**BARRIERS OF INVENTORY MANAGEMENT IN HUMANATARIAN LOGISTICS:**

**A SYRIAN SUPPLY CHAINS STUDY**

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**Introduction**

The basic task of humanitarian logistics comprises acquiring and delivering requested [supplies and services](http://www.ifrc.org/en/what-we-do/logistics/key-logistics-services/) at the places and times where needed, whilst ensuring best value for money. In the immediate aftermath of any disaster, these supplies include items that are vital for survival, such as food, water, temporary shelter and medicine, amongst others (IFRC.org, 2018). The role of inventory management in humanitarian supply chain is to deliver goods efficiently. This involves timely and cost effective delivery of goods across the supply chain from suppliers to ultimate beneficiaries or consumers (Fritz Institute, 2012). Logistics cluster organisations activate in Syria, Yemen, Sudan, and other disaster affected-areas have experienced wide range of humanitarian inventory management challenges which hinder the attainment of optimal inventory management within humanitarian supply chains.

Inventory represents a large cost to the humanitarian supply chains. This made up of the cost of the inventory itself, cost of transporting the goods, storage or ware house cost, cost of managing the goods which involves labour, fumigation, repackaging costs. The inventory manager's job is to make inventory available at the lowest possible cost. In order to achieve this, the inventory manager must ensure a balance between supply and demand by establishing minimum holding stocks to cover lead-times. The inventory manager must constantly liaise with the programs to keep abreast of changing needs and priorities. The warehouse must always have sufficient stocks to cover the lead-time for replacement stocks to avoid stock-outs. Furthermore, inventory management in an emergency is more ‘project based’, matching supply with demand in a rapidly changing environment. This requires building a supply chain that has a high level of flexibility and adaptability, speed in identification of need and rapid order fulfilment through the supply chain. Optimisation comes from having logistics systems that can configure, procure and consolidate these packages quickly and a distribution chain that is flexible and can adapt to changing requirements quickly and at least cost. Information systems that facilitate transparency of the supply chain inventory levels, location, and demand provide the necessary visibility to facilitate good planning and effective decisions that maximize services and reduce costs. (White, 2015).

**Literature review**

Many resources are utilised as reference points such as publications, reports, and official studies that are published by activated international organisations in Syria that have prolonged experiences in terms of relief, emergency, and recovery operations within Syria since 2012. World Food Program reported that there are 3.5 million people that require humanitarian assistance, 9 million people in need of food assistance, and 6.3 million people are displaced inside Syria (WFP Syria, 2016). United Nations High Commissioner for Refugees (UNHCR) stated that there is 13.1 million people in need in Syria, 6.6 million internally displaced persons, and 2.98 million people in hard-to-reach and besieged areas inside Syria at the end of April 2018 (UNHCR Syria, 2018). This research paper considered UN agencies’ publications, reports, official studies, and their experts opinion as references with high level of reliability, accountability, inclusivity, and objectively. Second group of references would be the publications, reports, and official studies issued by international NGOs and their local partners. Many international NGOs have served Syrian crisis honestly and honourably regardless of unsavoury circumstances, threats, political tensions and other challenges. Some of these are renounced international NGOs such as Oxfam Organization, Norwegian Refugee Council (NRC), Danish Refugee Council (DRC), International Committee of the Red Cross (ICRC), Syrian Arab Red Crescent (SARC) and others. Relevant academic publications were utilised as third group of references. This include academic research papers, case studies, and similar resources that issued by academic institutes, academic researchers, research projects, and freelance researchers. Noticeably, overseas Development Institute (ODI) has published numerous of academic research papers related to Syrian emergency operations that is considered as professional, transparent, and honest.

**Inventory management barriers among Syrian humanitarian supply chains**

In addition to review of industry publications and extant literature, this study further conducted interviews with industry experts from different organisations in an effort to identify existing logistics gaps and bottlenecks in terms of inventory management within humanitarian organisations peculiar to Syria.

Logistics Cluster (2017) has identified major inventory management gaps in Syria which are shortlisted below:

1. Access and security constraints remain the biggest impediment faced by the humanitarian community in reaching vulnerable communities with life-saving relief supplies inside Syria.
2. Restrictions on movement of humanitarian cargo and the need to increase inter-agency humanitarian facilities such as convoys transport services to reach the difficult-to-access locations.
3. Need for the coordination of cross-border transhipment services from Jordan and Turkey to Syria.
4. Limited storage capacity for prepositioning across Syria.
5. Lack of a reliable fuel supply chain.
6. Lack of facilities for coordination and circulation of logistics information.
7. Increasing need for dedicated logistics training

IFRC (2015) argued that safe access to those in need inside Syria must be guaranteed by all sides for SARC, ICRC and IFRC staff, volunteers, and humanitarian workers in general who frequently put their lives at risk while on duty. The ability to respond to the increasing needs of the most vulnerable in both urban and rural areas, whether internally displaced, residents, host families, refugees, or people who have simply become poverty stricken during years of conflict and suffering. All sides need to allow humanitarian aid to be delivered impartially and with neutrality across front lines, and in particular into besieged areas (IFRC, 2015).

IFRC experts further argued that funding is an important issue in humanitarian inventory management, because of delays and interruptions in terms of funds means delays and interruptions in humanitarian supply chains regardless of other factors such as logistics capacity, safe access, availability of transportation services, transparency, and geopolitical factors (IFRC, 2015).

Findings show many barriers to inventory management within humanitarian supply chains inside Syria. These barriers could divided to few categories as below.

1. Safety and security issues that poses threat to humanitarian aid workers and the entire humanitarian operations.
2. Socio-political issues including government regulations, heavy conflicts, and conflict of interest.
3. Funding problem due to lack of funds, interruption of funds, or conflict in the allocation of funds.
4. Logistics issues including logistics capacity, logistics expertise, transportation, local markets capability, logistics information, and logistics systems and structures.

This study focuses on the relevance logistics challenges facing inventory management within humanitarian supply chains in Syria and attempt to find out the appropriate solutions for these barriers systematically.

**Analysis**

The main aim of this paper is analyse the barriers in terms of logistics functions especially inventory management that could hinder aid workers in fields, and attempt to propose solutions to this challenges objectively. Propositions from researchers and humanitarian relief experts has been taken into consideration extensively. This paper presents solutions that could enhance inventory management within humanitarian logistics especially in Syrian case.

Deployment electronic supply chain system is crucial step to manage inventory management effectively and efficiently. This include tracking different logistics functions which will facilitate control of procurement orders, collection of goods and services, organise storage system, efficient delivery to end user.

Most of humanitarian experts proposed using of HELIOS system which is open-source complete IT solution for the humanitarian supply chain. This is largely due to successful implementation of HELIOS at Oxfam organisation. HELIOS solution can radically cut the time and cost of paperwork in half due to the following features presented by (Fritz, Institute, 2018):

1. Provides tactical supply chain visibility from mobilization to warehouse. Whether in the field or the headquarters office, online or offline. The HELIOS platform provides macro and micro views and reports from a variety of angles. HELIOS tactical visibility improves coordination across all operating units of an organisation, improving accountability and ensuring that donor funds, goods and services have maximum impact on those in need.
2. HELIOS is the first and only application to automate logistics processes at both the headquarters and field levels and provide tactical visibility from each of these perspectives.
3. Offers supply chain visibility from the donor perspective, enabling organisations to monitor and report on donations, improve donor communications, and engage donors more deeply in the work of the organisation.
4. HELIOS web-based application is available to humanitarian organisations for an affordable monthly charge to cover the software maintenance and support of the project.

Storage capacity development that enhances humanitarian organisations options and increases their ability to quick emergency responses across Syria. With increasing number of items for delivery to the warehouse, there is urgent need to expand storage capacity. Wiik Hall which is a mobile storage unit could erected at the rear of the existingwarehouse. This solution is suitable and practical for most of humanitarian organisations across Syria.

Training local logisticians is a solution to cut costs of outsourcing services and avoid import external logistics experts from out of Syria. Most of humanitarian originations adopt this policy in Syria. For example, UN agencies submit online courses, online educational platforms, and on-site training courses to their national employees. UN agencies are also working to improve capacity of local cooperating partners through employee training in order to build their logistics know-how.

There is increasing trend worldwide to enhance human resources for emergency preparedness by offering open-source online training courses such as online training in Ready Disaster platform, IFRC platform, Kaya platform and other similar platforms. This will increase awareness about humanitarian operation, humanitarian logistics and build the local capacity.

**Findings**

There are many stern barriers affecting inventory management in humanitarian logistics which leads to huge expenditures and loss of time and resources. Lack of transparency and accountability of activated humanitarian organisations in fields has resulted into stern relationships and collaborations due to miss-trust between donors and humanitarian aid workers.

This paper has analyse barriers to inventory management of Syrian humanitarian logistics which are highlighted below:

1. Limited storage capacity for prepositioning across Syria. In addition, there is misuse of available storage capacity and that leads to minimum stockpile and inflation of storage prices for personal interest.
2. Lack of a reliable fuel supply chain which makes humanitarian supply chains unreliable in Syria.
3. Lack of expertise necessary to optimise inventory management in case of Syrian humanitarian supply chains. According to researchers and experts, lack of specific experiences have resulted in escalating the number disaster casualties which could have been minimise if attended to properly.
4. Restrictions on movement of humanitarian cargo and weaknesses of transport services that resulted in delays as a result of incessant postponements.
5. Experts argued that apart from the bad circumstances due to prolonged crisis, the geopolitical factors has side effects on humanitarian supply chain at most times according to most experts.
6. Hidden cooperation between activated workers, independents or organisations, to exchange necessary information, resulting in moving unnecessary cargo to Syria, which overwhelm storage facilities and unsatisfactory congestions in Syrian humanitarian supply chains.
7. Unavailability of electronic solutions. Only few of organisations have IT system that facilitates tracking of inventory movements in details to demonstrate precisely the inventory specifications such as expected order, current orders, warehouse inventory, stockpiles, inventory movements, and their locations.

**Recommendations**

This work offers the following recommendations based on analyses of data that was collected from experts, aid workers and academic researchers in the field of inventory management within humanitarian supply chain with especial interest to Syria:

1. Employment of electronics solutions that support humanitarian supply chains functions especially inventory management such as HELIOS discussed in this paper and other as appropriate solutions. HELIOS has low cost implication as it is open-source based and it is user friendly for users with low IT literacy. IT permits access to information in real-time, leading to timely planning, accuracy in resource allocation, accountability, information sharing between relevance parties, enhancing transparency and access for donors to monitor activities (Fritz Institute, 2018)
2. Deploying of temporary storage units such as WIIK hall tents; as appropriate solution in emergency. This will help in addressing the challenge of Limited storage capacity for prepositioning across Syria. When a crisis first arises, response time is of the essence, emergency aid halls and tents built for rapid assembly under tough conditions and have strategically warehoused in advance in locations around the world will minimise this impact (O.B.Wiik, 2018).
3. Building local humanitarian logistics experts that fit our current and future needs in terms of humanitarian operations especially inventory management. Most of experts proposed the logical solution that is using online platforms for training local aid workers and increasing their capacity as possible. Kaya org, Disaster Ready org, and others consider as the good examples of open-learning resources. This will address the challenge of lack of expertise fundamental for any optimal inventory management.

**References**

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