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HELP LOGISTICS

Operational Research Report | September 2024

Evaluation of the Emergency Supply Prepositioning Strategy (ESUPS)

A qualitative analysis of ESUPS' relevance, effectiveness, and sustainability

In collaboration with

ESUPS

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Acknowledgments

We extend our gratitude to all the participants who contributed to this project through interviews and their involvement in the validation workshop. Their insights have been instrumental in shaping our findings and recommendations.

Our thanks also go to the members of the ESUPS Steering Group for their meticulous review and feedback, which enhanced the quality of this report.

This evaluation report is made possible by the generous support of the American people through the United States Agency for International Development (USAID). The contents are the responsibility of the authors and do not necessarily reflect the views of USAID or the United States Government.

Citation

CHORD. (2024). Evaluation of the Emergency Supply Prepositioning Strategy (ESUPS). [Report]

Executive summary

Context

A swift disaster response depends on effective preparedness measures, and prepositioning relief stocks is one key preparedness strategy. By strategically positioning supplies near potential crisis zones, humanitarian actors can reduce response times and costs. However, prepositioning faces significant challenges, including limited funding, poor stock management, insufficient visibility, and weak coordination across the humanitarian sector. The Emergency Supply Prepositioning Strategy (ESUPS) initiative addresses these pressing challenges through its three pillars: Data collection, data analysis, and advocacy and communications. ESUPS' STOCKHOLM platform (STOCK of Humanitarian Organisations Logistics Mapping) aggregates, visualises, and analyses data on prepositioned relief stocks. Through its platform and its advocacy and communications efforts, ESUPS enables better coordination and strategic decision-making in logistics.

Scope of the evaluation

This report evaluates the ESUPS initiative through three key dimensions: its **relevance** in meeting the humanitarian actors' needs related to prepositioning, its **effectiveness** in systematically and technically addressing those needs, and its **sustainability** in delivering long-term value to humanitarian supply chains and preparedness initiatives.

Drawing on qualitative insights from a diverse group of 31 users and non-users of STOCKHOLM representing 21 organisations, the evaluation critically examines ESUPS' ability to support prepositioning for humanitarian actors, especially National Disaster Management Organisations (NDMOs).

Key findings

Maximizing relevance

ESUPS improves visibility into cross-organisational prepositioning activities through optimised data collection and analysis, allowing for more coordinated efforts. STOCKHOLM is positioned as a platform for guiding strategic prepositioning decisions, particularly for NDMOs. However, STOCKHOLM requires broader adoption and consistent data updates to achieve its full potential. Ongoing advocacy and communications are critical to increase STOCKHOLM's adoption and prevent misunderstandings about its goals and functions.

Overcoming barriers to effectiveness

Despite STOCKHOLM's intuitive design and user-friendly functionalities, ESUPS continues to face several challenges that hinder its overall effectiveness. Competition and distrust impede effective data-sharing, while staffing shortages lead to irregular data updates. A limited user base and concerns about data reliability from other organisations further erode trust. Additionally, the platform's advanced analytical capabilities remain underutilised, restricting ESUPS' full potential. Overcoming these barriers is key to maximising ESUPS' effectiveness.

Ensuring sustainability

STOCKHOLM's sustainability relies on its ability to provide accurate visibility into cross-organisational prepositioned stock. For ESUPS to stay relevant and effective over time, its platform must achieve broader user adoption, be integrated with existing systems, and secure stable, long-term funding, relying on the advocacy and communications pillar. These elements are important to ensure that ESUPS continues to support coordinated and effective humanitarian action.

Recommendations

Several strategic improvements must be implemented to ensure the continued success and long-term impact of ESUPS, many of which are already part of ongoing efforts. These actions will continue to strengthen the initiative's relevance, effectiveness, and sustainability while promoting broader adoption and collaboration, ultimately enhancing its overall performance. More detailed recommendations are available in the corresponding section of the report.

1. **Clarify the purpose** of ESUPS and STOCKHOLM and **align users' expectations** through targeted advocacy.
2. Achieve a critical mass of STOCKHOLM users and **increase regular data updates** for accurate visibility and better coordination.
3. **Build and bridge trust** by balancing transparency and privacy.
4. Strengthen **collaboration and ownership of local actors**, especially NDMOs.
5. **Invest in prescriptive analytics** to provide actionable insights for decision-making.
6. **Facilitate loan-and-borrowing activities** to optimise the use of relief stock and bridge preparedness and response.
7. Pursue **system integrations to reduce system duplications** and improve collaboration.
8. Report on **success stories** and regular evaluations to inspire broader adoption.
9. **Explore long-term funding strategies** to secure diverse funding sourcing ensuring the ongoing platform's support.
10. Be critical of the need for prepositioning to **adopt a holistic approach to preparedness** by incorporating prepositioning into broader strategies.

In its pursuit of contributing to both the localisation and collaboration agenda, STOCKHOLM can play a key role in increasing visibility across prepositioned stock levels. With targeted improvements, ESUPS, collaboratively with other partners such as the United Nations Humanitarian Response Depot (UNHRD), the Global Logistics Cluster, or Dubai Humanitarian, can shift the paradigm towards more coordinated, data-driven preparedness. This evaluation also underscores the importance of continuous innovation in the humanitarian sector to ensure more effective and efficient responses in the future.

Contents

List of abbreviations

ASYREC	Automated System for Relief Consignments
CHORD	Centre for Humanitarian Logistics and Regional Development
ESUPS	Emergency Supply Prepositioning Strategy
ICRC	International Committee of the Red Cross
IFRC	International Federation of Red Cross and Red Crescent Societies
INGO	International Non-Governmental Organisation
IOM	International Organisation for Migration
KLU	Kühne Logistics University
MENA	Middle East and North Africa
NDMA	National Disaster Management Agency
NDMO	National Disaster Management Organisation
NFI	Non-Food Item
NGO	Non-Governmental Organisation
OCHA	(United Nations) Office for the Coordination of Humanitarian Affairs
PALM	PAcific Logistics Mapping platform (STOCKHOLM's predecessor in the Pacific)
RCRC	Red Cross and Red Crescent
STOCKHOLM	STOCK of Humanitarian Organisations Logistics Mapping
UN	United Nations
UNHRD	United Nations Humanitarian Response Depot

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1: Introduction

1.1 | Background

Disasters have unpredictable impacts and can leave communities in urgent need of help. Successful disaster response includes the timely provision of relief items—essential supplies and services that help sustain life, alleviate suffering, and restore dignity. Preparedness in the humanitarian supply chain is crucial and involves anticipating the demand for supplies and services during disasters, strategically positioning resources, and proactively initiating effective coordination among key stakeholders before a disaster strikes (Stumpf et al., 2023).Prepositioning stocks near potential disaster zones is a primary example of supply chain preparedness and ensures that the necessary relief items are readily available, leading to a faster response time, reduced post-disaster suffering of the affected population, and potentially more lives saved (Jahre et al., 2016).

However, prepositioning strategies face serious challenges. The unpredictability of disasters can lead to insufficient or unused prepositioned relief stocks. Hence, humanitarian actors, such as humanitarian organisations and NDMOs, must determine the optimal levels of prepositioned stock for relief items in the countries they serve. For example, the exchange of prepositioned relief stocks among humanitarian actors can help reduce stock shortages or overstocking during the disaster response. Therefore, having accurate and easily accessible information about prepositioned relief stocks is essential for successful cross-organisational coordination. Despite the lagging commitment, the humanitarian community recognises the significant impact of prepositioning as a key aspect of supply chain preparedness, especially when supported by data-driven approaches (ALNAP, 2022).

1.2 | ESUPS and STOCKHOLM

ESUPS is an initiative established in 2016 to enhance prepositioning strategies for relief items at national and regional levels (ESUPS, 2024). Hosted by Welthungerhilfe and governed by a steering group including multiple humanitarian actors and academic entities,[1] ESUPS supports coordinated strategies and encourages joint planning for relief stock prepositioning among humanitarian actors. Its guiding principles are:

- **Preparedness and Anticipatory Action**: ESUPS does not focus on the response phase,
- **Localisation**: ESUPS aims at empowering national decision-makers, in particular NDMOs,
- **Collaboration**: ESUPS encourages a joint stock prepositioning strategy definition among humanitarian actors.

ESUPS also advocates for digitalisation and data-driven decision-making. It operates on three pillars that collectively support its strategic direction: Data collection, data analysis, and advocacy and communications.

1. Through its platform STOCKHOLM, ESUPS collects, aggregates, and visualises data on prepositioned relief stocks by mapping available relief stocks, quantities, and locations to guide decision-making, help identify gaps, and reduce duplication of coordination efforts.

2. Data collection allows for data analysis, which is ESUPS' second pillar. STOCKHOLM provides an algorithmic analysis, combining historical emergency response data and humanitarian logistics information, which supports the identification of opportunities for improving coordinated stock prepositioning strategies. The mathematical model, developed in partnership with Pennsylvania State University, considers the history of disasters in each country and compares the existing relief stock of various organisations to the estimated needs drawn from past disasters. Such analyses identify gaps and overlaps in stock prepositioning at the national level. As a result, these data analyses help define clear recommendations in the implementation of a cross-organisational prepositioning strategy.

3. Advocacy and communications, as the third pillar, support research and documentation on the benefits of stock data-sharing, loan-and-borrowing, and branding postponement. This pillar requires the development of relevant communication strategies using the right messages to the appropriate audiences. The information from the data collection and analysis is used to promote coordinated prepositioning strategies among humanitarian actors at the country level. The advocacy and communications pillar aligns with the humanitarian sector's call for a joint approach at all levels of the supply chain to magnify the impact of humanitarian action (European Commission, 2022). It depends on the high quality of the data collection and analysis, which, in turn, motivates humanitarian actors to engage with STOCKHOLM, share their data, and contribute to the change in mindset towards a more collaborative and transparent approach of prepositioning.

As of September 2024, STOCKHOLM includes over 119 agencies and about 600 registered users from 58 countries (Figure 1), including international and local non-governmental organisations (NGOs), United Nations (UN) agencies, Red Cross and Red Crescent (RCRC) entities including the International Committee of the Red Cross (ICRC), the International Federation of Red Cross and Red Crescent Societies (IFRC), and National Societies, donor agencies, the private sector, and academic institutions (Figure 2).

1. e.g., Action Against Hunger, International Federation of Red Cross and Red Crescent Societies (IFRC), International Organisation for Migration (IOM), Save the Children International, World Vision, the Pennsylvania State University, and the UNHRD.

Figure 1: Number of individual users and agencies registered to STOCKHOLM between September 2021 and September 2024

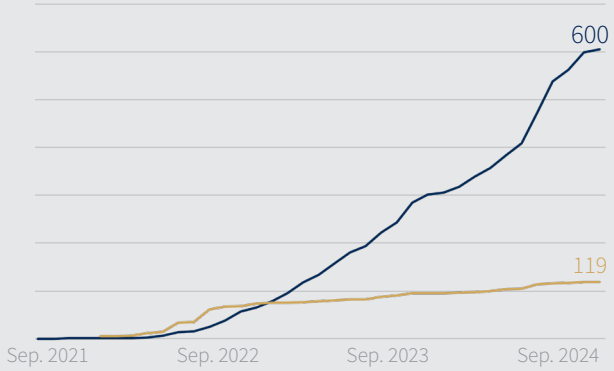
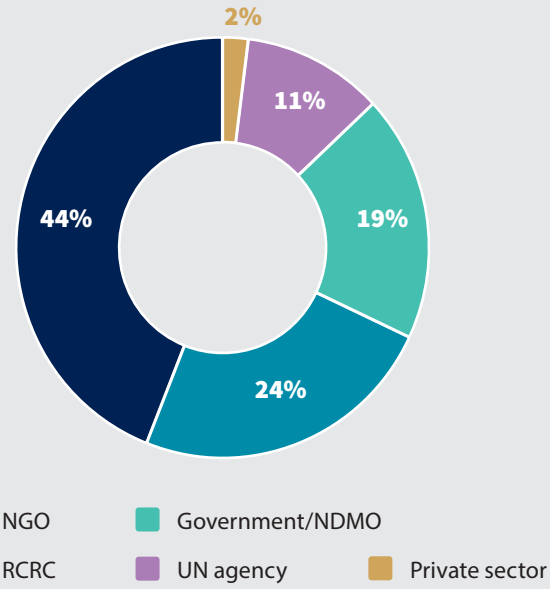


Figure 2: Breakdown of agency types registered to STOCKHOLM as of September 2024



STOCKHOLM integrates with other systems such as the Dubai Humanitarian Databank enhancing regional stock data visibility. It also connects with the Logistics Cluster's LogIE platform (Logistics Cluster, 2024). The objective is to establish LogIE as the main gateway for decision-makers to access all stock-related data from multiple sources (such as the Dubai Humanitarian Databank (Dubai Humanitarian, 2024), the Automated System for Relief Consignments platform (ASYREC; ASYREC, 2024), and STOCKHOLM) without having to monitor four individual systems. While the Databank will offer a view on available regional stocks and ASYREC information on emergency import procedures for these stocks, STOCKHOLM will remain the central platform to collect and analyse nationally prepositioned stocks data.

LogIE as the main gateway interfacing STOCKHOLM, Dubai Humanitarian Databank, and ASYREC platforms

1.3 | Research purpose and scope

The purpose of this evaluation is to assess ESUPS in terms of relevance, effectiveness, and sustainability. These aspects are key indicators that shed light on the perceptions of ESUPS' strategic direction. The three aspects relate to the pillars of ESUPS as follows:

The **relevance** measures whether ESUPS addresses the actual needs of the humanitarian actors, particularly in stock prepositioning at the national level. Relevance is a driver of sustainability as it ensures STOCKHOLM's future adoption and continuous usage. It connects to (1) data collection in terms of identifying and visualising stock data, (2) data analysis in terms of providing evidence-based decision support, and (3) advocacy and communications in terms of demonstrating the value added through ESUPS' efforts.

The **effectiveness** evaluates STOCKHOLM's technical usefulness in meeting its purpose and depends on its functionality, design, and structure, which also influence future adoption. In turn, effectiveness is reflected in (1) data collection in terms of if and how individuals interact with the STOCKHOLM, (2) data analysis in terms of if and how individuals use it for decision-making, and (3) advocacy and communications in terms of if and how the value added through ESUPS' efforts is perceived.

The **sustainability** reflects the future engagement, commitment, and continuous contribution to ESUPS' efforts and STOCKHOLM. It depends not only on financial considerations but also on the perceived value brought by the initiative. Sustainability manifests in (1) data collection evidenced by increased data input and growing adoption, (2) data analysis demonstrated by the production of high-quality outputs that improve the platform's appeal, and, primarily, (3) advocacy and communications through a change in mindset towards more collective supply chain preparedness strategies.

This evaluation report is based on common use cases and perspectives from individuals engaged in prepositioning efforts, including users and non-users of STOCKHOLM. It provides insights into the integration of STOCKHOLM into planning and decision-making for stock prepositioning. It also examines the role of ESUPS in coordinating prepositioning efforts across organisations. This report aims to guide ESUPS decision-makers and partners on the platform's functionality and potential areas for improvement, incorporating feedback from diverse stakeholders to provide comprehensive user-case evidence. The evaluation's outcome will elaborate on the future directions and recommendations for ESUPS in the humanitarian sector and the potential growth and optimisation of STOCKHOLM's user base.

1.4 | Methodology

The evaluation, conducted by researchers from CHORD, was approached systematically using a mixed-methods design.

Semi-structured interviews with 25 humanitarian supply chain experts provided qualitative insights into the usage patterns and attitudes of both users and non-users of STOCKHOLM. The interviews occurred in two phases to allow for refinement based on the initial results. 22 participants were interviewed during the first round to identify the dominant themes and patterns against the three areas of evaluation; namely, relevance, effectiveness, and sustainability. The second round of interviews, involving three participants, provided more depth on specific areas of interest identified in the first round and verified emerging questions.

Following this, a focus-group workshop with seven humanitarian supply chain specialists further refined the combined findings and facilitated the formulation of key recommendations. This combination of methods enhanced evidence-based sense-making and enabled data triangulation, validating and enriching the overall findings.

To ensure diversity, purposive sampling was employed, selecting the interviewees based on specific criteria such as their expertise, their geographical location, or the type of organisation they pertain to. This approach was suitable for gaining a comprehensive understanding of ESUPS and its efforts from both technical and advocacy perspectives. Therefore, users of STOCKHOLM, and non-users with supply chain preparedness expertise were all equally approached. Figure 3 depicts the proportion between the sampled groups. Between March and June 2024, 31 individuals from 21 different organisations across five continents participated in the evaluation, with 39% of the participants being women. Figure 4 and Figure 5 display the organizational and geographical coverage, respectively. The full list of participants can be found in Table 1 in the Appendix.

Figure 3: Proportion of users and non-users of STOCKHOLM among the evaluation sample

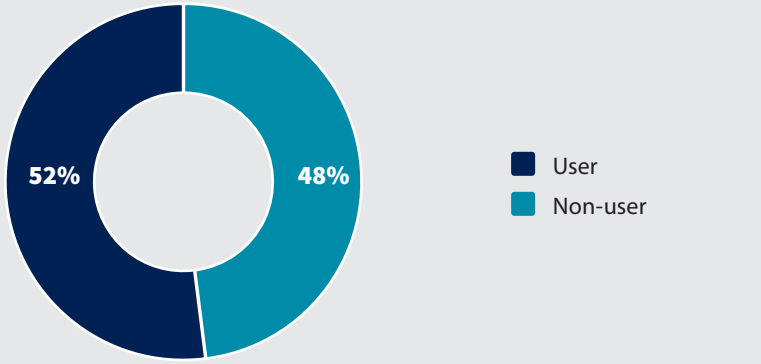


Figure 4: Proportion of organisational types represented by the evaluation sample

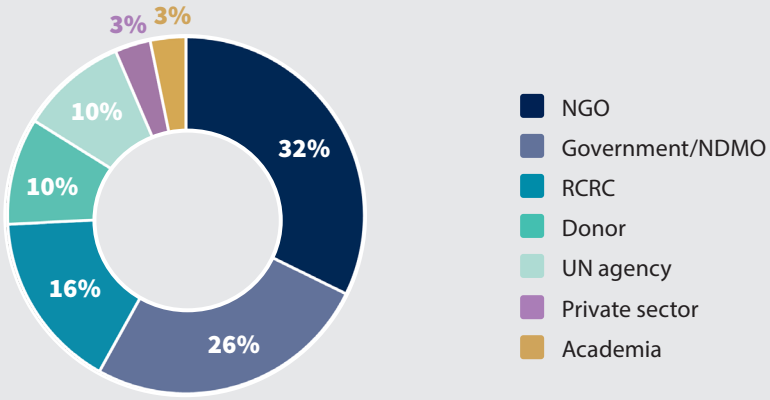
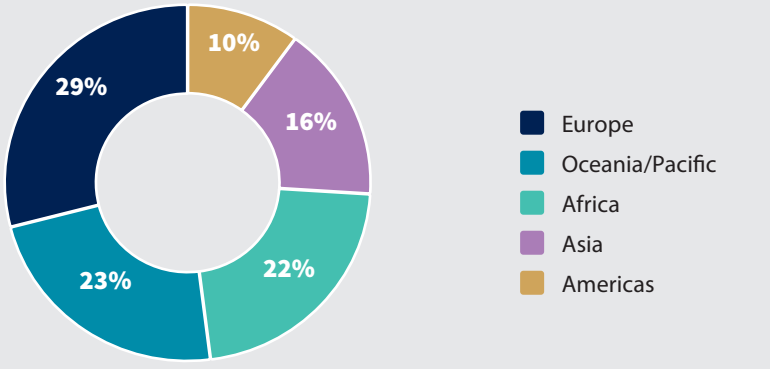


Figure 5: Proportion of the regions of operation represented by the evaluation sample



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2: Understanding the operational environment for prepositioning relief stocks

Prepositioning relief stocks is strategically important for disaster response, as it allows organisations to respond quickly after a disaster. However, there is a risk of resources being tied up without any guarantee of an emergency occurring. Consequently, humanitarian organisations face challenges such as the management of prepositioned stock or the limited funding available. Moreover, they face a trade-off between national and international prepositioning; national prepositioning may face political barriers, while international prepositioning can sometimes entail free-of-charge storage. However, international prepositioning is perceived as having less time-effective availability during crises due to the lengthy transport and customs clearance.

2.1 | Challenges of managing prepositioned stock

Prepositioning relief stocks offers advantages for disaster response operations by allowing for immediate distribution and avoiding delays and financial burdens associated with emergency procurement. Most prepositioned relief items are Non-Food Items (NFIs),[2] which usually do not have a natural expiry date but can deteriorate if not stored properly. In contrast, food and medical items have a limited shelf life[3] that is affected by the storage conditions. Therefore, a proper warehousing setup is a crucial factor in the prepositioning strategy. The possible expiration or deterioration of relief items represents a major barrier to prepositioning, and the costly and regulated disposal of expired items further challenges humanitarian organisations and concerns donor agencies.

> *"In terms of the value of prepositioning, we always say prevention is better than cure. We're spending a lot of money during an emergency response. If we start procuring at the onset of the emergency, we will not be able to respond immediately, but if we have prepositioned goods, we can immediately distribute in three days from the time that [the disaster hits]. That's the value of prepositioning."* – Participant 9

> *"When it comes to the challenges of prepositioning, it is the maintenance. The maintenance of these stocks and the facilities that we use for storage can be quite expensive, especially with the kind of weather that we have. Sometimes it's too hot and the items that are stored inside might get damaged."* – Participant 23

2. Such as blankets, tarpaulins, or water, sanitation, and hygiene items.
3. For instance, high-energy biscuits have approximately a two-year shelf live (United States Department of Argriculture, 2015)

2.2 | Challenges of funding prepositioning

Humanitarian organisations struggle to secure funding for prepositioning relief stocks because they typically receive funding only when a disaster response is declared (Crossley et al., 2021). Donor agencies are hesitant to invest in resources that may not be used immediately or at all. This resistance to fund prepositioning, in turn, reinforces the competition for financial resources between humanitarian organisations during and after a disaster response. For small and mid-size organisations, the difficulty in mobilising financial resources can make the prepositioning of relief stocks almost unfeasible. A plausible consequence of this situation is that organisations may be less inclined to have strategic plans for prepositioning, and opt for it when prepositioning is financially possible, e.g., turning towards free regional options like those offered by the UNHRD.

> *"The availability of funds at a time when there is no response, that's where the challenges are. […] Because if the stocks are in the country, then each and every INGO and even local NGOs will somehow be competitors in the sense that they need funds to replenish those stocks."* – Participant 9

> *"For mid-sized organisations, prepositioning wasn't that successful in a way as it represents a lot of financial mobilisation."* – Participant 11

2.3 | Challenges of national and international prepositioning

Despite the above-mentioned operational and financial challenges against prepositioning, implementing it offers humanitarian organisations considerable benefits but also some risks at both the national and global levels.

National prepositioning allows to secure stocks closer to disaster response zones, thus reducing lead times. However, sourcing quality items from local markets is often difficult, as nationally available stock may not meet the necessary quality standards for long-term storage. Moreover, country-specific bureaucratic and political restrictions can lead to stock immobility, impeding the movement of stock to locations outside the country at times of emergencies.

> *"From the logistics side, it doesn't make sense to preposition everything in the country. [There is] this trade-off between trying to localise or have the stocks where we need them, compared to the reality of when you need them somewhere else."*
> – Participant 16

> *"The quality and the availability of items in-country that suit the need and the description of the items that we need to store for emergencies is an issue. Sometimes the items that are available are not of good quality that can be stored for long."*
> – Participant 23

Consequently, humanitarian organisations may be more inclined to maintain an international stock level. Due to the risks and costs associated with national prepositioning, some humanitarian organisations resort to using free-of-charge storage spaces at the international level, such as UNHRD, for cost-efficiency reasons. However, relying solely on international prepositioning presents its own risks. Mobilising stocks from afar during disaster response incurs higher transportation costs and logistical difficulties, such as custom impediments, undermining the primary objective of providing rapid relief to the affected populations.

> *"I thought [it] was super ironic that [the donor agency] gives NGOs the money to preposition their stock and they preposition it in Dubai because it's free, obviously, instead of doing it […] closer to the location."* – Participant 16

> *"Even though we have big emergency responses, the countries are not easy to open the port or the border. Still, they require customs. So, bringing something from outside of the country will be challenging, but, within the country, it will be easy."* – Participant 10

3: The relevance of ESUPS for the prepositioning of relief stocks

Effective supply chain preparedness includes improved visibility into prepositioned relief stocks. STOCKHOLM enhances this visibility by centralising data from various organisations. In turn, this visibility supports better decision-making, improves coordination, and reduces redundancy. It supports both humanitarian organisations and NDMOs in coordinating their prepositioning efforts. However, some stakeholders are hesitant about this platform due to resource constraints, scepticism about its applicability, and confusion about its functionality and scope. Addressing these issues through targeted advocacy and clear communications is essential for maximising ESUPS' relevance.

3.1 | Data collection and analysis support for collaborative prepositioning strategies

3.1.1 | The challenge of insufficient visibility of prepositioned relief stock

Insufficient visibility on the prepositioned relief stock levels of different humanitarian organisations and their locations in the country poses a key challenge for decision-making for supply chain preparedness. This is especially challenging for national authorities who are responsible for leading response efforts and often lack information on relief stocks prepositioned by humanitarian organisations. Without knowing the available stocks and the response capacities of the humanitarian organisations, it is difficult for each organisation to plan the allocation of its resources and maintain appropriate stock levels, all while still considering the larger context. Therefore, making data on prepositioned relief stocks available for exchange is crucial for reducing duplications and improving cross-organisational coordination, especially at the national level where sharing information is often limited to ad hoc connections.

"Just seeing what other agencies have prepositioned is helpful in itself. If I'm trying to make a decision on where to put stocks, but I have zero visibility into what any other agency is doing, then that's quite challenging." – Participant 17

"We have no idea what stock is where. In many cases, we're saying 'How many items of this kind should I stock?' I want to cover this amount, if I know how much is already there, and how much capacity others have to respond." – Participant 15

There are ongoing efforts to increase the visibility of information related to prepositioned stock between organisations. For example, through cross-organisational mechanisms such as national clusters, humanitarian actors inform each other about their stock levels and locations. However, significant gaps remain in information-sharing including during national coordination meetings. Thus, while a general mechanism for information-sharing is in place, ensuring a more comprehensive visibility of different organisations' prepositioned stocks needs further attention.

"We normally have what you call coordination meetings. These are normally monthly meetings where all partners come on board. As far as stock prepositioning is concerned, this has been coordinated by the World Food Programme, so we have monthly interagency meetings where we specifically discuss the stock prepositioning matters." – Participant 2

"In the Logistics Cluster meetings and coordination meetings, it's like: "Who's got stock where?" Nobody knows! So, it is important just to make it visible because without knowing and seeing what information there is, you cannot make any decisions. It's as simple as that." – Participant 16

3.1.2 | The main benefit of visibility of prepositioned relief stocks

Having better cross-organisational visibility of data on prepositioned relief stocks through a centralised platform is likely to result in improved decision-making for the planning of prepositioning, with less redundancy and waste. This visibility is not only beneficial for supply chain staff but also for program staff of the different humanitarian organisations who access the platform.

"If we had the capacity to have all the information consolidated at the country level, we could react much faster and we would not have to hold a conference with each region to see what items they have, but everyone could look at a system in real-time, see what information we have, what is available there and with that respond much faster." – Participant 7

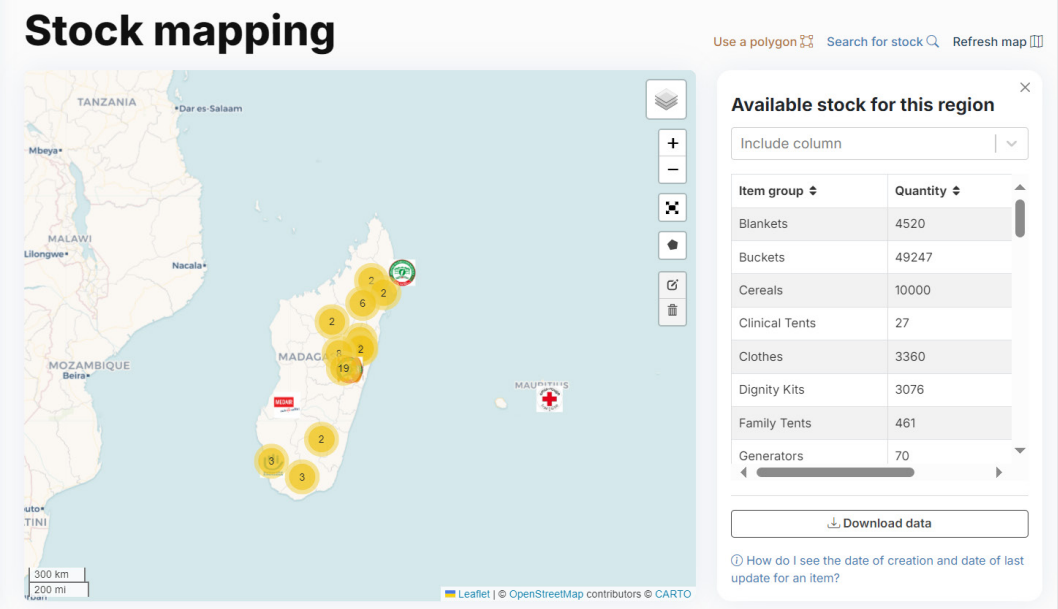
"I personally believe that information in itself is aid. And so, it aids us to plan. It aids us to then define what we would need, what we don't have, not just for operational purposes, but for our program people who are proposal writers or are working with partners." – Participant 29

3.1.3 | STOCKHOLM: A data collection tool for visibility of prepositioned relief stocks

STOCKHOLM collects and displays nationally prepositioned stock data. It aggregates data from various organisations to help make decisions that can improve prepositioning strategies and hence supply chain preparedness.

"For me, it's a platform that is specifically designed for preparedness." – Participant 24

"STOCKHOLM is primarily for [visibility]. It accesses a database to all the stocks and the supplies that we have for the organisation, or that we have in a country. [...] If I can see that so and so supplies will be expiring soon, then I'll get in touch with [the person] there at the [neighbouring] NDMO and say, 'Hey, I see that certain supplies are expiring soon, mine are too. Can we give you the money and you procure?'" – Participant 18



The stock mapping feature in STOCKHOLM shows items organised in groups with respective quantities. Prepositioning locations are marked on the map.

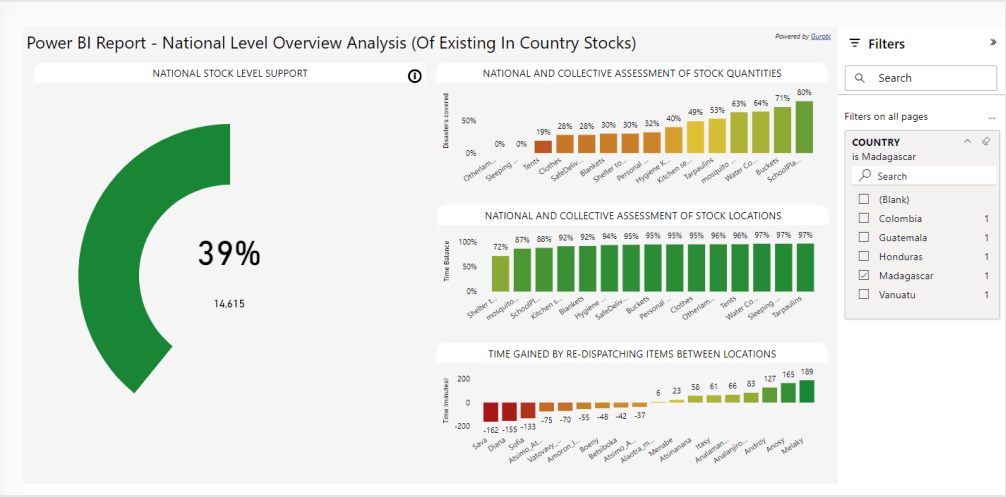
3.1.4 | STOCKHOLM: A data analytics tool for strategic decision-making

While its descriptive elements enable the visualisation of data, STOCKHOLM also has analytical features that can support strategic prepositioning decision-making. For instance, based on the available data on prepositioned relief stocks from different organisations, STOCKHOLM can calculate the approximate ideal stock levels and warehousing locations needed to prepare for disaster response.

"I should be in a position to see how the stock analysis can be done. You cannot make the right decision when you have not done your stock analysis." – Participant 2

"I'm really looking to optimise the global prepositioning, so it is relevant in my decision-making in terms of trying to understand where to place certain items. So as part of our process, we would look at what other agencies are prepositioning, so that can inform what types of items to keep in certain areas." – Participant 17

Users can analyse the stock level at national level through STOCKHOLM. Graphs display the respective levels of item groups for a filtered country.



3.2 | Increased relevance through proactive advocacy for coordinated prepositioning

3.2.1 | ESUPS' role in facilitating a cross-organizational and collaborative mindset

ESUPS is perceived as relevant in leveraging STOCKHOLM for coordinated prepositioning planning. The ESUPS team is expected to take the lead in advocating for a common understanding and shared objectives among humanitarian actors. The dual role of promoting coordination and providing a technical solution is highly valued.

"The platform brings on board all the partners to know who is doing what and how activities are going to be implemented for coordination and planning purposes." – Participant 2

"We have to learn from the past, but we also have to base our decisions on proper data. And I think that in that way ESUPS and the STOCKHOLM platform are a good way to tackle this because so far organisations have been looking at this prepositioning of stocks one by one. The fact that we can coordinate it, talk about it, and share decisions and experiences can guide us through a much better way of responding to these emergencies." – Participant 11

"I think the value isn't just in the system itself as a technical thing, it's also what it brings: this overall mindset shift. Organisations that were very defensive and trying to protect their corner are now openly collaborating and this all comes from having a central system that brings them all together […] It's really this working together and having a common goal. Even if the system itself doesn't solve it technically, working together will solve it." – Participant 16

3.2.2 | Advocacy towards NDMOs

With STOCKHOLM providing a better flow of information, NDMOs can actively monitor and influence national prepositioning strategies. This enables better coordination of prepositioning activities and highlights the importance of their involvement in the platform. By understanding STOCKHOLM, NDMOs can leverage this platform to strengthen partnerships with humanitarian organisations, further solidifying their position as the central player in disaster preparedness and response. Therefore, advocacy efforts to support NDMOs in utilising STOCKHOLM are necessary to ensure the platform's relevance.

"And one of the things that is very interesting at the strategical level is [that STOCKHOLM] allows us [the NDMO] to orientate what kind of priority of activities to include. [It] will be really useful for political, for operational, for strategical [aspects], for all the stakeholders, especially at the government level, to prioritise and to orientate." – Participant 26

"Before we [in the NDMO] make any decisions to distribute supplies, I jump onto [STOCKHOLM]. And it not only informs me to provide the correct recommendations to the decision makers but I'm also able to influence those decisions because I am probably the only person who's well aware of the stock supplies, and the quality of the stocks. So, I'm able to get all the information from STOCKHOLM, have a look at it, and then make recommendations like 'We need to replenish these' or 'We need to find some funding'." – Participant 18

3.2.3 | Advocacy towards addressing misaligned expectations of STOCKHOLM

Two important misaligned expectations about STOCKHOLM exist within the humanitarian sector. First, although STOCKHOLM is primarily designed for preparedness, especially to facilitate the NDMO's coordination role prior to an emergency, it is often perceived as a tool for use during the response phase. Second, there is an increasing expectation that STOCKHOLM will serve as a real-time movement tracker for prepositioned relief stocks. Relatedly, confusion persists between STOCKHOLM and inventory management systems. Better communications by ESUPS could address these issues and avoid possible disappointments.

"I still feel it can work both for the preparedness and the response phase because in our case, the prepositioning and the interaction extend beyond the preparedness phase. Even during the response, there is still back and forth between the department [of Disaster Management Affairs] and the partners."
– Participant 28

"If this platform could help us track the movement of items coming in from a donor or partners into the warehouse and out from the warehouse to the affected areas, that would be one thing that will help us a lot."– Participant 8

"When people accessed the prepositioning items at the country level, there was confusion. Some people are thinking that this is the inventory management system. This is not the inventory management system. You need to include only the prepositioning of core relief items. So, that was my challenge when I was talking with the field and regional offices."
– Participant 20

3.2.4 | Bridging the gap with national users' day-to-day realities

Some express reluctance to use STOCKHOLM for three main reasons. First, some humanitarian actors lack the necessary human resources to conduct physical inventories and enter data regularly. Second, others – particularly some NDMOs – are not convinced of STOCKHOLM's applicability to their agenda and operational context. Third, some critics argue that ESUPS is another Northern Hemisphere-driven solution, implying it does not address local needs. To address this reluctance, advocacy and communications are essential for engaging with national stakeholders to build trust and highlight the platform's relevance to local needs.

"I think the main takeaway is that international organisations really need to be focusing on how things will be applicable and operational at the country level. It can be a very sophisticated system, or it can be as simple as whatever shape it is. But ultimately if you're not able to bring this to the operation level in a way that it's easily adaptable and usable, then whatever setup, even the simplest one will bring zero value or bring minimum value."
– Participant 29

"So, when I ask the partners 'Why would you not use such a software?' The answer was 'It's too many resources for small NGOs', for example. So, that has hindered the use, that you still have to manually input everything." – Participant 16

"I'm very sceptical of these Northern Hemisphere-driven solutions for Southern Hemisphere challenges. […] My question would be instead of putting all that money in STOCKHOLM, wouldn't it be better to just invest in the data culture and the basic data gathering infrastructure and the simplest software of warehouse management for an NDMA?"
– Participant 3

4: The effectiveness of ESUPS for the prepositioning of relief stocks

STOCKHOLM is highly valued for its user-friendly features, such as its intuitive design, easy access, and effective map functionalities, which facilitate quick decision-making. Despite these strengths, several challenges prevent its full effectiveness, including varying levels of digital maturity among users, limited mutual trust, and inconsistent data updates. The platform also suffers from a limited user base and a lack of awareness about its advanced features, which affects its overall utility. Addressing these issues through targeted communications to improve user education is key to improving ESUPS' effectiveness.

4.1 | Effective features and functions of STOCKHOLM

Various features and functions of STOCKHOLM were recognised and appreciated for their user-friendliness, including its intuitive design, straightforward functionality, and usability of its features.

The personalised dashboard on STOCKHOLM provides users an overview of their stock details. Filtering options for item clusters, item groups, and storage facilities give users the option to adjust the dashboard to their preferred reference point for visualisation.

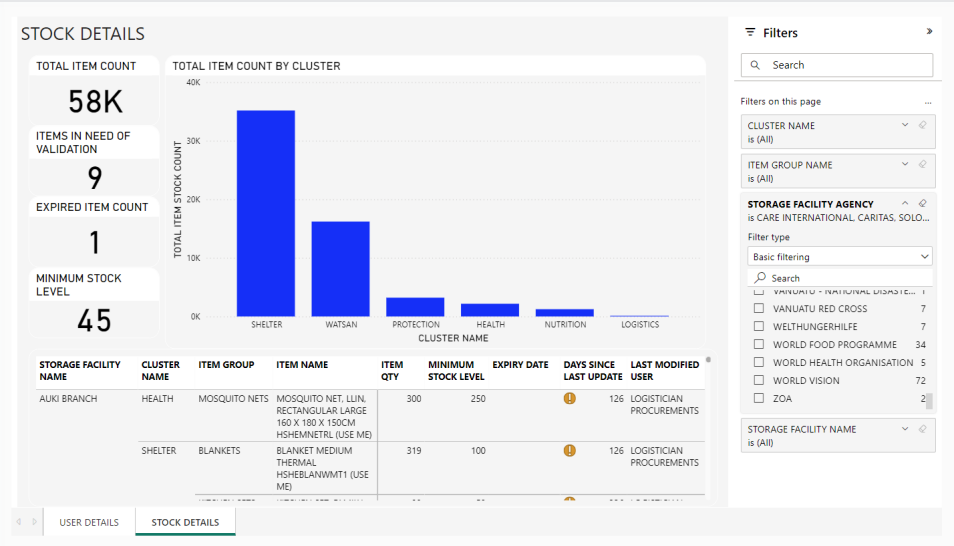


Table 2: List of user-friendly features of STOCKHOLM

Feature	User-friendliness
General accessibility	*"Anyone that's actually used the computer would understand how to use it just by giving a quick one-minute tutorial on it."* – Participant 19
Quick access	*"It is designed in such a way that we will be able to access quick data information for quick decision-making."*– Participant 24
Interface simplicity	*"The system interface is good. It's very simple and straightforward, not very complicated, so it's easy for everyone just to play around with the dashboard or the platform."*– Participant 10
Internet-based	*"It's also very important that this system can be used online. It can support an operation in any given area because it can be used online as long as somebody can get access to the Internet."*– Participant 2
Map functionality	*"The mapping feature is quite intuitive where you put a polygon on the map and it shows you the stocks in that area. So, I use that quite often"* – Participant 17
Filters/keyword search	*"I like the fact that you could add the different filters and add different columns of what you wanted to see."* – Participant 21
Standardised item categories	*"All the major NFIs that we use are on the system as standard items. So, it's quite easy for me to go on [the platform] and find my items and then to upload and update the stocks."*– Participant 17
Stock information/ expiration notification	*"It's very relevant in terms [being] able to understand geographical locations, items information, and expiry dates. Prior to six months when the items expired, we got a notification for that item."* – Participant 24
Personalised dashboard	*"The personalised dashboards according to the role are pretty easy to see."* – Participant 14
Exporting data	*"I found the exporting of data and information very easy."* – Participant 21
Training material	*"They try to provide a very good guide. The materials are fine on the website and very accessible. The videos are good, and the PDF document of the training material is fine."*– Participant 8

4.2 | Features and functions of STOCKHOLM in need of improvement

Participants have provided valuable feedback regarding smaller improvements and recommendations for enhancing STOCKHOLM. Suggestions include addressing missing features, such as the loan-and-borrowing function, and improving user-friendliness, as outlined below.

Table 3: List of requested improvements for STOCKHOLM

Feature	Improvement rationale
Stock owners' contact details[4]	*"It would be interesting to see the stock, who is the stock owner, and see the contact [details]."* – Participant 14
Simplification of filters	*"I have made a search by keyword, but then I have to add some filters to make sure that I'm covering the full research, with the keyword."* – Participant 12
Regular reminder to update the data	*"A monthly or every two months or every quarter reminder for all the agencies using the platform can help as well to encourage the update of each stock."* – Participant 23
Historical data on stock allocation for the reponse[5]	*"Historical information about where the stocks have gone in the past, that would also be really helpful."* – Participant 17
Identification of generic versus branded stock type	*"ESUPS can be that first example to push people to change a bit the mindset of 'I don't need my logo in that box, but I need the item to be there, and if it's my logo or his logo or a local NGO logo it doesn't matter because the end game is to provide it to the affected population"*– Participant 30
Loan-and-borrowing feature	*"Another feature that could be added to STOCKHOLM is the loan-and-borrow system. […] The [ESUPS team] said they wanted to work on it, but of course, it's complicated, especially with branded stocks."* – Participant 16
Prescriptive data analysis	*"I think people are looking for more prescriptive than just descriptive data. So, there is definitely an appetite for that."*– Participant 16
Declaration of commitment/ partnership[6]	*"In terms of getting more users involved, it would be helpful to have agencies committing or accepting to use the platform at different levels. So, maybe [implement] some sort of declaration that agencies will use the platform and then, if I see that all these other agencies have started using it, then I'm going to want to have my data on there so that I'm represented there."* – Participant 17

4. This feature currently does not exist due to the privacy policy used by STOCKHOLM.

5. STOCKHOLM not being a warehouse management system, it does not track the movement of the stock.

6. While this is a national effort and initiative, STOCKHOLM could facilitate the visibility of these declarations of commitment.

4.3 | Challenges impeding the effectiveness of ESUPS

While STOCKHOLM is perceived positively for its effective features and functions, there are still five significant challenges that limit the platform's overall effectiveness.

4.3.1 | Limited digital maturity

The first challenge lies in the different levels of technological maturity that present organisational and structural barriers to the adoption of digital tools by new users. Considering the status of digital maturity and literacy in the humanitarian sector, the use and implementation of digital tools might not be easily feasible.

> *"We are still using Excel sheets which is a vast source of mistakes. As [a donor agency], we are pushing partners to adopt, to digitalise their systems, and so on. But we are so backward. It's crazy. The way we work here internally, we have nothing, nothing at all"*
> – Participant 11

> *"Let's be honest, 80% of the humanitarian stakeholders don't have digitalised solutions in their warehousing space on that level. It's already a miracle if they have an Excel file which is showing them an inventory list … One person out of the entire supply chain and logistics department of the NDMO had an official Excel license. [With ESUPS,] we're trying to plough a field with a Ferrari."* – Participant 3

4.3.2 | Limited mutual trust among users

The second challenge is rooted in the view that humanitarian organisations prefer maintaining control over their resources and generally do not trust other actors to share extensive details about their sensitive strategic and operational data, especially if natural disasters were to happen in countries with ongoing protracted crises.[7] Moreover, this limited trust stems from the fear that adopting STOCKHOLM would shed light on possible operational inefficiencies, thus causing reputational risks in the relationship with donor agencies.

> *"There are so many limitations and one very operational limitation is that many organisations are never going to be willing to share the information in a protracted emergency where government entities are party to the conflict. Because then, locations of warehouses are mapped and warehouse content is even mapped, which is then basically an open invitation for looting or confiscation or inappropriate appropriation of items. We see that time and again."*
> – Participant 3

> *"Trust is used as an excuse not to collaborate: 'How can we know that the government won't get access to our warehouse location?'. The smaller NGOs don't want to show the donor that they have such little stock, because then a donor could be like, 'Your image is that you are bigger than what you actually are. And suddenly using a system like STOCKHOLM would show your operational inefficiencies.'"*
> – Participant 16

7. Users seem however unaware of the 'hide exact location' feature, which allows them to conceal sensitive data on the platform when necessary.

4.3.3 | Limited data updates and lack of data quality

The third challenge is that, given that prepositioned stock movement may occur at any time, limited data updates in STOCKHOLM can negatively influence users' perceptions of the quality and reliability of the data used for decision-making. This negative perception is amplified when users are uncertain about the accuracy of stock data from other organisations, compromising the data collection pillar of ESUPS. However, having precise information available before an emergency is fundamental, even if the response dynamics quickly render it outdated.

> *"I'm only updating if we are having a strategic decision to change where our stocks are prepositioned. I am doing it every six months when we're making big decisions in terms of where items would be stocked. Occasionally, I'm also going on the platform to check and see what other agencies are doing in terms of their prepositioning."* – Participant 17

> *"When it comes to other organisations, I don't really trust the information online on the platform because we don't know what's going on with the other organisation. I remember from some of the updates provided through our National Emergency Operation Centre that another NGO in the country had supplies in stock but during the emergency, they asked us if we could provide them because they had run out of stock. So, it poses a question: 'Are you telling me that the information that you have on the platform is not correct? It's not updated?'"* – Participant 23

4.3.4 | Limited pool of users

The fourth challenge arises as the effectiveness of STOCKHOLM for the broader humanitarian community depends on a critical mass of users being persuaded to embrace the platform. The platform has around 600 registered users as of September 2024, but it is not yet clear how many of these have actively and regularly utilised the platform to inform their preparedness decision-making.

> *"For me, this tool will be very powerful, and it will be very strategic if all the key players are also using it. [...] ESUPS will be as powerful as the community is using it and then [the question is] how many community partners or players really want to use it?"*
> – Participant 10

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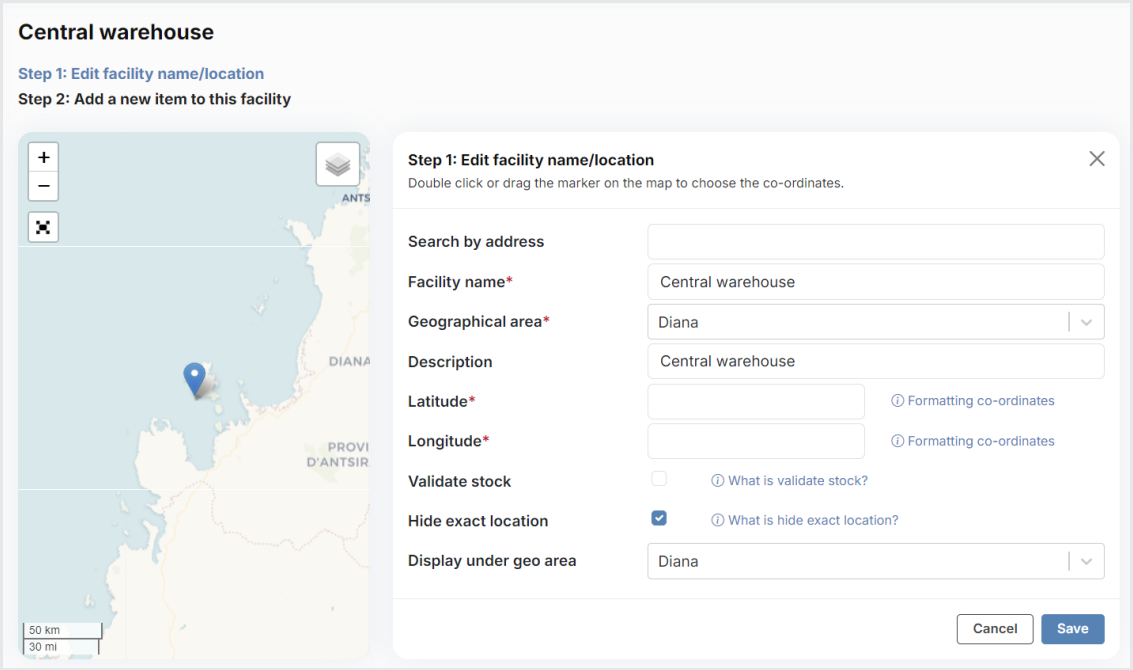
4.3.5 | Lack of awareness of existing features

The fifth challenge is that some users appear to be unaware of some of STOCKHOLM's features and functions, such as registration on the platform,[8] visibility of participating organisations,[9] the option for bulk uploading of data via Excel, simplifying the input of location when creating a warehouse,[10] hiding the exact location of a warehouse,[11] and joint planning.[12] It also appears that the analytical features of the platform have remained underutilised. This indicates the need for better and broader communications programs to demystify the platform and incentivise its optimal use.

"People haven't been using it for long. The only thing that we are doing right now is updating stock, extracting stock reports from it." – Participant 24

"I don't think I've ever used the analytical side of it. To be honest, I think the most that I've ever done is just to export." – Participant 21



When entering new data, users have the option in STOCKHOLM to hide the exact location of the relief stock storage facility.

8. The registration can be facilitated by the following guide: 2024.03-Invitation-to-Register-STOCKHOLM-User-Guide-EN.pdf (esups.org) available in English, Spanish, and French. If the problem comes from the organisation's IT internal restrictions, the following document serves as a guide for their respective IT department: 2024.03-Security-STOCKHOLM-User-Guide-EN.pdf (esups.org).
9. It can be found under "Stock mapping", "Insert countries", and "Search for stock". The map will display the logos of the agencies operating in the area. By adding "agency" to the drop-down menu of the table, the list of agencies will be displayed and can be downloaded in an Excel document.
10. Users can insert the GPS coordinates of the warehouse or type the address of the location (that will then give the coordinates) or pin the location on the map (that will also automatically give the coordinates). These three options are independent of one another.
11. Users can decide to hide the exact location of their facilities by ticking the corresponding box when creating their facility location.
12. While not being a feature as such, joint planning is an outcome of the reason why STOCKHOLM was designed. The information gathered on STOCKHOLM and the produced recommendations should ultimately allow actors to do joint planning.

4.3.6 | System duplication and limited integration with other systems

Finally, the sixth challenge is system duplication and the perceived limited integration of ESUPS and STOCKHOLM with other existing mechanisms. Humanitarian actors often use individually developed digital solutions, which is likely to impede collaboration and simultaneously fuel competition. Donor agencies might also contribute to this duplication, as their funding strategies sometimes encourage the development and deployment of redundant systems. The effectiveness of ESUPS therefore depends on how well STOCKHOLM integrates into the existing information management systems and vice versa (illustrated by the ongoing efforts of STOCKHOLM to integrate with LogIE, Dubai Humanitarian Databank, and ASYREC). Additionally, advocacy and communications efforts are essential to prevent humanitarian actors from perceiving STOCKHOLM as redundant and to discourage donor agencies from financing duplicated systems.

"Those countries have already a lot of tools. This is the difficulty as an NDMO: Any kind of project that comes to our country, they say that their tool is the best, and it's the same as STOCKHOLM."
– Participant 26

"And then of course you have the duplication effect. Everybody has their own system. […] Our donors are giving funding for STOCKHOLM and at the same time, they are giving the funding to IFRC to develop their own system. They keep talking about stopping duplication, and then they do duplication again, which is very frustrating. […] There's no standardisation of systems." – Participant 16

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5: The sustainability of ESUPS for the prepositioning of relief stocks

To further improve ESUPS sustainability, the platform should focus on adding value through collaboration and localisation. Key technical recommendations include providing prescriptive data analytics, clarifying stock classifications, incorporating a loan-and-borrow mechanism, and integrating with existing systems. Some of these recommendations are currently being addressed. In addition, effective advocacy and communications - through evaluations and success stories, expansion of the geographical reach, engagement of top leadership and national actors, and comprehensive training - are important to sustain the initiative. Securing continuous and long-term funding is crucial, and while a cost-recovery model could be considered in the future, it requires a prior broad recognition of ESUPS' value within the humanitarian community.

5.1 | Value creation as a prerequisite for ESUPS' sustainability

ESUPS aims to create value for humanitarian actors by fostering cross-organisational coordination on prepositioning relief stocks. Equally important, the initiative provides national stakeholders, such as NDMOs, with opportunities to have better visibility and decision-making power for preparedness in their countries. Collaboration and localisation are already part of the guiding principles of ESUPS and are key to its sustainability.

"I believe the platform will be sustained regardless of the focus and how to tackle the challenges. The need for this kind of platform is there and the more we need to have collaboration, the more we need to have a combined platform." – Participant 29

"But if anything that would be of increased value to ESUPS is this external partnership. We talk about localisation, we talk about nationalisation, and also empowering our implementing partners at the country level or at the last implementation level. That's also something to feed in and to bridge to our partners, how information does exist and then where relevant it can be exploited to benefit the partners' activities around emergency response."
– Participant 10

5.2 | Recommendations to improve ESUPS' sustainability

5.2.1 | Recommendations regarding ESUPS' data collection and data analysis pillars

The interviewees provided four main recommendations for ESUPS to enhance its value creation along its data collection and data analysis pillars.

First, ESUPS should continue to **provide more prescriptive data analysis** through the platform to inform supply chain preparedness decisions, such as determining whether prepositioning is the optimal preparedness measure to adopt in the context under study, understanding what the appropriate modality for aid delivery is, and whether to adjust the stockpile based on the disaster characteristics.

> *"More prescriptive data is definitely also wanted. Some said 'Should we send cash, or should we preposition?'. They wanted a system like STOCKHOLM to tell them what to do. And of course, then 'How much I should put in the warehouse? So, if this storm moves, should we leave the stock here? Should we move it?'"* – Participant 16

Second, ESUPS should pursue **their standardisation of prepositioned relief stock** and ensure a clear classification of the content of prepositioned relief stock. Generic (also known as white) versus branded stocks need to be distinguished.

> *"We have that idea of having non-label items and that having non-restricted funds should be the way. ESUPS can be that first example to push people to change a bit the mindset of 'I don't need my logo in that box, but I need the item to be there, and if it's my logo or his logo or a local NGO's logo, it doesn't matter because the end game is to provide it to the affected population' and having that view that ESUPS provides, I think it's the way."* – Participant 30

Third, ESUPS should **incorporate a loan-and-borrowing mechanism** among the features of STOCKHOLM. This feature would support stock rotation and prevent waste by indicating if prepositioned relief stocks have the approval to be borrowed by other humanitarian actors that need them.

> *"A loan-and-borrow system would be an excellent way to ensure the items are used instead of disposing of them before expiry. If there's anything that the platform can assist with, that's a great way of making sure the items are properly utilised before expiring."* – Participant 23

Fourth, and while first initiatives have been engaged in that direction, ESUPS should further **integrate STOCKHOLM into existing information management systems** in the humanitarian sector to avoid duplication of coordination mechanisms.

> *"In the future when ESUPS is getting bigger, a main concern that can be raised is the integrations with the internal systems of each player. Because more INGOs and companies will implement online systems or online platforms. It will be great if it is linked to each other. It should be integrated. So, the [IT] environment should be there so that there is no duplication of work."* – Participant 10

5.2.2 | Recommendations regarding the advocacy and communications pillars

Continuous advocacy and communications at all levels are essential to first attract organisations to adopt STOCKHOLM and subsequently keep them engaged in uploading data on their prepositioned stocks and in collaborating at national level.

The more STOCKHOLM is discussed, the more likely it will be used by more humanitarian actors and, as a result, trust will get built. **Performing regular evaluations and sharing success stories** could be a powerful advocacy and communications mechanism, also ensuring that the scope, goal, and principles of ESUPS are clear to all.

> *"I'm thinking about ownership. You need to select a few countries, a few NGOs to scale it to that level, to get it functioning, so that you are able to now tell the story to others."* – Participant 1

Advocacy should focus on **broadening geographical outreach** to ensure ESUPS' future sustainability. Expanding into new, politically, and socio-economically different regions requires adapting the platform to those different environments, but, more importantly, aligning communications efforts accordingly.

> *"There's a bit of work to understand who other actors may be in Africa and MENA and then get their buy-in […] It's very sparse when you go to the Middle East or Africa because I don't think [the ESUPS team] has the networks there. So, there's still a lot of work to be done toward global coverage. It's maybe a little bit Asia and Pacific centric for now."* – Participant 25

Ensuring the sustainability of ESUPS requires **strong buy-in from top leadership and key stakeholders** within the involved organisations. The support from the global offices can also prompt national offices to adopt the platform. Effective adoption depends on the alignment and support from the highest levels of the organisation, making it key for advocacy and communications to target these senior leaders. Additionally, the buy-in should extend beyond the supply chain department to include programmatic personnel, improving cross-departmental collaboration and improved integration.

> *"Probably where I'm seated, making it an agenda within our country programs to ensure that then we devise a strategy, that we are not just feeding the information to the tool. [...] Having a buy-in from Supply Chain, having buy-in from the leadership of different country Programmes, and then [having] the country Programme department and country directors leading this. [...] Once we sell it mostly to the Programmes team and they are able to use that tool, it will be easy for Supply Chain."* – Participant 1

To ensure sustainable alignment with its localisation objectives, ESUPS must continue to **actively involve national stakeholders**. Specifically, NDMOs could be co-owners and co-developers of the platform, given their primary role in coordinating national preparedness efforts. To achieve this, there needs to be increased awareness and collaborative, participatory efforts between the ESUPS and national stakeholders.

> *"I sometimes feel it gets a little bit hierarchical with the concept that it's international organisations that will be the mainstay for ESUPS, and I think that's very true. But we are in a world now where localisation is not just a concept anymore, it's our new world."* – Participant 31

The sustainability of ESUPS requires that **comprehensive training and continuous support** are offered to potential and existing users. Training can focus on teaching users what the scope of STOCKHOLM is to clarify expectations, how to do accurate data entry, and how to use the platform for decision-making given its existing functionalities. Ongoing support from experts beyond the ESUPS core team and refresher courses for existing users are also essential to ensure long-term usage.

> *"Having a training that isn't just about using the platform itself, but about how to build a system around the platform within an organisation. So, if there's a way that the training can be rolled out, not just organisation by organisation, but to get more than one stakeholder in a room in advance."* – Participant 21

ESUPS should **facilitate discussions on long-term framework agreements for joint planning** on stock prepositioning, such as loan-and-borrowing mechanisms. To achieve such a collaboration, a commitment from humanitarian organisations to engage in loan-and-borrowing practices should be reached, and ESUPS is encouraged to support the setup of such agreements. These efforts can make up a key part of preparedness plans in countries of operations.

> *"So, the platform for sure gives the visibility and this is important, but sometimes it's not enough because knowing that there is something doesn't mean that it can be used. […] What I think is missing sometimes is an actual discussion between the actors of the humanitarian community to have better collaboration and better agreement in terms of exchanging stock."* – Participant 15

In summary, ensuring the sustainability of ESUPS requires it to be perceived as creating value (that is, to facilitate coordinated prepositioning strategies) and be ultimately **recognised by humanitarian actors as the standard tool** for coordination and collaboration on the question of prepositioned relief stocks. While having an effective technical platform is key in this institutionalisation process, ongoing communications must continue to clarify ESUPS' positioning and value and encourage broader participation. This advocacy towards institutionalisation should target not only potential users among humanitarian actors but also donor agencies, encouraging them to align their funding strategies and policies with the development and implementation of platforms recognised as references in the sector.

> *"It's impossible to make it mandatory. So, you have to accept it. But you have to show how useful it can be to embark more people into it. You cannot force people to participate and coordinate. But if they see that it is really a potentially high benefit for them, they will do it. […] It has to become somehow a standard in the [humanitarian] system."* – Participant 11

5.3 | Financial support as a prerequisite for ESUPS' sustainability

5.3.1 | Funding structure for ESUPS' sustainability: short-term vs. long-term funding

The sustainability of ESUPS is closely tied to securing consistent funding. Continuous and sufficient financial resources are vital for maintaining and improving the platform, as well as supporting the necessary advocacy and communications initiatives.

> *"It may be sustainable as long as funds are available."* – Participant 9

Traditionally, donor agencies have supported humanitarian tools through short-term, project-specific funding, and policy requirements to encourage data-driven coordination and the use of specific tools.

> *"If the donor told us as implementing partners that 'I want you to use this tool', I don't think we would have a lot of us pushing back. It's in the compliance space."* – Participant 4

However, there is a noticeable conflict between the predominance of short-term funding for humanitarian action and the need for long-term funding to sustain digital solutions such as STOCKHOLM over time. The issue of funding and the implications of the respective funding mechanisms are fundamental to the emergence and long-term sustainability of digital humanitarian solutions and tools.

> *"Who would fund this? Governments should fund it but cannot fund it. UN agencies and NGOs have funding cycles that are limited in time. Donors will never fund something like this for 10 years to come, especially because it's a humanitarian tool, it's not even a development tool. You can't even sell it to the UN development program. And the private sector, what does the private sector gain out of this? The private sector is going to say, 'why don't you use our system?'"* – Participant 3

The short-term funding structure of donor agencies and the limited funding cycles of humanitarian organisations hinder the commitment to long-term solutions and impair trust in them.

> *"For people from ESUPS, from Welthungerhilfe, they invest in it. That's a lot of energy, also from the organisations that commit to using it. And then the support stops. Donors erode the trust of the partners if you don't do long-term funding."* – Participant 16

5.3.2 | A cost recovery model for ESUPS' sustainability?

Given the current funding challenges, alternative funding options such as cost recovery could be explored. A cost recovery approach consists of securing financial contributions from humanitarian actors. In particular, humanitarian organisations could invest either their direct and earmarked funding from donor agencies for preparedness initiatives or their own flexible funds.

> *"In the long run, there is probably a possibility to have a conversation on switching into [e.g.,] some sort of association, a fluid form of how they receive funding. […] Being a member of the association and receiving very specific services [could be a possibility]. […] If there is enough buy-in and the organisations see how they are benefiting from the service, each agency can say, 'we'll subscribe to it'."* – Participant 5

However, implementing a cost recovery structure requires convincing all humanitarian actors of the added value of ESUPS. Considering the currently limited user base of the platform, the mistrust among humanitarian actors due to the highly competitive operational environment, and the limited perceived value of the platform, such a transition could prove difficult and may not be widely adopted.

> *"For me, the cost recovery part comes when you have reached that level, where you have a good buy-in and a good regular use by the national societies where they see the benefits and where they are happy to use it by taking over the costs. And I don't see that it has reached that level yet."* – Participant 14

Furthermore, a cost-recovery mechanism would raise the question of accountability for the information available on the platform. The current challenges in data accuracy and updating behaviour pose an accountability risk.

> *"The cost recovery would be that you could ask for a fee for looking at the data, but who is then going to be held accountable for the accuracy of the data? I charge you €20 for you to have access for one month to my platform, but I cannot control the validity of the data on my platform. So, you're going to blame me and ask for the €20 back for data that I'm not even responsible for."* – Participant 3

5.3.3 | Long-term commitment of the ESUPS team to STOCKHOLM's sustainability

Lastly, the question of financial sustainability draws back on the role of the ESUPS team and their commitment to evolving the platform in line with technological and operational needs. Resource commitment, both financial and human, are crucial but interlinked elements that are essential to the longevity of the platform.

> *"What is the commitment from ESUPS? For how long will this system be maintained? Who will maintain [it]? Are there any potential costs for every use of this? Because this is not an easy platform, a simple platform in the sense that it needs a lot of work and then maintenance. That's all about the commitment itself."* – Participant 10

6: Recommendations

ESUPS, through both STOCKHOLM and its advocacy and communications efforts, should focus on enhancing the platform's technical capabilities while promoting widespread adoption and understanding. The ultimate goal should be to institutionalise the platform, clearly defining its relevance within the humanitarian ecosystem. The summarised recommendations from the evaluation are as follows:

1. **Clarify the purpose of ESUPS and STOCKHOLM:** Clearly define and communicate the benefits and role of ESUPS and STOCKHOLM. Align expectations with both new users (potentially in new countries) and existing users through advocacy campaigns, communications, and targeted training. This clarification is a fundamental effort in creating an added value. The importance of value creation in the preparedness phase should be clarified by ESUPS in such a way that direct use of STOCKHOLM is made for strategic decisions, but only indirect use is made in the operational disaster response—that is, through collaborative prepositioning strategies. Training should target both new users but also existing ones through refreshers on existing and new features.

2. **Achieve a critical mass of STOCKHOLM users:** Continue advocacy to reach a critical mass of regular users who consistently update data, ensuring the platform's effectiveness. STOCKHOLM as a data-driven solution requires a continuous input of relevant data to strengthen the data collection pillar. Without the adoption of the tool and accurate input of data, meaningful analysis to optimise stock levels across organisations and countries cannot be performed on the platform. For STOCKHOLM, the credo is: The more users, the more data, the better.

3. **Build and bridge trust:** Reflect on trust barriers and invest in building trust among stakeholders. Serve as a bridge between actors and continue to explore joint advocacy and communications efforts with entities such as donor agencies, the Global Logistics Cluster, hulo, UNHRD, NDMOs, or academia. As an example, the high adoption of the STOCKHOLM platform and the broad awareness of the ESUPS initiative in the Pacific region reflect joint targeted advocacy efforts carried out in collaboration with the United Nations Office for the Coordination of Humanitarian Affairs (OCHA) and the Global Logistics Cluster. While trust should be built through relationships, the platform should also support trust-securing features that guarantee the visibility of stock levels to derive collaborative strategies, but at the same time ensure privacy concerns, and limit one-sided, competitive disadvantages from sharing sensitive information. ESUPS advocacy and communications efforts can contribute to the breakdown of mistrust and encourage mutual understanding between unequal entities, such as donor agencies and organisations, or competitive entities, such as suppliers.

4. **Strengthen collaboration and ownership of local actors:** Continue and strengthen the collaboration with local actors. Secure the buy-in of humanitarian organisations' leadership and

place the ownership of the platform's use into the hands of local actors, especially NDMOs. Given the national focus of STOCKHOLM, which complements the global systems (i.e., the UNHRD platform), ESUPS is committed to the localisation agenda (ESUPS, 2023). To fulfil this commitment, it should be ensured that ESUPS' efforts and STOCKHOLM correspond to the actual national needs. Misalignment leads to misuse, which in turn creates no value. Strengthening the collaboration with local actors also fosters the development of more comprehensive prepositioning strategies, such as finding the right balance between prepositioning at the national and regional levels.[13]

5. **Invest in prescriptive analytics:** Continue to explore the potential of data analytics to enhance decision-making for supply chain preparedness. By providing actionable insights on whether prepositioning or alternative measures like cash transfers are more suitable, or advising on stockpile adjustments based on disaster specifics, the platform can offer clear and strategic guidance to its users. This approach will address the expressed need for detailed recommendations and improve the effectiveness of preparedness efforts, making STOCKHOLM an even more valuable tool for humanitarian actors.

6. **Facilitate loan-and-borrowing activities:** Facilitate the communication between agencies to establish loan-and-borrowing agreements. Technically enable the platform to provide visibility and decision-making support for these activities. By doing so, ESUPS would extend its advocacy efforts to bridge the gap between preparedness and response. Facilitating joint strategies through stock exchanges via loan-and-borrowing is in line with the core principles of ESUPS. Establishing lines of communication for stock exchanges contributes to a more efficient use of prepositioned stock, especially in near-expiry cases.

7. **Pursue system integrations:** Integrate STOCKHOLM with other existing initiatives at international levels (e.g., logIE) and local levels (e.g., local warehouse management systems). The integration of systems goes hand in hand with strengthening local collaboration and ownership as well as efforts to reduce the duplication of digital systems. Moreover, a strong integration of systems ensures longevity as a reciprocal relationship between the digital systems is created and their complementarity can add value to the overall humanitarian action.

8. **Report on success stories and regular evaluations:** Regularly report on key success stories and return on investment/impact metrics. Conduct regular evaluations to measure and communicate the platform's and initiative's impact. Success stories of practical cases contribute to clarifying the value of adopting STOCKHOLM and the impact ESUPS has on advocating for a new approach to prepositioning. Both for users, potential users, and the broader humanitarian community, such information serves as crucial proof and inspiration to move forward in changing the mindset of preparedness efforts toward collaborative action.

9. **Explore long-term funding strategies:** Reflect on possibilities for long-term funding to maintain and improve the platform and sustain advocacy and communications efforts. Consider traditional direct donor agencies' funding, donor agencies' funding to local organisations with incentives to use the platform, funding from development agencies, government funding, cost-recovery models, and collaborations with the private sector. Advocate for donor agencies to review their funding strategies and policies to promote system integrations and avoid duplication of efforts in platform development. Additionally, encourage donor agencies to adopt policies that support platforms proven to be useful, well-integrated, and institutionalised, thereby triggering a virtuous cycle for long-term

13. Such considerations are also part of the ongoing collaboration between the UNHRD, ESUPS, and other partners. To tackle challenges such as a lack of stock turnover resulting from the free storage offered at the UNHRD's regional hubs, the UNHRD established a dedicated task force, with ESUPS playing an active role. This collaboration provides a space to connect global and national prepositioning strategies.

funding and sustained usage. Close exchange with donor agencies can contribute to fostering an understanding of system longevity through a long-term commitment to humanitarian efforts, breaking the short-term funding cycles.

10. Be critical of the need for prepositioning: Emphasise that prepositioning is not necessarily the ultimate solution, especially if done in isolation. Consider advising organisations on whether to preposition or rely on suppliers and resilient markets, by defining prepositioning as part of a broader supply chain preparedness agenda and localisation initiatives. By taking on a holistic lens, ESUPS would reinforce the relevance and effectiveness of its platform, given a targeted assessment of needs, a consulting perspective, and a commitment to shifting towards a joint mindset.

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7: Conclusion

"It's like this feedback loop: The more relevant it becomes, the more users [it attracts], the more relevant it becomes, and so on." – Participant 16

This quote aptly describes the potential self-reinforcing cycle of relevance and effectiveness that ESUPS as an initiative and STOCKHOLM as a technical platform needs to achieve in order to engage a significant mass of humanitarian actors in coordinated prepositioning efforts and to ensure long-term sustainability. Through continuous improvements, STOCKHOLM can become an essential tool in humanitarian supply chain preparedness. Consequently, the ESUPS initiative will be able to significantly contribute to joint prepositioning efforts in preparation for humanitarian operations.

For ESUPS and STOCKHOLM to achieve their full potential, active participation in the initiative and user ownership of the platform are essential. Users must take an active role in defining a regular schedule for data updates and establishing the necessary coordination mechanisms that STOCKHOLM can support. This sense of ownership will not only enhance the platform's effectiveness but also ensure its long-term sustainability. In a context where funding is often limited, the adoption of such a solution by national actors can also be seen as a strategic investment in driving greater efficiency, collaboration, and resilience within the humanitarian sector.

Looking forward, ESUPS must continue to align its agenda with broader sustainability goals, encompassing both environmental and social dimensions. Prepositioning is inherently linked to these sustainability topics, and ESUPS has the opportunity to play an important role in promoting long-term sustainable preparedness practices within the humanitarian sector. By integrating these considerations into its strategy, ESUPS can ensure that its initiatives not only meet the immediate needs but also contribute to a broader shift in mindset across the sector. Moreover, continued efforts to align systems should be pursued to promote a unified approach to prepositioning.

"I guess it would be interesting in 12 months' time to look at where we are with ESUPS." – Participant 31

By maintaining its focus on relevance, effectiveness, and sustainability through its three pillars, ESUPS would have the potential to position STOCKHOLM as the reference tool for coordinated prepositioning strategies. This could not only enhance collaboration and efficiency within the humanitarian sector but also ensure the long-term viability and impact of the initiative.

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Appendix

Table 1: List of interviewees

Participant	Region	Organisation Type	Level	Usage	Participated in the Interviews	Participated in the Workshop
Participant 1	Africa	NGO	National	Non-user	X	
Participant 2	Africa	RCRC	National	Non-user	X	
Participant 3	Africa	Donor Agency	Regional	Non-user	X	
Participant 4	Africa	NGO	Regional	Non-user	X	
Participant 5	Americas	Donor Agency	Global	Non-user	X	
Participant 6	Americas	NDMO	National	Non-user	X	
Participant 7	Americas	NDMO	National	Non-user	X	
Participant 8	Asia	NGO	Global	User	X	
Participant 9	Asia	NGO	Regional	User	X	
Participant 10	Asia	NGO	Regional	User	X	
Participant 11	Europe	Donor Agency	Global	Non-user	X	
Participant 12	Europe	Private Sector	Global	User	X	
Participant 13	Europe	RCRC	Global	Non-user	X	
Participant 14	Europe	RCRC	Global	User	X	
Participant 15	Europe	UN Agency	Global	Non-user	X	
Participant 16	Europe	UN Agency	Global	Non-user	X	
Participant 17	Europe	UN Agency	Global	User	X	
Participant 18	Oceania/ Pacific	NDMO	National	User	X	
Participant 19	Oceania/ Pacific	NDMO	National	User	X	
Participant 20	Oceania/ Pacific	NDMO	National	User	X	
Participant 21	Oceania/ Pacific	NGO	National	User	X	
Participant 22	Oceania/ Pacific	NGO	National	User	X	
Participant 23	Oceania/ Pacific	NGO	National	User	X	
Participant 24	Oceania/ Pacific	RCRC	Regional	User	X	
Participant 25	Asia	RCRC	Regional	User	X	X
Participant 26	Africa	NDMO	National	Non-user		X
Participant 27	Africa	NDMO	National	Non-user		X
Participant 28	Africa	NDMO	National	Non-user		X
Participant 29	Asia	NGO	Regional	User		X
Participant 30	Europe	Academia	Global	Non-user		X
Participant 31	Europe	NGO	Global	User		X

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