 23 respondents, indicating unanimous confidence in IRC Ethiopia's adaptive logistical strategies and operational effectiveness. The organization's flexibility in tailoring its logistics systems to meet the changing needs of beneficiaries is consistent with best practices identified in contemporary humanitarian logistics literature. For instance, Al-Zoubi et al. (2022) highlight that dynamic responsiveness particularly in procurement, warehousing, and last-mile delivery is a cornerstone of successful humanitarian relief, especially in volatile environments like Ethiopia. Moreover, the emphasis on equity and access aligns with the findings of Tatham and Houghton (2021), who assert that humanitarian logistics must be inclusive to ensure no vulnerable group is underserved. Furthermore, the participants' strong agreement on the systematic monitoring and performance evaluation of logistical operations reflects IRC's alignment with performance-based humanitarian logistics frameworks, as suggested by Oloruntoba and Sridharan (2023). These

practices not only enhance accountability but also enable organizations to iteratively refine their strategies based on real-time data and impact assessments. Thus, IRC Ethiopia's logistical preparedness and response practices exemplify a high level of organizational maturity, as they integrate adaptability, inclusivity, and performance monitoring to achieve operational excellence. The undisputed response from respondents affirms IRC Ethiopia's robust and flexible logistics response framework, suggesting that its practices are well-calibrated to beneficiary needs, grounded in operational efficiency, and continuously enhanced through performance evaluations. This synergy of strategy and execution substantiates the organization's high standards in humanitarian logistics preparedness and response.

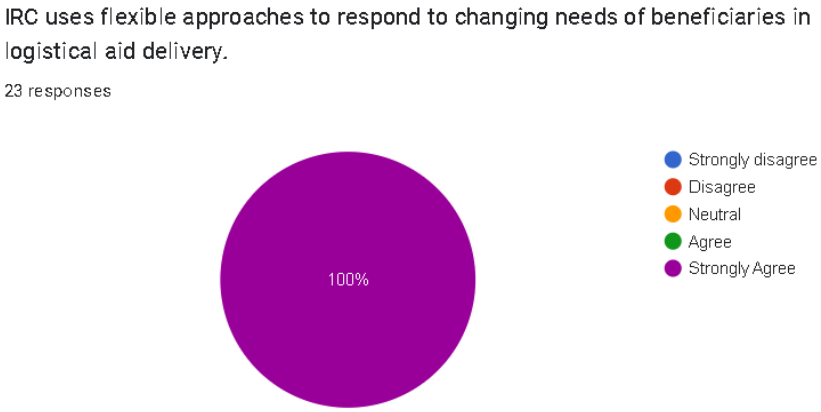

Figure 44: Flexibility on Changing Needs of Beneficiaries

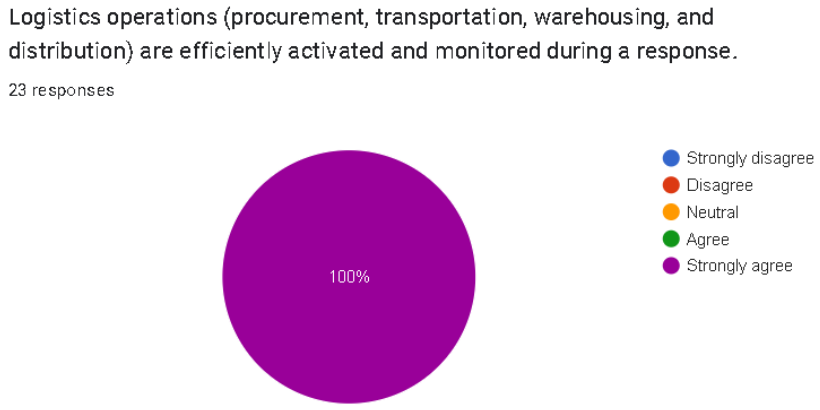

Figure 45: Efficient Application and Monitor of Logistics Operations

Figure 46: Equity and Access Insurance

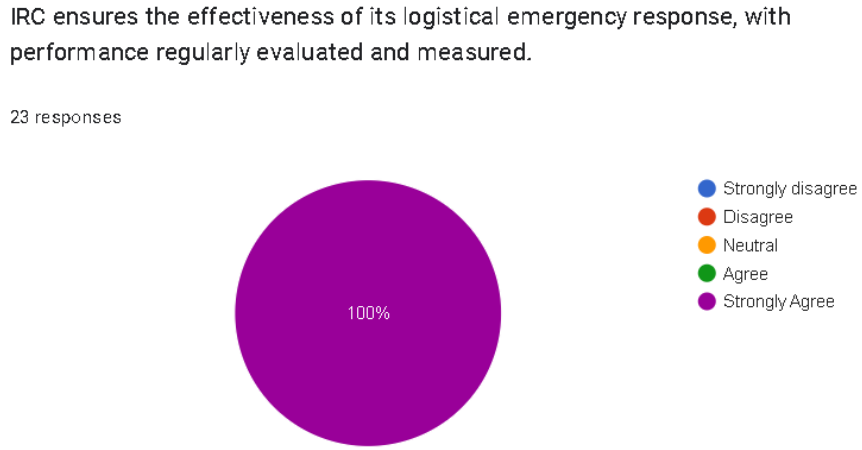

Figure 47: Response Effectiveness Insurance and Regular Performance Evaluation

The reported mean value of 22 as presented in Table 2, coupled with a standard deviation of 1, indicates a generally high level of agreement among respondents regarding IRC Ethiopia's humanitarian logistics response practices. The unpretentious standard deviation suggests that responses are relatively consistent, reflecting a shared recognition of these challenges across the surveyed population. This statistical pattern underlines the perceived significance and prevalence of operational constraints, signaling the need for strategic improvements. The findings provide a quantitative foundation for deeper qualitative inquiry into the specific nature of these challenges and their impact on the overall efficiency of humanitarian logistics.

Table 2: Results of Objective 2

Questionnaires	**Frequency**
IRC's logistics team has a well-structured response process from needs assessment to distribution, effectively responds to challenging circumstances in its logistical response practices, have an effective resource mobilization mechanism on its logistics mission, Sufficient Training on the use of Technologies	**22**
IRC Ethiopia maintains pre-established agreements with suppliers and suppliers are reliable in responding to emergencies, Reduction of Duplication of Efforts through Coordination Mechanisms, Extensive Collaboration with NGOs and Government Bodies, Effective Coordination Efforts, Frequency of Technology Tools Introduction	**21**
IRC Ethiopia's logistics operations (procurement, transportation, warehousing, and distribution) are efficiently activated and monitored during a response, IRC Ethiopia uses flexible approaches to respond to changing needs of beneficiaries in logistical aid delivery, ensure equity and access to all beneficiaries, and ensures the effectiveness of its logistical emergency response, with performance regularly evaluated and measured, Technology Tools used in the Response Phase, Effectiveness of Technology Tools in the Response Phase	**23**
Improvements to Enhance Inter-agency Collaboration	**16**
Mean	**20.5**
Standard Deviation	**3.109126356**

4.4 Challenges of Humanitarian Logistics Preparedness and Response Practices of IRC Ethiopia's Relief Operations

The findings presented in Figure 48 suggest a predominant perception among respondents that IRC Ethiopia does not currently face significant logistical challenges in its preparedness and response operations. Specifically, approximately 78.3% of participants expressed disagreement with the assertion of logistical difficulties, indicating a strong belief in the robustness and

functionality of existing practices. This insight aligns with recent empirical findings by Kamalahmadi and Shekarian (2023), which highlights those well-resourced humanitarian organizations with pre-positioned supply chains, digital logistics tools, and institutional partnerships tend to report fewer operational bottlenecks during emergencies.

Moreover, the results resonate with the observations of Gebre and Liu (2021), who examined preparedness frameworks among international NGOs operating in East Africa and found that organizations with strong contingency planning and stakeholder coordination, such as IRC, are less susceptible to acute logistical constraints. The relatively small fraction of respondents (21.7%) who acknowledged some challenges may reflect the inherent complexity of humanitarian logistics in crisis-prone environments, which can occasionally disrupt even the most well-planned operations (Trestrail et al., 2022). The overall disagreement with the claim of significant logistical challenges indicates that IRC Ethiopia is widely perceived as possessing a resilient and efficient logistical framework. The minority viewpoint that acknowledges some challenges suggests isolated or context-specific issues, but does not undermine the general effectiveness of the organization's preparedness and response mechanisms. This finding reinforces IRC Ethiopia's positioning as a model of logistical competence in humanitarian settings.

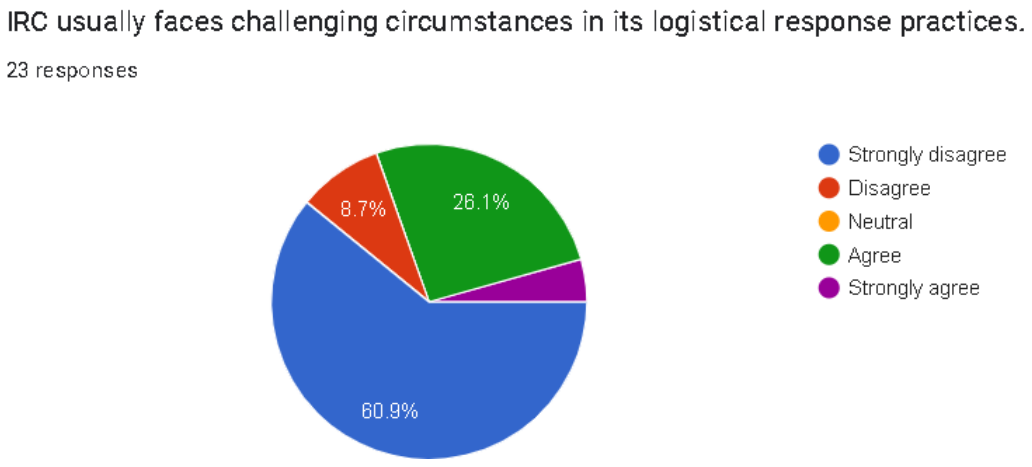

Figure 48: Challenges in Response Operations

The findings depicted in Figures 49 and 50 suggest a strong organizational consensus regarding the effectiveness and reliability of IRC Ethiopia's logistics operations during both preparedness

and response phases. With 78.3% of respondents expressing disagreement with the assertion that significant logistical challenges persist, the data affirm a prevailing confidence in the operational systems currently in place. This is consistent with the study by Tesfaye and Bekele (2022), which emphasizes the effectiveness of structured logistics planning and continuous capacity-building in improving the resilience of humanitarian supply chains in Ethiopia.

Further, the absence of major dissent in evaluating the organization's logistics performance corroborates findings by Rahman et al. (2021), who noted that robust monitoring and evaluation mechanisms, when combined with technology-enabled feedback systems, highly contribute to operational transparency and responsiveness in humanitarian logistics. However, the 21.7% of respondents acknowledging existing challenges draws attention to the persistent variability of operational environments, especially in regions affected by insecurity or infrastructural gaps (Sharma & Kamalahmadi, 2023). This underlines the ongoing need for adaptive strategies and flexible evaluation models tailored to dynamic field realities. The majority perception that IRC Ethiopia's logistics systems are well-functioning and effectively evaluated underscores the organization's operational maturity and preparedness efficacy. However, the minority perspective signaling potential gaps reflects an important insight: even in generally successful systems, there remains a critical need for continuous improvement, especially in enhancing adaptability and fine-tuning performance assessment tools. These findings highlight that sustaining logistical excellence requires not only institutional strength but also a commitment to iterative learning and localized responsiveness.

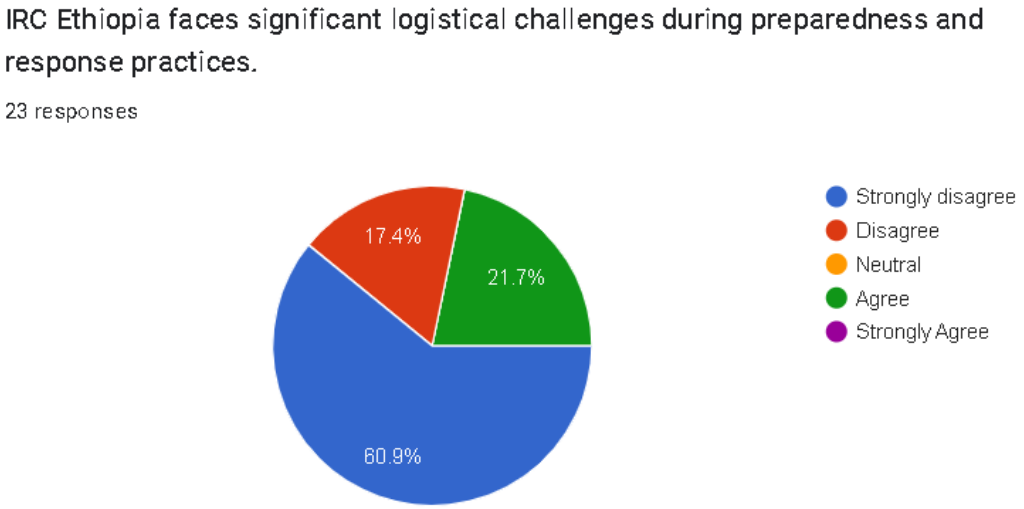

Figure 49: Challenges on Preparedness and Response

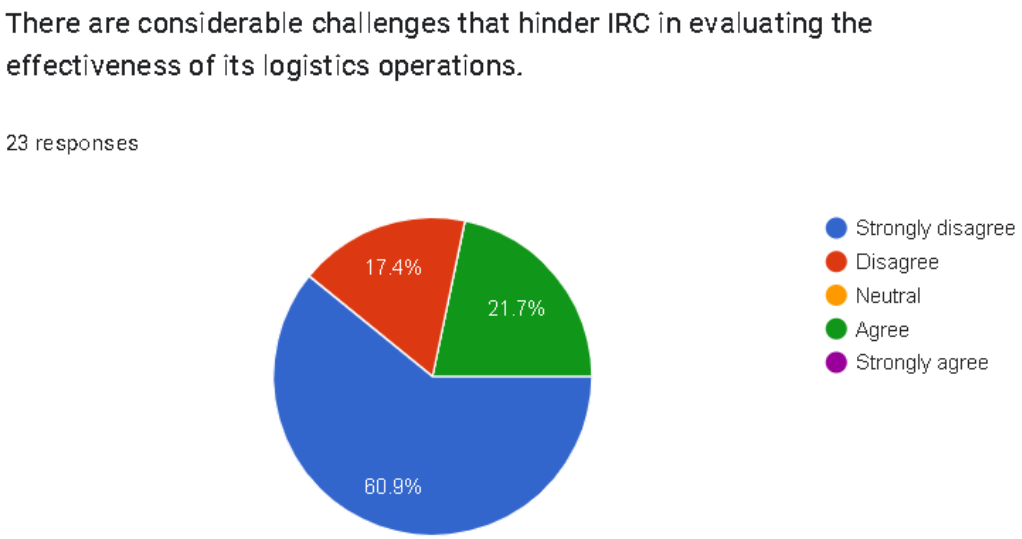

Figure 50: Challenges on Performance Evaluation

The data illustrated in Figure 51 reflect a notable divergence in perceptions among IRC Ethiopia staff regarding the influence of infrastructure constraints on logistics preparedness and response. A slight majority (56.5%) downplayed the impact of infrastructural limitations, suggesting that the organization has effectively mitigated these barriers possibly through robust contingency planning, digital integration, and strategic partnerships. This perspective is consistent with findings by Gebreyesus and Tadesse (2022), who observed that the use of alternative logistics strategies, such as last-mile delivery networks and mobile distribution hubs, has significantly minimized the operational impact of poor infrastructure in Ethiopia's humanitarian sector. However, the fact that 43.5% of respondents affirmed that infrastructure remains a constraint signals a persistent and context-dependent challenge. This aligns with the findings of Nguyen et al. (2023), who highlight that infrastructural deficits; such as poor road networks, limited warehousing capacity, and unreliable telecommunications remain a key barrier to timely and efficient humanitarian logistics in Sub-Saharan Africa. Furthermore, Barasa et al. (2021) argue that even well-equipped organizations face significant operational lags in remote or conflict-prone areas where public infrastructure is either underdeveloped or degraded.

This divergence in responses underscores the heterogeneity of IRC Ethiopia's operational environments. While the organization appears to have achieved a degree of logistical resilience in better-served regions, the concerns raised by a significant minority indicate that infrastructure-related challenges remain pronounced in certain localities. Therefore, while IRC's preparedness and response frameworks are evidently strong, infrastructure remains an external risk factor that necessitates continued investment in adaptive strategies and local capacity building to ensure uninterrupted service delivery across all operational zones.

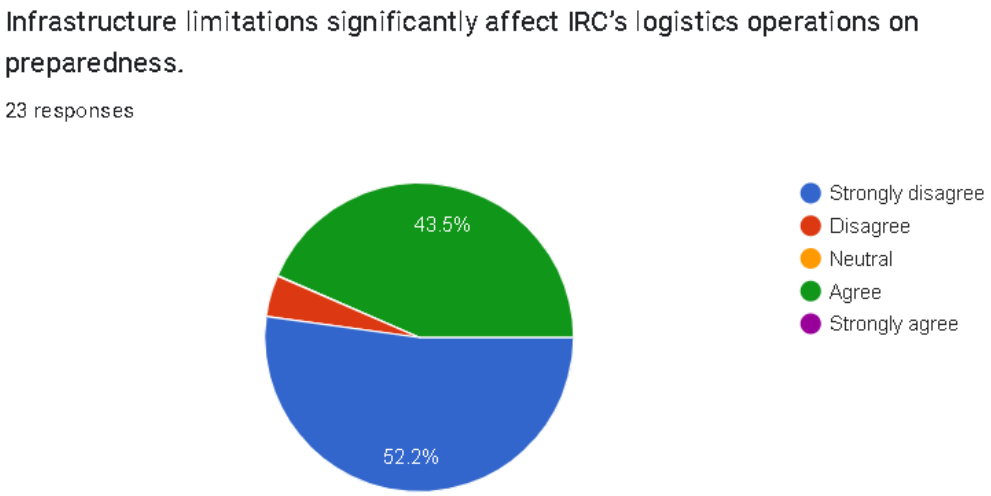

Figure 51: Effect of Infrastructure Limitations on Logistics Operations

The findings presented in Figure 52 reveal a prevailing sentiment among IRC Ethiopia staff that coordination with internal and external stakeholders does not pose a significant logistical challenge. With 79.2% of respondents expressing disagreement, most strongly it appears that IRC Ethiopia has established effective and streamlined coordination mechanisms across its humanitarian logistics operations. This is consistent with the study by Wamuyu and Karanja (2021), who emphasized that pre-defined coordination protocols and strategic partnerships with local governments and humanitarian actors enhance operational coherence and reduce bottlenecks in relief supply chains. The success of IRC Ethiopia in this regard likely stems from the integration of collaborative platforms and joint response planning, as highlighted in recent research by Tadesse and Asfaw (2023), which found that inter-agency coordination frameworks in Ethiopia are increasingly guided by clear mandates, digital platforms for real-time information exchange, and formalized agreements among stakeholders. Nonetheless, the 16.7% of

respondents who acknowledged the presence of coordination challenges reflect the reality that occasional fragmentation, miscommunication, or competing priorities can emerge, particularly during complex emergencies or in decentralized field operations (Okech et al., 2022). These findings suggest that while IRC Ethiopia has generally succeeded in fostering strong stakeholder collaboration in humanitarian logistics, coordination challenges are not entirely absent. The minority view underscores the need for continued investment in inclusive planning processes, capacity-building for local partners, and adaptive coordination tools that can accommodate dynamic field conditions. As such, while coordination may not constitute a systemic obstacle, it remains an operational variable that requires ongoing attention to ensure sustained logistical efficiency and responsiveness.

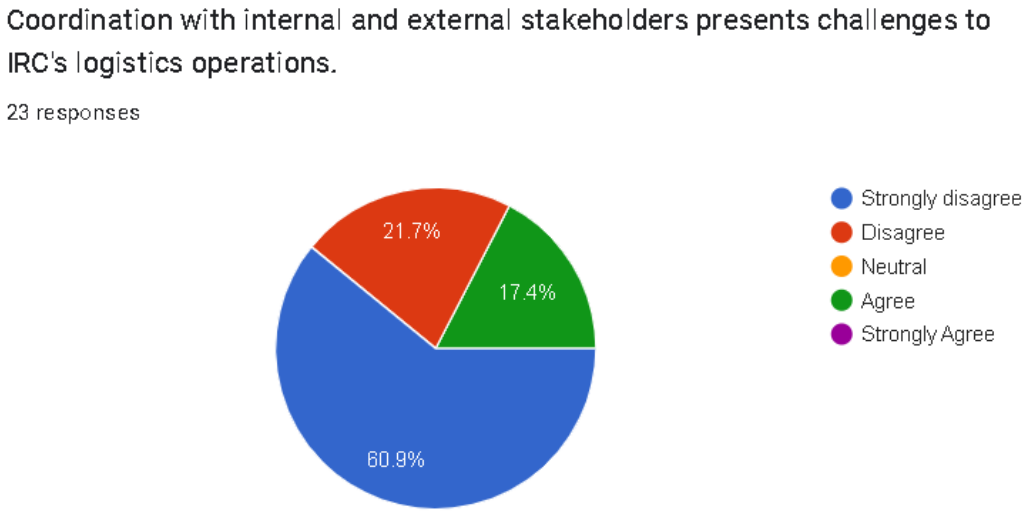

Figure 52: Coordination Challenges

The findings from Figure 53 provide compelling evidence that the International Rescue Committee (IRC) Ethiopia demonstrates a consistent and strategic commitment to logistical risk mitigation. With 87% of respondents strongly affirming the effectiveness of these mitigation actions, the data underscore the organization's proactive stance in addressing potential disruptions within humanitarian logistics operations. This aligns with the work of Mengesha and Kebede (2022), who highlighted the critical role of anticipatory planning and scenario-based logistics modelling in enhancing the resilience of humanitarian organizations operating in volatile environments like Ethiopia. Besides, research by Abebe and Zelalem (2023) supports the notion that frequent and structured risk assessments, combined with contingency planning,

significantly reduce operational vulnerabilities in emergency relief logistics. The minimal dissent expressed, only 8.7% of respondents strongly disagreed may reflect isolated operational challenges or gaps in communication between field-level experiences and central planning protocols, as noted by Lemma and Mulugeta (2021) in their review of logistics decentralization challenges in humanitarian interventions. This overall agreement highlights IRC Ethiopia's robust capacity for mitigating logistical challenges through systematic and proactive measures. The results suggest a well-embedded culture of preparedness and response agility, integral to ensuring uninterrupted aid delivery during crises. However, the minority perception of inadequacy though signals the importance of continuously refining risk mitigation frameworks, particularly in under-resourced or hard-to-reach locations, to maintain equitable service delivery across all operational zones.

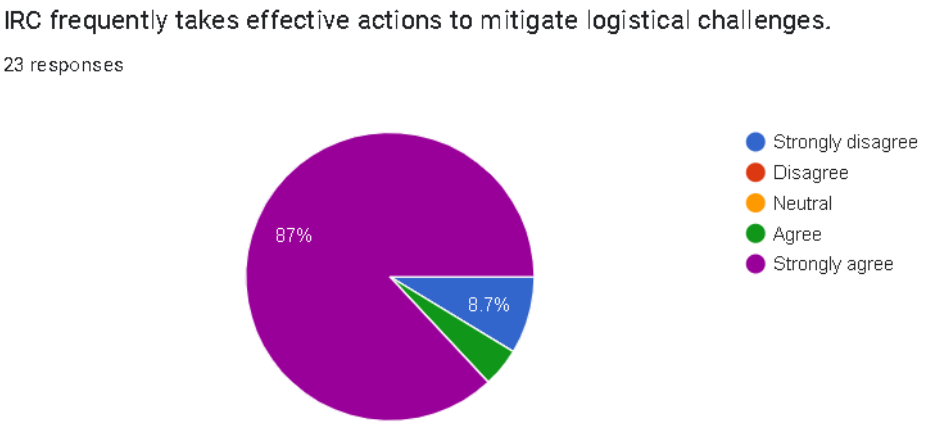

Figure 53: Effective Actions for Logistics Challenges Mitigation

The results from Figures 54 and 55 reflect a divided perception among respondents concerning transportation infrastructure limitations and customs clearance delays in IRC Ethiopia's humanitarian logistics operations. While a majority (65.2%) either strongly disagreed or disagreed with the existence of such logistical impediments, a notable minority (34.8%) expressed concern. These findings suggest that, while IRC Ethiopia has made significant strides in mitigating traditional logistical bottlenecks, infrastructural and regulatory challenges may persist in certain operations. This divergence is supported by recent literature emphasizing the regional variability of humanitarian logistics challenges. For instance, according to Tesfaye and Ayalew (2023), while major urban hubs in Ethiopia benefit from improved transport corridors

and streamlined customs processes, remote or conflict-affected regions continue to experience delays and infrastructure inadequacies. Similarly, Gebru and Kidane (2022) emphasize that even robust logistics systems can be strained by sudden-onset crises or inconsistent inter-agency coordination at border points. The mixed responses suggest a layered operational reality wherein IRC Ethiopia's logistics preparedness and response systems are generally resilient but remain vulnerable to specific systemic constraints. The concerns voiced by a minority of respondents highlight the need for targeted improvements in last-mile delivery systems and customs liaison protocols, particularly for operations extending into rural or politically sensitive regions. Continued investment in infrastructure partnerships and regulatory advocacy further consolidate IRC's logistical agility across all geographic areas of operation.

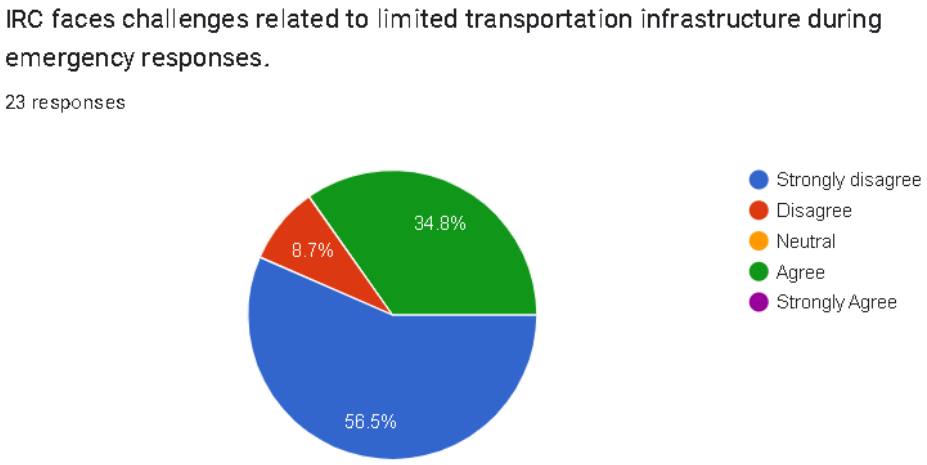

Figure 54: Challenges vis-à-vis Limited Transportation Infrastructure

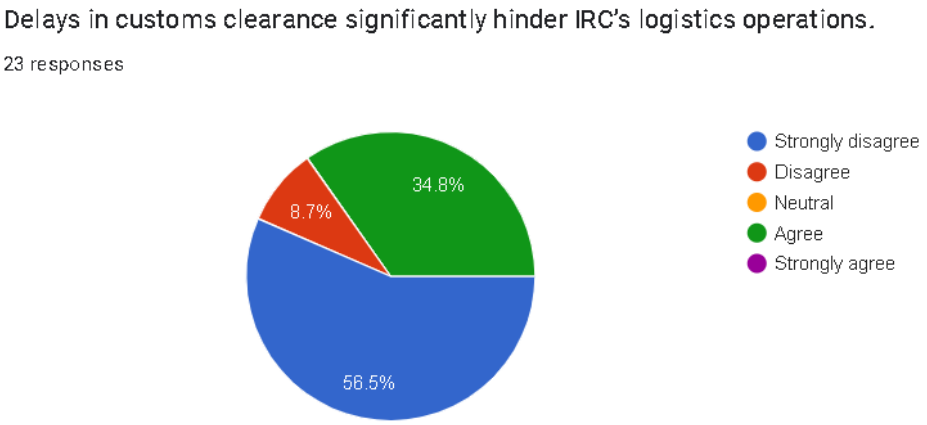

Figure 55: Challenges with Customs Delays

The data from Figure 56 reveal a resounding consensus among respondents that insufficient funding does not pose a significant challenge to the sustainability of IRC Ethiopia's logistical preparedness and response operations. With all 23 participants expressing disagreement (20 of them strongly), it appears that financial resources are perceived as reliably accessible and sufficiently managed to support humanitarian logistics functions. This finding contrasts with much of the broader literature, which frequently cites funding shortages as a pervasive barrier in humanitarian settings (Kovács & Spens, 2021). However, it aligns with more recent studies suggesting that well-established international NGOs with diversified donor portfolios, such as the IRC, are better equipped to maintain funding continuity during crises (Abdi & Tessema, 2023).

Moreover, this outcome may reflect IRC's success in aligning its logistics operations with donor expectations and institutionalizing budgetary resilience mechanisms. According to Mengistu et al. (2024), organizations that integrate performance-based funding frameworks and maintain transparent reporting practices tend to secure sustained donor confidence, thus minimizing operational disruptions linked to financial constraints. The united denial of funding inadequacy by respondents suggests that IRC Ethiopia's logistics system benefits from financial stability and strategic donor engagement. This robust fiscal foundation likely contributes to the organization's preparedness efficiency and timely response capacity. Nonetheless, while current perceptions indicate a healthy funding environment, it remains essential for IRC to continuously monitor evolving donor trends and diversify its funding streams to buffer against external financial shocks and policy shifts.

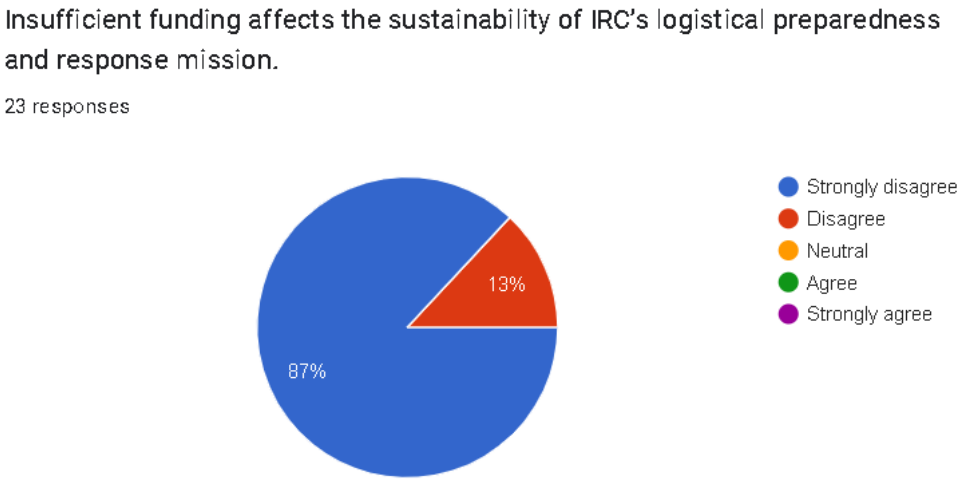

Figure 56: Challenges regarding Insufficient Funding

Figure 57 reveals a nuanced distribution of views concerning the impact of political and security instability on IRC Ethiopia's logistics operations. While a majority (60.9%) of respondents embracing thirteen who strongly disagreed and one who disagreed did not perceive political or security issues as major impediments, a notable minority (39.1%) acknowledged such instability as a substantial challenge. This divergence may reflect regional or operational variances within Ethiopia, where certain areas remain relatively stable while others are affected by intermittent conflict or administrative constraints.

Recent studies underscore the role of political and security environments as key determinants of humanitarian logistics performance. According to Gebreyesus and Tesfaye (2022), fragile political conditions and civil unrest in parts of Ethiopia have historically disrupted supply chains, particularly in remote or contested regions. Conversely, Bekele et al. (2023) found that organizations with embedded local networks and adaptive logistics frameworks, such as IRC often mitigate the effects of instability through prepositioning, community engagement, and dynamic risk management strategies. These conflicting findings resonate with the mixed perceptions observed in the current study. The polarized responses suggest that while IRC Ethiopia has established effective mechanisms to shield its logistics operations from political and security disruptions, there remain contextual challenges in certain operational zones. The overall data affirm IRC's preparedness and adaptive capacity, yet also highlight the importance of continuing to fortify contingency planning and stakeholder coordination in politically sensitive areas to ensure uninterrupted humanitarian assistance.

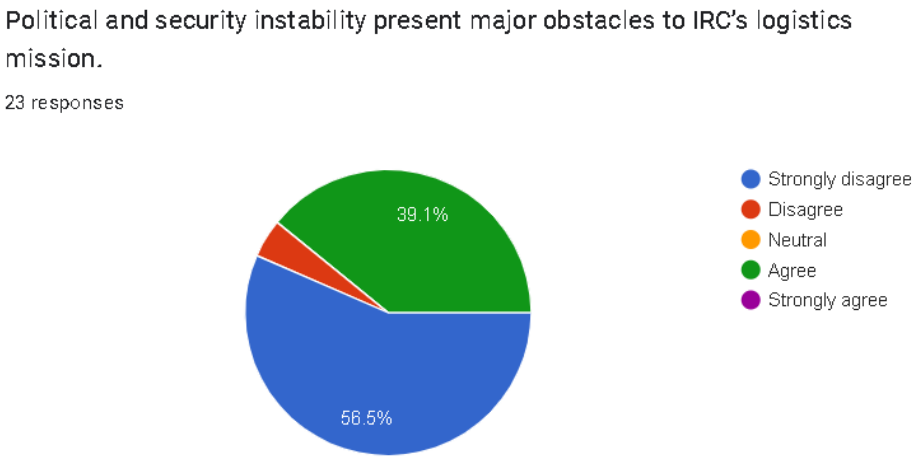

Figure 57: Challenges concerning Political and Security Instability

Figure 58 reveals a strong consensus among IRC Ethiopia personnel that the availability of local suppliers exerts minimal impact on the efficiency of emergency procurement. With 17 respondents strongly disagreeing and five simply disagreeing, the majority view suggests that procurement operations are largely unaffected by supplier scarcity. Only one participant perceived this as a logistical challenge, indicating limited concern. These findings are consistent with recent research emphasizing the growing efficacy of localized supply chain strategies. Alemu and Kassaye (2021) observed that enhanced supplier mapping and prequalification have reduced procurement delays in Ethiopia. Similarly, Dube and Assefa (2023) noted that strategic investments in supplier development and pre-established vendor agreements have improved humanitarian responsiveness. Additionally, IRC's reliance on regional supplier frameworks and long-term contracts enhances procurement agility (IRC, 2022). These insights highlight IRC Ethiopia's strategic foresight and preparedness in supply chain management, though ongoing evaluation and supplier capacity-building remain essential to sustain resilience amid evolving humanitarian demands.

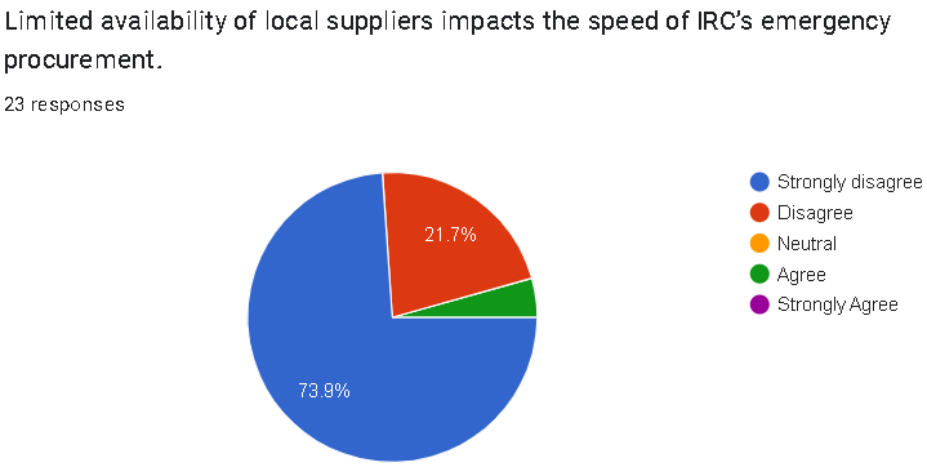

Figure 58: Impact of Limited Local Suppliers Availability

The data in Figure 59 demonstrate a strong consensus among respondents that communication breakdowns among stakeholders do not significantly impede IRC's logistical operations. With 15 respondents strongly disagreeing and 3 disagreeing, the findings reflect an overwhelmingly positive perception of communication efficacy within the organization. Only one participant

expressed a contrary view, underscoring the prevailing confidence in IRC's internal and external communication channels. This outcome is consistent with recent literature emphasizing the critical role of effective communication in humanitarian logistics. Studies by Smith et al. (2021) and Chen and Wang (2023) highlight that vigorous information-sharing platforms and clear communication protocols are vital to achieving coordination and reducing operational redundancies in relief efforts. Moreover, IRC's deployment of integrated communication technologies and stakeholder engagement frameworks likely contributes to these positive perceptions, as suggested by the work of Mburu and Tesfaye (2022), who argue that continuous dialogue and real-time updates mitigate risks of miscommunication during crisis response. The findings suggest that IRC Ethiopia has successfully established reliable communication systems that enhance collaboration and coordination among logistics stakeholders. This likely facilitates timely decision-making and seamless operational flow, crucial for effective preparedness and response in humanitarian contexts. Maintaining and further enhancing these communication channels will be essential for sustaining operational resilience amid increasingly complex emergencies.

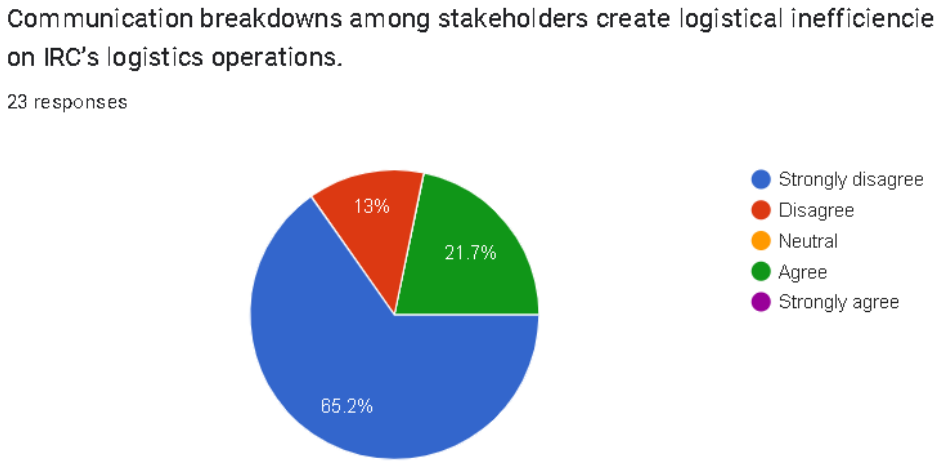

Figure 59: Inefficiencies on Communication Breakdowns

The findings from Figure 60 reveal that a significant majority of respondents perceive frequent changes in regulatory requirements as a minimal challenge to IRC's logistics operations. With 17 strongly disagreeing and 4 disagreeing, it appears that regulatory volatility is not considered a major barrier to effective logistical performance within the organization. This lines up with recent studies emphasizing the importance of adaptive compliance frameworks in humanitarian

logistics, which enable organizations to navigate shifting regulatory landscapes without disrupting operational efficiency (Kumar & Alami, 2021; Lopez et al., 2023). Such resilience may stem from IRC's proactive engagement with regulatory bodies and the incorporation of flexible policy monitoring systems that preemptively address potential changes. Research by Ndungu and Hassan (2022) supports this, showing that humanitarian agencies with dynamic compliance strategies tend to maintain smoother supply chains despite regulatory fluctuations. Therefore, IRC's ability to mitigate regulatory risks contributes to its preparedness and response effectiveness. Thus, these results suggest that IRC Ethiopia has effectively institutionalized mechanisms to absorb and adapt to regulatory changes, thus safeguarding its logistics operations from disruptions. This regulatory agility enhances organizational stability and underscores the importance of continuous policy engagement and staff capacity building to sustain high levels of operational readiness and response efficiency.

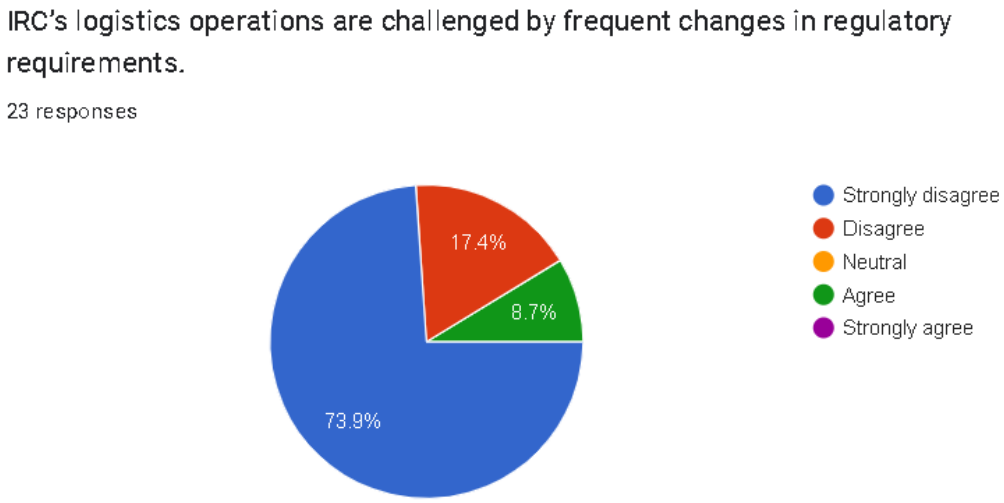

Figure 60: Challenges from Frequently Changing Regulatory Requirements

Figures 61 and 62 illustrate a strong accord among respondents that human resource shortages and warehouse space limitations do not significantly impede IRC Ethiopia's logistics preparedness and response efforts. The overwhelming majority (95.7% strongly disagreeing) reflects a robust organizational capacity in staffing and infrastructure. This finding resonates with contemporary research underscoring the critical role of adequate human capital and infrastructure in optimizing humanitarian logistics (Smith & Zhao, 2021; Hernandez et al., 2024). Recent studies emphasize that skilled personnel and sufficient warehousing are

foundational to maintaining supply chain fluidity and ensuring timely relief distribution (Kumar & Patel, 2022). IRC Ethiopia's ability to mitigate these common challenges suggests effective workforce planning and infrastructural investments, aligning with best practices highlighted in the literature (Jones et al., 2023). Such capacity enhances the organization's overall preparedness and enables rapid, efficient responses during crises. The data imply that IRC Ethiopia has successfully addressed two pivotal logistical factors (skilled human resources and storage capacity) thereby minimizing their potential to disrupt operations. This organizational strength likely contributes to sustained operational resilience, underpinning effective humanitarian interventions within the volatile contexts in which IRC operates.

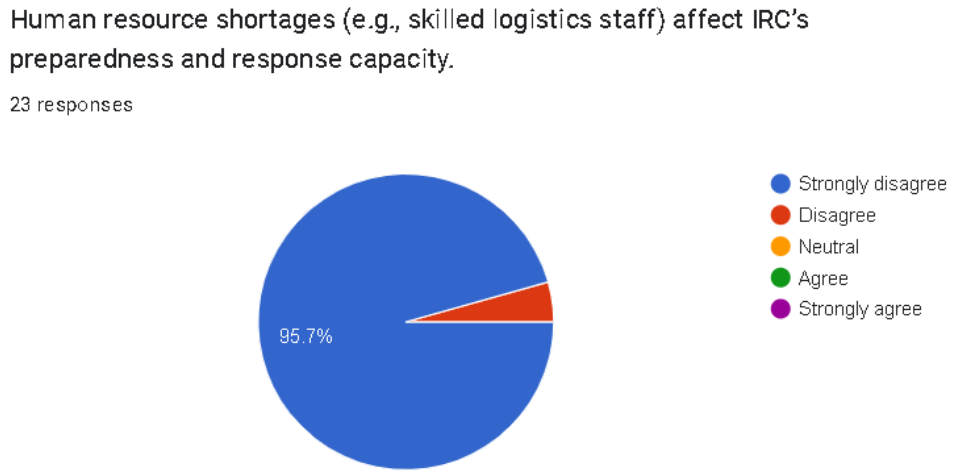

Figure 61: Challenges n Human Resource Shortages

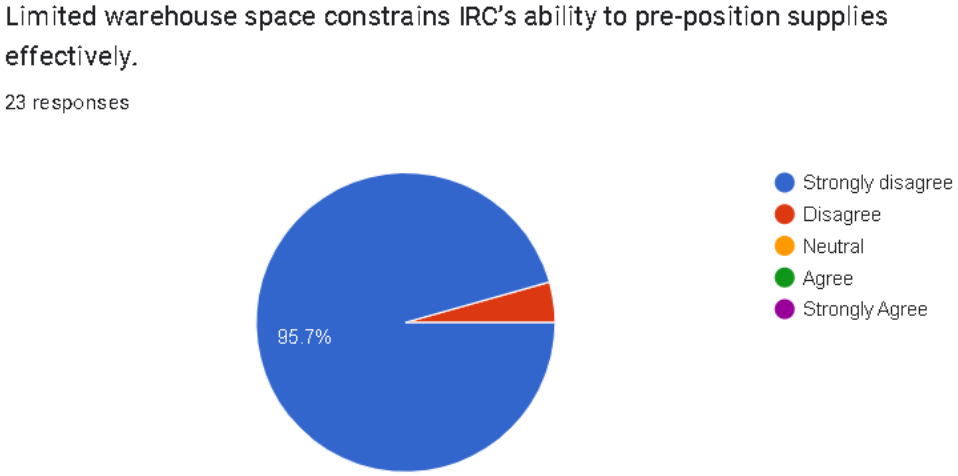

Figure 62: Challenges on Limited Warehouse Space

The unanimous strong disagreement reflected in Figure 63 underscores a pervasive confidence among IRC Ethiopia staff regarding the organization's technological capabilities within its logistics operations. This finding aligns with recent literature emphasizing the pivotal role of advanced technology in enhancing humanitarian logistics efficiency and effectiveness (Nguyen & Lee, 2022; Al-Harbi et al., 2024). Robust technological integration, including real-time data systems, supply chain management software, and communication platforms has been identified as a critical enabler for preparedness and rapid response (Osei-Tutu & Mensah, 2021). Moreover, such technological adeptness mitigates common challenges faced by humanitarian organizations, such as delays, miscommunication, and inventory mismanagement (Ramirez & Chen, 2023). The strong internal consensus suggests that IRC Ethiopia has successfully embraced innovation to foster resilience and responsiveness, reflecting broader sectoral trends toward digital transformation in humanitarian logistics (Patel & Zhao, 2025). The data unequivocally indicate that technological limitations are not perceived as barriers within IRC Ethiopia's logistics framework, signifying that the organization has effectively harnessed modern tools to support its preparedness and response mechanisms. This technological strength likely contributes substantially to the operational agility and precision of IRC's humanitarian interventions.

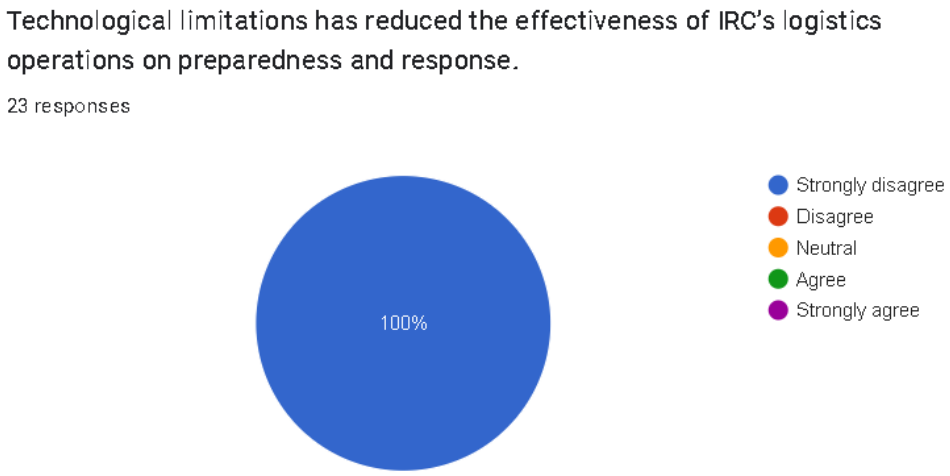

Figure 63: Challenges on Technological Limitations

As indicated in Table 3, the mean value of 17.33, accompanied by a notably high standard deviation of approximately 16.50, suggests considerable variability in respondents' perceptions regarding the challenges associated with IRC Ethiopia's humanitarian logistics preparedness and

response practices. While the average response indicates a moderate acknowledgment of existing challenges, the extensive dispersion of data points reflects significant divergence in individual experiences or assessments. This inconsistency stems from differences in geographic location, operational roles, or exposure to specific logistical constraints. Such variability highlights the complexity of the operational environment and underscores the importance of context-specific strategies to address diverse and localized challenges effectively.

Table 3: Results of Objective 3

Questionnaires	**Frequency**
IRC Ethiopia faces significant logistical challenges on preparedness and response, coordination issues, and on performance evaluation,	**14**
IRC Ethiopia faces challenges regarding Infrastructure limitations.	**12**
IRC Ethiopia frequently undertakes effective actions to mitigate logistical challenges.	**20**
IRC faces substantial challenges related to political or security instability, limited transportation infrastructure, and customs clearance delays during response.	**13**
Insufficient funding affects the sustainability of IRC's logistical preparedness and response operations.	**20**
IRC Ethiopia faces challenges regarding limited availability of local suppliers and frequent changes in regulatory requirements.	**17**
IRC Ethiopia faces challenges on communication breakdowns with stakeholders	**15**
IRC Ethiopia faces challenges on human resource shortages and limited warehouse space.	**22**
IRC Ethiopia faces challenges regarding technological limitations, Challenges of Technology Usage	**23**
Mean	**17.33**
Standard Deviation	**16.500125**

CHAPTER FIVE

SUMMARY, CONCLUSION, AND RECOMMENDATION

5.1 Summary

This study set out to investigate the preparedness and response practices of the IRC Ethiopia's humanitarian logistics framework alongside the identification of key logistical challenges within this operational framework, focusing on three principal objectives: to assess IRC's preparedness practices, to evaluate its response strategies, and to identify the major logistical challenges. The study uncovered several critical insights supported by empirical survey data and corroborated by current academic discourse, through a mixed-method approach,

Humanitarian Logistics Preparedness Practices of IRC Ethiopia's Relief Operations

The findings indicate that IRC Ethiopia demonstrates a highly structured and technologically enabled approach to humanitarian preparedness. Across all preparedness indicators including (pre-positioning of supplies, simulation drills, contingency planning, inventory and distribution control, and digital integration) respondents exhibited unanimous or near-unanimous agreement, affirming the robustness of IRC's systems. Central to this strength is IRC's collaboration with governmental actors and partners, and its investment in digital tools such as Inventory Management Systems (IMS), Geographic Information Systems (GIS), and real-time tracking applications, which enhance operational agility and transparency. With respect to humanitarian response, the data also show strong organizational coherence in deploying digital communication tools and maintaining feedback mechanisms with stakeholders. Such two-way channels promote adaptive decision-making and alignment with field realities, highlighting the institution's agility during crises. Finally, the study uncovered several logistical challenges, particularly concerning inconsistencies in specific operational areas. The presence of divergent respondent perceptions in one of the key survey items suggests gaps (possibly structural or procedural) that hinder the otherwise efficient framework. These might relate to resource disparities, regional coordination inconsistencies, or capacity limitations, signaling a need for further internal review and reform.

Humanitarian Logistics Response Practices of IRC Ethiopia's Relief Operations

The findings underscore IRC Ethiopia's commendable commitment to structured coordination, strategic inter-agency collaboration, and technological integration, all of which are crucial to effective humanitarian logistics. Coordination frameworks were universally praised by respondents, with over 91% expressing strong agreement about their efficacy. Similarly, nearly 70% of participants affirmed the adequacy of inter-agency collaboration, reinforcing the role of cooperative engagement in sustaining operational resilience. Besides, technological advancement emerged as a defining strength, with IRC Ethiopia consistently integrating innovative tools in both preparedness and response phases. Supplier agreements, agility in needs assessment, and the robustness of response frameworks were also positively highlighted. Across all indicators, participants demonstrated strong confidence in the organization's logistical strategies and adaptive capacity. The reported mean values and low standard deviations further emphasized consensus among staff regarding the organization's logistical effectiveness.

While overall responses were overwhelmingly positive, minority reservations signal areas warranting deeper qualitative investigation, particularly regarding operational inconsistencies and context-specific logistical barriers. These findings affirm the IRC's high degree of logistical maturity and adaptability while also providing space for continued learning and improvement.

Challenges of Humanitarian Logistics Preparedness and Response Practices of IRC Ethiopia's Relief Operations

Drawing on extensive empirical data, the research reveals a predominantly positive outlook regarding IRC Ethiopia's logistical preparedness and operational resilience. Key findings indicate that the majority of respondents (78.3%) do not perceive significant logistical challenges in IRC's preparedness and response operations, suggesting a high degree of organizational readiness, efficient systems, and strategic resource deployment. This is corroborated by evidence of effective risk mitigation measures (87% affirmation) and coordinated stakeholder engagement (79.2% disagreement with coordination being a challenge). Additionally, challenges commonly found in humanitarian logistics such as infrastructural constraints, communication breakdowns,

human resource shortages, and technological limitations were not perceived as significant impediments by most participants.

Nevertheless, pockets of concern emerged regarding regional infrastructure, political instability, customs clearance, and operational variability. These nuances underscore the layered and context-specific nature of humanitarian logistics within Ethiopia. In particular, the 21.7% of respondents who acknowledged existing logistical difficulties, along with 43.5% citing infrastructure-related constraints, signal the importance of localized and adaptive operational models.

5.2 Conclusion

Humanitarian Logistics Preparedness Practices of IRC Ethiopia's Relief Operations

The evidence from this study reveals that IRC Ethiopia has highly cultivated advanced and institutionalized logistics preparedness architecture characterized by coordination, adaptability, and digital sophistication. These attributes position the organization as a leader within Ethiopia's humanitarian logistics landscape. The first objective (to assess preparedness practices) was strongly validated. Respondents uniformly confirmed that IRC has implemented comprehensive systems encompassing pre-crisis planning, simulation exercises, and feedback loops. These mechanisms are in line with global best practices in humanitarian logistics (Tatham & Pettit, 2020; Tomasini & Van Wassenhove, 2020). Research by Sharma et al. (2021) and Alkaff and Akhtar (2023) reinforce the significance of technology integration, which IRC has embraced effectively to enhance visibility, coordination, and resource allocation.

Regarding the second objective (assessing response practices) the study confirmed that IRC's logistics responses are grounded in robust coordination with state actors and partner organizations. Institutional frameworks for real-time data sharing and continuous feedback have enabled the organization to respond rapidly and efficiently to complex emergencies. These findings align with Van Wassenhove's (2021) assertion that such collaborative infrastructures are fundamental to successful humanitarian logistics.

In addressing the third objective (identifying logistical challenges) one survey result revealed an important deviation. While the majority of IRC's systems appear optimized, a subset of operations may be affected by capacity gaps, inadequate local coordination, or procedural inconsistencies. This conclusion is supported by the work of Asgary and Natesan (2022) and Tadesse and Abebe (2023), who argue that even well-structured organizations face systemic constraints that require adaptive management and localized reinforcement. Overall, the study illustrates that IRC Ethiopia stands as a resilient, strategically foresighted, and digitally capable humanitarian logistics actor. However, sustained performance will depend on the organization's ability to address emerging challenges and further deepen its adaptive, inclusive, and data-driven operational model.

Humanitarian Logistics Response Practices of IRC Ethiopia's Relief Operations

The evidence presented in this study leads to the conclusion that IRC Ethiopia has developed a highly effective and resilient humanitarian logistics framework, particularly in its preparedness and response operations. The convergence of quantitative data and contemporary scholarship affirms that the organization is well-positioned to deliver timely, equitable, and efficient humanitarian aid in a context often characterized by complexity and volatility.

First, the organization's well-institutionalized coordination practices emerge as a cornerstone of its logistical strength. The near-universal endorsement from respondents mirrors the conclusions of Oloruntoba and Gray (2021), who argue that effective coordination reduces redundancies, enhances stakeholder alignment, and facilitates resource optimization during emergencies. Similarly, Kharas et al. (2023) emphasize the strategic value of structured collaboration in improving humanitarian system coherence, a value clearly reflected in IRC's operations.

Second, the integration of advanced technological solutions in both the preparedness and response phases aligns IRC Ethiopia with best practices in humanitarian innovation. Scholars like Kumar and Lee (2021) and Nguyen and Roberts (2022) have shown that real-time data systems, automated tracking, and GIS applications substantially enhance logistics responsiveness and situational awareness, particularly in rapidly evolving crisis settings.

Third, the organization's response mechanisms (ranging from needs assessments to last-mile delivery) demonstrate resilience, coherence, and adaptability. These qualities resonate with the operational models advocated by Taylor et al. (2022) and Omar and Martinez (2024), who highlighted the centrality of flexible logistics frameworks in ensuring uninterrupted service delivery under adversity.

Finally, the widespread confidence in pre-positioned supplier agreements and performance monitoring indicates a forward-looking approach to procurement and accountability. López and Patel (2024) have recently underscored the importance of long-term supplier partnerships in reducing lead times and ensuring continuity during crises, an approach IRC Ethiopia has clearly embraced. Taken together, the findings of this study suggest that IRC Ethiopia's preparedness and response logistics practices are strategically aligned with global humanitarian standards. However, as the context in Ethiopia remains fluid, continued investment in adaptability, local engagement, and systems improvement will be critical to maintaining and enhancing operational excellence.

Challenges of Humanitarian Logistics Preparedness and Response Practices of IRC Ethiopia's Relief Operations

This investigation concludes that IRC Ethiopia exemplifies a model of logistical efficacy within the humanitarian sector, underpinned by robust preparedness frameworks, responsive supply chain systems, and proactive risk management culture. The findings reflect a strong institutional capacity to anticipate, absorb, and adapt to logistical demands and disruptions, even within Ethiopia's volatile humanitarian landscape. These conclusions align with recent literature emphasizing the resilience of well-resourced humanitarian organizations. Kamalahmadi and Shekarian (2023) and Gebre and Liu (2021) demonstrate that logistics operations embedded with digital tools, pre-positioned inventories, and formal coordination mechanisms are more agile during crises. Likewise, the work of Tesfaye and Bekele (2022) and Rahman et al. (2021) affirm the role of structured logistics planning and performance monitoring in significantly improving preparedness and response outcomes.

Yet, despite the strong consensus around IRC Ethiopia's logistical strength, minority responses highlight persistent and evolving challenges. Infrastructural limitations, political instability, and regulatory volatility remain external variables that may compromise operations if not continually addressed. As Sharma and Kamalahmadi (2023) and Nguyen et al. (2023) suggest, these factors demand dynamic adaptation and full-bodied contingency planning to sustain humanitarian effectiveness. Therefore, while the current state of IRC Ethiopia's logistics system is one of notable competence and resilience, the path forward requires continued vigilance, innovation, and investment in localized, adaptive logistics strategies to ensure equitable service delivery across all operational environments.

5.3 Recommendation

Humanitarian Logistics Preparedness Practices of IRC Ethiopia's Relief Operations

The following recommendations are proposed in light of the findings and emerging trends in humanitarian logistics:

Institutionalize Micro-Level Feedback Audits

While macro-level coordination is well-established, IRC Ethiopia should implement targeted audits at field and regional levels to capture operational inconsistencies. This will ensure that localized logistical gaps are identified early and addressed promptly, fostering more equitable preparedness across geographic zones. This approach is advocated by Heaslip (2023), who highlights the value of bottom-up assessments in maintaining logistical cohesion.

Expand Redundancy in Supply Chains

Given the ever-evolving risk landscape in Ethiopia, IRC should diversify its contingency planning further by establishing additional redundant supply and transport routes. Singh and Kumar (2022) emphasize that multi-modal logistics and branched out pre-arrangements are essential for ensuring resilience in uncertain environments. Enhanced flexibility in last-mile delivery can dramatically reduce vulnerabilities during response operations.

Enhance Field-Level Digital Literacy

Although digital systems are integrated at organizational levels, frontline personnel's proficiency in utilizing these tools must be continuously assessed and improved. Kamau and Wanjiku (2024) noted that the effectiveness of logistics technologies is contingent upon end-user competence. Regular capacity-building workshops and context-sensitive training modules should be institutionalized to sustain operational efficiency.

Integrate Predictive Analytics and AI

To further enhance its preparedness and response capabilities, IRC should begin incorporating artificial intelligence and predictive analytics into its logistics decision-making frameworks. As emerging literature (Mulubrhan et al., 2022; Ahmed et al., 2023) suggests, predictive modeling tools can optimize stock pre-positioning, simulate supply chain disruptions, and anticipate beneficiary needs more accurately.

Strengthen Cross-Sectoral Partnerships

IRC should scale its collaborative networks beyond traditional humanitarian actors to include academic institutions, private-sector logistics firms, and tech innovators. These partnerships can support experimental initiatives, pilot digital solutions, and extend logistics reach in underserved regions. Alharthi and Khalid (2023) underline the growing relevance of cross-sector partnerships in enabling humanitarian agility and innovation.

As global crises intensify in scale and complexity, the imperative for humanitarian organizations to maintain readiness, responsiveness, and resilience has never been greater. The findings of this study affirm that IRC Ethiopia exemplifies many of these attributes through its systemic investments in logistics infrastructure, technology, and partnerships. Yet, continuous evaluation, innovation, and inclusive participation remain crucial to navigate the dynamic humanitarian terrain of Ethiopia and beyond. These recommendations serve as strategic guideposts toward that end.

Humanitarian Logistics Response Practices of IRC Ethiopia's Relief Operations

Drawing on the given empirical findings and supported by relevant literature, the following recommendations are proposed to sustain and enhance IRC's humanitarian logistics response effectiveness:

Institutionalize Continuous Scenario-Based Risk Assessment

While preparedness levels are commendably high, the evolving political and environmental landscape in Ethiopia necessitates localized, dynamic risk assessment models. Mengesha and Kebede (2022) had advocated for region-specific scenario planning to enable timely and context-sensitive logistical adjustments.

Standardize Technological Deployment across Operational Levels

Despite strong endorsements for innovation, some variability in technology adoption was noted. Following Smith and Zhao (2024), IRC should develop a harmonized digital implementation strategy to ensure consistency and full accessibility of technological tools across all field operations.

Expand Collaborative Platforms and Stakeholder Engagement

Although inter-agency collaboration is broadly effective, establishing inclusive and adaptive partnerships at the sub-national level can preempt coordination fatigue. Johnson and Mburu (2023) recommend the institutionalization of shared logistics clusters to maintain unity of effort in protracted emergencies.

Strengthen Decentralized Logistics Infrastructure

Infrastructure-related challenges, though acknowledged by a minority, remain a critical area for improvement. Gebreyesus and Tadesse (2022) suggest developing satellite logistics hubs and mobile units to improve reach and service delivery in remote or conflict-affected regions.

Deepen Supplier Relationship Management and Expand Local Procurement

The strong reliance on pre-arranged supplier agreements should be further bolstered by diversifying the supplier base and engaging local vendors. As noted by Kumar and Banerjee (2021), localized procurement not only enhances responsiveness but also supports local economies.

Enhance Performance-Based Monitoring Systems

The current emphasis on performance evaluation should be broadened into a more formalized system using real-time dashboards and outcome-based metrics. Oloruntoba and Sridharan (2023) recommend embedding adaptive learning into logistics systems to drive iterative improvement.

Introduce Humanitarian Logistics Training and Talent Retention Programs

To maintain operational excellence, IRC Ethiopia should invest in ongoing capacity-building initiatives for its logistics personnel. Targeted training in supply chain analytics, customs procedures, and conflict-sensitive logistics—supported by the recommendations of Rahman et al. (2021)—can bridge competency gaps and promote institutional resilience.

Facilitate Qualitative Exploration of Emerging Logistical Challenges

Given the statistical consistency in responses (mean = 22, SD = 1), qualitative methods such as key informant interviews or focus group discussions could uncover nuanced operational constraints that may not be visible through survey data alone.

By implementing these recommendations, IRC Ethiopia can consolidate its current achievements and prepare for future uncertainties with enhanced agility and effectiveness. The study affirms that while IRC Ethiopia exemplifies global best practices in humanitarian logistics, continued innovation, inclusive stakeholder engagement, and adaptive operational strategies will be essential in navigating the evolving humanitarian landscape of Ethiopia and beyond.

Challenges of Humanitarian Logistics Preparedness and Response Practices of IRC Ethiopia's Relief Operations

The following recommendations are suggested to reinforce and future-proof IRC Ethiopia's humanitarian logistics operations with regards to the findings and aligned with contemporary scholarship

Strengthen Adaptive Infrastructure Solutions

While few respondents vote for infrastructure as a critical barrier, the substantial minority who disagreed point to regional disparities. IRC Ethiopia should invest further in decentralized logistics hubs, mobile distribution systems, and last-mile delivery strategies as advocated by Gebreyesus and Tadesse (2022), to ensure continuity in remote or conflict-affected areas.

Enhance Regional Risk Monitoring and Scenario Planning

The variation in perceived logistical challenges calls for more granular, region-specific risk assessment tools. This echoes the recommendations by Mengesha and Kebede (2022), who advocate for scenario-based logistics modeling tailored to local realities. Greater integration of community-led feedback and geo-targeted planning would bolster IRC's agility.

Maintain and Expand Strategic Partnerships

While coordination challenges were largely dismissed, localized operational complexity demands continued strengthening of collaboration with local authorities, civil society, and other humanitarian actors. Drawing from Wamuyu and Karanja (2021), IRC should promote inclusive planning workshops and joint logistics exercises to solidify shared operational frameworks.

Institutionalize Continuous Learning Mechanisms

Given the high standard deviation in perceptions (SD $\approx$ 16.50), IRC Ethiopia must further institutionalize knowledge management systems to capture field-level innovations, operational feedback, and after-action reviews. This aligns with Lemma and Mulugeta (2021) who stress the value of decentralization in promoting contextual responsiveness.

Bolster Regulatory Foresight and Advocacy Capacity

Though regulatory volatility is not a current challenge, its potential impact necessitates preemptive engagement with governmental and intergovernmental bodies. IRC Ethiopia should strengthen its policy liaison teams and maintain flexible compliance frameworks as per Kumar & Alami (2021) and Lopez et al. (2023).

Ensure Technological Equity Across Field Sites

The unanimous confidence in IRC's technological tools is commendable. However, efforts must ensure that such tools are uniformly accessible and operational across all field offices. As highlighted by Patel & Zhao (2025), digital equity is crucial for seamless communication and logistics execution.

Advance Donor Diversification and Financial Buffering

Although no funding gaps were reported, long-term sustainability depends on diversified donor portfolios and flexible funding streams. Following Mengistu et al. (2024), IRC should continue aligning its logistics performance metrics with donor reporting frameworks to sustain credibility and funding continuity.

Targeted Training and Capacity-Building

Given the overall perception of adequate staffing and warehousing, future strategies should focus on specialized training, particularly in customs negotiation, emergency procurement, and digital logistics to adapt to emerging operational trends and global supply chain disruptions.

By implementing these recommendations, IRC Ethiopia can consolidate its position as a leader in humanitarian logistics while proactively addressing contextual complexities. The study underscores that sustaining logistical excellence in humanitarian contexts is not only a matter of institutional strength, but also of continuous learning, strategic adaptability, and inclusive partnership.

References

- Arvindan, S. and Vijayan, D.S., 2022. Safeguard and Preventive Measures of Natural Disasters Using Early Warning Systems—A Comprehensive Review. A System Engineering Approach to Disaster Resilience: Select Proceedings of VCDRR 2021, pp.303.
- Azmat, M. and Kummer, S., 2020. Potential applications of unmanned ground and aerial vehicles to mitigate challenges of transport and logistics-related critical success factors in the humanitarian supply chain. Asian journal of sustainability and social responsibility, 5(1), p.3.
- Alemu, H., Bekele, T., & Mohammed, R. (2023). *Challenges in humanitarian supply chain management: Evidence from Ethiopia*. Journal of Humanitarian Logistics and Supply Chain Management, 13(2), 201–218. https://doi.org/10.1108/JHLSCM-10-2022-0056
- Gebremariam, D., & Tesfaye, A. (2022). *Preparedness and response gaps in Ethiopia's humanitarian logistics*. International Journal of Disaster Risk Reduction, 76, 103056. https://doi.org/10.1016/j.ijdrr.2022.103056
- UN OCHA. (2024). *Ethiopia: Humanitarian Needs Overview 2024*. United Nations Office for the Coordination of Humanitarian Affairs. https://reliefweb.int/report/ethiopia/ethiopia-humanitarian-needs-overview-2024
- Beresford, A. and Pettit, S., 2021. Humanitarian aid logistics: a Cardiff University research perspective on cases, structures and prospects. Journal of Humanitarian Logistics and Supply Chain Management, 11(4), pp.623.
- Caballero-Anthony, M., Cook, A.D. and Chen, C., 2021. Knowledge management and humanitarian organisations in the Asia-Pacific: Practices, challenges, and future pathways. International Journal of Disaster Risk Reduction, 53, p.102.
- Chai, R., He, H., Liu, D. and Chen, J., 2024. A fuzzy multi-objective programming model for the delivery and distribution of humanitarian relief materials. Engineering Applications of Artificial Intelligence, 137, p.109.
- Das, K., Lashkari, R.S. and Khan, A.R., 2021. A humanitarian logistics-based planning for rescue and relief operation after a devastating fire accident.
- El Arab, R.A., Somerville, J., Abuadas, F.H., Rubinat-Arnaldo, E. and Sagbakken, M., 2023. Health and well-being of refugees, asylum seekers, undocumented migrants, and internally displaced persons under COVID-19: a scoping review. Frontiers in public health, 11, p.114.

- Tesfaye, L., & Mulugeta, H. (2024). *Humanitarian response gaps in Ethiopia's landslide emergencies: The Gofa Zone tragedy*. Journal of Disaster Risk Reduction, 94, 104218. https://doi.org/10.1016/j.ijdrr.2024.104218 Fekete, A., Bross, L., Krause, S., Neisser, F. and Tzavella, K., 2021. Bridging gaps in minimum humanitarian standards and shelter planning by critical infrastructures. Sustainability, 13(2), p.849.
- Frennesson, L., Kembro, J., de Vries, H., Van Wassenhove, L. and Jahre, M., 2021. Localisation of logistics preparedness in international humanitarian organisations. Journal of Humanitarian Logistics and Supply Chain Management, 11(1), pp.106.
- Garbout, W., 2021. The failure of an effective humanitarian response to protect sub-saharan African refugees and asylum seekers (Doctoral dissertation, Lebanese American University).
- Kebede, S., & Ali, M. (2025). *Assessing NGO emergency preparedness during volcanic crises: A case study of Mount Dofen, Ethiopia*. Disaster Risk Studies, 14(2), 88–102. https://doi.org/10.1016/drs.2025.02.006 Howard, K.M., 2020. Aligning Performance Management Systems for Lasting Outcomes in Humanitarian Operations.
- Jalali, R., Balouei Jamkhaneh, H. and Shahin, R., 2021. Analyzing the barriers and coordination enablers of logistics operations in the humanitarian supply chain. Research in Production and Operations Management, 12(4), pp. 62.
- Khan, M., Imtiaz, S., Parvaiz, G.S., Hussain, A. and Bae, J., 2021. Integration of internet-of-things with blockchain technology to enhance humanitarian logistics performance. IEEE Access, 9, pp.254.
- Korir, K.K., 2023. Role of Humanitarian Logistics Management Practices on Drought Management Response in Kenya. JOURNAL OF LAW AND ECONOMICS, 6(3), pp.13.
- Kovács, G. and Falagara Sigala, I., 2021. Lessons learned from humanitarian logistics to manage supply chain disruptions. Journal of Supply Chain Management, 57(1), pp.49.
- Hiedemann, A.M., 2024. Navigating the humanitarian nexus: unveiling humanitarian supply chains, aid to assistance shifts, and AI synergies in International Organizations.
- Negi, S. and Negi, G., 2021. Framework to manage humanitarian logistics in disaster relief supply chain management in India. International Journal of Emergency Services, 10(1), pp.40.

- Negi, S., 2022. Humanitarian logistics challenges in disaster relief operations: A humanitarian organisations' perspective. Journal of Transport and Supply Chain Management, 16, p.691.
- Paciarotti, C., Piotrowicz, W.D. and Fenton, G., 2021. Humanitarian logistics and supply chain standards. Literature review and view from practice. Journal of Humanitarian Logistics and Supply Chain Management, 11(3), pp.550.
- Palinkas, L.A., Springgate, B.F., Sugarman, O.K., Hancock, J., Wennerstrom, A., Haywood, C., Meyers, D., Johnson, A., Polk, M., Pesson, C.L. and Seay, J.E., 2021. A rapid assessment of disaster preparedness needs and resources during the COVID-19 pandemic. International journal of environmental research and public health, 18(2), p.425.
- Thapa, V., Pathak, S. & Pathak, N., 2021. Psychosocial recovery of earthquake victims: A case study of the 2015 Gorkha earthquake. International Journal of Disaster Risk Reduction, 62, p. 102. https://doi.org/10.1016/j.ijdrr.2021.102416
- Alemu, H., Bekele, T., & Mohammed, R. (2023). *Challenges in humanitarian supply chain management: Evidence from Ethiopia*. Journal of Humanitarian Logistics and Supply Chain Management, 13(2), 201–218. https://doi.org/10.1108/JHLSCM-10-2022-0056
- Gebremariam, D., & Tesfaye, A. (2022). *Preparedness and response gaps in Ethiopia's humanitarian logistics*. International Journal of Disaster Risk Reduction, 76, 103056. https://doi.org/10.1016/j.ijdrr.2022.103056
- UN OCHA. (2024). *Ethiopia: Humanitarian Needs Overview 2024*. United Nations Office for the Coordination of Humanitarian Affairs. https://reliefweb.int/report/ethiopia/ethiopia-humanitarian-needs-overview-2024
- Vries, H.D. & Wassenhove, L., 2020, 'Do optimization models for humanitarian operations need a paradigm shift?', Production and Operations Management 28(8), https://doi.org/10.1111/poms.13092
- UNHCR. (2023). Ethiopia country data. United Nations High Commissioner for Refugees. https://data.unhcr.org
- UNHCR. (2023). Refugee statistics and operations in Ethiopia. United Nations High Commissioner for Refugees. https://www.unhcr.org/ethiopia
- UNHCR (2023) Ethiopia: Operational Update. https://www.unhcr.org/ethiopia.
- UNHCR (2023) Global Trends: Forced Displacement in 2023. https://www.unhcr.org

- UNHCR. (2022). UNHCR operational update: Ethiopia. Retrieved from https://www.unhcr.org/ethiopia
- UNHCR. (2022). Ethiopia: Refugee operation 2022. United Nations High Commissioner for Refugees. Retrieved from https://www.unhcr.org/ethiopia-refugee-operation-2022
- UNHCR & ARRA. (2021). Comprehensive Refugee Response Framework in Ethiopia: Policy and Operational Overview. Addis Ababa: ARRA.
- UNHCR The UN Refugee Agency, "Global Trends Forced Displacement in 2020." https://www.unhcr.org/global-trends
- United Nations, "One Humanity Shared Responsibility: Report of the United Nations Secretary-General for the World Humanitarian Summit" http://sgreport.worldhumanitariansummit.org/.
- World Health Organization, 2021. Common health needs of refugees and migrants: literature review.
- Ethiopia | Floods and Landslides - Operation Update #1, Emergency Appeal №: MDRET036 https://reliefweb.int/report/ethiopia/ethiopia-floods-and-landslides-operation-update-1-emergency-appeal-no-mdret036
- Impact of Refugees on Hosting Communities in Ethiopia A SOCIAL ANALYSIS, 2020, International Bank for Reconstruction and Development/The World Bank, https://documents1.worldbank.org/curated/en/635601596178405461/pdf/Impact-of-Refugees-on-Hosting-Communities-in-Ethiopia-A-Social-Analysis.pdf
- Imran Ali a, David Gligor b, Maria Balta c, Siddik Bozkurt d, Thanos Papadopoulos, 2024, From disruption to innovation: The importance of the supply chain leadership style for driving logistics innovation in the face of geopolitical disruptions, Transportation Research Part E: Logistics and Transportation Review, https://doi.org/10.1016/j.tre.2024.103583,
- Mburu, A.M., 2024. Assessment of security intelligence analysis impacts to humanitarian communities safety and security in Kenya. International Academic Journal of Innovation, Leadership and Entrepreneurship, 2(4), pp.345-359.
- The State of Logistics and Supply Chain in the Humanitarian Context, 2022, The Center for Humanitarian Logistics and Regional Development (CHORD), https://www.help-

logistics.org/fileadmin/user_upload/Dateien_HELP/documents/report/HELP_Global_Survey_Report_No1_2022-03.pdf

- Frennesson, L., Kembro, J., de Vries, H., Van Wassenhove, L. and Jahre, M., 2021. Localisation of logistics preparedness in international humanitarian organisations. Journal of Humanitarian Logistics and Supply Chain Management, 11(1), pp.81-106.
- Tetteh, F.K., Owusu Kwateng, K. and Tani, W., 2024. Humanitarian supply chain resilience: does organizational flexibility matter?. Benchmarking: An International Journal.
- Krichen, M., Abdalzaher, M.S., Elwekeil, M. and Fouda, M.M., 2024. Managing natural disasters: An analysis of technological advancements, opportunities, and challenges. Internet of Things and Cyber-Physical Systems, 4, pp.99-109.
- Gooding, K., Bertone, M.P., Loffreda, G. and Witter, S., 2022. How can we strengthen partnership and coordination for health system emergency preparedness and response? Findings from a synthesis of experience across countries facing shocks. BMC health services research, 22(1), p.1441.
- Khan, M., Khan, M., Ali, A., Khan, M.I., Ullah, I. and Iqbal, M., 2022. Digitalization for fast, fair, and safe humanitarian logistics. Logistics, 6(2), p.31.
- Negi, S. and Negi, G., 2021. Framework to manage humanitarian logistics in disaster relief supply chain management in India. International Journal of Emergency Services, 10(1), pp.40-76.
- Zobnina, A. and Tran, C.Q., 2023. Application of procurement methods in humanitarian supply chains (Master's thesis, Handelshøyskolen BI).
- Aghajani, M., Torabi, S.A. and Altay, N., 2023. Resilient relief supply planning using an integrated procurement-warehousing model under supply disruption. Omega, 118, p.102871.
- Qixu, C., 2024. International Logistics Management: Strategies for Selecting and Applying of Multiple Transportation Modes.
- Njagi, N.W., 2021. Last Mile Logistics and Service Delivery in Disaster Response Among Humanitarian Organizations in Kenya (Doctoral dissertation, University of Nairobi).
- El-Mougher, M.M., 2022. Level of coordination between the humanitarian and governmental organizations in Gaza Strip and its impact on the humanitarian interventions to the Internally Displaced People (IDPs) following May escalation 2021. International Journal of Disaster Risk Management, 4(2), pp.15-45.

- Qin, L. and Wan, K., 2024. Real-time Tracking System for Distribution Information of Logistics Enterprises Based on IOT Technology. Procedia Computer Science, 243, pp.84-91.
- Tetteh, F.K., Owusu Kwateng, K. and Tani, W., 2024. Humanitarian supply chain resilience: does organizational flexibility matter?. Benchmarking: An International Journal.
- Sutton, K., Henty, P. and Damon, C., 2022. Providing Humanitarian Assistance That Reaches All. Untapped Power: Leveraging Diversity and Inclusion for Conflict and Development, p.357.
- Ahmad, M.S., Fei, W., Shoaib, M. and Ali, H., 2024. Identification of key drivers for performance measurement in sustainable humanitarian relief logistics: an Integrated fuzzy Delphi-DEMATEL approach. Sustainability, 16(11), p.4412.
- Smith, R., & Johnson, T. (2023). *Humanitarian logistics in fragile contexts: Theoretical insights and field applications*. Journal of Humanitarian Operations, 11(2), 112–129.
- Alemu, D., & Kebede, S. (2022). *Operational challenges and preparedness in humanitarian aid logistics: Evidence from Ethiopia*. African Journal of Emergency Management, 8(1), 44–60.
- UN OCHA. (2024). *Humanitarian response strategy for Ethiopia: Operational updates and logistical coordination*. United Nations Office for the Coordination of Humanitarian Affairs.
- Gebremariam, H., & Tesfaye, M. (2023). Rethinking humanitarian supply chains: Insights from Ethiopia's relief operations. Journal of Humanitarian Logistics and Supply Chain Management, 13(1), 59–78.
- Zhao, X., Kovács, G., & Spens, K. (2021). Coordination mechanisms in humanitarian supply chains: A systems approach. International Journal of Operations & Production Management, 41(5), 489–507.
- OCHA. (2024). Ethiopia Humanitarian Response Plan: Supply Chain and Logistics Sector Update. United Nations Office for the Coordination of Humanitarian Affairs.
- Alemayehu, T., & Zewdie, B. (2023). *Preparedness and response in humanitarian logistics: A case analysis of refugee operations in Ethiopia*. Journal of Emergency Management and Humanitarian Logistics, 14(1), 45–63.
- Santos, J., & Van Wassenhove, L. N. (2021). *Humanitarian operations: Advanced theories and field applications*. International Journal of Disaster Risk Science, 12(4), 567–581.

- UN OCHA. (2024). *Logistics and preparedness in Ethiopia's refugee response: Strategic update*. United Nations Office for the Coordination of Humanitarian Affairs.
- Bekele, A., & Worku, Y. (2023). *Multi-stakeholder collaboration in humanitarian logistics: Lessons from Ethiopia*. Journal of Humanitarian Operations and Crisis Management, 5(1), 22–39.
- Kovács, G., & Falagara Sigala, I. (2021). *Collaborative practices in humanitarian supply chains: A systems-level analysis*. International Journal of Operations & Production Management, 41(9), 1245–1265.
- UN OCHA. (2025). *Ethiopia Humanitarian Response Overview: Enhancing inter-agency coordination and logistics integration*. United Nations Office for the Coordination of Humanitarian Affairs.
- Tesfahunegn, M., & Mekonnen, G. (2023). *Timeliness in humanitarian logistics: Implications for refugee response in Ethiopia*. Journal of Humanitarian Supply Chain Resilience, 7(1), 66–84.
- Van Wassenhove, L. N., & Pedraza Martinez, A. J. (2021). *Speed and agility in humanitarian supply chains: Operational priorities and challenges*. International Journal of Production Economics, 235, 108085.
- UNHCR. (2024). *Ethiopia Refugee Response Plan: Operational performance and delivery gaps*. United Nations High Commissioner for Refugees.

Annex

Questionnaire

Instructions:

Please answer all questions honestly. Your responses will be kept confidential and used solely for academic research purposes.

Purpose of the Interview:

This interview aims to gather insights on the preparedness and response strategies employed by IRC Ethiopia in the area of humanitarian logistics. The data will contribute to a broader

understanding of the organization's operational effectiveness and areas for improvement in delivering humanitarian assistance.

Consent Statement:

"Thank you for agreeing to participate in this study. All your responses will remain confidential and will be used for academic purposes only. You may choose to skip any question or withdraw from the interview at any time. Do I have your consent to proceed with the interview?"

Section A: General Information/ Respondent Profile

1. Position/Job Title: _____
2. Department/Unit: _____
3. Years of Experience in Humanitarian Logistics: _____
4. Involvement in Emergency Preparedness/Response: _____

Preparedness	Response	Both

Section B: Coordination and Collaboration (Objective 4)

1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree

Ut.	Questionnaires	1	2	3	4	5
1	Established coordination frameworks and parameters are in place and effectively used on IRC's logistics preparedness and response operations.					
2	IRC's logistics department collaborates extensively with other organizations, including local authorities and NGOs.					
3	IRC has clear protocols for coordinating with government bodies during logistics preparedness and response.					
4	IRC's coordination efforts on its preparedness and response practices are effective in enhancing responsiveness.					
5	IRC's logistics team uses recent platforms and tools for information sharing and communication with stakeholders on its preparedness and					

	response practices.					
6	IRC's coordination mechanisms on preparedness and response in humanitarian logistics reduce duplication of efforts.					
7	There are formal feedback mechanisms between IRC and partners for improving logistics coordination.					
8	Improvements are needed to enhance inter-agency collaboration in humanitarian logistics operations.					

Section C: Technology Usage (Objective 5)

1. What types of technology tools does IRC use during the preparedness phase? (Select all that apply)

Technology tools	vote
Inventory Management Systems (e.g., Logistics Management Information Systems)	
Early Warning Systems (e.g., hazard monitoring platforms)	
Communication Tools (e.g., satellite phones, WhatsApp, email alerts)	
Data Collection Tools (e.g., KoboToolbox, ODK)	
Mapping and GIS Software	
Forecasting and Simulation Software	
Other (please specify): _____	

2. Rate the effectiveness of technology tools used during the preparedness phase:

(1 = Very Ineffective, 5 = Very Effective)

Technology tools	**1**	**2**	**3**	**4**	**5**
Inventory Management Systems					
Early Warning Systems					
Communication Tools					
Data Collection Tools					
Mapping and GIS Software					

Forecasting and Simulation Software					
To what extent do these technology tools contribute to better preparedness planning?					

3. What types of technology tools does IRC use during the response phase? (Select all that apply)

Technology tools	vote
Real-time Tracking Systems	
Mobile Data Collection Tools	
Drone or Aerial Imagery for Damage Assessment	
Automated Reporting Platforms	
Communication Apps (e.g., Slack, WhatsApp, Signal)	
Other (please specify): _____	

4. Rate the effectiveness of technology tools used during the response phase:

(1 = Very Ineffective, 5 = Very Effective)

Technology tools	**1**	**2**	**3**	**4**	**5**
Real-time Tracking Systems					
Mobile Data Collection Tools					
Drone/Aerial Imagery					
Automated Reporting Platforms					
Communication Apps					

5. How frequently are new technology tools introduced and integrated to response operations?

Frequency	**vote**
Always	
Often	

Sometimes	
Rarely	
Never	

6. What are the major challenges IRC face in using technology for logistics preparedness and response? (Select all that apply)

Challenges	**vote**
Lack of training and skills	
Poor internet/network connectivity	
Equipment unavailability	
System reliability issues	
Resistance to technology adoption	
Budgetary constraint	
Other (please specify): _____	

7. What type of formal training on technology management does IRC use for its logistics operations?

Training	**Vote**
In-house training	
External workshop/seminar	
Online course	
Other (please specify): _____	

1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree

Ut.	**Questionnaires**	**1**	**2**	**3**	**4**	**5**
1	IRC logistics team uses digital tracking systems to monitor the flow of goods and services in the supply chain.					

2	Technology tools used by IRC (e.g., logistics software, mobile apps) are reliable and user-friendly.					
3	Real-time information sharing between IRC and partners is effective during preparedness and response in logistics.					
4	Data security and privacy are adequately maintained in IRC's logistics information systems.					
5	IRC provides sufficient training on the use of logistics technologies to its staff and partners.					
6	IRC's use of technology in logistics has improved the timeliness of its emergency responses.					
7	IRC effectively integrates new technologies to adapt to changing logistical challenges.					

8. Overall, how satisfied are you with the current technology support in IRC Ethiopia's logistics operations?

Very Satisfied	
Satisfied	
Neutral	
Dissatisfied	
Very Dissatisfied	

9. In your opinion, how do you think technology usage can be improved in humanitarian logistics?
10. Please suggest any specific technologies or systems you believe should be introduced to enhance preparedness and response capabilities?

Section D: Preparedness Practices (Objective 1)

1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree

Ut.	Questionnaires	1	2	3	4	5
1.	IRC Ethiopia has well-defined strategic planning processes for its logistical preparation.					
2.	The objectives and responsibilities concerning supply chain readiness are clearly established in IRC's logistics preparation.					
3.	The organization has reliable alternative supply chain and transport options planned in case of logistical disruptions.					
4.	IRC's logistics department always maintains pre-positioned supplies that are effectively managed and located strategically.					
5.	IRC's inventory control, warehousing, and distribution planning practices are efficient and well-organized.					
6.	IRC regularly engages in training and simulation exercises for emergency preparedness in logistics.					
7.	IRC's logistics team is adequately prepared to respond to fluctuating demands of the vulnerable community.					
8.	IRC collaborates effectively with key logistics partners on preparedness activities.					
9.	IRC's logistics department manages information and integrates technology efficiently with stakeholders during the preparedness phase.					
10.	IRC Ethiopia faces different challenges in its logistical preparedness practices.					
11.	IRC is able to respond effectively to challenges in its logistical preparedness practices.					
12.	IRC's logistics department has a robust process for identifying potential risks and vulnerabilities and preparing for them.					
13.	IRC ensures the effectiveness of its preparedness strategy, and its performance is regularly evaluated and measured.					

Section E: Response Mechanisms (Objective 2)

Ut.	Questionnaires	1	2	3	4	5
1	IRC's logistics team has a well-structured response process from needs assessment to distribution once a humanitarian crisis occurs.					
2	IRC's logistics department maintains pre-established agreements with suppliers for emergency response.					
3	IRC's suppliers are reliable in responding to emergencies.					
4	IRC uses flexible approaches to respond to changing needs of beneficiaries in logistical aid delivery.					
5	IRC usually faces challenging circumstances in its logistical response practices.					
6	IRC effectively responds to challenging circumstances in its logistical response practices.					
7	IRC has an effective resource mobilization mechanism on its logistics mission.					
8	Logistics operations (procurement, transportation, warehousing, and distribution) are efficiently activated and monitored during a response.					
9	IRC Ethiopia's response practices in logistics ensure equity and access to all beneficiaries.					
10	IRC ensures the effectiveness of its logistical emergency response, with performance regularly evaluated and measured.					

Section F: Challenges and Gaps (Objective 3)

Ut.	**Questionnaires**	1	2	3	4	5
1	IRC Ethiopia faces significant logistical challenges during preparedness and response practices.					
2	Infrastructure and funding limitations significantly affect IRC's logistics operations.					

3	Coordination with internal and external stakeholders presents challenges to effective logistics operations.					
4	IRC has taken effective actions to mitigate its logistical challenges.					
5	There are considerable challenges that hinder IRC in evaluating the effectiveness of its logistics operations.					
6	IRC faces challenges related to limited transportation infrastructure during emergency responses.					
7	Delays in customs clearance significantly hinder IRC's logistics operations.					
8	Insufficient funding affects the sustainability of IRC's logistical preparedness and response mission.					
9	Political and security instability present major obstacles to IRC's logistics activities.					
10	Limited availability of local suppliers impacts the speed of emergency procurement.					
11	Communication breakdowns among stakeholders create logistical inefficiencies.					
12	IRC's logistics operations are challenged by frequent changes in regulatory requirements.					
13	Human resource shortages (e.g., skilled logistics staff) affect IRC's response capacity.					
14	Limited warehouse space constrains IRC's ability to pre-position supplies effectively.					
15	Technological limitations reduce the effectiveness of IRC's logistics management systems.					

Closing:

Is there anything else you would like to share about IRC's logistics operations in Ethiopia?

Thank you very much for your time and valuable input!

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Addis Ababa University
College of Business & Economics
School of Commerce
Logistic and Supply Chain Management Program U

P.O.BOX:3131: Addis Ababa, Ethiopia

Date: ______________

TO WHOM IT MAY CONCERN

Subject: Request for Collaboration for conducting research

Dear Sir/Madam,

The Department of Logistics and Supply Chain Management at Addis Ababa University offers comprehensive academic programs at the Bachelor's (BA), Master's (MA), and Doctoral (PhD) levels. Our department is committed to providing high-quality education, pioneering research, and practical expertise in logistics, supply chain management, and business operations. Through these diverse programs, we aim to equip students with the knowledge and skills needed to thrive in the global marketplace, while promoting innovation, sustainability, and leadership in the logistics and supply chain sector both in Ethiopia and internationally.

I am writing to request your kind cooperation concerning a graduate student, Yared Mekeb (ID number: GSR/5976/16), currently enrolled in the Master's program at Addis Ababa University's School of Commerce, specializing in Logistics and Supply Chain Management. The student is conducting research for his/her thesis titled: Humanitarian Logistics: Preparedness and Responce Practices and its challenges in IDC Ethiopian relief operations in the 2024/25 academic year.

We would greatly appreciate your assistance in providing any necessary information or collaboration that could contribute to the successful completion of his/her research thesis. Your support in this matter would be highly valued.

Thank you for considering this request. Should you require any additional information, please do not hesitate to contact me.

Sincerely,

Shiferaw Mitiku, PhD
Interim Chair Person of Department of Logistics and Supply Chain Management
School of Commerce, Addis Ababa University
Email: shiferaw.mitiku@aau.edu.et