



The Impact of Supply Chain Management on Operations Effectiveness in Humanitarian Organizations in Yemen

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Keywords

1. Supply Chain Management
2. Operations Effectiveness
3. Humanitarian Organizations

Abstract:

The purpose of this research is to identify the impact of supply chain management on the effectiveness of operations in humanitarian organizations in Yemen, to know the level of practice of supply chain management in the humanitarian sector in Yemen, and to know the practical level of practice of humanitarian operations in Yemen. The research followed the quantitative approach and the questionnaire tool to collect data. The research community consisted of all workers in 137 humanitarian organizations operating in Yemen. Given the difficulty of determining the total number of workers in these organizations, a sample of 250 individuals from among those working in the purchasing and logistics departments was selected using the stratified random sampling method, and then the sample was selected randomly to ensure representation of the various organizations and their departments. The research results concluded that supply chain management has a significant positive impact on the effectiveness of operations in humanitarian organizations in Yemen. The research presented several recommendations, including that each humanitarian organization should have a supply chain manager with extensive experience in both humanitarian procurement and logistics for better management. And that supply chain management should be active and well-organized by adhering to the organizations' standard operating procedures, especially those related to the supply chain department.

أثر إدارة سلاسل الإمداد على فعالية العمليات في المنظمات الإنسانية في اليمن

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الكلمات المفتاحية

2. فعالية العمليات

1. إدارة سلاسل الإمداد

3. المنظمات الإنسانية

الملخص:

الغرض من هذا البحث هو التعرف على أثر إدارة سلسلة التوريد على فعالية العمليات في المنظمات الإنسانية في اليمن، ومعرفة مستوى ممارسة إدارة سلسلة التوريد في القطاع الإنساني في اليمن، والتعرف على المستوى العملي لممارسة العمليات الإنسانية في اليمن، واتباع البحث المنهج الكمي، وأداة الاستبيان لجمع البيانات، وتكون مجتمع الدراسة من جميع العاملين في 137 منظمة إنسانية عاملة في اليمن، ونظرًا لصعوبة حصر إجمالي عدد العاملين في هذه المنظمات، تم اختيار عينة مكونة من 250 فردًا من العاملين في أقسام المشتريات والخدمات اللوجستية، وذلك باستخدام أسلوب العينة العشوائية الطبقية، ثم اختيار العينة بشكل عشوائي لضمان تمثيل مختلف المنظمات وأقسامها. وتوصلت نتائج البحث إلى أن إدارة سلاسل الإمداد لها تأثير إيجابي كبير على فعالية العمليات في المنظمات الإنسانية في اليمن. وقدم البحث العديد من التوصيات منها: أن يكون لكل منظمة إنسانية رئيس سلسلة توريد يتمتع بخبرة كبيرة في كل من المشتريات الإنسانية والخدمات اللوجستية من أجل إدارة أفضل. وبأن تكون إدارة سلسلة التوريد نشطة ومنظمة جيدًا من خلال الالتزام بإجراءات التشغيل القياسية للمنظمات وخاصة تلك المتعلقة بقسم سلسلة التوريد.

Introduction:

Supply chain in Yemen suffer from many challenges such as poor infrastructure and political and security instability, which has delayed the delivery of humanitarian aid and hindered the work of humanitarian organizations in Yemen. With the increase in humanitarian crises, the role of supply chains emerges as an important factor in improving the logistical performance of organizations working in the humanitarian field. Many studies show the importance of applying supply chain management principles used in the private sector to improve the performance of operations in humanitarian organizations, taking into account the unique challenges and characteristics of this environment. **Wassenhove** (2006) indicates that the interaction between the private sector and humanitarian organizations can contribute to enhancing efficiency and effectiveness by exchanging experiences and applying innovative strategies such as flexibility, adaptability and alignment, which are essential features for achieving a rapid and more effective humanitarian response.

Governments, nongovernmental organizations (NGOs), UN agencies, and private sector organizations are typically involved in multifaceted catastrophe responses. One of the players in the situation who is familiar with supply chain management academic theory and corporate practices should be in charge of humanitarian efforts, **Moore & Antill** (2000). However, integrated and coordinated efforts are not necessarily the result of the many actors' particular objectives in humanitarian operations. Furthermore, the implementation of successful supply chain strategies is hampered by the various administrative and managerial styles as well as the intricate relationships between various firms.

Since the year 2015, the number of humanitarian organizations have increased from 31 to 137 due to the critical situation Yemen has been going through since that time up to now. Humanitarian organizations in Yemen include National Non-Governmental Organizations (NNGOs), International Non-Governmental Organizations (INGOs), and United Nations (UN) Agencies (OCHA, 2016).

These organizations conduct many humanitarian operations through different programs such as Health Programs, Nutrition Programs, WASH (Water, Sanitation, and Hygiene) Programs, Protection Programs, and Education Programs. These programs help mitigate the suffering of sickness, hunger, environmental epidemics, unsafety within communities, and illiteracy. To ensure the smooth flow of these humanitarian operations, each organization consists of, at least, programs unit, finance department, HR & admin department, monitoring & evaluation department, security department, and supply chain management department (OCHA, 2024).

Among the above-mentioned departments, the supply chain management department is considered as the backbone for any organization for the reason that it is the department responsible for providing the goods/ services since the time those goods/ services are requested till being provided. Hence, supply chain management needs to ensure conducting the humanitarian operations in a timely accurate manner (INGO, 2023).

Hence, the current Research seeks to study the impact of supply chain management on the effectiveness of operations in humanitarian organizations operating in Yemen, by exploring the relationship between logistical efficiency and the level of response to needs and evaluating the level of supply chain management practice in humanitarian work in

Yemen as well as measuring the practical level of practicing humanitarian operations.

2. RESEARCH PROBLEM

As long as humanitarian operations need to take place at the right time in the right place with the right quality, quantity, and most competitive cost, the supply chain management needs to be well-organized & active to the extent that the needed operations are conducted properly without such delays or defects that may harm the humanitarian mission in a way or another (INGO, 2023).

The problem which top management of humanitarian organizations usually face is recruiting humanitarian supply chain staff because of the lack of candidates who have specific experience in the humanitarian sector. Another reason for the very few experienced persons in this field is due to the fact that before 2015 most supply chain activities, in Yemen, were done in oil & gas companies, and for sure the work methodology differs between those companies and Non-Governmental Organizations (INGO, 2023).

Al-Kamim & Abdelrab (2019) study indicates that supply chain management practices play a major role in improving the operational performance of organizations by strengthening relationships with suppliers and customers, improving internal processes, and exchanging information efficiently, in the context of humanitarian organizations in Yemen, these practices can contribute to increasing the effectiveness of relief operations by improving the flow of resources and reducing time gaps in aid delivery, which positively reflects on the humanitarian response and the quality of services provided to beneficiaries.

Abu Al-Rijal et al. (2017) study addressed the obstacles facing organizations in

Yemen when adopting supply chain management practices. The results of the study showed that the geographical distance between suppliers and customers is the biggest obstacle facing these companies in improving supply chain management, in addition to a group of other factors that affect the effectiveness of compatibility between different parts of the supply chain. The study indicates the importance of dealing with these challenges to ensure improved performance and coordination within Yemeni organizations.

Having a humanitarian supply chain management requires many efforts like giving training in all the supply chain activities like procurement “purchasing, vendor selection, & contract management” and logistics “transportation, warehousing, distribution, shipping, customs clearance, & fleet management”. Additionally, some related humanitarian courses need to be given to employees.

Therefore, the research problem lies in answering the following question which is: What is the impact of supply chain management on operations effectiveness in humanitarian organizations in Yemen?

3. RESEARCH QUESTIONS

In this study, the researcher identified the impact of supply chain management on operations effectiveness in NGOs in Yemen by answering the following questions:

1. What's the impact of supply chain management on operations effectiveness in humanitarian organizations in Yemen?
2. What is the level of supply chain management practice in the humanitarian sector in Yemen?

3. What is the practical level of humanitarian operations practice in Yemen?

4. RESEARCH HYPOTHESIS

According to the study's problem and questions, the main hypothesis of this study is:

H1- There is a statistically significant impact of supply chain management on operations effectiveness in humanitarian organizations in Yemen. This main hypothesis is divided into the following sub hypotheses:

H1A- There is a statistically significant impact of procurement on operations effectiveness in humanitarian organizations in Yemen.

H1B- There is a statistically significant impact of logistics on operations effectiveness in humanitarian organizations in Yemen.

5. RESEARCH OBJECTIVES

This study achieved the following objectives:

Identify the impact of supply chain management on operations effectiveness in humanitarian organizations in Yemen.

Identify the level of supply chain management practice in the humanitarian sector in Yemen.

- 1- Identify the practical level of humanitarian operations practice in Yemen.

6. SIGNIFICANCE OF THE RESEARCH

The significance of this study lies in:

6.1 Theoretical significance:

- The study contributes to enriching the literature related to supply chain management in humanitarian organizations, by providing a scientific analysis of its impact on the effectiveness of operations.

- The study sheds light on modern concepts and models in supply chain management, and explains the extent of its adaptation to the environment of humanitarian crises in Yemen.

- The study contributes to bridging the research gap related to supply chain management applications in emergency and disaster contexts.

6.2 Practical significance:

- The results of the study help humanitarian organizations operating in Yemen to improve supply chain management strategies, which is reflected in the speed and efficiency of responding to humanitarian needs.

- The study provides applicable recommendations that will contribute to enhancing the flexibility and efficiency of supply chains, which contributes to reducing costs and improving the quality of services provided.

- The study contributes to supporting decision-makers in humanitarian organizations with reliable information on how to improve operational processes through effective supply chain management strategies.

7. RESEARCH LIMITS

Objective limits: The study considered the impact of supply chain management on operations effectiveness in NGOs in Yemen.

Place limits: The study was carried out at humanitarian organizations in Yemen.

Human limits: Supply Chain Management Employees.

8. OPERATIONAL DEFINITIONS

Supply Chain Management is coordination of information, location, transit, inventory, and production among supply chain actors to attain the optimal balance of efficiency and

responsiveness for the market being supplied (Hugos, 2018). A Supply Chain includes every step that goes into meeting a customer's request, whether directly or indirectly (Chopra & Meindl, 2015).

The operational definition for supply chain management in this study is the management responsible for procurement of goods/ services based on specified purchase requests, then coordinating logistical activities like warehousing, transportation, and information to meet the operations required in the field.

Procurement is the methodical process of organizing, locating, negotiating, and obtaining the resources, goods, and services that an organization needs to accomplish its goals (Zhou et al., 2023).

Operational definition for procurement is the job through which required goods/ services are provided.

Logistics: The American Logistics Association's Council of Supply Chain Management Professionals defines logistics as "the part of supply chain management that plans, implements, and controls the efficient forward and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet customer requirements" (Pfohl, 2023, p.4)

The operational definition of logistics is the coordination of goods and services delivery till they reach the end beneficiary.

Humanitarian Organizations' Operations are operations conducted to alleviate human suffering (Law Insider, 2024).

The operational definition of humanitarian organizations' operations is the interventions NGOs implement to mitigate human suffering.

9. Research Methodology

This study followed the use of the quantitative approach as it is the most appropriate to achieve the objectives.

10. POPULATION AND SAMPLING:

The population was humanitarian organizations in Yemen which are UN Agencies, INGOs, and NNGOs. According to "OCHA, Yemen Organizations' Presence as of November 2023", the number of active humanitarian organizations in Yemen is 137 that's 9 UN Agencies, 37 INGOs, and 91 NNGOs. Based on sample size calculator by Raosoft, the sample was any supply chain management staff in 50 organizations since the number of staff in each supply chain management per organization is 5 staff at least. So, the sample size is 250 supply chain management employees.

11. DATA COLLECTION TOOL

The main data collection tool adopted in this research is the questionnaire developed which was adopted from the previous literature as well as it was validated by some academic professors.

Reliability of Questionnaire: The reliability of the questionnaire tool was verified by using the internal consistency test Cronbach's Alpha. The test of the reliability was carried out for every construct in the study's instrument. Table 1 shows the Cronbach's alpha result scores for the instrument's constructs.

Table 1 Cronbach's alpha result

Construct	No. Items	Cronbach's alpha
Purchasing	3	0.848
Supplier/ Vendor Selection	7	0.831

Contracting/ Management	Contracts	6	0.768
Warehousing		4	0.852
Transportation		3	0.751
Distribution		3	0.827
Shipping		3	0.704
Customs Clearance		3	0.762
Fleet Management		3	0.771
Time & Place		3	0.873
Cost		3	0.833
Quality & Quantity		5	0.871

Table 1 shows that the Cronbach's alpha coefficient to verify the reliability of the research instrument ranged between 0.704 and 0.873, indicating that the instrument has a good level of reliability, indicating that the instrument is generally valid for use in measuring the study variables.

12. DATA ANALYSIS:

The Statistical Package for the Social Sciences (SPSS) program was used to analyze the data, using data validity and reliability tests, demographic analysis, regression analysis, and correlation analysis.

13. DATA ANALYSIS

a. Gender Frequency: The sample of the study showed that 70.4% of the respondents were males, while 29.6% were females. The distribution of the Gender is shown in Table 2

Table 2 Gender of Study's Sample

Gender	Freq	% Valid	% Valid Cum.
Male	176	70.40	70.40
Female	74	29.60	100
Total	250	100	100

From the table2 the above analysis shows the desire of humanitarian organizations to hire males as employees due to the nature and the risks borne to their daily tasks. Usually, in the Yemeni context, the representation of females is less than the percentage shown in this study, this also shows the importance of gender balance in the human resource practices in humanitarian organizations.

b. Age Frequency: The sample of the study showed that 18.4% of the respondents were under 30 years old, 53.2% were between 30-40 years old, 20% of the of the respondents were between 41-50 years, and 8.4% of the respondents were above 50 years old. The distribution of the age in the field is shown in Table 3 Age Distribution of Study's Sample.

Table 3 Age Distribution of Study's Sample

Age	Freq	% Valid	% Valid Cum.
30 – 40	133.00	53.20	53.20
41 – 50	50.00	20.00	73.20
Less than 30	46.00	18.40	91.60
More than 50.	21.00	8.40	100
Total	250	100	100

The above analysis shows the importance of combining the youth and the experience in the operations of humanitarian organization. They focus on hiring employees between thirties and forties. The humanitarian organizations give less priorities to the ages that are less than this range or over this range, yet the percentage is not that low as humanitarian organizations desire to have even more experience or energy from their employees.

c. Education Level: The education level of the sample of this study showed that 4.8% of the respondents were holding a diploma degree, 57.2% of the respondents were holding a

bachelor's degree, 35.6% were holding a master's degree, while only 2.4% were holding a doctoral degree. The distribution of the education level is shown in Table 4.

Table 4 Education level of study's Sample.

Education level	Freq	% Valid	% Valid Cum.
Bachelor	143.00	57.20	57.20
Master	89.00	35.60	92.80
Diploma	12.00	4.80	97.60
Ph.D	6.00	2.40	100
Total	250	100	100

The above analysis shows that humanitarian organizations focus more on the holders of bachelor's degrees because they treat the higher education levels as overqualified for their humanitarian tasks.

d. Experience Years: The sample of the study showed that 23.6% of the respondents were having 1-3 years of experience, 22.8% were having 4-6 years of experience, 23.2% were having 7-9 years of experience, while 30.4% of the respondents were having more than 10 years of experience. The distribution of the respondents' years of experience is shown in Table 5.

Table 5 Experience years of study's Sample.

Experience	Freq	% Valid	% Valid Cum.
10 years or more	76.00	30.40	30.40
1 – 3	59.00	23.60	54.00
7 – 9	58.00	23.20	77.20
4 – 6	57.00	22.80	100.00
Total	250	100	100

The above analysis shows that humanitarian organizations provide compelling evidence indicating a preference for experienced employees. A significant proportion of their workforce possesses over ten years of experience, underscoring the importance of experience as a crucial factor for these organizations. This assertion is further supported by data demonstrating that candidates with the least appealing profiles tend to possess minimal experience.

e. Job Title: The sample of the study showed that 41.6% of the respondents were not managers, 21.2% of the respondents were line managers, 20.0% were middle level managers, while 17.2 % of the respondents were high level managers. The distribution of the respondents' job title is shown in Table 6.

Table 6 job title of Study's Sample.

Job Title	Freq	% Valid	% Valid Cum.
Not a manager	104.00	41.60	41.60
Line Manager	53.00	21.20	62.80
Middle Level Manager	50.00	20.00	82.80
High Level Manager	43.00	17.20	100.00
Total	250	100	100

14. RESEARCH FINDINGS

14.1. ANSWER OF THE FIRST RESEARCH QUESTION

Which states: What is the impact of supply chain management on the effectiveness of operations in humanitarian organizations in Yemen? Answering this question requires testing the main hypothesis and sub-hypotheses of the research.

14.1.1`Testing the main hypothesis H1

There is a statistically significant impact of supply chain management on operations

effectiveness in humanitarian organizations in Yemen. The hypothesis was tested through regression analysis in the table7

Table 7 Regression analysis.

Model Coefficients - oper_effic				
Predictor	Estimate	SE	t	p
Intercept	-0.294	0.1647	-1.78	0.076
Supp_Mgt	0.707	0.0399	27.75	<.001

The regression analysis in Table (7) shows that "supply chain management" has a positive and statistically significant effect on "operations effectiveness", as the regression coefficient for supply chain management (Supp_Mgt) reached (0.707), and the value of (t = 27.75) with statistical significance (p < 0.001). In addition, the statistical model shows that supply chain management explains about (75.6%) of the variance in operations effectiveness (R² = 0.756), and the F value of the model was (f=770) with statistical significance (p < 0.001), which confirms the

support for the existence of a positive and statistically significant effect of supply chain management on operations effectiveness, which proves the validity of hypothesis H1.

14.1.2 Testing Sub-Hypothesis H1A

There is a statistically significant impact of procurement on operations effectiveness in humanitarian organizations in Yemen. The hypothesis was tested through regression analysis in the table 8

Table 8 Regression Analysis.

Model Coefficients - oper_effic				
Predictor	Estimate	SE	t	p
Intercept	-0.299	0.1663	-1.80	0.074
Procurement	0.492	0.0593	8.30	<.001
Logistics	0.615	0.0644	9.55	<.001

The regression analysis in Table (8) shows that "procurement" has a positive and statistically significant effect on "operational

effectiveness". The regression coefficient for procurement was (0.492), with a t value of (t=8.30) and statistical significance (p <

0.001). This indicates a strong significant effect. These results support the existence of a positive and statistically significant effect of procurement on the effectiveness of operations, which proves the validity of hypothesis H1A.

14.1.3 Testing Sub-Hypothesis H1B

There is a statistically significant impact of logistics on operations effectiveness in humanitarian organizations in Yemen. The hypothesis was tested through regression analysis in the table 8

The regression analysis in Table (8) shows that "logistics services" have a positive and statistically significant effect on "operations effectiveness", The regression coefficient for logistics services (Logistics) reached (0.615),

with a t value of ($t=9.55$) and statistical significance ($p < 0.001$). These results confirm the existence of a positive and statistically significant effect of logistics services on operations effectiveness, which proves the validity of hypothesis H1B.

14.2. ANSWER OF SECOND RESEARCH QUESTION

To answer the second question, which states: What is the level of supply chain management practice in the humanitarian sector in Yemen?

The responses of the research sample were analyzed for each question of the questionnaire, then the overall average and the overall average of the standard deviation were extracted for each dimension of supply chain management practice, as shown in Table 9

Table 9 the level of supply chain management practice in the humanitarian sector in Yemen.

Variable	Section	Dimension	N	Mean	Std. Dev.	%
Supply Chain Management	Procurement	procurement	250	4.27	0.88	85.40%
		Supplier/ Vendor Selection	250	3.97	0.89	79.40%
		Contracting/ Management Contracts	250	4.12	0.88	82.40%
	Logistics	Warehousing	250	4.20	0.91	84.00%
		Transportation	250	4.03	0.75	80.60%
		Distribution	250	4.40	0.71	88.00%
		Shipping	250	3.87	0.86	77.40%
		Customs Clearance	250	4.20	0.91	84.00%
		Fleet Management	250	3.97	0.87	79.40%

The previous Table 9 shows the level of practice of supply chain management in the humanitarian sector in Yemen. The findings reveal that the distribution dimension ranks highest with an arithmetic mean of (4.40), a

standard deviation of (0.71), and a relative percentage of (88%). This indicates that distribution processes are the most effectively implemented aspect of supply chain management in the humanitarian sector in

Yemen. Following distribution, the "Procurement" dimension ranked second with a mean of (4.27), a standard deviation of (0.88), and a relative percentage of (85.4%). This suggests significant attention is given to the procurement process in the humanitarian sector in Yemen. The "Warehousing" and "Customs Clearance" dimensions were tied, both achieving a mean of (4.20) and a percentage of (84%), though warehousing exhibited a slightly lower standard deviation (0.91) compared to customs clearance. "Transportation" showed moderate performance with a mean of (4.03), a standard deviation of (0.75), and a relative percentage of (80.6%). "Contracting/Contracts Management" followed closely with a mean of (4.12) and a percentage of (82.4%). Other dimensions, such as "Supplier/Vendor Selection" and "Fleet Management," showed relatively lower levels of practice with identical percentages of (79.4%) and a mean of (3.97). Meanwhile, "Shipping" achieved the lowest level of

practice with a mean of (3.87), a standard deviation of (0.86), and a percentage of (77.4%). In conclusion, while some dimensions of supply chain management demonstrate strong performance, particularly distribution and procurement, others, such as shipping and vendor selection, require further improvement to enhance the overall effectiveness of supply chain practices in the humanitarian sector in Yemen.

14.3 ANSWER OF THIRD QUESTION

The answer to the third question, which stated: What is the practical level of humanitarian operations practice in Yemen?

The responses of the research sample to each question of the questionnaire were analyzed, then the overall general average and the overall general average of the standard deviation were extracted for each dimension of practicing humanitarian operations, as shown in Table 10

Table 10 shows the practical level of practicing humanitarian operations in Yemen

Variable	dimension	N	Mean	Std. Dev.	%
Operations Effectiveness	Time & Place	250	4.30	0.78	82.50%
	Cost Variable	250	4.07	0.9	76.75%
	Quality & Quantity	250	4.30	0.8	82.50%

Table 10 shows the practical level of practicing humanitarian operations in Yemen; The dimension of "Time & Place" ranked highest with an arithmetic mean of (4.30), a standard deviation of (0.78), and a relative percentage of (82.5%). This highlights that ensuring operations are conducted at the right time and place is a key strength in humanitarian operations in Yemen. Similarly, the "Quality & Quantity" dimension also achieved a mean of (4.30), with a slightly higher standard deviation

of (0.80) and the same relative percentage of (82.5%). This indicates a high level of consistency in delivering services that meet quality and quantity expectations. On the other hand, the "Cost" dimension showed a relatively lower performance, with a mean of (4.07), a standard deviation of (0.90), and a percentage of (76.75%). While still indicating an overall positive level of performance, this suggests that cost management may present more challenges compared to time, place, quality, and quantity

considerations. In summary, the table reveals that while the humanitarian operations in Yemen are strong in terms of timeliness, spatial appropriateness, and quality standards, cost-related challenges remain an area for potential improvement to enhance the overall effectiveness and efficiency of these operations.

15. RECOMMENDATIONS

According to the study's result, the following recommendations are proposed:

Some humanitarian organizations don't have head of supply chain who manages procurement & logistics teams that's they just have a department for procurement and another department for logistics; then, one manager of these 2 departments acts as an acting supply chain head which leads to overlapping in duties. Hence, what I recommend is that each humanitarian organization must have a supply chain head who has a huge experience in both humanitarian procurement and logistics for better management.

1. As humanitarian supply chain management is considered as a recent department for NGOs in Yemen, I recommend that all the staff in supply chain management should have ongoing trainings in the humanitarian sector. It is important to ensure that employees have ongoing access to training opportunities that allow them to maintain and enhance their proficiency in doing the tasks assigned to them.

2. Since operations at NGOs need to be effective in terms of right place & time, right cost and right quantity & quality, I recommend that supply chain management needs to be active and well-organized via abiding to the organizations' standard

operating procedures specifically the ones related to supply chain section.

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