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# Transportation Management Practices And Performance Of Humanitarian Organization: A Case Study Of Kenya Red Cross Society

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***Abstract:*** ***The objective of the study was to determine the relationship between transportation management and the performance of humanitarian organizations in Kenya. The study was conducted in all the 64 branches of Kenya Red Cross Society as a humanitarian organization. The study was pillared on two theories; Theory of Constraints (TOC) and Grey System Theory. The philosophical underpinning of the study was Positivism. The study adopted a descriptive research design with a target population of 1200 staff of Kenya Red Cross Society in all the 64 branches. Quantitative data was collected as the primary data with the sample size calculated based on Nasuirma, (2000) formula for quantitative data that gave a sample size of 94 respondents. Data collection techniques adopted was questionnaires. Cronbach's alpha was used in a testing for reliability and validity to ensure internal consistency of the tool. Quantitative data analysis was analyzed using SPSS software. Correlation test was used to test the association between the variables. The results indicated significant positive relationships between transportation management practices and performance of humanitarian organizations. The bivariate model showed positive correlation coefficients which indicated that an increase in transportation management score, would result in an increase in organization performance. The research concluded that transportation management has a significant positive relationship with the performance of humanitarian organizations. This therefore meant that there was need for improvement of transportation management practices to ensure an improvement on the performance of humanitarian organizations during disaster response.***

***Keywords: Transportation, Humanitarian Organizations, Performance***

## I. INTRODUCTION

In Humanitarian Organizations, fleet management is the second largest overhead cost, being 15% of the total humanitarian relief logistics cost (Falasca and Zobel 2011). Plans and policies on sourcing and allocation of vehicles by Humanitarian Organizations can be suddenly rendered irrelevant on real grounds since the occurrence of natural disasters usually cannot be predicted. Transportation is the second largest overhead cost to humanitarian aid and disaster relief operations after personnel (Pedraza-Martines, et. al., 2011). Main operational decisions on transportation involve allocation of relief supply, planning of vehicle delivery, and scheduling of vehicle routing (Balcik, et. al., 2008). This is an important component of any humanitarian aid process. It seeks to deliver the products and other commodities to the beneficiaries of emergency disasters. Transportation can be done by trucks, airplanes, ships, and other methods that can be deemed adequate for the respective situations (Oloruntoba, 2006). Transport is done from warehouses or distributions centers to the areas where they are needed. Since transportation and delivery are such important cost centers in humanitarian organizations, their management is becoming an

integral part to ensure that they are done in the most efficient and cost-effective manner.

Instead of primary infrastructure and a stable vehicle fleet as in commercial supply chain management, the infrastructure for relief is often destabilized and the fleet has to be organized at the disaster location from available resources in humanitarian aid and disaster relief circumstances (Kovacs and Spens, 2007). In the disaster area, physical infrastructures including bridges, roads, railways, and airports are often destroyed. Transportation capacity becomes limited or even non-existent (Thomas and Kopczak, 2005). Common forms of transportation include planes, trains, automobiles, and other two-wheel devices such as bikes or motorcycles. In the context of humanitarian organizations, transport is defined as: **"**The activities involved in moving supplies from point of origin to internal customers or beneficiaries" (Logistics Cluster, transport, 2011). By means of well-handled transport system, goods could be sent to the right place at right time in order to satisfy customers' demands. A good transport system performing in logistics activities brings benefits not only to service quality but also to company competitiveness (Tseng, et. al., 2005). Transportation management in emergencies is a complex task depending on the nature of the disaster. How it is structured is very dependent on the state of infrastructure, security in the area of disaster, demand, nature of product etc. (Logistics Cluster, transport, 2011). Transportation modes are an essential component of transport systems since they are the means by which mobility is supported. Geographers consider a wide range of modes that may be grouped into three broad categories based on the medium they exploit: land, water and air. Each mode has its own requirements and features, and is adapted to serve the specific demands of freight and passenger traffic. (Rodrigue, et. al., 2009).

## STATEMENT OF THE PROBLEM

Humanitarian organizations are faced with a number of challenges and disruptions in the efficient and effective delivery of relief requirements to the disaster victims due to inadequate transportation practices (Christopher and Tatham, 2011). This has resulted into devastating effects to the human population. This has been contributed to the underdeveloped transportation systems of the majority of the humanitarian organizations in Kenya which is reflected by the slow logistical response to disaster and in several occasions, the response to these disasters by relief organizations are ineffectively executed with experiences of delays and flaws in disaster response execution leading to increase casualties and worsened conditions of disaster victims.

## GENERAL OBJECTIVE

To determine the relationship between transportation management practices and performance of humanitarian organizations in Kenya.

## SPECIFIC OBJECTIVES

- ✓ To assess the relationship between transport modes and performance of humanitarian organizations in Kenya.
- ✓ To examine the relationship between infrastructure status and performance of humanitarian organizations in Kenya.
- ✓ To evaluate the relationship between use of 3PL and performance of humanitarian organizations in Kenya.
- ✓ To examine the relationship between No. of vehicles and performance of humanitarian organizations in Kenya.

# II. THEORETICAL REVIEW

## A. THEORY OF CONSTRAINT

The Theory of Constraints is an overall management philosophy for running or improving an organization that is well suited to model complex systems (Sullivan, 2009). Theory of Constraints can be applied in production, logistics, supply chain, distribution, project management, accounting, research and development, sales and marketing and so on. As the main idea is that every system has at least one weakest point, in literature there are lots of studies which have different concentration areas and reveals different issues of TOC. So, if companies can handle constraints in their system and manage these constraints, they would have a continuous improvement management system thus they could achieve higher profits. Taking into account that the main focus of this paper is the relationship between transportation management and the performance of humanitarian organizations TOC allows for the understanding of the effectiveness of transportation management in humanitarian logistics. Moreover, humanitarian logistics being a process with functions as process activities, identifying the weakest link in the transportation system and treating the weak link as a constraint thereby focusing all efforts on the one process activity identified as a constraint will definitely improve the performance. This therefore makes relevance of TOC to the study as it proposes to identify a constraint in the system and considering it as an opportunity hence aligning all the efforts into minimizing the constraint thereby improving the overall performance of humanitarian organization.

## B. STAKEHOLDER THEORY

Stakeholder theory explains and describes the purpose and strategic direction of the firm through the concept that managers work to simultaneously incorporate the legitimate interest of all appropriate stakeholders when making business decision. Stakeholder theory stems from literature on corporate social responsibility, organization theory, strategic planning and systems theory (Freeman, 2010). ST states that each organization has relationship with groups that either affect its decision or are affected by them, the stakeholders. Stakeholder theory is concerned with the way their relationship influences the processes and outcomes both for the organizations and stakeholders (Jones and Wicks 1999).

First from a stakeholder's perspective, business can be understood as a set of relationship among groups that have a stake in the activities that make up the business (Freeman, 1984). It is about how customers, suppliers, employees, financiers, communities and managers interact to jointly create and trade value. When stakeholders' interests conflict, the

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executive must find a way to rethink problems so that the needs of a broad group of stakeholders are addressed and to the extent that this is done even more value may be created for each Harrison, et. al. (2010). If tradeoffs have to be made as sometimes happen, the executive must figure out how to make the tradeoffs and then work on improving the tradeoffs for all sides (Freeman, et. al., 2007).

Humanitarian logistics being a multi-functional activity with different stakeholders prominent among them being the government, donors, humanitarian organizations, media and beneficiaries the actions of each stakeholder will invariably affect the activities of the other stakeholder(s) and given that transportation management is performed by different stakeholders in an attempt to make the best combination of the best set of activities to get the highest output in terms of lives saved in an disaster situation through effective and efficient transporation intervention gives credence to the relevance of this theory to this paper.

## III. EMPIRICAL REVIEW

Dufour, et. al., (2018) developed a computer simulation for optimization of transport routes which recommended a new route for delivery of relief supplies from UNHRD to East Africa. Using the new route was 21% less expensive than using the existing route. This showed that in emergency operations transportation is more difficult to plan and implement than usual. Thorough preparedness, coordination and well-informed information systems can overcome these problems to a great extent Berkoune, et. al. (2012). This study found that the literature focus was on emergency fleet or transportation management, and normal and developmental operations fleet management has not been addressed to any great extent. Lee, et. al. (2013) study a scheduling problem with operations that require renewable as well as non-renewable resources. The routing of each team is given, the operations have deadlines and the availability of the renewable resources depends on the sequence of the operations.

Campbell, et. al. (2008) takes the first step towards developing new methodologies for the routing problems. They focus specifically on two alternative objective functions for the traveling salesman problem and the vehicle routing problem; one that minimizes the maximum arrival time and one that minimizes the average arrival time. Yuan and Wang (2008) focus on the path selection problem in emergency logistics management and build mathematical models to select the best path. The motivation of their research is to consider more actual factors in time of disaster when building models. Two mathematical models are built in the study and algorithms are developed to solve the model.

Barbarosoğlu, et. al. (2002) develops a mathematical model for scheduling helicopter activities during a humanitarian relief operation. A two-level hierarchical decomposition is applied to this problem, resulting in two mixed integer mathematical models with conflicting objective functions. The top level mainly involves tactical decisions of determining the helicopter fleet, the total number of tours to be performed by each helicopter. The base level addresses operational decisions such as the vehicle routing of helicopters from the operation base to the emergency area, the delivery schedule and the re-fueling schedule of each helicopter given the solution of the top level. Since there are multiple objectives in this hierarchical structure, an iterative coordination heuristic is designed to enable the information exchange between the tactical problem and the operational problem. Haghani and Oh (1996) address a large-scale multi-commodity, multi-modal network flow problem with time windows. They determine the detailed routing and scheduling of the available transportation modes, delivery schedules of the various commodities at their destinations, and the load plans for each of the transportation modes. The formulation of the problem is based on the concept of a time-space network. Özdamar, et. al. (2004) presents a time-dependent logistics problem that is a hybrid of two sub-problems: the multi-period multi-commodity network flow problem and the multi-period VRP with multiple transportation modes. The model continuously regenerates plans incorporating new information. It indicates the optimal mixed pickup and delivery schedules for vehicles as well as the optimal quantities to be delivered during the defined time frame.

Yi and Özdamar (2006) describe an integrated location-distribution model for coordinating logistics support and evacuation operations in disaster response activities. The proposed model is a mixed integer multi-commodity network flow model that treats vehicles as integer commodity flows rather than binary variables. The authors classify the model as an integrated capacitated location-routing model with a network flow-based routing formulation. The proposed modeling framework is designed as a flexible dynamic (multi-period).

Kinyua (2008) explored the challenges of transporting humanitarian goods in poor road infrastructure. The challenges included slow pace, trucks breakdown downs, lack of refueling points and high costs of hireling trucks. The costs of logistics are quite high that it impacts negatively on supply chain performance in various ways. The studies discussed did not indicate how transportation management affect the responsiveness of humanitarian organizations in disaster which the current study proposed to determine.

## IV. KENYA RED CROSS SOCIETY (KRCS) AS A HUMANITARIAN ORGANIZATION IN KENYA

The Kenya Red Cross Society being a member of International Red Cross and Red Crescent Movement was legally transformed to into the Kenya Red Cross Society from the Kenya branch of British Red Cross through the Act of Parliament, Cap 256 of the Laws of Kenya on 21st December 1965. With its headquarters in Nairobi, the current structure of the KRCS is organized across eight regions and 64 branches, covering the entire country. Approximately 1200 staff and over 100,000 volunteers work for the KRCS. Kenya Red Cross Society being an affiliate of the IRCS which is arguably the largest humanitarian organization in the world and KRCS itself being the largest in the Kenya with branches and presence in all the 47 counties and regional officers in Kenya and with the Government of Kenya having a major stake by being an auxiliary of the Government of Kenya created

through an Act of Parliament, therefore the case study of KRCS will represent the length and breadth of the case of Humanitarian Logistics with reference to disaster response in Kenya adequately.

## V. PERFORMANCE OF HUMANITARIAN ORGANIZATIONS

Humanitarian Organizations' activities are mostly centered on saving lives and averting further loss of life during crises hence their operations will be deemed successful if they are able to respond to the affected population's needs on time while efficiently utilizing the available resources. These organizations primarily rely on donors for funding, hence responsibility and accountability to these donors plays a crucial role in the organization's performance. The organizations must ensure that there is visibility in their operations; their presence is felt by the communities they are aiding and that they continuously report to the donor on the progress of the projects and how the funds have been utilized. Transferring the above concept to application within Humanitarian Organization-Logistics & Supply Chain Management, there are two different kinds of customers: one is the donor, and the second is the beneficiary. The donor can be viewed as an "upstream" customer who provides funding to HOs, while, the beneficiary or community can be seen as a "downstream" customer, for whom resources are being spent by the HOs (Antai, et. al., 2015; Oloruntoba, et. al., 2009).

The performance Humanitarian Organization is critically dependent on the satisfaction of both the donor and beneficiary, and this is achievable through timely provision of quality goods and services to beneficiaries in a transparent and accountable way (Oloruntoba, et. al., 2009). The performance of Humanitarian Organization is largely a measure of effectiveness (prompt assistance to the beneficiaries), while the performance of development related operations is instead a measure of efficiency (cost minimization and sustainable resource consumption). Beamon (2004) described the unique characteristics of the disaster relief environment in comparison with commercial supply chains. Unlike commercial supply chains where demand can be predicted and therefore supply be planned, considering the lead times and have the demand met in time. In the humanitarian logistics and supply chain, demand is unpredictable since the events leading up to the need for supplies cannot be foreseen. The lead times are much shorter and at times even zero due to the emergency situation. It is also hard to control inventory since the demand, locations and lead times for the various operations vary for instance stock could be kept for a certain location but due to an emergency be required to be transported to a different location. It is therefore imperative that transportation activities be well coordinated in order to ensure that humanitarian operations are successful.

## VI. METHODOLOGY

The methodology adopted was descriptive survey research design in conducting the study. The study was carried out in Kenya Red Cross Society as a humanitarian organization operating in Kenya. The study captured all the 64 branches in the 5 regions of Kenya Red Cross Society with 1200 staff members in the all branches countrywide. The sample size was based on Nasuirma (2000) formula which gave a sample size of 94. The study adopted a simple random sampling as the technique of sampling since it gave equal chance to all the samples in the population which ensured adequate representation of the population. The researcher collected quantitative from the sample of 94 staff from the total number of 1200 staff of KRCS. The techniques used in quantitative data collection in this study was primarily a questionnaire which was administered through email to all the branches based on the sample proportion. A total of 94 questionnaires were sent through mail and 87 questionnaires were emailed back duly filled making a response rate of 93%. Cronbach's alpha was used for assessing the internal consistency of a questionnaire (or survey) that is made up of multiple Likert-type scales and items was conducted and produced Cronbach's alpha of 0.735 which was sufficient as suggested by Taber et. al., 2018. Transportation management was measured using questions with a five-point Likert Scale assigned dummy values as follows: Strongly disagree (SD) = 1, Disagree (D) = 2, Neutral (N) = 3, Agree (A) = 4, Strongly agree (SA) = 5. A continuous score was computed by summing the responses under each theme and compared across the demographic characteristics using t-test statistic. Cronbach Alpha was used to test for scale reliability whose coefficient was classified as adequate if it lied between 0.64-0.85 (Taber, et al., 2018) and acceptable if greater than 0.64. Linear regression was conducted to determine the effects of the independent variables on the dependent variable. Both bivariate model (simple linear Regression model) and multivariate models (Multiple linear regression model) were fit.

### A. FINDINGS

Descriptive and inferential analysis were done and the results were as summarized in Table 6.1 and Table 6.2.

| | **n (%)** | **Mean (sd)** |
|---|---|---|
| Transport modes affect performance | | |
| Neutral | 1. 9 (10.3) | 2. |
| Agree | 3. 33 (37.9) | 4. |
| Strongly Agree | 5. 45 (51.7) | 6. 4.4 (0.7) |
| Infrastructural status affect performance | 7. | 8. |
| Neutral | 9. 5 (5.7) | 10. |
| Agree | 11. 27 (31.0) | 12. |
| Strongly Agree | 13. 55 (63.2) | 14. 4.6 (0.6) |
| Use of 3PL affect performance | 15. | 16. |
| Neutral | 17. 11 (12.6) | 18. |
| Agree | 19. 23 (26.4) | 20. |
| Strongly Agree | 21. 53 (60.9) | 22. 4.5 (0.7) |
| Number of vehicles affect performance | | |
| Neutral | 10 (11.5) | |
| Agree | 26 (29.9) | |
| Strongly Agree | 51 (58.6) | 4.5 (0.7) |
| **Overall Score (mean, sd)** | **17.9 (0.1)** | **4.5 (0.3)** |

*Source: Survey Data, (2020)*

*Table 6.1: Proportion of Respondents' Opinion on whether Transportation Management affect Organizational Performance in the Kenya Red Cross Society*

A sample of 87 respondents were successfully interviewed using structured questionnaires. Based on the total sample size of 94 respondents, this gave a response rate of 93% as the other 7% never emailed back the questionnaires sent to them via email. The sample included 20% from the higher-level management, 52% of respondents from middle level management and 29% from lower-level management. the results indicated that 38% and 52% of the respondents agreed and strongly agreed respectively that transport modes affect performance, 31% and 63% respectively agreed and strongly agreed that infrastructure status affects performance. Twenty-six percent and 61% of the respondents agreed and strongly agreed that use of 3PL affect performance while 12% were indifferent on this. The number of vehicles affects performance according to 30% and 59% respectively of the respondents who agreed and strongly agreed to this statement respectively.

There was an overall mean score of 4.5 out of 5 which indicated a high agreement score by the respondents that transportation management practices had effect on organizational performance. Pearson correlation analysis was conducted on transport management score against organization performance score to test whether transport management had any association with organization performance.

**Model Summary[a]**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | | Durbin-Watson |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | R Square Change | F Change | df1 | df2 | Sig. F Change | |
| 1 | .599[a] | .358 | .351 | .41713 | .358 | 51.396 | 1 | 92 | .000 | 1.302 |

**ANOVA[b]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 8.943 | 1 | 8.943 | 51.396 | .000[b] |
| | Residual | 16.008 | 92 | .174 | | |
| | Total | 24.950 | 93 | | | |

**Coefficients[c]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | 95.0% Confidence Interval for B | |
|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | Lower Bound | Upper Bound |
| 1 | (Constant) | 1.471 | .276 | | 5.339 | .000 | .924 | 2.019 |
| | Tran mgt | .576 | .080 | .599 | 7.169 | .000 | .417 | .736 |

a. Predictors: (Constant), Tran. Mgt.
b. Dependent Variable: Org. Perf.

*Source: Survey Data, 2020*

*Table 6.2: Simple Regression model showing Effect of Transportation Management on the Performance Organization*

From the simple linear regression model above, a unit increase in transport management score would increase organization performance by 0.576 units. This result was statistically significant at 5% significance level ($F_{(1,92)}$ = 51.396; t = 7.169; and $p$ = 0.000). The coefficient of determination ($R^2$=0.358) showed that transportation management practices accounted for 35.8% of the variations in organization management. The results showed that there was a statistically significant positive correlation coefficient of 0.599 (p=0.000) between transportation management practices and organization performance. From the simple linear regression results above we could therefore conclude that there was sufficient evidence that transportation management practices had a significant positive relationship on organization performance.

The study is similar to a study done by Liu (2014), who found out that one, the decision makers are supposed to use the shortest distance between Evacuation Centres and Affected Areas to rank all potential Evacuation Centres, as well as to adopt "unique" deployment strategy. Two, Decentralized Evacuation Bases is better than centralized Evacuation Bases because there is always a backup source of supplies during a disaster. However, study had a focus on earthquake as the only disaster of interest unlike the current study that covers response to all disasters in general. Further the study was done in Canada which is a developed nation therefore the findings might not reflect the situation in Kenya which is a developing nation in which the current study is based.

The study also mirrors the study done by Kinyua (2008) who explored the challenges of transporting humanitarian goods in poor road infrastructure. The challenges included slow pace, trucks breakdown downs, lack of refueling points and high costs of hireling trucks. The costs of logistics are quite high that it impacts negatively on supply chain performance in various ways. The researcher did not indicate whether humanitarian organizations had adequate funds to fund logistics and also how other transportation management practices affected the performance of humanitarian organizations in disaster which the current study found out.

## VII. CONCLUSION

The study focused on establishing the relationships Transportation Management practices and the Performance of Humanitarian Organizations in Kenya with a case study on Kenya Red Cross Society. The results indicated significant positive relationships between Transportation Management practices and the Performance of Humanitarian Organizations in Kenya. The research concluded that transportation management practices had a positive significant relationship with the Performance of Humanitarian Organizations in Kenya hence there was need for the improvement of transportation management practices to ensure an improvement on the performance of humanitarian organizations in Kenya hence ensure efficient and effective assistance of disaster victims.

## VIII. RECOMMENDATIONS

Humanitarian organizations should aim at improving transportation management practices since it contributes to shorter lead time, higher accessibility to disaster zones, increased recovery time and higher satisfaction of the disaster victims.

REFERENCES

[1] A. Haghani and S. C. Oh, Formulation and solution of a multi-commodity, multi-modal network ow model for disaster relief operations," Transportation Research, vol. 30, no. 3, pp. 231{250, 1996.
[2] Antai I., Mutshinda C., Owusu R. (2015). A 3-R principle for characterizing failure in relief supply chains' response to natural disasters. Journal of Humanitarian Logistics and Supply Chain Management, 5(2), 234-252. https://doi.org/10.1108/JHLSCM-07-2014- 0028
[3] Balcik, B. & Beamon, B. (2008). Facility location in humanitarian relief. International Journal of Logistics: Research & Application, 11(2), 101-21.
[4] Barbarosoglu, G., Ozdamar L., and Cevik, A. (2002). "An interactive approach for hierarchical analysis of helicopter logistics in disaster relief operations". Eur J Oper Res 140.1, pp. 118 –133. DOI: 10.1016/S0377-2217(01)00222-3.
[5] Beamon, B. M. (2004). Humanitarian Relief Chains: Issues and Challenges. Proceedings of the 34th International Conference on Computers and International Engineering.
[6] Berkoune D., Renaud J., Rekik M., Ruiz A. (2012). Transportation in disaster response operations. Socio-Economic Planning Sciences, 46(1), 23-32.https://doi.org/10.1016/j.seps.2011.05.002
[7] Campbell, A. M., Vandenbussche, D. and Hermann, W. (2008). "Routing for Relief Efforts". Transp Sci 42, pp. 127–145. DOI: 10.1287/trsc.1070.0209.
[8] Christopher, M and Tatham, P. (2011). Introduction to Humanitarian Logistics, Meeting the Challenge of Preparing for and Responding to Disasters, edited by Christopher, M and Tatham P. London, Kogan Page, 1-14.
[9] Dufour É., Laporte G., Paquette J., Rancourt M.È. (2018). Logistics service network design for humanitarian response in East Africa. Omega, 74, 1-14. https://doi.org/10.1016/j.omega.2017.01.00 2 Eisenhardt, K, M. (1989). Building Theories from Case Study Research. Academy of Management Review, 14 (4), 532-50.
[10] Falasca M., Zobel C.W. (2011). A two-stage procurement model for humanitarian relief supply chains. Journal of Humanitarian Logistics and Supply Chain Management, 1(2), 151-169.
[11] Difference"). Journal of Business Logistics: Strategic Supply Chain Research, 34(3), 183-188.
[12] G. L. Barbarosoglu and Y. Arda. (2004). A two-stage stochastic programming frame work for transportation planning in disaster response," Journal of the Operational Research Society, vol. 55, pp. 43(53).
[13] Freeman, R.E. (1984). Strategic management: A stakeholder approach. Boston: Pitman.
[14] Freeman, R.E., Harrison, J., & Wicks, A. (2007). Managing for stakeholders: Business in the 21st century. New Haven, CT: Yale University Press.
[15] Harrison, J.S., Bosse, D.A., & Phillips, R.A. (2010). Managing for stakeholders, stakeholder utility functions and competitive advantage. Strategic Management Journal, 31(1), 58–74
[16] Jones, S. (1987). Choosing action research', in Mangham, I (ed) Organization Analysis and Development, Wiley, Chichester
[17] Kinyua, J. (2013). Supply chain performance in humanitarian organizations in Kenya. (Master's thesis). University of Nairobi, Nairobi, Kenya.
[18] Kova´cs Gyo¨ngyi and Spens Karen M. (2007). "Humanitarian logistics in disasterrelief operations", International Journal of Physical Distribution & LogisticsManagement, Vol. 37 No. 2,2007, pp. 99-114, @Emerald Group PublishingLimited,0960-0035, DOI 10.1108/09600030710734820
[19] Kova´cs Gyo¨ngyi and Spens Karen M. (2011). "Trends and developments inhumanitarian logistics – a gap analysis", International Journal of Physical Distribution& Logistics Management, Vol. 41 No. 1, pp. 32-45, @Emerald Group PublishingLimited, 0960-0035, DOI 10.1108/09600031111101411
[20] KRCS. (2006). Kenya Red Cross Society, Strategic Plan 2006-2010.
[21] Lee, W., Yang, N. (2009). Location problem solving by spreadsheets, WSEAS transaction on business and economics, no. 8, vol. 6.
[22] Logistics Cluster -Logistics Operational Guide (The LOG), Assessment and planning, URL: http://log.logcluster.org/response/warehouse-management/index.html, accessed on Feb, 2011
[23] Logistics Cluster -Logistics Operational Guide (The LOG), Assessment and planning, URL: http://log.logcluster.org/response/distribution/index.html, accessed on Feb, 2011
[24] Logistics Cluster -Logistics Operational Guide (The LOG), Assessment and planning, URL: http://log.logcluster.org/response/transport/index.html, accessed on Feb,
[25] Nasiurma, D. K. (2000). Survey Sampling: Theory and methods. University of Nairobi: Nairobi, Kenya.
[26] Oloruntoba, R and Gray, R. (2006). Humanitarian Aid: An Agile Supply Chain? Supply Chain Management: An International Journal, 11(2), 115-120.
[27] Ozdamar, L, Ekinci, E and Kucukyazici, B. (2004). Emergency Logistics Planning in Natural Disasters, Annals of Operations Research, 129, 217-245.
[28] Pedraza-Martinez, A. J. and Van Wassenhove, L. N. (2013). "Vehicle Replacement in the International Committee of the Red Cross". Prod Oper Manag 22.2, pp. 365–376. DOI: 10.1111/j.1937- 5956.2011.01316.x.
[29] Rodrigue Jean-Paul, Comtois Claude, Slack Brian.(2009).The Geography ofTransport Systems, Published May 18th 2009 by Routledge – 352 pages
[30] Taber, K.S. (2018). The Use of Cronbach's Alpha When Developing and Reporting Research Instruments in Science Education. Res Sci Educ48, 1273–1296. https://doi.org/10.1007/s11165-016-9602-2
[31] Thomas, A and Kopczak, L. (2005). From Logistics to Supply Chain Management: The Path Forward in the Humanitarian Sector. Fritz Institute. Retrieved from:

ISSN: 2394-4404

http://www.fritzinstitute.org/PDFs/WhitePaper/FromLogisticsto.pdf/

[32] W. Yi and L. Ozdamar. (2007). A dynamic logistics coordination model for evacuation and support in disaster response activities," European Journal of Operational Research, vol. 179, pp. 1177{1193}.