International Journal of Human Resources Management (IJHRM)
ISSN (P): 2319-4936; ISSN (E): 2319-4944
Vol. 6, Issue 1, Dec - Jan 2017; 7-24

International Academy of Science, Engineering and Technology
Connecting Researchers; Nurturing Innovations

DETERMINANTS OF SKILLS AND COMPETENCIES OF HUMANITARIAN LOGISTICIANS: A SRI LANKAN PERSPECTIVE FOR DEVELOPING COUNTRIES

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ABSTRACT

In recent years due to the interest, attention and the precedence of humanitarian operations, logistics took a new turn into humanitarian areas. Humanitarian Logistics (HL) has now become one of the significant factors in assisting to any disaster. Skills of the logisticians are therefore a necessity to effectively manage the supply chain in a disaster.

Given the recent issues that are being faced with regard to HL at each disaster that occurs in Sri Lanka, it is vital to research in to the area of HL. A number of researches have been carried out in finding skills of the humanitarian logisticians at global level. However, as to date there has been limited discussion on the skills of humanitarian logisticians in the Sri Lankan humanitarian field.

A Principal Component Analysis (PCA) was conducted in order to find the skills of humanitarian logisticians in Sri Lanka. Skills which were identified earlier by researchers were further tested in order to find the applicability in the local HL landscape. We have identified deferent set of component than in the previous studies. Results will assist the training and recruiting humanitarian logisticians. Additionally, this paper also indicates future research requirements to the field of HL.

KEYWORDS: Logistics, Skills, Sri Lanka, PCA

INTRODUCTION

Conceptual Background of Humanitarian Logistics

It is evident that there are key similarities between, commercial and humanitarian supply chain management, such as managing the flows of goods, information, and finances. It can be argued that both humanitarian and commercial supply chains have common structures such as demand management, supply management, and fulfillment management (Balcik, et al., 2010). However, there is also a clear distinction between commercial supply chains and the humanitarian relief supply chains, where the latter entails working with ‘ad hoc’ teams of organizations in unpredictable and potentially difficult circumstances. The Fritz Institute defines HL as a process of planning, implementation and management of cost efficiency, of storage of goods, materials and related information from the point of origin to the point of consumption with the objective of alleviating the suffering of victims.

Humanitarian Logistics Skills and Competencies

Some authors (Amir & Imran, 2013) (Airila, et al., 2014) have explained that, skills and competencies are similar

as they both mean the ability that an individual has acquired through training and experience to perform a specific activity or task more successfully. However, there are differences in the two concepts. According to Amir & Imran, (2013) skills are specific learned activities, and they range widely in terms of complexity. By knowing which skills are required for a certain job in an organisation can identify the abilities required by an individual. On the contrary, competencies translate the skills into abilities enabling individuals to perform the job requirements competently. Therefore, "competencies are deemed as effective application of skills".

There has been an increase in HL publications in recent times (Kunz & Reiner, 2012). However, there are only a limited number of studies that have been conducted in the field of skills identification and performance improvement with regard to HL (Kovács & Tatham, 2010). In one of their studies, Kovács and Tatham (2010) highlighted the importance of logistics skills for effective management, career development and knowledge. There are a number of literature reviews that have been conducted in the field of HL with the evolution of the subject over the last decade. These researches included different types of analysis and recommendations for future research topics. Nevertheless, one common aspect of all these studies is the prominence given to the area of logisticians' skills and the effect of these skills regarding the efficiency of organizational settings, where no adequate research has been carried out. The relevant skills are vital for the employment and career development of humanitarian logisticians due to the demanding work situations and high turnover of the humanitarian logisticians (Perry 2006; Kovacs 2011; Kovács and Tatham 2010). It is essential to discuss the skills of individuals who are engaged in HL. The skills contribute as a material input not only towards the resource configuration but also to the sustainable growth of an organization. Skills will develop the absorptive capacity of firms which will in turn increase their capabilities (Collis & Montgomery, 1995). It is said that skills have a strategic value (Kovács, Tatham and Larson, 2012) as they cannot be easily copied or acquired. Further the Resource Based View (RBV) describes skills as a firm's internal resource that affects the competitive advantage. All firms have to consider the skills of individuals as an asset in gaining competitive advantage. Considering the aforementioned factors, this research conceptualizes the question as; what skills are significant in carrying out HL activities in the Sri Lankan context?

Sri Lankan Humanitarian Situation

Although, Sri Lanka is not considered as one of the most disaster-prone countries, the 2004 tsunami, which devastated livelihoods across South East Asia, caused not only a profound shock but also gave a warning that Sri Lanka is vulnerable to low-frequency high impact events which can cause extensive damage (IRP, 2010). In May 2005, the Sri Lanka Disaster Management Act No 13 of 2005 was enacted in parliament with a view to provide solid legislative and institutional arrangements for Disaster Risk Management, establishing a powerful National Council for Disaster Management under the President and the Disaster Management Centre (DMC) as the lead agency for disaster risk management. In November 2005, the Ministry of Disaster Management (MDM) was established to provide strong leadership. The 'Road Map' of 2005 proposed a number of disaster risk management initiatives including policy, institutional mandates and developments, hazard vulnerability and risk management, training and education etc. It is expected that proper implementation of this Road Map will go a long way 'towards a safer Sri Lanka' from natural disasters. Between the years 2000-2011, more than 3 million people have been affected in Sri Lanka by various natural disasters such as tsunami, epidemics, floods and storms (DMC, 2010). This shows the importance of establishing a robust disaster management system. Although, much work is in progress the prominence given to the training and skills development of Sri Lankan humanitarian logisticians are still in its infancy (Rajakaruna, et al., 2016).

LITERATURE SURVEY

Literature Survey in Humanitarian Logistics

Overstreet, et al. (2011) proposed that future research should concentrate more on profession of humanitarian logisticians in order to recruit, train and retain humanitarian logisticians in an effective manner. Kunz and Reiner (2012) in their article on literature surveys into HL also identified the lack of research into human resource management. The conceptual paper developed by Leiras, et al.,(2014) included a research framework for literature review through qualitative and quantitative content analysis. Having considered the updates of the previous literature reviews conducted on HL, authors have added seven more classification criteria that included humanitarian skills as a research classification, indicating the high level of prominence on skill development.

Skills and Competencies for Humanitarian Logistics

It is evident that logistics researches regarding the skills of the logisticians differ from actual skills, attributes, experience, competencies, and knowledge areas (Kovacs, 2011). Gammelgaard & Larson, (2001) described the differences between context-independent skills and context-dependent competencies. They indicated that both skills and competencies are important in logistics and supply chain management. According to Myers, et al., (2004) there is a distinction between logistics knowledge acquired through education and work experience. They further indicated that, although there is a positive relationship between logistics skills and employee performances the same relationship does not apply in the context of education and experience. Most researchers commonly grouped skills and knowledge as subcategories into functional skills, technical skills, leadership skills and global management skills (Dischinger, et al., 2006). In another research Gibson & Cook, (2001) indicated a set of general management skills, interpersonal skills, technical skills and logistics specific capabilities. These studies have concluded the same concept that there are skill sets that are important, and a specific set of skills called technical logistical skills exist. During a survey of supply chain managers in Europe; Vereecke, et al., (2008) added the soft skills that complement technical skills. Murphy & Poist, (2007) and Dazmin, et al., (2011) also supported that there are three major skill sets that complement supply chain management, such as logistics skills (that combines functional and technical skills), business skills and management skills. However, the most significant and most discussed skill groups were elaborated by Mangan & Christopher, (2005) where they indicated a T-shaped skill profile that highlights the difference within “breadth versus depth of knowledge, skills, and competencies in the different areas” in the SCM profession as indicated in figure 1.

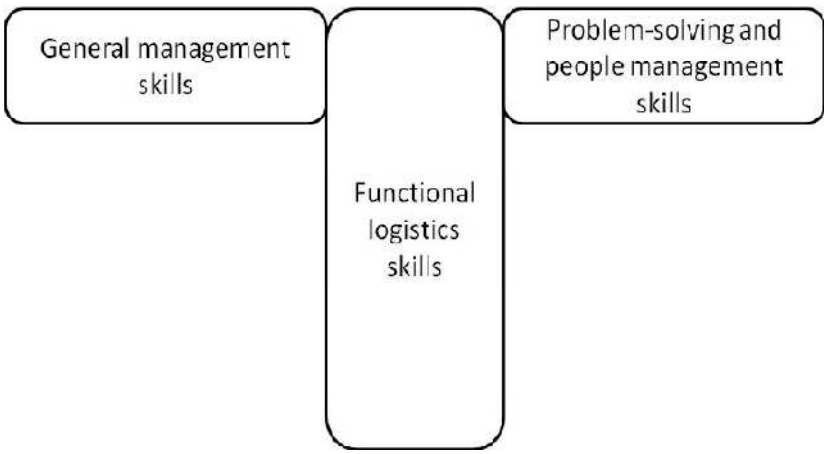

Figure 1: ‘T- Shape’ Skills Profile for Logisticians-(Mangan and Christopher 2005)

There are many other differences between the skills of logisticians due to geographical areas (Okongwu, 2007), gender (Cooper, et al., 2010), ethnicity (André, 1995), student vs. practitioners (Gammelgaard & Larson, 2001), position & firm type (Gibson & Cook, 2001) and business vs. HL (Kovács & Tatham, 2010). However, Murphy & Poist, (2007) stated that it is important to become a "manager first and a Logistician second".

Other studies have also suggested new managerial skills which are relevant to a humanitarian context, such as pressure tolerance (Swords, 2007), team building, and operational management etc. The Chartered Institute of Logistics and Transport (CILT, 2014) have also included medical logistics, customs procedure, donor management and camp management. Walker & Russ (2010) have enhanced the skill sets by adding security and safety, monitoring and evaluation, needs assessment and knowledge of sanitation etc. With a high turnover of humanitarian logisticians (Harke & de Leeuw, 2015) it is a continuing task to recruit and retain logisticians with all the necessary skills at a time of disaster due to the challenge of limited resources (Thomas & Kopczak, 2005).

Skills and bundles of skills are linked and named as capabilities where they are aggregated into hierarchies (Grant, 2009). Within literature it was not agreed as to how the logistic capabilities can be segregated into specific sets of logistics skills (Kotonen, et al., 2013). Kovács, et al., (2012) have summarized that skills are important for the development of dynamic capabilities, where there is a hierarchy of skills and capabilities may be required by organizations according to their perspectives.

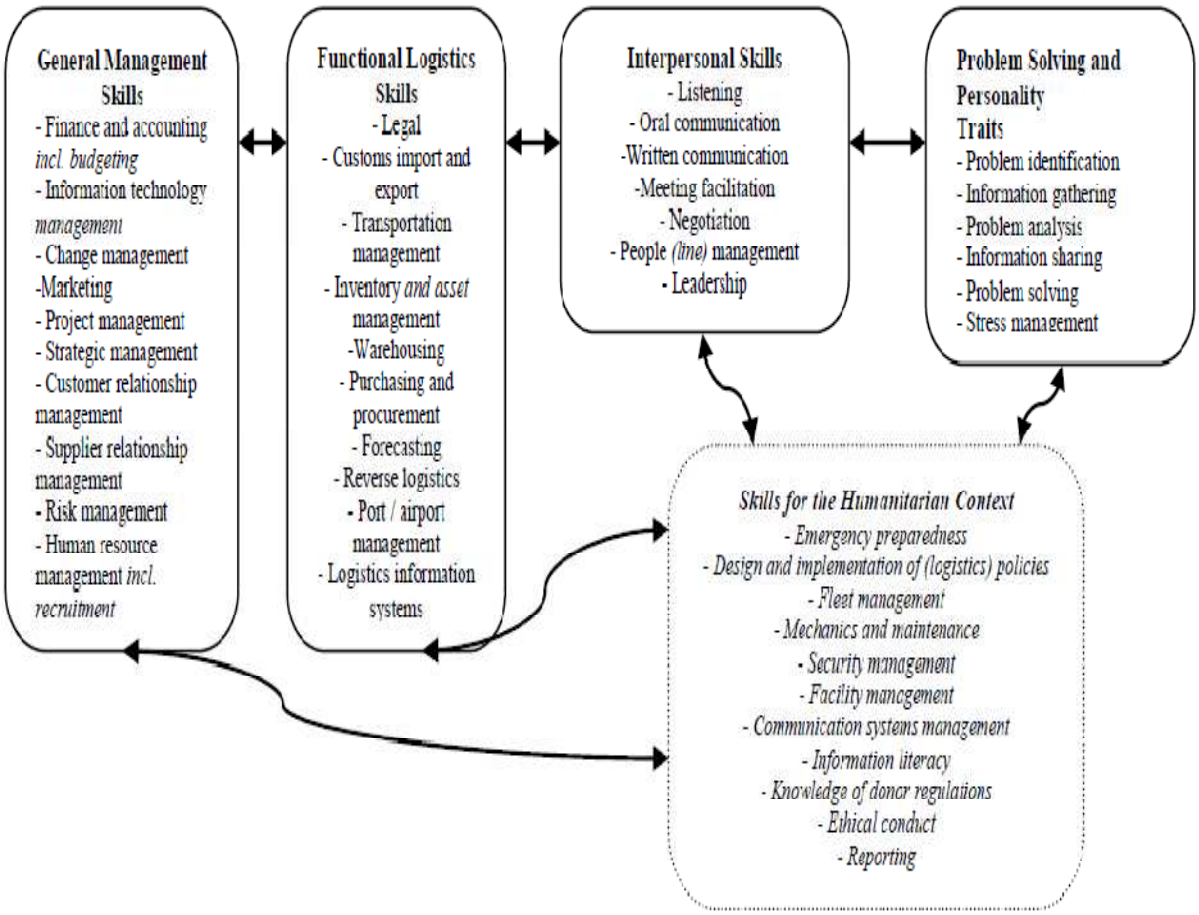

Figure 2: Skills and Competencies Profile for the Humanitarian Logisticians - (Kovács, Tatham, and Larson, 2012)

As shown in above figure 2, Kovács, et al., (2012) have highlighted the skill profiles for humanitarian logisticians. This model was influenced by Mangan & Christopher's, (2005) 'T- shape' skills profile. They proposed to conduct a more comprehensive study in order to find the actual skills required to do the job in an effective manner. They also recommended further research to address the link between skills and HL performance. The study conducted by Mangan and Christopher (2005) can be considered as the most accepted amongst the research community (Kovács and Tatham 2010; Kovács, Tatham and Larson 2012; Tatham and Kovacs 2010; Trunick 2007; Allen, et al. 2013; Bo¨lsche, Klumpp and Abidi, 2013; Kunz and Reiner 2012). Nevertheless, Kovács, Tatham and Larson (2012) in their study concluded that there are some additional skills required by humanitarian logisticians as indicated in figure 2.

The necessity for further studies with a holistic understanding of the actual daily job profile of humanitarian logisticians and the effectiveness of each job towards organizational performance are crucial as per conclusive statements by the authors concerned. This research was conducted with the view of exploring further skills that are required to carry out the jobs in an effective and professional manner. The Sri Lankan Humanitarian sector was used to test the skills empirically. A PCA was conducted to group the skills in to number of components.

Concepts of Principle Component Analysis (PCA) to Skills and its Contribution

There were researches conducted by using PCA to find the skills. Dada, (2014) carried out a research to find the skills of the quantity surveyors by using PCA. It was revealed through this research that there are some skills that can be grouped together to find a more specific set of skills for the quantity surveyors. Additionally, another research conducted by, Daud, (2014) elaborated that the findings of the competencies of Malaysian logisticians can also be grouped together to increase efficiency in many areas such as training, selection and performance auditing. This research was also conducted by using PCA to list the basic skills that are required to carry out the tasks of logisticians effectively and efficiently. In this research a PCA was conducted to minimize the dimensions of the variables that were used as skills of humanitarian logisticians by Kovács, et al., (2012). The Sri Lankan humanitarian landscape is further considered since some elements of these skills were not applicable in the Sri Lankan context as indicated by the focus group and key informant interviews. Therefore, those skills which are practically significant will only be used as measures in this research.

RESEARCH DESIGN AND CONCEPTUALIZATION

Research Model

Although the humanitarian relief chain has a number of similarities to commercial supply chains such as structure, logistics activities and organizational settings, HL differs from commercial supply chains primarily due to dynamic demand patterns and the risk of operating in global supply chains (Wassenhove, 2006). Many researchers have shown the strong association between logistics skills and its contribution towards key dimensions such as career development, education, job development, training and performance etc. (Myers, et al., 2004; Murphy & Poist, 2007; Gammelgaard & Larson, 2001; Kovács & Tatham, 2010). Although, different models were tested in the past, there is a common acceptance for the 'T-Shape' model put forwarded by Mangan & Christopher, (2005) as the most accurate model describing the logistics skills. Further, Kovács, et al., (2012) introduced some specific skills to the HL in addition to the 'T-Shape' model, introducing a skill set which comprises of general management, functional logistics, problem solving, interpersonal skills including a set of specific humanitarian skills. These skills which have not been empirically tested previously are considered as variables to this research. By performing the tests in the Sri Lankan humanitarian landscape to find out the similarities and differences in comparison to the model presented by Kovács, et al., (2012).

The model is depicted in figure 2.

Research Methods

The variables were identified following the literature review and initial interviews with scholars and practitioners. This research was conducted by carrying out both exploratory and descriptive elements of research design.

To analyze insights for more stimulating and precise comprehension to the research; a literature survey was carried. Additionally, a comprehensive survey was also carried out by interviewing personnel involved in the field of HL. Key informant interviews[1] were also conducted.

In human research a descriptive study can provide information about natural behavior, attitudes or other characteristics of a particular group. Accordingly, interviews were carried out with various personnel in the humanitarian field including a number of organizations such as Government (Ministry of Disaster Management - MDM) and other organizations like the UN, and NGOs as well as other state sector organizations that are directly responsible for humanitarian logistic activities in Sri Lanka in accordance with the cross-sectional methodology of this research. Further, the sample used in the survey to find the information using a questionnaire is also an example of using cross sectional methodology in this research.

Based on the theory discussed in the literature survey, the model put forwarded by Mangan & Christopher, (2005) and Kovács, et al., (2012) was tested to find out the components of the HL skills. Testing such a model confirms the theories and the practical impact of HL towards developing a skilled workforce.

Since this is primarily a deductive research, prominence was given to the quantitative methods in identifying and proving the models that are presented by the other scholars. PCA was used to find out the components that are linked with various HL skills.

Due to time constrains, this research was carried out as a cross sectional study. The questionnaire development and validation was carried out during August 2016. The pilot testing of the questionnaire was completed in September 2016. After completing the reliability analysis, data was gathered from Sri Lankan humanitarian logisticians from September to November 2016. The data was then analysed. The primary data collection was carried out as a cross-sectional study whilst continual surveying of the activities of humanitarian organizations was carried out throughout the study.

The research problem was to find out the skills that are significant to Sri Lankan humanitarian logisticians. Therefore the unit of analysis in this study was the 'humanitarian logistician'. Accordingly, this research data was gathered from individual logisticians to identify their skills.

Questionnaire Development

As indicated in the literature survey, the questionnaire was designed with reference to previous studies that have been carried out. Five dimensions which were elaborated in the literature survey were considered (general management skills, functional logistics skills, problem solving skills, interpersonal skills and humanitarian specific skills). Respondents were requested to indicate the frequency of use of each dimension. Such skill levels and their usage was analysed later in

[1] The purpose of key informant interviews is to collect information from a wide range of people—including community leaders, professionals, or residents—who have firsthand knowledge about the community. These community experts, with their particular knowledge and understanding, can provide insight on the nature of problems and give recommendations for solutions.

the research using PCA analysis. A pilot study was also carried out by distribution of questionnaires to 50 selected humanitarian logisticians to validate the reliability of the questionnaire. This sample was ranging from logistics officers 'on and off the field'.

Reliability and Validity of Questionnaire

A focus group of six professionals including scholars was selected to test the validity of the variables that are embedded in the questionnaire as indicated in the literature survey (Kovács, Tatham and Larson, 2012). Among many concepts of validity, content validity ensures that the measures include an adequate and representative set of items to tap the concept (Warnakulasooriya, 2008). A focus group was used to measure the efficacy of each Individual Item Content Validity (ICVI). They were requested to mark 1 to 4 for each item to show their agreement / disagreement for the items (not relative-1, somewhat relative-2, quite relative-3, highly relative-4). The items were also judged for clarity and simplicity. Details of the content validity calculations for HL skills are depicted in table 1. Individual ICVI values lower than 0.78[2], were omitted from the measurement scale.

Table 1: ICVI for Humanitarian Logistics Skills - (Source Survey Data)

Dimension	Element (Item Description)	FG1	FG 2	FG 3	FG 4	FG 5	FG 6	Number Agreed (if value is between 3 to 4 agreed)	ICVI (No of Agreement /Members in FG)
General Management Skills	Accounting and Budgeting	4	4	4	4	4	4	6	1
	Project Management	4	3	2	4	4	3	5	0.833
	Supplier and Customer Relationship Management	4	4	3	4	3	3	6	1
	Disaster Management	4	4	4	4	4	4	6	1
	Human Resource Management	3	4	3	3	3	3	6	1
	Change Mgt	4	2	1	2	1	2	1	0.167
	Marketing Mgt	2	1	2	2	2	1	0	0
	Strategic Mgt	2	3	1	1	2	2	1	0.1667
Functional Logistic Skills	Contract & Commercial Law	4	4	4	4	4	4	6	1
	Import & Export Procedures	4	3	2	4	4	3	5	0.8333
	Inventory Management	4	4	3	4	3	3	6	1
	Warehouse Management	4	4	4	4	4	4	6	1
	Procurement Management	3	4	3	3	3	3	6	1

[2] Lynn's, (1986) criteria indicated that ICVI should be 1 with 3 to 5 experts, and a minimum of 0.78 with 6 to 10 experts.

	Transport & Fleet Management	4	3	2	4	3	3	5	0.8333
	Air Port & Sea Port Management	2	3	4	4	3	4	5	0.8333
	Information System Management	3	4	2	4	3	3	5	0.8333
Problem Solving Skills	**Problem identification analysis and decision making**	4	4	4	4	4	4	6	1
	Data Gathering and Distribution	4	3	2	4	4	3	5	0.8333
	Stress Management	4	4	3	4	3	3	6	1
Interpersonal Skills	**Communication Skills**	4	4	3	4	3	3	6	1
	Conference and Meeting Management	4	3	2	4	4	3	5	0.8333
	Negotiation	4	4	4	4	4	4	6	1
	Leadership	4	4	4	4	4	4	6	1
Humanitarian Specific Skills	**Emergency Preparedness**	4	4	4	4	4	4	6	1
	Organizational Policies& procedures in HL	4	3	2	4	4	3	5	0.8333
	Facility Management	4	4	3	4	3	3	6	1
	Knowledge on Donor Regulations	4	4	4	4	4	4	6	1
	Ethical Conduct	3	4	3	3	3	3	6	1
	Liaison with Other Organizations	4	3	3	4	3	3	6	1
	Conducting & Participating in Training	2	3	4	4	3	4	5	0.8333
	Team Playing	3	4	3	4	3	3	6	1
	Mechanics & Maintenance	1	2	2	2	1	3	1	0.1666
	Security Mgt	3	4	2	2	1	2	0	0

	Communication Sys Mgt	2	1	2	1	1	1	0	0
ICVI Average									**0.7941**
Total Agreement									**19**

Note:

- All items that have Individual Item Content Validity (ICVI) more than 0.78 were considered for the questionnaire.
- Scale Content Validity Index (SCVI) was not considered since ICVI values were more than 0.78 (Lynn, 1986).

On the basis of the tests carried out, items such as Change Management, Marketing Management, Strategic Management, Mechanics & Maintenance, Security Management and Communication System Management (Refer to Table 1) were not selected for further testing since the focus group indicated those items are not relevant to the Sri Lankan humanitarian landscape. Accordingly, 28 variables were selected for principle component analysis.

A reliability test was carried out for the variables prior to distribution of questionnaire. Reliability can be measured by different methods. When reliability of a measure is established, we can confirm for the consistency and the stability of the items in the scale (Sekaran, 2007). Cronbach's Alpha test was selected to measure the consistency of the scale. A sample of 50 humanitarian logisticians was selected to carry out a pilot study. Results of the Cronbach's Alpha tests are indicated as 0.899. Therefore, it is agreed that the items are positively correlated to one another. Thus the Cronbach's Alpha value is considered as good (between 0.8 and 0.9) demonstrating a strong reliability between variables and determinants.

Sampling Procedure

The population considered in this research was the humanitarian staff employed in all state, private and international nonprofit organisation in Sri Lanka that carry out humanitarian logistic activities. Hence, if a person is engaged in any logistics, procurement, storage, distribution or supply chain activities and obtains remuneration for conducting his /her duties in humanitarian work in any of the aforementioned sectors, was considered an element of the population for this research. Since managerial positions in any organisation can predict the performance (Morris, et al., 2015) care was taken to consider the personnel engaged in managerial positions in all the sectors that are engaged in humanitarian operations.

According to the ministry of Social Affairs and Disaster Management there are 218 organizations that are listed as nonprofit organisations. After examining the nature of each of these organizations, it was found that there are only 23 organizations engaged in humanitarian activities in the nonprofit sector. Furthermore, there are UN agencies such as UNDP, UNCHR, UNOPS, WHO and WFO which have also deployed humanitarian logisticians in Sri Lanka. Additionally, there are other HL personnel for MDM at Province, District and Provincial Council level (including military personnel). There are also personnel who work for the MDM at the head office and other agencies such as National Disaster Relief Service Center (NDRSC) to coordinate all the disaster related logistics activities in the MDM. Since the number of organizations was large, it was challenging to obtain the details of all such personnel. Therefore, we had to rely on convenience sampling methodology to obtain data. Since this is a non-probable sampling method there is an element of bias. Adequate attempts were made to obtain a sample that represents the population. Moreover, steps were taken to obtain

the details from every district of the country adopting various distribution methods (questionnaires were distributed through survey monkey website, posting the details to the respondents and also through emailing the questionnaires to respondents). Another method adopted to minimize the sample biasness was by obtaining a larger sample. Thus, 500 questionnaires were dispatched through the methods mentioned above out of which 323 completed questionnaires were received.

This represents a response rate of 65.6% which is considered a good indicator for social research (Moser & Kalton, 1979). According to Allison, (2001) the best way to avoid missing data is not to have any. However, when entering this data, which was collected from questionnaires, some data were missing. Thirteen questionnaires were found with missing data and out of those, five questionnaires were rejected as they were unreliable (two with larger number of missing data and the three with extreme ends of the Likert scale). The missing data of those eight questionnaires were handled though 'hot deck imputation method' (Marina, 2013). Finally 323 questionnaires were available for data analysis (the rejection rate was 1.5%).

ANALYSIS OF DATA

Tests Prior to PCA

PCA was used in order to find the specific skills for the HL and their related components to the Sri Lankan HL sector. Prior to PCA, several feasibility tests were carried out. One such test was to see the results of KMO and Bartlett's Test scores. The KMO value was more than 0.6 and the Bartlett's Test of Sphericity was lesser than 5% which qualified for further progress in PCA.

Thereafter, the Correlation Matrix was analysed. It was observed that most items are having a correlation value more than 0.3. Therefore, the second condition to carry out the PCA was also satisfied. Additionally, the Communalities table also indicated that all items have high correlation values.

PCA of Humanitarian Skills

All variables selected to tests the skills components were qualified from the initial tests. The PCA was carried out. In doing so, the first test was to find out how the total variance was explained. As can be seen in the Table 2 below, the total variance indicates that the first 7 components explained 74% of the Eigenvalues. Thus, it is initially established that all 24 skills should fall in to 7 components as per the Cumulative percentage.

Table 2: Total Variance Explained - (Source Survey Data)

Component	Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	10.711	38.252	38.252	5.562	19.863	19.863
2	3.351	11.968	50.220	4.649	16.602	36.465
3	1.643	5.866	56.086	4.282	15.292	51.758
4	1.486	5.308	61.394	1.654	5.906	57.664
5	1.283	4.582	65.976	1.642	5.866	63.530
6	1.118	3.992	69.968	1.540	5.498	69.028

7	1.055	3.769	73.737	1.318	4.709	73.737
Extraction Method: Principal Component Analysis.						

When analyzing the Scree Plot as depicted in figure 3, it was not clear as to how many components should be included in these Humanitarian skills. It was observed that there are two breaks in the Scree Plot, between the first two components, second two components and next two components. However, a further test was conducted to find out the exact number of components to be used since the breaks were not properly visible after the first two components.

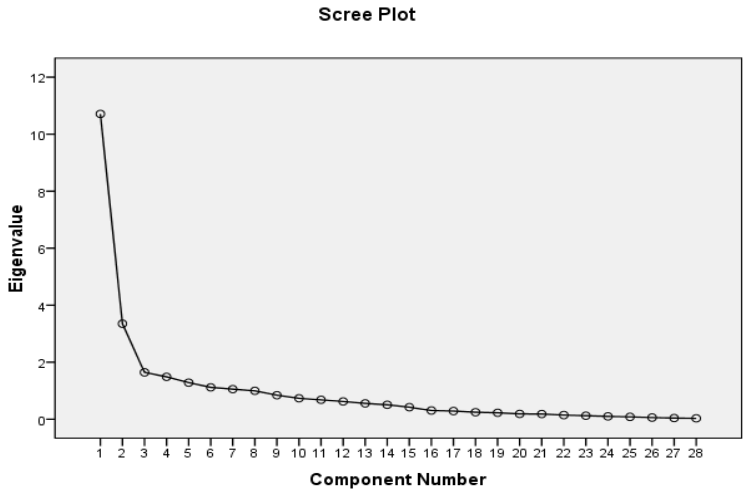

Figure 3: Scree Plot of Skills Humanitarian Logisticians- (Source Survey Data)

Consequently, Parallel Analysis according to Monte Carlo Simulation was conducted to find out the difference between the Initial Eigenvalues and parallel analysis Eigenvalues. The 'rule of thumb' is to consider the factors which have higher initial Eigenvalues than the parallel analysis Eigenvalues. There were only 4 factors that had higher values.

Thus, PCA was conducted again for 4 factors and the component matrix was analysed. When considering the Component Matrix it was observed that these 4 factors interrelate well. However it was also observed that the first two factors have a higher interrelation than the others. This was also evident from the 'Break' of the Scree Plot wherein the breaks after the first two factors are highly visible. In addition to this the parallel analysis also recommended only 6 factors.

To arrive at a final agreement, pattern matrix was analysed to see the loading at each of these 4 factors. It was revealed that all these 4 factors consist of items with more than 4 loadings. Hence, the 4 factors will qualify. Pattern Matrix is given in Table 3.

Table 3: Pattern Matrix (Source Survey Data)

Skills	Component			
	1	2	3	4
Warehouse Management	0.907			
Inventory Management	0.736			
Procurement Management	0.725			
Project Management	0.723			
Supplier and Customer relationship management	0.705			

Information System Management	0.625			
Communication skills	0.597	0.514		
Negotiation	0.528			
Stress Management	0.469	0.411		0.314
Problem identification analysis and decision making	0.465			
Human Resource Management	0.415			
Accounting and Budgeting	0.411	0.312		
Conducting & Participating in Training		0.857		
Team Playing		0.786		
Leadership		0.774		
Liaison with other organizations		0.767		
Ethical conduct		0.674		
Conference and meeting management		0.663		
Facility management		0.549		
Data gathering and distribution		0.510		0.420
Air Port & Sea port Management			0.793	
Import & Export Procedures	0.333		0.739	
Organizational Policies& procedures in humanitarian logistics		0.330	0.657	
Contract & Commercial Law	0.378		0.644	
Knowledge on Donor regulations		0.396	0.443	
Transport & Fleet Management			0.416	
Disaster Management				0.733
Emergency preparedness		0.363		0.645
Extraction Method: Principal Component Analysis. Rotation Method: Oblimin with Kaiser Normalization.				
a. Rotation converged in 12 iterations.				

Components Results of the PCA of the Sri Lankan Humanitarian Logisticians

Pattern Matrix was further considered and the highest value of each skill variable at each component was kept and the other values were deleted. These results showed the variables that belong to each component. Therefore, variables in each component are presented in figure 4.

Component One - Humanitarian Logistics Management Skills

This principal factor accounts for 19.86% of the observed total variance and it contains twelve items. These items were namely, warehouse management, inventory management, procurement management, project management, supplier and customer relationship management, information system management, communication skills, negotiation, stress management, problem identification analysis and decision making, human resource management and, accounting & budgeting. This supports the views of Mangan & Christopher, (2005) who indicated that logisticians have to have a mixture of logistics specific skills (or SCM core skills) with a broader competence in a number of other areas.

Component Two – Humanitarian Interpersonal Skills

The observed total variance for these components was 16.60%. These included eight skills such as; conducting & participating in training, team playing, leadership, liaison with other organizations, ethical conduct, conference and

meeting management, facility management and data gathering & distribution. According to Gibson & Cook, (2001) it is important to be a manager for all logisticians to be effective. This shows why the skills such as leadership and team playing are included as significant skills in this component.

Component Three – Humanitarian Supply Chain Coordination Skills

This principal factor accounts for 15.29% of the total variance. This component had six skills that concentrated more on to the physical distribution and coordination activities in HL. These skills were; air port & sea port management, import & export procedures, organizational policies & procedures in HL, contract & commercial law, knowledge on donor regulations and transport & fleet management. As explained by Kovács, et al., (2012) there are specific skills that belong to humanitarian logisticians.

Component Four – Humanitarian Logistics Disaster Management Skills

The balance 9.64% of the principal factor was accounted for disaster management and emergency preparedness. These are humanitarian specific skills. That could be the reason that they stand in a separate component. This explains that humanitarian specific skills are significant for the logisticians to perform their duties (Kovács & Tatham, 2010).

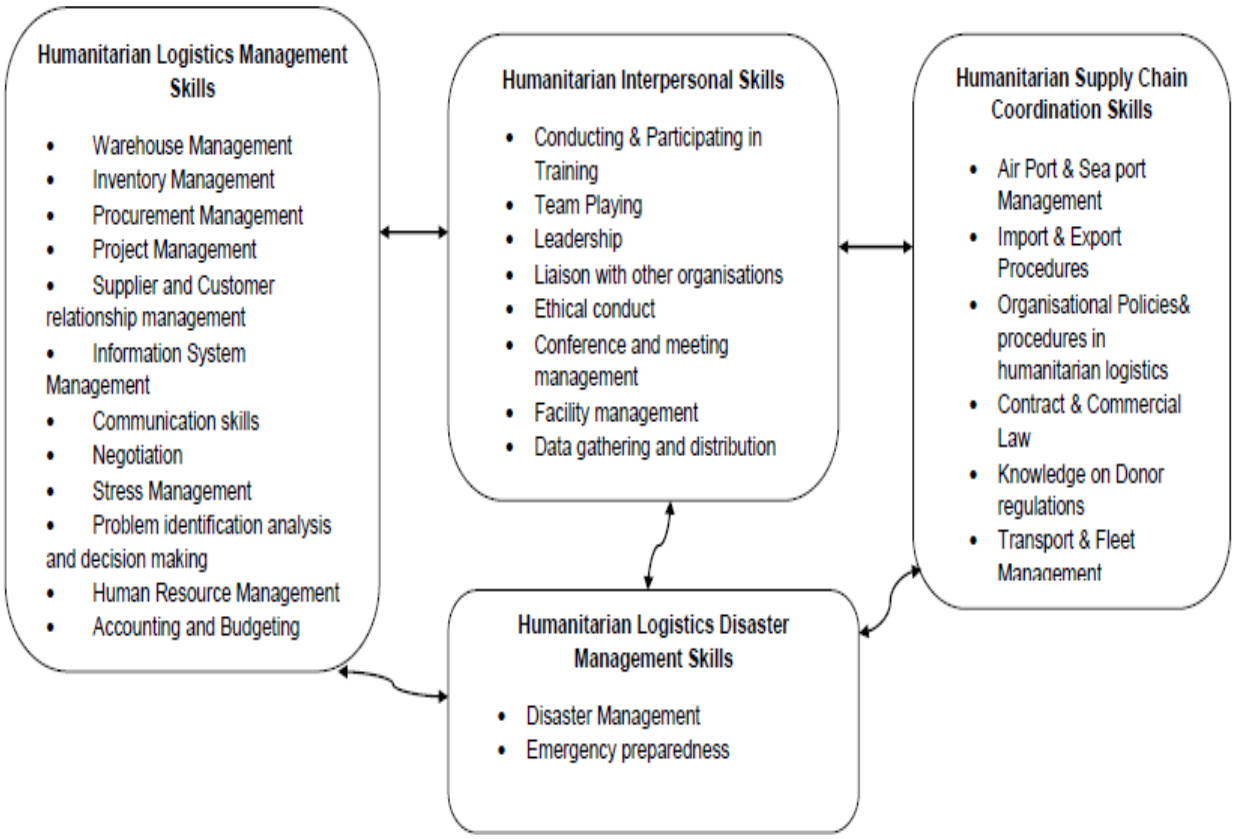

Figure 4: Skills and Competencies Profile for Sri Lankan Humanitarian Logisticians

CONCLUSIONS

Discussion and Indications of Results

This research was carried out to find out the key components for various skills in HL. According to Mangan & Christopher, (2005) logistics skills have three different components such as general management, functional logistics and

problem solving & people's management skills. Kovács, et al., (2012) added interpersonal and humanitarian specific skills to these as new components with special relevance to HL management. Therefore, theoretically there were five components according to Kovács, et al., (2012) that included 34 various skills. Our study revealed that there are only four components with 28 skills that are used by the Sri Lankan Humanitarian Logisticians. We have also identified that these skills do not fall in to specific category (general management, functional logistics, problem solving, people management or HL specific skills). Additionally, it was also revealed that these skills belong to different components in practice than those introduced by Kovács, et al., (2012). We also confirm that humanitarian skills do follow fall in to any particular trend and they differ by the nature of the operation, disaster category, and geographical areas and other variables as indicated by several authors (Sohal & D'Netto, 2004), (Okongwu, 2007) (Rahman, et al., 2009) (Walker & Russ, 2010). Collis & Montgomery, (1995) pointed out that identifying specific skills is significant to determine the strategic value of each skill as a resource. Therefore, this research will assist training institutes in the preparation of curricula for HL. In addition, organizations also can make use of this model to develop job descriptions, balance score cards and job advertisements in the humanitarian sector towards improved effectiveness and efficiency. Individuals who are employed in the sector can use these findings for career planning and development considering the phenomenal importance of this life-saving profession. As authors, we sincerely hope that this study will make a substantive contribution to the challenge of identifying humanitarian logistician skills and competencies and present ideas, concepts and approaches that could be further researched in the future.

Limitations and Future Research

Our research was only limited to the Humanitarian logisticians in the Sri Lankan humanitarian context. There may be other skills that support the HL work depending on various factors as discussed earlier. It was not practical to obtain a complete list of personnel engaged in the Sri Lankan humanitarian sector due to the newness of the sector in the country. Although, a deliberate effort was taken to minimize the sample bias in convenience sampling, we recommend that future research use more robust sampling methods to explore the variance of our results. Our sample consisted of humanitarian logisticians of both genders. However, as directed by Cooper, et al., (2010) future research should also to be carried out to explore the different skills with regard to gender. The four components in our research have contributed to 61% of the skills required for HL. Thus there are other skills that still represent 39% of the subject (refer to Table 2). Future research can identify other areas that contribute to the skills of the humanitarian logisticians. This research was conducted in a South Asian country, where the educational, societal, and cultural values differ from other regions. Therefore, it is recommended that this skill model would be most suitable for the Asian region. Further research is warranted prior to such implementation. Finally, we also recommend researching the effects of these skills in to the performance of humanitarian organizations (Kovács, Tatham and Larson, 2012).

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