

INFLUENCE OF HUMANITARIAN TECHNOLOGY ON THE IMPLEMENTATION OF HUMANITARIAN AID PROJECTS IN NGOS BASED IN NAIROBI COUNTY, KENYA

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Abstract

Humanitarian crisis across the globe continue to increase in size, frequency and complexity challenging the ability of NGOs in disaster relief to save lives of persons in distress. This has been a challenge to countries prone to natural disaster and human conflict such as Syria, Southern Sudan, Central Africa Republic, Yemen, Somalia and Democratic Republic of Congo. In Kenya, humanitarian crises have occurred in the form of recurrent drought, floods, malnutrition and food security, disease outbreak, post election violence, resource based inter-communal conflicts as well as terror attacks. In 21st Century, disasters have become frequent, complex and growing in size, overstretching humanitarian sector ability to respond effectively. As a result, there is increasing need to apply humanitarian technology when implementing humanitarian aid projects and NGOs in disaster relief have been laggards in adopting humanitarian technology. The objective of this study was to examine the influence of humanitarian technology and the implementation of humanitarian aid projects. The paradigm guiding the study is pragmatism and the study employed a cross sectional-survey design. The sample was drawn from NGOs in disaster relief programmes using both probability and non-probability sampling technique. Both primary and secondary data was utilized in data collection. Primary data was collected using self administered questionnaires, Key Informant Interview and Focus Group Discussions Guides. Questionnaires issued were 117 out of these, 85 which is 72.6% were returned for analysis. The data was analysed using both descriptive and inferential statistics. For descriptive analysis, mean, percentages and frequencies were used. For inferential analysis, correlations and regressions were used. For $p<0.05$, H_0 was rejected and H_1 accepted. For the strength of the relationships, r values were considered where: $+0.10 < r < +0.29$; weak correlation $+0.30 < r < +0.49$; moderate correlation $+0.5 < r < +1.0$; Strong correlation. The qualitative data was analyzed using content analysis. The study findings indicate that humanitarian technology influence implementation of humanitarian aid projects. In conclusion, humanitarian technology is critical in implementation of humanitarian aid projects and there is need to put more emphasis on use of existing humanitarian technology. The study recommended that there is need for NGOs in disaster relief to adopt more technologies another recommendation was that there is need to increase trainings in Humanitarian technology in academic institutions.

Key Words: *Humanitarian technology, Implementation of Humanitarian aid projects, NGOs in disaster relief, Private sector engagement*

Introduction

Implementation of humanitarian aid projects has been transformed through technology in post modern times (Read, Taithe and Mac Ginty, 2016). Most of these new technologies are offered by the private sector to improve effectiveness and efficiency of implementing humanitarian aid projects. Some of the technologies benefiting the humanitarian sector include the use of cell phones, biometric identification, geospatial technologies as well as platforms on social media. Another helpful technology is the virtual distribution by use of mobile money, e-transfers, credit cards and other payment systems (Ramalingam, Scriven, and Foley 2009). The technology is improving response in emergencies and providing resource mobilization to enable wider and more effective coverage of emergencies and as such save lives of persons in distress. Meir (2011) researched on the impact of new Information Communication and Technology on humanitarian sector and found out that volunteer networks have been good source of digital information on disasters, making a great shift in humanitarian operations. Coverage in humanitarian is changing in the sense that before application of these technologies the aid workers had to visit the site physically in order to know the level of crises, risking their own lives. In recent times the communities in distress are able to utilize technologies such as the internet, mobile phones at the site of a disaster for quicker and better humanitarian intervention by aid workers.

The study acknowledges that the definition of technology is very broad and that humanitarian aid projects implementation has always been facilitated by technology as basic as pen and paper. Humanitarian innovation is a way of potentially transforming humanitarian space through existing technology in order to save lives in distress. For this study the humanitarian technology refers to application of technology to improve the quality of emergency preparedness, response, recovery and efforts to restores livelihoods after disaster. Humanitarian Technology is an emerging domain that has largely concentrated on the use of social media, cash cards, digital foods, digital resource mobilization, crisis mapping and crowd sourcing among others. For this study the researcher utilized these indicators to examine influence of Humanitarian Technology on implementation of humanitarian aid projects: humanitarian innovation, use of communication technologies, digital fund mobilization and digital humanitarian response.

Statement of the problem

Over the past decade, humanitarian crisis has doubled and continue to rise increasing humanitarian need. Conversely, the implementation of humanitarian aid projects in Kenya continues to be faced by difficulties. On the other hand, majority of NGOs have remained laggards in adopting new humanitarian technology. Kenya Vision 2030 Mid Term Plan II on aid effectiveness has laid down implementation framework requirements for effective aid to be achieved. The National Disaster Operation Center (NDOC) under the Ministry of Interior and Coordination of National Government is expected to ensure better humanitarian projects are implemented after a disaster takes place. However, they have faced challenges due to increasing disasters resulting in deaths of thousands of persons in distress. These challenges can be minimized by injecting humanitarian technology by Private Sector who have expertise in technology that can help improve disaster response. However, previous studies indicate that in engaging the private sector, there are opportunities as well as constraints, but these constraints can be overcome. Laxity in adopting humanitarian technology may result in

NGOs in disaster relief becoming less relevant as their ability to respond to disasters and conflict continues to diminish due to overwhelming needs and increasing disaster frequencies. As such this study is both timely and relevant and seeks to close the gap in research by examining the influence of humanitarian technology on implementation of humanitarian aid projects in NGOs in disaster relief based in Nairobi Kenya.

Research Objective

To examine the extent to which humanitarian technology influences the implementation of humanitarian aid projects

Research Questions

To what extent does humanitarian technology influence the implementation of humanitarian aid projects?

Research Hypothesis

H₁ Humanitarian technology, significantly influence the implementation of humanitarian aid projects

Literature Review

The study reviewed existing literature on implementation of humanitarian aid projects as well as humanitarian technology.

Implementation of Humanitarian aid projects

This study has critically examined the existing literature on implementation of humanitarian aid projects in relation to humanitarian technology. The literature has revealed that the humanitarian sector has been faced by increasing disasters and humanitarian needs over the years testing NGOs in disaster relief ability to save lives. The humanitarian sector has been struggling to achieve the required threshold when implementing humanitarian aid projects and this has called for other actors including business partners in the private sector and governments to engage (UNOCHA, 2016). Humanitarian technology contributes to achieving implementation threshold by providing better, quicker services and quality products including utilization of high technology to achieve desired goals. Implementation of humanitarian aid projects have been a challenge; this has called for the need for humanitarian technology to be applied in-order to save more lives when disasters happen in Kenya. Table 1.1 shows some of the recent disasters in Kenya.

Table 1.1 Chronological of disasters and their effects in Kenya

Year	Disaster		Activity / Effect
2019	Dusit 2	terror attack	Death of 21 people killed by terrorists
2018	Solai	deadly floods	Death of 45 people washed away by floods from an agricultural dam
2015	Garissa University	terror attack	Terror attack at Garissa University with 147 casualties

2015	Cholera outbreak	Cholera outbreak in 21 counties with 6529 cases reported
2014	Lamu terror attack	Lamu terror attack at Mpeketoni village with 50 casualties
2013	Nairobi Westgate terror attack	Terror attack at a Nairobi Westgate shopping mall with 69 casualties
2011	Drought and famine in Kenya	Widespread across the country and the Horn of Africa
2007/08	Post Election Violence	Conflict across Kenya

Source: Scientific American Journal (2007) modified by researcher

Proper tools and techniques when delivering aid are also integral to better implementation of humanitarian aid projects. Engaging the private sector in humanitarian technology can enrich implementation of humanitarian aid projects because they have specific expertise and knowledge (Hilhorst, 2002). In Kenya there are several disasters including drought, famine, floods to name a few as mentioned by (Zyke and Kent, 2014) just like other countries Kenya is a recipient of aid money to address humanitarian needs. The Vision 2030 is Kenya's blue print that aims to transform the economy to become globally competitive and prosperous by offering quality life to its citizens. The Second Mid Term Plan of vision 2030 has laid down implementation frameworks requirements for effective aid to be achieved. It is important to address disasters because they have the ability to destabilize economies hindering development. Humanitarian technology is necessary when responding to these disasters and implementing projects.

Humanitarian technology and implementation of humanitarian aid projects

Humanitarian technology has been critical in improving how humanitarian aid projects are implemented during the onset of disasters, much of the technology is sourced from the private sector by the humanitarian organizations. In recent times there has been humanitarian transformation through humanitarian technology as disasters are increasing and are more complex in the 21st Century than it was in the 19th Century. The private sector has been instrumental in innovating ways to respond efficiently and effectively to the humanitarian crises caused by natural disasters or human conflict. On the other hand, humanitarian sector has little by way of innovation of products and processes (Ramalingam et. al., 2009). Therefore, there is need for humanitarian organizations to engage the private sector when responding to the ever growing, humanitarian crises, they have had to rely on technology which is becoming a critical component for implementation of humanitarian aid projects. These technologies have fundamentally altered how humanitarian response is done. Virtual distributions greatly contribute to helping persons in distress in a timely manner, as they do not have to wait for long hours for help to reach them (Sandvick, Jumbert, Karlsrud and Kaufmann, 2014). Cash transfer systems enable the affected population to get food by themselves instead of depending on food from outside their locations (Harvey, 2007). On digital resources mobilization technology, the private sector provides avenues for disaster funds mobilization through the telephone as well as social media. For example, during the 2011 famine in Kenya there was a Kenyans for Kenya initiative, by the Kenya Red Cross Society. Drummond and Crawford (2014) pointed out that private sector enabled rapid fund raising for the initiative by the Kenya Red Cross where US\$ 8.5M was raised via mobile phones. This technology was offered by Safaricom to raise money using social platforms (Hoxtell et.al, 2015). Another technology is crowd sourcing; this is the process of obtaining

online information from a large group of people who are located at the scene of the disaster. It advances humanitarian efforts to gather, validate and process information by tapping into the real knowledge and information of people in need. For example, via short messaging services, Twitter, Facebook, WhatsApp or other social media means. In Kenya, Ushahidi open source mapping company pioneered the combination of crowd-sourcing and crisis mapping for humanitarian purpose and it helped focus effort to gain access to persons in distress (Belliveau, 2016).

On crises mapping and identification technologies, the Haiti earthquake in 2010 was the main contributor to changing humanitarian response (Kovacs and Spens, 2007). The private sector brought innovations such as Google person finder system prepared by Google volunteers for response in the Haiti earthquake. Digicel a mobile operator availed its communication data to non-profit initiatives in order to track population displacements in Haiti (Bailey, 2014). This data identified where the displaced people were congregated improving coverage of response. Google also worked with the aerial surveillance company; Geo-eye to take aerial pictures to assess damage and steer aid to worst hit areas. Another example is 2004 Tsunami where IBM was using technology to track missing persons (Betts and bloom, 2014). Geographical Information Systems (GIS) technology also helps in guiding intervention more effectively for instance, UK Map Action that specializes in satellite earth imaging created real time maps of disaster areas (Stauffacher, Drake, Currión and Steinberger, 2005).

Theoretical Framework

This study is based on the diffusion of innovation theory that has elaborated the connectedness with humanitarian technology and implementation of humanitarian aid projects.

Diffusion of Innovation theory

Humanitarian technology has been applied by NGOs such as World Vision, Oxfam, Christian Aid among other NGOs more often than not this technology comes from Private sector companies that are generally seen as leaders in innovation, including humanitarian innovation. However, majority of NGOs in disaster relief programmes are laggards in adopting innovations from the private sector regardless of the value they are likely to bring to the humanitarian sector. According to Ramalingam et.al (2009) innovation focuses on implementation of improved or new products and processes to contribute to effectiveness and efficiency in service delivery. The concept of diffusion was first studied by sociologist Gabriel Tarde, Friedrich Ratzel and Leo Froberius in late 19th century. Diffusion of innovation theory seeks to describe the rate at which new ideas are adopted in different sectors. Diffusion is seen to be in three distinct phases; presentation of new ideas, acceptance and integration of accepted elements of ideas. Sahin (2006) asserts that statistical and behavioural research on innovation diffusion suggests that preferences to adopt new ideas or products can vary even within a single organization. For instance, in a World Vision case study on Last Mile Mobile Solutions to support field data collection, analysis and management processes in efforts to eliminate duplication during food distributions, the innovation went through several stages. Stage one was recognition stage, invention stage, development stage, implementation stage and diffusion stage (Narhan, Farkas and Maphosa, 2009). On technology acceptance Bagozzi (2007) argue that it depends on the decision on

the desired goal, intention of the innovation to be applied and end action desired by an organization. Embracing novelty as demonstrated in figure 1

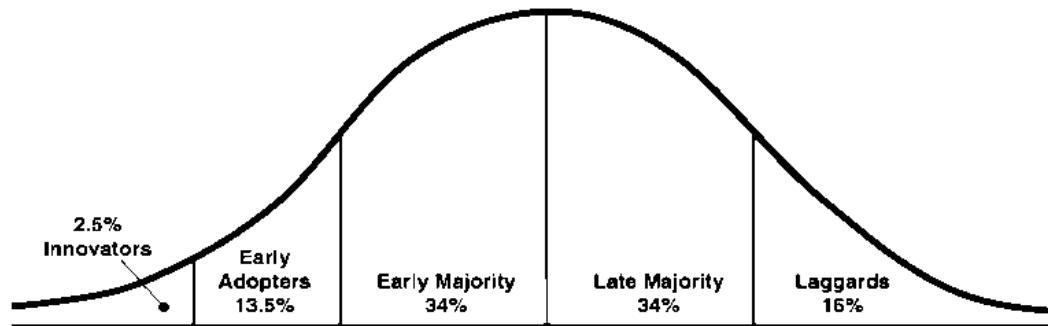


Figure 1 Bell curve distribution of types of adopters in the population

(Source: Sahin, 2006)

Humanitarian organizations willingness to accept new innovation range from early adopters to those who accept it far later after being introduced while some drop them all the same. Some humanitarian organizations tend to adapt very fast while others tend to weigh advantages and disadvantages before accepting it in their system. This as explained by (Betts and Bloom, 2014) in the context of providing protection and assistance to persons in distress, even a small number of exploitation by innovation could discredit humanitarian innovation and therefore humanitarian organizations are usually cautious. Nevertheless, NGOs in disaster relief are likely to have challenges during implementation of humanitarian aid projects if they are to remain laggards in adopting innovation due to changing nature of technology. Therefore, there is need to put more effort to embrace and apply available humanitarian technology.

Conceptual Framework

The study was guided by a conceptual framework shown in Figure 2. that demonstrates the inter-relationship between the dependent and independent variable which were further explored and tested to find conclusions of the study. The independent variable for this study was humanitarian technology and the dependent variable was implementation of humanitarian aid projects as guided by the research objective.

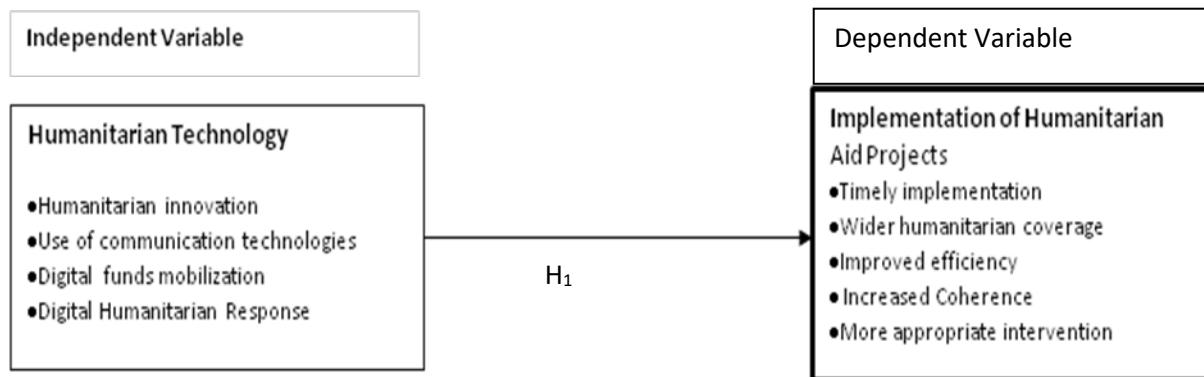


Figure 2: Conceptual Framework on humanitarian technology and implementation of humanitarian aid projects

Research Methodology

This study employed a cross-sectional survey research design. This design was appropriate as it allows the researcher to collect data at one point in time as opposed to longitudinal design. The sample was 117 respondents from NGOs in disaster relief. The sample was selected using both probability and non-probability sampling and only those organizations that had engagement in humanitarian aid projects were selected to participate in the study. The study used Self Administered Questionnaires, Key Informant Interviews and Focus Group Discussions. The data was analysed using SPSS soft ware. Quantitative data was analysed using inferential statistics and descriptive statistics while qualitative data was analysed using content analysis.

Findings and Discussions

The study had the following findings and discussions

Background information of respondents

The study sought general information about the respondents as it was important to know the characteristics of the players in provision of humanitarian aid services. This includes; geographic scope of operation, duration of engagement, humanitarian private sector

collaboration, mode of collaboration and key areas of engagement. The results are presented in table 1.2

Table 1.2 Background characteristics of respondents

Categories of background information	frequency	Cumulative frequency	Percentage (%)
Geographic scope of operation			
International	58	58	68.2
Regional	18	76	21.2
National	9	85	10.6
Total	85		100
Duration of engagement in the humanitarian sector			
0-5 years	6	6	7.1
6-10 years	23	29	27.1
11-15 years	13	42	15.3
16 years and above	43	85	50.6
Total	85		100
Humanitarian private sector collaboration			
Yes	69	69	81.2
No	16	85	18.8
Total	85		100
Mode of collaboration			
Long term partnership	15	15	17.6
Implementing partner	18	33	21.2
Short term partnership	23	56	27.1
Adhoc partnership	29	85	34.1
Total	85		100

On geographic scope the study findings show that majority of the NGOs in disaster relief engaging in humanitarian activities are mainly international organizations constituting of 58 (68.2%) while 18 (21.2%) were operating regionally and 9(10.6%) were operating nationally. This shows that they have experience and exposure to implementation of humanitarian aid projects that have been applied in other countries and have the ability to translate the same experience when implementing humanitarian aid projects in Kenya.

On the duration of operation in the humanitarian sector findings indicate that 43 (56.6%) have been engaged for more than 16 years. While 23 (27.1%) have operated for 6-10 years and 13 (15.3%) have been in operation for 11-15 years and 6 (7.1%) have been in operation for 0-5 years. With statistics showing that 50.65% of the respondents have been in the industry for more than 16 years clearly indicating that majority targeted players in the sector understand the nature of disasters in Kenya at large, and know the best way to offer assistance given their years of operation in the country.

On humanitarian private sector collaboration, study findings indicate that 81.2% of the humanitarian organizations in Nairobi agree to the fact that humanitarian-private sector collaboration has a huge effect on the implementation of humanitarian aid projects in NGOs within Nairobi. A paltry 16 (18.8%) on the other hand were of the view that humanitarian aid has greatly had not done much to influence implementation of humanitarian aid projects during onset of disasters in the country. These findings seem to confirm the initial assertion by the study that humanitarian-private sector collaboration had a significant influence on the implementation of humanitarian aid projects during disaster management. It also concurs with Leach et. al (1994); Mc Quid (2000) in their argument that no actor has all the required capacity to respond to the ever increasing disasters in size and frequency in Kenya; resource constraints as well as different ideologies always exist in the same space and need to be well managed to improve implementation.

On the mode of collaboration, the study findings clearly show that 15(17.6%) have long term partnership, 18 (21.2%) collaborate as implementing partners, 23 (27.1%) collaborate on short term partnership while 29 (34.1%) collaborate in adhoc partnerships. This indicates that majority of the private humanitarian NGO-private partnerships and collaborations are done on temporary need basis with short term and adhoc collaborations combined taking 52 (61.2%) of the mode of collaboration. This implies that the NGO's only partner with private entities in addressing a certain humanitarian disaster, after which partnerships are quickly dissolved. In 2016 OCHA and KEPSA also observed that such collaborations were more often adhoc and one off donations.

Implementation of Humanitarian aid projects

Implementation of humanitarian aid projects is the dependent variable in the study therefore the study sought the opinion of the respondents on their level of agreement or disagreement with the statements on a Likert scale of 1-5 where 1=strongly disagree, 2=Disagree, 3=Neutral, 4=Agree and 5=Strongly Agree. The results are presented in Table 1.3

Table 1.3 Implementation of Humanitarian Aid Projects

Statements	1	2	3	4	5	Mean	SD
a. Our organization implements humanitarian aid projects on time	2(2.35%)	14(16.47%)	11(2.94%)	42(49.41%)	16(18.82%)	3.59	0.817
b. Laxity by our organizations in responding to disasters can result to loss of lives of persons in distress	1(1.2%)	14(16.5%)	14(16.5%)	43(50.6%)	13(15.3%)	3.73	1.005
c. Our Organization ensure wider geographical coverage of disaster site to ensure most persons in distress get help	4(4.7%)	13 (15.3%)	10(11.76%)	42(49.41%)	16(18.82%)	3.65	0.972
d. Humanitarian aid reach persons in distress without any access difficulties to the disaster site	3 (4%)	17 (20%)	9 (10.6%)	42 (49.4%)	17 (20%)	3.41	1.080
e. Humanitarian aid projects implementation is not efficient	5(5.9%)	6 (7.1%)	12(14.12%)	50 (58.8%)	12(14.12%)	3.27	1.159
f. Efficient implementation puts persons in distress at the core of disaster response	4(4.7%)	8 (9.4%)	10 (11.8%)	51 (60%)	12(14.12%)	3.73	0.822
g. Private sector and Non-Governmental Humanitarian Organizations share common goals	18%)	9 (10.59%)	15(17.65%)	50(58.82%)	12(14.12%)	3.22	0.993
h. Policies and Principles of Non-	2(2.35%)	28(32.94%)	13(15.29%)	33(38.82%)	9 (10.59%)	3.40	0.928

Governmental Humanitarian Organizations and Private sector Companies are dissimilar	i. Humanitaria n aid projects implemented do not meet the priority needs of persons in distress	1(1.18%)	20(23.53%)	8 (9.41%)	46(54.12%)	10(11.76%)	3.93	1.078
	j. Ownership of Humanitarian Aid Projects by persons in distress lead to provision of appropriate support	2(2.35%)	20(34.12%)	14(16.47%)	34(40%)	6 (7.06%)	3.44	0.970 0.371
Composite Mean and Standard Deviation								3.447 8

n=85

The findings in Table 1.3 show that all data items had their means above 3 and standard deviation of 0.37 which implies that there is a positive influence from majority of the respondents who agreed with the assertions made with regard to implementation of humanitarian aid projects in humanitarian organizations within Nairobi. On ‘our organization implements humanitarian projects on time’ 2 (2.35%) Strongly Disagree, 14 (16.47%) Disagree, 11(2.94%) were Neutral, 42 (49.41%) Agreed and 16 (18.82%) Strongly Agreed. This line item had a mean score of 3.59 and a standard deviation of 0.817 which is above the composite mean of 3.447 and standard deviation of 0.3718. This implies that the respondents are more certain and therefore agree more with the assertion in this data item than they would for aggregated data items. On ‘laxity by our organization in responding to disasters can result in loss of lives of persons in distress’ 1 (1.2%) Strongly Disagree, 14 (16.5%) Disagree, 14 (16.5%) were neutral, 43 (50.6%) Agreed and 13 (15.3%) Strongly Agreed. This line item had a mean score of 3.73 and standard deviation of 1.005 which is above the composite mean and standard deviation. This implies that the statement has positive influence on implementation of humanitarian aid projects. This assertion concurs with an observation by Delgado et al., (2013) which argues that the first five minutes of a disaster are critical to the survival of the victims, and that delayed humanitarian response exposes victims to more pain and trauma, and in some cases deaths that could have been avoided. The statement ‘our organization ensure wider geographical coverage of disaster site to ensure most persons in distress get help’ 4(4.7%) Strongly Disagreed, 13 (15.3%) Disagreed, 10 (11.76%) were neutral, 42 (49.41%) Agreed and 16 (18.82%) Strongly Agreed. This statement has a mean score of 3.65 and standard deviation of 0.972 which is higher than the composite mean and standard deviation. This implies that the line statement has positive influence on implementation of humanitarian aid projects. According to the National Disaster Response

Plan, a plain wide area with close proximity to the disaster site should always be selected as an assembly point, to ease the evacuation and victim rescue process (NDOC, 2009).

Fourth statement ‘humanitarian aid reach persons in distress without any access difficulties to the site’ 3 (4%) Strongly Disagreed, 17 (20%) Disagreed, 9 (10.6) were neutral, 42 (49.4%) Agreed and 17 (20%) Strongly Agreed. This line item has a mean score of 3.41 and a standard deviation of 1.080 which is equal to the composite mean and above the composite standard deviation of 0.3718. We can therefore conclude that this statement has positive influence on the implementation of humanitarian aid projects. The above data item assertion has been greatly addressed following rigorous disaster management awareness programs, which resulted in civic education on responding to disasters. On the fifth statement ‘Humanitarian aid projects implementation is not efficient’ 5 (5.9%) Strongly Disagreed, 6 (7.1%) Disagreed, 12 (14.12%) were neutral, 50 (58.8%) Agreed and 12 (14.12%) Strongly agreed. This line item has a mean score of 3.27 which is below the composite mean and standard deviation of 1.159 which is above the composite standard deviation. This shows that the respondents are less certain in agreeing with the assertion in this data item and therefore agree less with this statement than they would for aggregated data items. A higher standard deviation than the composite standard deviation implies that there were more widespread responses with figures below the composite mean. On ‘efficient implementation puts persons in distress at the core of disaster response’ 4(4.7%) Strongly Disagreed, 8(9.4%) Disagreed, 10 (11.8%) were neutral, 51 (60%) Agreed and 12 (14.12%) Strongly agreed. The mean score of this line item is 3.73 and standard deviation is 0,822 which are above the composite mean and standard deviation. This implies majority of the respondents were in agreement with the assertion made in regard to implementation of humanitarian aid projects.

On the sixth statement ‘Private sector and Non-Governmental Humanitarian Organizations share common goals’ 1 (1.18%) Strongly Disagreed, 9 (10.59%) Disagreed, 15 (17.65%) were neutral, 50 (58.82%) Agreed and 12 (14.12%) Strongly Agreed. This line item had the least mean of 3.22 which is lower than the composite mean and standard deviation of 0.993 which is higher than the composite standard deviation. This shows that even though respondents agreed that private sector and humanitarian NGOs share common goals, majority were less certain on the influence of shared common goal on the implementation of humanitarian aid projects. Line item on ‘Policies and principles of Non-Governmental Humanitarian Organizations and Private sector companies are dissimilar’ 2 (2.35%) Strongly Disagreed, 28 (32.94%) Disagreed, 13 (15.29%) Agreed and 9 (10.59%) Strongly Agreed. This line item has a mean score of 3.40 which is equal to composite mean and standard deviation of 0.928 which is above the composite standard deviation of 0.3718. This implies that there was unanimity among respondents in agreement with the assertion made in regard to the influence of NGOs and private sector principles and policies on implementation of humanitarian aid projects, even though the responses were widely, hence a higher standard deviation.

On the statement ‘Humanitarian aid projects implemented do not meet the priority needs of persons in distress’ 1(1.18%) Strongly Disagreed, 20 (23.53%) Disagreed, 8 (9.41%) were neutral, 46 (54.12%) Agreed and 10 (11.76%) Strongly Agreed. This line item had a mean score of 3.93 and standard deviation of 1.078 which is above the composite mean and standard deviation. This implies that majority of the respondents were in agreement that most humanitarian projects do not meet the needs of disaster victims. Lastly on ‘Ownership

of humanitarian aid projects by persons in distress lead to provision of appropriate support' 2 (2.35%) Strongly Disagreed, 20 (34.12%) Disagreed, 14 (16.47%) were neutral, 34 (40%) Agreed and 6 (7.06%) Strongly Agreed. This line item had a mean score of 3.44 and standard deviation of 0.970 which is above the composite mean and standard deviation. This implies that the respondents are more certain and therefore agree more with the assertion that involving local people in implementation of humanitarian projects makes them feel more supported in times of distress, than they agree with aggregated data items. This in line with Leach et.al., (1994) in emphasizing that there should be genuine participation of local community that has been affected by the disaster.

Interviews and Focus Group Discussions were conducted to triangulate the results from the questionnaires and there was a similar observation. The issue of implementation of humanitarian aid information was important to the persons in distress. In terms of timelines and appropriateness of the response one of the respondents said;

'Sometimes the NGOs are late but the companies are able to help us with water and food which save our lives.' FGD participant.

This support from the private sector companies prevent further suffering by the persons affected by disasters.

Humanitarian technology and Implementation of humanitarian aid project results

In analyzing the extent to which the Humanitarian technology influences implementation of humanitarian aid projects, the study carried out the following tests and findings given as explained below. The study sought to establish the frequencies and percentages for each data item response on the Likert Scale of 1-5 where: 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree. As well as measuring the data item means against the group mean, with the findings as tabulated in Table 1.4.

Table 1.4: Humanitarian Technology and implementation of humanitarian aid projects

Statements	1	2	3	4	5	n	Mea SD
a. Humanitarian innovation has fundamentally changed humanitarian aid projects implementation	6(7.06%)	25(29.41%)	7 (8.24%)	34(40%)	(15.29%)	3.27	1.238
b. Innovation of Humanitarian Products (GPS systems, Thuraya, mobile phones) contribute to saving persons in distress during disasters	8(9.41%)	15(17.65%)	18(21.18%)	33(38.82%)	11(12.94%)	3.56	0.932
c. Communication technologies have assisted in communities in distress participation during disasters	3(3.53%)	26(30.59%)	19(22.35%)	31(36.37%)	6 (7.06%)	3.43	1.044
d. Use of mobile phones by persons in distress has eased communication during disasters	8(9.41%)	17 (20%)	8 (9.41%)	44(51.76%)	8(9.41%)	3.6	0.915
e. Instant communication on humanitarian needs by persons in distress has contributed to their empowerment	2(2.35%)	23(27.06%)	9 (10.59%)	40(47.06%)	11(12.94%)	3.41	1.094
f. Digital fund mobilization has	1(1.18%)	37(43.53%)	6(7.06%)	32(37.65%)	9(10.59%)	3.13	1.132

transformed humanitarian financing							
g. Raising humanitarian funds through mobile money (M-pesa, T-cash, Airtel money) has been a success	5(5.88%)	6 (7.06%)	14(16.47%)	50(58.82%)	10 (11.76%)	3.81	0.732
h. Cash transfer through mobile money enable quicker access to relief aid	3(3.53%)	13(15.29%)	12 (14.12%)	47(55.29%)	10(11.76%)	3.56	1.005
i. Biometric Identification technology (use of finger prints using electronic gadgets) enable identification of persons in distress	5(5.88%)	11(12.94%)	10(11.76%)	50(58.82%)	9(10.59%)	3.67	0.836
j. Implementation of projects using (master cards, mobile phones etc) enable wide geographical coverage helping many persons in distress	3(3.53%)	29(34.12%)	12(14.12%)	(34)	40% 7(8.24%)	3.45	1.097
Composite Mean and standard deviation						3.429	0.45304

n=85

From the Table 1.4 Statement (a) humanitarian innovation has fundamentally changed humanitarian aid projects implementation' 31 (36.47%) either disagreed while 47 (55.29%) agreed and 7(8.24%) were neutral. The mean score of the line item is 3.27 which are lower than the composite mean 3.429 and a standard deviation of 1.238 which is higher than the composite standard deviation of 0.45305. This implies that even though majority of the respondents agreed with the assertions made about innovations in humanitarian world, their

agreements were not as strong as those made about the aggregate technology department for humanitarian aid projects in Nairobi. However, the data item responses were less dispersed compared to the aggregate responses. Sandvik and Kaufman (2013) argued that that technology has reconceptualised humanitarian space reducing the gap between the helper and the helped. Private sector engagement as argued by (Care, 2015) has brought innovative change in humanitarian aid sector that should be exploited to continue improving the sector.

Statement (b) ‘Innovation of humanitarian products contribute to saving persons in distress during disasters’ 23 (27.06%) disagreed while 44 (51.76%) agreed and 18(21.18%) were neutral. The mean score of this line item is 3.56 and standard deviation of 0.932 which is higher than the composite mean and standard deviation. This implies that majority of the respondents were in agreement with the assertion made on the extent to which private sector engagement in humanitarian technology influences implementation of humanitarian aid projects. Statement (c) communication technologies have assisted in communities in distress participation during disasters of the respondents 29 (34.12%) disagreed while 37 (43.53%) agreed and 19(22.35%) were neutral. The mean score of this line item is 3.43 and a standard deviation of 1.044 which is higher than the composite mean and standard deviation. This implies that the senior humanitarian managers were in agreement with the assertion made on the independent variable. As argued by Belliveau (2016) communication technologies contribute in assisting the persons in distress to participate in their own needs when disaster happens. Statement (d) ‘Use of mobile phones by persons in distress has eased communication during disasters’ 25 (29.41%) disagreed while 52 (61.18%) agreed and 8(9.41%) were neutral. The mean score for this line item is 3.6 and standard deviation is 0.915 which is higher than the composite mean and standard deviation. This implies that the majority were in agreement with the assertion on humanitarian technology

Statement (e) Instant communication on humanitarian needs by persons in distress has contributed to their empowerment’ 25 (29.41%) disagreed while 51 (60%) agreed and 9(10.59) were neutral. The mean score of this line item was 3.41 which is lower than composite mean of 3.45 and a standard deviation of 1.094 which is higher than the composite standard deviation. This implies that even though majority of the respondents agreed with the assertions made about communicating humanitarian needs for people in distress, their agreements were not as strong as those made about the aggregate technology department for humanitarian aid projects in Nairobi. However, the data item responses were less dispersed compared to the aggregate responses.

Statement (f) Digital fund mobilization has transformed humanitarian financing’ of the respondents 38 (44.71%) disagreed while 41 (40.24%) agreed and 6(7.07%) were neutral. The mean score on this line item was 3.13 which is lower than the composite mean and a standard deviation of 1.132 which is higher than the composite standard deviation. This implies that even though majority of the respondents agreed with the assertions made about digital fund mobilization, their agreements were not as strong as those made about the aggregate technology department for humanitarian aid projects in Nairobi.

Statement (g) ‘Raising humanitarian funds through mobile money has been a success’ of the respondents 11 (12.94%) disagreed while 60 (70.59%) agreed and 14(16.47%) were neutral. The mean score of this line item 3.81 and standard deviation of 0.732 which is higher than the composite mean and standard deviation. This implies that majority were in agreement with the assertion made on humanitarian technology. Belliveau (2016) argued that new

technologies have been instrumental in overcoming some of the challenges that existed in humanitarian aid for instance issues of distributing cash through visa cards and mobile money. Statement (h) ‘Cash transfer through mobile money enables quicker access to relief aid’ of the respondents 16 (18.82%) disagreed while 57 (67.06%) agreed and 12(14.12%) were neutral. The mean score of this line item is 3.56 and standard deviation is 1.005 which is higher than the composite mean and standard deviation. This implies that majority of the respondents agreed with the assertions made about mobile money transfer for people in distress. Higher standard deviation also means that the data item responses were more dispersed compared to the aggregate responses.

Statement (i) ‘Biometric identification technology enable identification of persons in distress’ of the respondents 16 (18.32%) disagreed while 59 (69.41%) agreed and 10(11.76%) were neutral. The mean score on this line item was 3.67 and standard deviation was 0.836 which is higher than the composite mean and standard deviation. This implies that there was agreement with the assertion made on the statement. Lastly statement (j) Implementation of projects master card, mobile phones enable wide geographic coverage helping many persons in distress’ of the respondents 32 (37.65%) disagreed while 44(51.76%) agreed and 12(14.12%) were neutral. The mean score on this line item is 3.45 and standard deviation is 1.097 which is higher than composite mean and standard deviation.

Data collected from KII and FGDs indicated that the reason why there is high significance is because of the presence of mobile phones, mobile money and other digital gadgets.

‘When we are in a crisis we are able to inform other people to help us using our mobile phones, sometimes they send us money that we can buy food and other basic needs’. FGD participant

Humanitarian implementation has been revolutionized by technology and now there are customer developed applications commonly known as apps used to fundraise for humanitarian disasters for instance there are water distribution Apps. There is need for more collaboration here in order to improve delivery. Without digitization, real time access, monitoring and control of humanitarian projects could be difficult. The fusion of the private sector and programmes and application for humanitarian sector has a widely acceptable relation. However, there could be a challenge in security and safety of information and access control. The focus group discussions determined that when technology is used it is easier to access help. The residents of Mathare during conflicts they were able to receive cash on their mobile phones to buy foods and drinks for their families during conflicts. They were also able to tell others of the challenges they were facing that made easier for them to be reached and helped.

Inferential Statistics for Humanitarian Technology and implementation of humanitarian aid projects

The inferential statistics in this section covered correlation analysis, regression analysis of humanitarian technology and implementation of humanitarian aid projects and hypothesis test.

Correlations of humanitarian technology and implementation of humanitarian aid projects

Correlation analysis was employed to establish the nature and the degree of the interaction between private sector engagement in humanitarian technology and implementation of humanitarian aid projects. The results obtained were as shown in Table 1.5

Table1. 5: Correlation Matrix for Humanitarian Technology

		Implementation of Humanitarian projects	Implementation of aid	Humanitarian Technology
Implementation of humanitarian projects	Pearson Correlation	1		0.382
	Sig. (2-tailed)			0.041
	n	85		85
Humanitarian Technology	Pearson Correlation	0.382		1
	Sig. (2-tailed)	0.041		
	n	85		85

The results in Table 1.5 indicate that there exists a significantly positive relationship between humanitarian technology and implementation of humanitarian aid projects, with a correlation coefficient of 0.382. The relationship is statistically significant since the p-value is 0.041, which is below the statistically accepted significance level of 0.05.

Regressions of humanitarian technology and implementation of humanitarian aid projects

The study assessed the relationship between humanitarian technology and implementation of humanitarian aid projects and obtained the model specification results as presented in Table 1.6

Table 1.6: Model Specification for Humanitarian Technology

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.547 ^a	0.582	0.580	0.0206

a. Predictors: (Constant), Humanitarian Technology.

b. Dependent Variable: Implementation of Humanitarian aid projects

The study found that humanitarian technology has a correlation index of 0.547 against implementation of aid projects in Humanitarian Organizations. Humanitarian technology was

also observed to have coefficient of determination of 0.582 against implementation of aid projects, an indication that it has the ability to explain 58.2% of the changes in aid project implementation. The regression analysis was carried out and the following outcomes presented in Table 1.7 were observed.

Table 1.7: Humanitarian Technology Regression Model Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		T	Sig.
		B	Std. Error	Beta			
1	(Constant)	3.225	0.311			0.703	0.009
	Humanitarian Technology	.391	0.0201	0.329		0.129	0.000

a. Dependent Variable: Implementation of humanitarian aid projects

The regression analysis carried out provided the study with the coefficient of the relationship between involvement of private sector in humanitarian technology and implementation of aid projects in Humanitarian Organizations. The regression model constant was observed to be positive, an indication that humanitarian financing and aid project implementation are positively correlated. At a 95% confidence level presumed in the study, humanitarian technology has a p-value (sig.) 0.041 which is less than 0.05 ($p<0.05$), indicating that the variable is statistically significant and has the ability to be used in the study. The variable was used in the study model, and provided the following regression model:

$$Y = 3.225 + 0.391X_1$$

The regression outcome indicates that humanitarian technology has a significantly positive influence on the implementation of aid projects in Kenya. Given that the p-value (0.041) is below 0.05, we reject the null hypothesis in favour of the alternative, and conclude that private sector engagement in humanitarian technology has a statistically significant influence on the implementation of humanitarian aid projects.

Test of Hypothesis One

The objective of the study was analyzed by carrying out regression analysis in testing the following hypothesis.

H_0 : Humanitarian technology does not significantly influence the implementation of Humanitarian aid projects.

H_1 : Humanitarian technology significantly influences the implementation of Humanitarian aid projects.

At a 95% confidence level presumed in the study, humanitarian technology has a p-value (sig.) of less than 0.05 ($p<0.05$), indicating that the variable is statistically significant and has the ability to be used in the study. Given that the p-value (0.041) is below 0.05, we reject the

null hypothesis in favour of the alternative, and conclude that private sector engagement in humanitarian technology has a statistically significant influence on the implementation of humanitarian aid projects.

Conclusion and recommendations

Humanitarian technology is likely to grow and thrive in the humanitarian sector, this is because there are growing needs that require advanced technology to solve disaster challenges. For this study both chapter two and four revealed that humanitarian organizations are laggards in adopting technology, however technology has continued to improve and to solve complex humanitarian needs among NGOs in disaster relief that adopt it early. This study advances the current knowledge on utilization of technology to improve implementation of humanitarian aid projects during disasters and argues that humanitarian organizations need to be more accepting and adapt to technology rather than remaining laggards and resulting in too controlled responses that lead to loss of lives. This study is important in encouraging the humanitarian organizations to work closely with the private sector in-order to benefit from their technological skills and knowledge to improve how humanitarian projects are implemented. Globally, humanitarian technology is getting more and more accepted including use of robotics and drones to save lives and the same energy should be focused in Kenya to save lives. As such humanitarian technology is key to improving response during disasters to ensure fewer deaths are recorded after a disaster happens.

This study shows a relatively positive relationship between humanitarian technology and implementation of humanitarian aid projects. As such the study recommends more application of existing humanitarian technology when implementing humanitarian aid projects. Perhaps the humanitarian organizations in Kenya are still testing the waters when it comes to utilization of technology or maybe they are risk averse in quickly accepting new technologies in the humanitarian sector. One major issue that emerged from the empirical study was that organizations in the humanitarian sector are laggards in adopting humanitarian technology and they are more cautious compared to the private sector. Probably developing flexible strategies in line with humanitarian technology could improve responsiveness by creating visibility of the information and materials during disaster response. In relation to humanitarian technology this study recommends more awareness creation to humanitarian staff on technology so that they can be able to embrace the emerging new technology faster and apply it in order to save more lives.

References

- Bagozzi, R.P. (2007). The legacy of the technology acceptance model and a proposal for a paradigm shift, *Journal of the Association for Information Systems* 8(4), 244–254.
- Bailey, S. (2014). *Humanitarian crisis, emergency preparedness and response: the role of business and the private sector: A strategy and options analysis of Haiti* (Humanitarian Futures Program) London: Overseas Development Institute.
- Belliveau, J. (2016). Humanitarian Access and Technology: Opportunities and Applications. *Procedia Engineering*, 159, 300-306.
- Betts, A., & Bloom, L. (2014). *Humanitarian innovation: The state of the art*. (OCHA Policy and Studies series 2014-009) Retrieved from UNOCHA: https://docs.unocha.org/sites/dms/Documents/OP9_Understanding%20Innovation_web.pdf
- Creswell, J.W. (2009). *Research Design; Qualitative, Quantitative and Mixed Methods Approaches*,
- Dearing, J. W. (2009). Applying diffusion of innovation theory to intervention development. *Research on social work practice*, 19(5), 503-518.
- Hanson, W. E., Creswell, J. W., Clark, V. L. P., Petska, K. S., & Creswell, J. D. (2005). Mixed methods research designs in counselling psychology. *Journal of counselling psychology*, 52(2), 224.
- Harvey, P. (2007). *Cash-based responses in emergencies*. (IDIS Bulletin Volume 38 Number 3) London: Institute of Development Studies.
- Kothari, C.R. (2004). *Research Methodology: Methods and techniques* (2nd ed.). Jaipur: Newage International Publishers.
- Kleinbaum, D.G., Kupper, L.L., and Muller, K.E. (1988). *Applied Regression Analysis and Other Multivariable Methods*, (2nd ed.). Belmont: Duxbury Press.
- Larry, H. (2013, January 7). Advanced Statistics in Research: Reading, Understanding, and Writing Up Data Analysis Results. *Shadow Finch Media LLC ISBN-13*, 978-0985867003.
- Meier, P. (2011). New information technologies and their impact on the humanitarian sector. *International review of the Red Cross*, 93(884), 1239-1263.
- Omoto, C. O. (2014). *The Effect Of Last Mile Mobile Solution Software Adoption On Food Aid Distribution By World Vision In Makueni Sub-county, Makueni County, Kenya* (Doctoral dissertation) Nairobi: University of Nairobi.
- Ramalingam, B., Scriven, K., & Foley, C. (2009). *Innovations in international humanitarian action*, (ALNAP 8th Review of Humanitarian Action. p 6). Retrieved from www.alnap.org/pool/files/8rhach3.pdf.
- Sahin, I. (2006). Detailed review of Rogers' diffusion of innovations theory and educational technology-related studies based on Rogers' theory. *The Turkish Online Journal of Educational Technology*, 5(2).

Sandvik, K. B., Jumbert, M. G., Karlsrud, J., & Kaufmann, M. (2014). Humanitarian technology: a critical research agenda. *International Review of the Red Cross*, 96(893), 219-242.