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DEPARTMENT OF PEACE AND GOVERNANCE

The importance of harnessing digital innovation for Humanitarian assistance: Case of Cyclone Idai in Manicaland Province, Zimbabwe.

By

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A Dissertation Submitted to the Department of Peace and Governance in partial fulfilment for the requirements for the Master of Science in International Relations

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Abstract

This study aimed to explore the importance of harnessing digital innovations in humanitarian assistance for natural disasters in Zimbabwe. The research was anchored in the theoretical frameworks of liberalism and ICT for Development theories. This study used a descriptive research design Data was gathered through purposive in-depth insights from key informants, including government officials and humanitarian organizations field workers and program representatives. A questionnaire, key informant interview guide and secondary data sources were used as research instrument to collect data.. The findings revealed that Cyclone Idai heavily impacted the social and economic activities of people in Manicaland particularly those in Chimanimani and Chipinge, with their livelihoods completely destroyed. The government of Zimbabwe tried to respond favorably to the disaster and through its declaration gained international support to provide humanitarian aid. Although there were efforts to provide immediate relief the cyclone brought with it challenges that made access to remote areas difficult and required expensive reconstruction of infrastructure. The findings also revealed that digital technologies or innovations have the potential to enhance effectiveness and efficiency in humanitarian aid delivery in Zimbabwe. This ensures inclusivity, financing, collaboration and coordination in the use of digital innovations to facilitate humanitarian aid. The study concluded that while challenges exist, there is significant optimism about the potential benefits of digital technologies in humanitarian assistance. Recommendations include establishing robust data collection systems, enhancing collaboration through digital platforms, ensuring inclusivity in digital solutions and leveraging of social media and communication platforms to enhance humanitarian assistance.

Key words: Digital innovation, Humanitarian assistance, harnessing, leveraging, relief, natural disaster, digital technologies, disaster risk management

Declaration form

I B190408B hereby declare that this dissertation is my own solemnly work and that it has not been copied or lifted from any other sources without acknowledgement.

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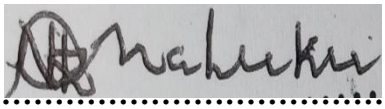
Supervisor: Dr. D. N. Mahuku

Signed  **……..**

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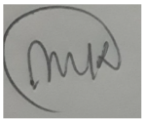
Signature  **……**

Dedication

To all humanitarian assistance responders around Zimbabwe

ACKNOWLEDGEMENTS

Firstly, I would like to express my deepest gratitude to the Creator of the Universe for his/her guidance throughout this academic journey.

I would like to acknowledge my supervisor and I feel deeply indebted for his time, commitment and tireless efforts to see this project come to an end.

I extend my profound gratitude to my family members for their support and motivations

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List of Abbreviations

AI – Artificial Intelligence.

NGO – Non-Governmental Organization

UN – United Nations.

UNDP – United Nations Development Program.

UNHCR – United Nations High Commissioner for Refugees.

UNICEF – United Nations Children's Fund.

UNOCHA – United Nations Office for the Coordination of Humanitarian Affairs.

WFP - World Food Program.

WHO – Word Health Organization.

Contents

CHAPTER ONE

INTRODUCTION

1.0 Background to the Study.

Zimbabwe faces significant humanitarian needs related to climate shocks, economic instability and health service gaps, which significantly challenges its ability in implementing effective digital humanitarian intervention. The country has been impacted by various disasters such floods, cyclones and droughts. Digital humanitarian intervention encompasses various approaches which includes social media, data collection and analysis, mobile technology and remotes sensing to provide effective and efficient humanitarian assistance. Digital innovations promotes collaboration, informed decision making and empowerment of the impacted communities through different platforms.

Tropical cyclones such as Cyclone Eline in 2000 and Japhet in 2003, affected regions in Manicaland and Masvingo severely. Cyclone Japhet brought with it heavy torrential rains which resulted in significant flooding in the provinces. This fuelled the destruction of infrastructure, loss of lives and negatively impacting agricultural output. The tropical Cyclone Idai made landfall in March 2019 and it was one of the most devastating cyclone in Zimbabwe which caused widespread damage in Chimanimani and Chipinge districts. Due to the unpreparedness of the populations and the government, this resulted to a humanitarian crisis Zimbabwe.

The cyclone tragically resulted in the reporting of an estimated 300 deaths of individuals in Chimanimani and Chipinge thus creating an emotional toll as many families had to cope with the sudden loss of their loved ones. The IPCC (2019) noted that, the flooding and destruction of infrastructure such as houses led to displacement of approximately 4000 people, henceforth, leaving many seeking shelter in temporary camps at Skyline campsite, where the conditions were often crowded and inadequate access to resources such as educational and health services.

The cyclone also poised aid recovery challenges in the districts affected. The initial response to the disaster both local and international aid agencies such as Oxfam and the UN

was swift, but faced delays due to transport infrastructures that were completely destroyed. Many communities were isolated which further complicated delivery efforts of food, water and medical supplies (UNOCHA, 2019). In the aftermath of the cyclone, many communities became highly dependent on the external aid for survival and day to day support. While international support was crucial, the sustainability of their efforts raised concerns among the local leaders about long-term recovery and capacity awareness.

The devastating cyclone also resulted in the destruction of infrastructure. Communities such as in Nyahonde, Nganga and Chikukwa witnessed their houses destroyed by the heavy winds, rains and mudslides leading to loss of shelter for vulnerable populations. Families had to live in makeshift tents which were ill-equipped to handle large groups of families and the harsh weather conditions such as cold nigh temperatures. Essential transport networks such as roads and bridges were washed away or rendered impassible making access to reach those in need exceptionally difficult to access emergency services relief interventions (UNICEF, 2019).

Cyclone Idai also led to economic challenges such as loss of livelihoods and economic displacement. Communities in Chipinge and Chimanimani lost their farms and crops due to the flooding which led to a food crisis. Agriculture being one of the backbone of Zimbabwe's economy, the destruction of crops and farms meant that many families were unable to provide basic necessities such as food (FAO, 2019). Loss of businesses and economic activities further plunged the communities into poverty. According to UNDRR (2019), loss of livelihoods as a means of income generating compounded the difficulties faced in securing food and other essentials including medicine.

The post Cyclone Idai disaster presented a multifaceted crisis for the people of Zimbabwe with the effects ranging from loss of lives and livelihoods to poor disaster risk management strategies. While recovery efforts are crucial, such challenges might be reduced if the government adopts digital humanitarian interventions in aid delivery.

1.1 Purpose of Study.

The study investigates how digital innovations can be harnessed to improve humanitarian assistance in Zimbabwe.

1.2 Statement of the Problem.

Zimbabwe has encountered numerous humanitarian challenges which includes food insecurity, health crises and natural disasters (floods and droughts),where traditional methods are often fall to meet the efficiency, reach and adaptability required to address the swiftly changing needs of vulnerable populations. The primary challenge is in determining effective strategies for utilising digital innovation to improve the delivery, accessibility and impact of humanitarian assistance in Zimbabwe.

1.3 Research Objectives.

1. Discuss the problems experienced by people affected by Cyclone Idai natural disaster in Zimbabwe.
2. Assess the government of Zimbabwe's response to natural disasters.
3. Examine the challenges faced in dealing with natural disasters like Cyclone Idai in Zimbabwe.
4. Suggest the importance of using digital solutions to effectively respond to natural disasters including Cyclone Idai.

1.4 Research Questions.

1. What are the problems faced by people affected by Natural disasters like cyclones in Zimbabwe?
2. How has the Zimbabwean government and other civil organisations responded to natural disasters like cyclones in Zimbabwe ?
3. What challenges were experienced by victims of cyclone Idai in Chimanimani district in Manicaland.
4. What is the importance of using digital solutions to efficiently and effectively respond to disasters like Cyclone Idai.

1.5 Assumptions.

1. The results of the study will significantly facilitate the expanding literature on the importance of harnessing digital technology in humanitarian assistance.

2. To offer actionable recommendations that can enhance the effectiveness of humanitarian support through digital technologies in Zimbabwe and similar regions, fostering a more inclusive and resilient approach to aid delivery.

1.6 Significance of the Study.

The study, “Importance of harnessing digital innovation for humanitarian assistance: Case of Manicaland, Zimbabwe ” holds significant importance in improved response efficiency, data driven decision making, capacity building improved accessibility and inclusivity, formulation of supportive frameworks and initiatives to the government, humanitarian responders and vulnerable populations. This contributes to a deeper understanding of the interaction between technology and humanitarian work, thus highlighting the potential for digital tools to revolutionize how humanitarian assistance is delivered in crisis situations.

1.7 Delimitations of the Study.

The research concentrates on Zimbabwe limits its findings to only one specific country, meaning that other nations in the region may have differing situations that are not considered. The study primarily focuses on the existing frameworks and policies in Zimbabwe, rather than anticipating future changes in the policy environment. The analysis of the impacts of digital innovations is limited to certain perspectives such as efficiency and effectiveness without evaluating other potential outcomes like community empowerment or long-term sustainability. The research emphasizes on particular dimensions of humanitarian aid such as communication or resources distribution and not explore the broader spectrum of humanitarian activities.

1.8 Limitations of the Study.

Study limitations included access to diverse group of stakeholders are involved in humanitarian assistance such as local authorities , NGOs and communities. Time was also a limitation to the study. The limited access to stakeholders resulted in a skewed presentation of persepectives, thus, potentially leading to incomplete insights into the impact or effectiveness of digital innovations in humanitarian efforts. This limitattiomn affected the validity of the conclusion drawn from the study as the experiences and contributions of different stakeholders were not fully captured. The interviews had more commitments which delayed the process of

interviews and further discussions due to limited schedule. To mitigate these limitations, the researcher employed a qualitative research. Gathered secondary data from reports, case studies and academic literature that is related to Cyclone Idai and the impact of digital innovations in humanitarian assistance. Additionally, virtual interviews were leveraged to expand outreach and engage a broader participant base despite geographic constraints. The issue of time was addressed by using questionnaires which were dropped at the organisations in which respnses were done via Microsoft forms.

1.9 Definition of Key Terms.

1. **Humanitarian assistance** is defined as the materials and logistics assistance that usually offered in short term to vulnerable people in need such as homeless, refugees and victims of natural disasters, wars and famines as a way to save lives, alleviate suffering and maintain human dignity. (The IRC, Feb 2025).

   Oxfam (n.d) defines **humanitarian assistance** as the delivery of emergency response services to people and communities that are affected by crisis and natural disaster such as Cyclone Idai.

2. **Digital innovation** can be defined as a planned use of digital modern technologies and methodologies in the effort to create new or improved technology and services, processes that is aimed at solving problems and deliver measurable value in the humanitarian environment.

(https://www.mendix.com/blog/digital-innovation/&ved=2ahUKEwj_oM3Jr860AxUxWUEAHUWiAuQFnoECGcQAQ&usg=AOvVaw2SWog2qF0miwXuZqC1yLOi).

3. Humanitarian workers can be defined as professionals or volunteers that provides lifesaving assistance and support to people who are affected by disasters which guided by the principles of humanity either impartially or neutrally (The IRC, 2025)

4. A **natural disaster** or crisis is identified as a sudden and catastrophic event that causes a widespread devastation, loss of lives and disruption of community livelihoods, economies and environments. (The UNDRR, n.d)

According to Metych (2025), a **natural disaster** is any dangerous emergency which is generated by either natural occurrence rather than human driven phenomenon which produces a great loss to human life or natural environment destruction which fuels for humanitarian assistance.

Nelson (2018) defines a **natural disaster** as any catastrophic event which is a result of natural processes of the earth which negatively impact the humans, cause economic loss and damage the environment, requiring the need for humanitarian assistance.

Prasad and Francescutti (2017) states that a **natural disaster** as a sudden natural event that is as a result of a hazard which is overwhelming highly to vulnerable communities which often results in mortality and morbidity.

5. A **disaster risk reduction** is defined by Mead (2022) as a framework that is designed for social and economic development pre or post disaster which is essential to be sustainable for the future.

   The UNDRR (n.d) identifies **disaster risk reduction** as a policy objective for disaster risk management that is aimed at preventing new and reducing existing risk to disasters which contributes to strengthening capacity building and achieve sustainable development in humanitarian aid.

6. Artificial intelligence according to Copeland (2025) defines it as the ability of a digital computer to undertake tasks that are usually associated human beings aimed at enhancing humanitarian aid delivery.

   Artificial intelligence refers to the theory and development of computer-generated systems which does tasks that are normally done by intelligent humans such as data analysis, collection and information dissemination which is aimed at promoting efficiency in the humanitarian sector (Negovic, Oprunenco and Sasiku, 2018).

   Artificial Intelligence (AI) is defined by Copland (2025) as the aptitude of digital computers or artificial computer-controlled robot that is tasked to perform tasks in humanitarian aid digitally, commonly associated with intellectual beings or to process features of humans.

1.10 Dissertation Outline.

Chapter One Introduces the background of a study for the research. the chapter 2 focuses on theoretical framework and literature review on digital innovation. Chapter three is focused on research methodology and design. Chapter four is cantered on data analysis and discussion of the findings. Chapter five concludes the research and provides recommendations towards the harnessing of digital innovation in humanitarian assistance.

CHAPTER 2

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.0 Introduction.

This chapter explore the importance of digital innovations in humanitarian aid, and the Case studies which can be referenced to in unearthing the importance, efficiency and effectiveness of technology in humanitarianism and their validity in reducing dependency on humanitarian traditional methods in conveying information.

2.1 Theoretical Framework.

Two theories are used which are the ICT for Development Theory by Richard Heeks (2007) in his book "The Deepening Divide: Inequality in the information society" and the Liberalism theory by Immanuel Kant (1724) to explain humanitarian aid intervention.

The key tenets of the ICT for Development (ICT4D) theory are as follows; Technology as a tool for empowerment. This is where ICT tools are not just viewed as tools, but rather facilitate in empowering individuals and communities by providing access to humanitarian information and resources both during and post disaster. The other assumption by Heeks was Bridging the Digital Divide. The assumption emphasizes on the need to reduce inequalities in the access of technology between socio-economic communities through awareness and training on the use of digital tools for humanitarian aid delivery, promoting effectiveness and efficiency of aid. Capacity building is also another assumption of the ICT4D theory. It emphasizes on the effective implementation of ICTs in humanitarian development requiring building community resilience to sustain the communities after a natural disaster impact. Sustainability is also another key assumption of the theory. It states that for a long-term impact in humanitarian aid, this requires sustainable investment in technology and training which ensures technology advancement in resource distribution and provision of information on or before disaster impact (Sein et al, 2018). According to Zheng (2015), the theory provides context specific solutions through tailoring ICT innovations, in humanitarian assistance to the local culture and the needs of the community rather than implementing one-size-fits all solutions, henceforth, influencing projects and initiatives that are aimed at harnessing technology for humanitarian assistance purpose.

This study also employs the Liberal theory in International Relations. Several key figures can be noted as the founding fathers of the liberal theory besides Immanuel Kant who are John Locke (1632-1704) whose ideas were about natural rights, social contract and the consent by the government which laid the foundation of the modern democratic thoughts. Thomas Hobbes (1599-1679) also highlighted on social contract, people consent to surrender some of their freedoms in the exchange for the security being provided by a sovereign authority. His views on social nature and social order contributed to discussions on the role of authority and governance in humanitarian intervention. Immanuel Kant (1724-1804) cantered himself on the relationship between freedom and laws, advocating for a political framework that respects the rights of individuals while maintaining order in humanitarian aid delivery.

According to Arrey (2023), liberalism centres on the commitment of universal human rights, funding for international intervention to end severe human suffering and inequalities in humanitarian aid landscape. Its key tenets include good governance, provision of public goods and services by the government and as well as the importance of humanitarian aid. A core tenet of the theory is that humanitarian support should be based on the consent of the government which leads to humanitarian support where there is freedom to participate. Liberalism values reason and rationality which promotes tolerance of different efforts in humanitarian assistance which is seen as important in the humanitarian sector. The justification of humanitarian actors' intervention must be through the protection of the rights of individuals and certainty their potential for collaboration and mutual benefits in times of disasters to provide aid to affected communities.

2.2 Japan Case Study.

2.2.1 Challenges which were faced by people affected by natural disasters in Japan.

Following the Earthquake, many individuals often suffered from injuries such as lacerations and fractures whilst others with trauma that required urgent medical attention. The survivors of the earthquake and tsunami faced continuous health issues which included exacerbation of pre-existing conditions, unsanitary conditions and lack of access to healthcare services. Health services were only provided to those that require immediate attention through

mobile health facilities which could not function at full capacity due to the destruction of infrastructure such as roads Ministry of Health, Labour and Welfare, 2019). Many survivors experienced psychological effects such as post-traumatic stress disorder, anxiety disorders and depression which was further influenced by the loss of loved ones and friends leading to depression.

Many homes were completely destroyed by the Great East Japan Earthquake of March 2011 which left many survivors without shelter and in urgent need of temporary housing solutions. Affected populations had to evacuate or relocate to new areas which disrupted their sense of community and belonging. Evacuation centres often became overcrowded which led to inadequate living conditions for example the Ishinomaki and Sendai City camps which left many questioning the provision of sanitation and food. Poor living conditions in evacuation centres hindered recovery efforts as many centres lacked basic amnesties and personal space.

The Great East Japan earthquake accompanied by the tsunami led to loss of employment to the affected populations. The disaster disrupted local economies which led to businesses closure and significant job losses particularly in industries such as tourism and fisheries. Many people found it difficult to secure new employment in the aftermath of the disaster which led to a prolonged financial insecurity. The cost of living also increased, some of the survivors had no adequate insurance to cover the damages that were caused by the disaster which made the cost of rebuilding overwhelming. As the demand for resources surged, prices for goods and services increased which exacerbated financial burdens on victims.

In the aftermath of the 9.1 earthquake magnitude of 2011 in Japan followed by a series of tsunamis, the disasters caused release of hazardous materials, for instance, the damage of the Fukushima Daiichi Nuclear Power Plant which led to nuclear accident and radiation leaks which were of health concern and environmental health risk resulting in over 10000 people being evacuated from their homes as a preventive measure (Hasegawa et al. 2016). Damaged infrastructures including power plants such as the Tohuku Oganawa Power Plant and Japco Tokai Power Plant were shut down which undermined the capacity of communities to access services online and have basic lighting on the camps and temporary homes resulting in complete darkness in Fukushima City for days Communication was also rendered unreliable

due to damage of most infrastructures which further displacement as separated populations could not communicate with their relatives or friends.

2.2.2 Japan Government's response to natural disasters.

Japan being a developed country, its response to natural disasters is well coordinated and highly prioritized. Due to its geographical location and history of natural disaster events, in 1961, the government devised a Disaster Countermeasures Basic Act in which this legislation outlined the roles of national and local government in disaster management. Its emphasis was on the significance of prevention and response mechanisms, henceforth establishing a dear framework for action in disaster response (Ministry of Foreign Affairs of Japan, n.d)The government also adopted the National Disaster Prevention Plan which is revised regularly to incorporate lessons learnt from the past natural disasters, thus ensuring DDR remains relevant to disaster response. The plan also included guidelines to various types of disaster including earthquakes and tsunamis focusing on risk assessment and mitigation strategies.

The Central Disaster Management Council (CDMC) being chaired by the Prime Minister is a body which was created to coordinate disaster response at a national level, formulate policies towards DDR and mobilize resources when there is a disaster impact .For instance, during the 2011 Tohoku Earthquake and Tsunami, the Japanese government activated the CDMC to mobilize local government`s agencies for immediate response and deploy Self -Defence forces for search and rescue operations as well as providing aid supplies and medical assistance to affected areas. The local municipalities also play a pivotal role in implementing disaster response strategies tailored to their unique circumstances in which they are responsible for developing local disaster management plans that consider the specific risks that are associated with their regions.

The Japanese government also engages in community preparedness and engagement. Educational programs such as the Disaster Preparedness Drills in schools and communities for regular earthquake drills, teaches people or communities on how to respond in case of a disaster , hence, promoting awareness and preparedness at the grassroots level. The

government also conducts campaigns to educate Japan citizens about disaster preparedness which provide guidelines on creating emergency kits and evacuation routes for impacted communities. The local government and NGOs also implement community resilience programs that are aimed on vulnerable populations such as the elderly, children, those living with disabilities and women by ensuring that everyone is prepared and well informed.

2.2.3 Challenges which were faced by Japan due to natural disasters

Due to the long history of earthquakes and tsunamis in Japan, the challenges which were encountered during these events have profoundly impacted the communities and the nation as a whole. The Great East Japan Earthquake in March 2011 which measured a 9.0 magnitude then followed by a powerful tsunami caused catastrophic damage particularly in the Tohoku region. The tsunami resulted to the Fukushima Daiichi Nuclear Power Plant disaster where reactors melted down causing radiation leaks, henceforth, the evacuation of nearby residents created long term displacement and health concerns such as lung cancer (Rafferty and Pletcher, 2025). The scale of the cascading disasters overwhelmed the local and national emergency response systems which was evidenced by the cut off from aid, provision of food, water and medical services which became increasingly difficult.

During the Typhoon Jebi in September 2018, it caused extensive flooding and wind damage, especially in Kansai Osaka and Kobe. Major transport network systems such as railways and airports were severely damaged, for instance, the Kansai International Airport had to be closed temporarily due to flooding, thus stranding and delaying passengers. Thousands of people were evacuated which required temporary shelter with sufficient supplies which the government had trouble to coordinate effective and efficient response. The typhoon also caused a significant damage to businesses which disrupted supply chains and posing challenges for community recovery efforts and agricultural industries faced losses that affected food supply and prices.

2.2.4 Japan`s digital humanitarian innovations in disaster response.

Japan has been at the forefront of utilising digital innovations for humanitarian assistance, particularly in response to natural disasters. Following the Tohoku 2011 Earthquake, Japanese government updated its Tsunami warning systems by integrating advanced ocean buoys and seismic sensors to provide real-time data and alerts. Earthquakes

Early Warning Systems were also upgraded to detect seismic waves and emergency alert messages seconds before the seismic waves or the shaking reaches populated areas, thus, allowing people to take precautions and automated systems such as electrified trains to halt operations (GFDRR, 2016). A centralised platform was also created where citizens can access disaster information on evacuation routes, shelters and emergency services The Japan government has also utilised big data analytic systems and Geo spatial data for disaster prediction. The big data analytics system used to predict natural disasters including earthquakes and tsunamis through analysing historical data patterns, henceforth, risk assessment and promoting preparedness. According to WEF (July 2025), Geo-spatial data such as Remote-censoring and GIS had been used to map and visualize disaster affected areas in which had facilitated in effective resource allocation and transportation routes for aid delivery.

Social media and communication platforms have facilitated in information dissemination in Japan. The Japanese government utilises social media platforms such as twitter and Facebook to spread awareness about disasters and provide real-time updates and critical information to the public (Rafferty and Pletcher, 2025). The platforms also provided local needs and damage assessment, hence, facilitated in community response to disasters.

The government has provided an Online Training and Education such as the E-learning for Disaster Preparedness to provide online training resources to educate citizens about disaster response strategies and preparedness measures, thus, enhancing community resilience.

2.3 Humanitarian assistance in Africa during natural disasters.

2.3.1 Mozambique Case Study.

In the late 2007, Mozambique was impacted by floods in the Zambezi Valley. The severe flooding resulted from the heavy rains which affected thousands of families. Roads and bridges were destroyed by the flood, isolating communities and hindering effective aid delivery. Thousands of houses were destroyed or rendered inhabitable putting families at risk of further displacement. Families struggled to access essential services and markets which disrupted their day to day living. Makeshift shelters in camps often lacked proper sanitation and security which increased their vulnerability to crimes and health issues. The trauma of losing homes and loved ones contributed to mental health issues such as depression and

anxiety, henceforth, with limited mental health support services, it became more challenging for survivors to cope with their experiences. Schools were flooded by the water which interrupted education system for children, hence affecting their long-term prospects.

The 2015-16 severe drought in Tete province resulted in crop failure and water shortages. Many farmers experienced total crop loss which led to increased poverty levels among the rural populations who solely depended on agriculture to support their livelihoods. Communities that relied on agriculture had difficulty in making ends meet because agriculture was the major support of their living and livelihoods support. The long-term impacts on food supply chains made it difficult to recover. According to CIWA (n.d), the 2016 drought also resulted in the limited access to clean drinking water which increased competition among communities for clean water and exacerbating tensions. Reliance on distant water sources also posed additional health risks trough contamination. With the agricultural system failing, households were faced with higher food prices for basic needs and reduced purchasing power.

In the year 2019, Cyclone Idai and Kenneth impacted Mozambique particularly in cities such as Beira. The cyclones caused extensive flooding and destruction of infrastructure in Mozambique. According to UNICEF (2019), over 4000 people were displaced which forced many into makeshift shelters that lacked basic amnesties. Prolonged displacement made it challenging for families to return home and rebuild their lives. The flooding contaminated drinking water supplies, thus, resulting in outbreak of cholera and malaria. Health facilities which were often overwhelmed to provided critical care to affected populations. The destruction of crops and livestock led to widespread food shortages. Many families faced malnutrition and hunger particularly among vulnerable groups like children and the elderly. Damage of infrastructures made it difficult for many businesses to operate leading to loss of income. Many rural communities who relied on farming faced deeper economic hardship due to their livelihoods being washed away.

Another notable disaster that impacted communities in Mozambique was the Cyclone Eloise of 2021 which further compounded the existing vulnerabilities in the country. The repeated nature of the cyclones in Mozambique leaves communities in a cycle of recovery, with little time to rebuild before the next disaster hit (Mugabe et al, 2021). Loss of resources and fatigue from ongoing relief efforts hinders capacity building. Challenges in disaster

response led to gaps in relief delivery which left many communities without immediate support. Delays in restoration of essential services prolonged recovery times and increased frustration among affected populations. Frequent cyclones and floods contributed to soil erosion and loss of habitat which threatened long-term agricultural productivity and natural resource management.

2.3.2 The government's response to natural disasters in Mozambique

Mozambique is highly vulnerable to natural disasters due its geographical location along the Indian Ocean. This exposes the country to cyclones, floods and droughts. In response to the disasters, the government of Mozambique has developed a range of strategies and initiative which are aimed at enhancing disaster risk management and capacity building among its communities. The Mozambican has recognised the need for a structured disaster management policies which are aimed at effectively mitigating the risks of natural disasters. This resulted in the establishment of the National institute for Disaster Management (INDC) which was tasked in coordinating national disaster management efforts. As part of this framework, the INGC have collaborated with various stakeholders such as government ministries, local authorities, NGOs and community-based organisations which facilitated in ensuring that resources effectively allocated and that there is a unified response to natural disasters.

Effective early warning systems are of significance for timely response to impending natural disasters. The government of Mozambique has implemented several initiatives to improve forecasting and alert mechanisms to inform communities of potential threats of natural disasters. For instance, the Mozambique Early Warning systems was designed to monitor weather patterns and provide timely information about impending cyclones and floods which can be noticed as the forecasting of the Cyclone Idai in 2019 allowed for the evacuation plans to be set in motion in vulnerable regions of Sofala and Manhica Provinces as noted by The Government of Mozambique (2019). The INGC works in collaboration with the meteorological agencies to disseminate timely weather alerts through various channels such as radio, television and mobile notifications warning communities which re prone to disaster impact to be prepared for evacuation and disaster strike. Awareness campaigns are also

conducted to educate the public on how to respond to early warnings improving efficiency in the response to natural disasters.

The government of Mozambique also recognized the role of local in disaster management. By engaging communities, this increases resilience and fosters local ownership of disaster response initiatives. Initiatives such as community resilience programs where launched which involved training local community leaders and volunteers in disaster response and management, especially in the rural areas where community-based committees assesses local vulnerabilities and develop contingency plans that are tailored to their specific needs. For instance, during the Cyclone Keneth in 2019, many communities utilised the knowledge from previous training sessions from Cyclone Idai in the same year to establish emergency shelters and organize evacuations effectively which minimized loss of life and property.

Given the significant demand for effective disaster management systems, Mozambique's government often collaborates with international organisations and humanitarian agencies to enhance its response capacity. Following the severe impact of the Cyclone Idai in 2019, the United Nations and various organisations such as the Red Cross and Oxfam collaborated with the Mozambican government to provide immediate humanitarian relief. This included food, water and medical supplies to affected populations and assisting in rebuilding efforts.

To reduce vulnerability of population to natural disasters, the government of Mozambique recognised the need to invest in infrastructure development particularly in flood-prone areas. In the aftermath of the Cyclone Idai in 2019, the Mozambican government together with international support-initiated reconstruction projects aimed at building more resilient infrastructures to natural disasters. This included the construction of flood-resistant roads and bridges as well as the improvement of drainage systems in the urban areas like in Beira City (Government of Mozambique, 2019). There also has been investments in upgrading water supply systems to ensure communities has access to clean water during natural disaster impact which is crucial in preventing waterborne diseases after flooding events.

2.3.3 Challenges faced in Mozambique due to natural disasters.

Mozambique has faced a large number of challenges due to various natural disasters such as cyclones, floods and droughts from 2000 to 2007. Mozambique was impacted by severe floods with major rivers overflowing due to heavy rainfall. Large -scale evacuation was needed which strained resources and emergency shelters. Flooding also led to significant contamination of drinking water supplies, which resulted in waterborne diseases.

In the year 2015, Mozambique also experienced one of the worst devastating droughts in decades which impacted crop yields resulting in food insecurity. According to Nhundu et al (2021), many rural households faced food shortages which led to malnutrition and hunger. Livestock and agricultural losses also caused an economic decline, particularly in rural communities who were dependant on farming.

In 2019, Cyclone Kenneth resulted in a landfall in the northern Mozambique, specifically in Cabo Delgado Province. The cyclone caused a significant damage to the agricultural sector which impacted food security negatively for communities reliant on farming. Medical facilities were also overwhelmed due to both physical damage and increased health risks which further complicated epidemic responses to the natural disaster.

2.3.4 Digital humanitarian assistance impact in Mozambique.

Digital tools had played a pivotal role in enhancing humanitarian assistance during natural disasters in Mozambique. These innovations have enhanced preparedness, response and recovery efforts.

The Cyclone Kenneth which impacted Cabo Delgado Province in less months after cyclone Idai in 2019 resulted in humanitarian agencies such as UNICEF, Oxfam and WHO employing digital technology to collect real time data about the impact of the cyclone in Cabo Delgado affected population. This information was crucial for assessing needs and planning for humanitarian response. Remote sensing technology was also utilised to monitor changes in land use and assess flood extents which enabled humanitarian responders to track the evolution of the disaster, thus, enhancing situational awareness (Government of Mozambique, 2019). Platforms such as social WhatsApp, Facebook and SMS messaging were also leveraged where

locals could provide feedback on the effectiveness of the relief efforts. Community inputs were valuable for adjusting strategies to meet local needs of the community more effectively.

Seasonal recurring floods in various years since 2000 to 2021 had impacted many regions in Mozambique especially during the rainy season. Haver and Hargrave (2018), pointed out that advanced weather forecasting and early warning systems have been implemented to alert communities of impending floods. These systems utilise satellite imaging data and provide timely alerts to local populations which allowed them to evacuate if necessary. Local authorities and organisations had also leveraged social media platforms to disseminate information efficiently regarding flooding risks, safety tips and available humanitarian assistance which kept communities informed timely (Sevogia, 2025).

2.4 Humanitarian assistance in Zimbabwe during disasters: A Roadmap

Humanitarian assistance in Zimbabwe during natural disasters such as droughts, cyclones and flash floods is a collaborative effort which involves various stakeholders such as the government itself, international organisations (UN and its agencies, Oxfam and the Red Cross) and as well as local NGOs to facilitate on disaster response at a national, local and community level. The key components of humanitarian assistance in Zimbabwe includes emergency relief supplies, shelter, health services and long-term recovery of affected communities.

Cyclone Eline in February 2000 impacted Zimbabwe particularly affecting regions including Masvingo and Manicaland. The cyclone brought with it torrential rains, heavy winds and caused a significant flooding which resulted in loss of lives, destruction of roads, bridges, communication systems and crops were washed away leading to food insecurity with many families losing their livelihoods.-

The government desperately responded to cyclone Eline by declaring the disaster a state emergency which was to streamline the allocation of resources towards relief efforts. The CPU was also activated to lead in emergency response in which they coordinated rescue efforts and the distribution of relief efforts. The Zimbabwe National Army (ZNA) and other local emergency services were deployed to conduct searches and operations in the areas that had been cut off by the floods. The government launched its initiatives to clear debris from

infrastructure and restore access to remote areas which facilitated in reconnecting transport networks to communities.

To prevent disease outbreaks in the aftermath of the cyclone, the government set up mobile clinics with professionals and ensured that access to clean water and sanitation facilities were guaranteed. Health awareness campaigns were coordinated and conducted to educate communities about waterborne diseases and how to prevent them.

The government of Zimbabwe collaborated with international organisations such as the WFP and UNICEF to provide food, shelter, and medical aid services to affected communities. It also collaborated with the WFP in distributing food aid to over 100 000 people who were displaced by the cyclone impact. Temporary shelters were built for families whose homes or houses were destroyed. For instance,, in Chimanimani and Buhera, the government facilitated in the establishment of small tent camps.

Cyclone Japhet in March of 2003 was also another disaster that affected Zimbabwe's disaster risk management system. The cyclone led to heavy winds and rainfall which notably affected Masvingo and Manicaland provinces again. The impact of the cyclone resulted in extensive flooding due to many rivers such as Save and Manyuchi river overflowing, hence, affecting both rural and urban communities. Numerous families were displaced as their homes were damaged by the heavy winds and rains.

In the aftermath of Cyclone Japhet, the government started to formulate policies such as the CPU Act (chapter 10, 06) and the Disaster Risk Management Policy that were aimed at improving disaster preparedness, including early warning systems and better land use planning mechanisms to mitigate future flooding impacts. The government also focused on building roads and bridges such as the maintenance of the Chiredzi-Masvingo road to revamp transport network and access to aid delivery.

The government of Zimbabwe's response to cyclone Japhet involved coordinated efforts in emergency measures. The government was prepared to assist affected provinces through quick mobilization of resources to conduct relief and rescue. The government also collaborated with UN, WFP, UNDP and UNICEF to assess the damage and provide essential services such as food distribution and medical care. Following the immediate relief efforts,

initiatives such as road and water supply networks were initiated to rebuild infrastructure and homes that were damaged by the cyclone. For instance,, the government together with humanitarian response agencies such as the WFP, WHO and Red Cross distributed food to over 50 000 affected individuals in impacted regions in Masvingo and Manicaland where the agricultural sector was heavily impacted (Chigwida, 2009).

Zimbabwe has frequently experienced drought since the late 1990s, which significantly impacted agriculture and water resources resulting in food insecurity for millions of people. The government often declares drought as a state of emergency to address food shortages and it collaborates with international partners to import food and provide humanitarian assistance to communities in need such as which were mostly impacted by the drought in 2007-2008 (FAO, 2016). The food and National Security Policies were also enhanced in 2009 to guide response efforts to ensure food security and availability during droughts.

According to ZINWA (2018), the government also implemented measures to conserve water such as promoting water harvesting and irrigation systems, for example, the Zambezi Valley and Save Irrigation Schemes irrigation system for agricultural support. It also invested in borehole drilling under the WASH programme with the WFP to facilitate with alternative clean water sources as well as sanitation for the impacted communities.

Through initiatives such as the Command Agriculture Programme, the government provided inputs such as seeds and fertilisers to farmers in a bid to boost food security especially in drought prone areas such as in Masvingo and the Matabeleland South province. The government has also conducted campaigns to educate farmers on climate adaptation strategies and sustainable land management practises (Government of Zimbabwe Report on Disaster, 2015). This encouraged communities to prepare in advance for potential droughts .

The Cyclone Idai among other natural disasters was the first natural disaster to devastate and cause more or impact to Zimbabwe's social and economic environment (Gambe, 2025). In relation to the cyclone, the government and various organisation responded to provide humanitarian support. The government's response through its Civil Protection Unit (CPU) played a central role in managing the Cyclone Idai disaster. It was tasked with coordinating all disaster management activities and working closely with the Chimanimani and Chipinge Districts local authorities, together they ensured that resources were deployed

effectively and communities received timely assistance (IPS, 2019). A thorough risk assessment by the government's CPU in Chimanimani helped in identifying areas most affected by the cyclone such as Kopa Growth Point which had 77 households affected and 305 people who were still missing within the early hours of the cyclone impact (Government of Zimbabwe, 2019). This facilitated in developing a detailed emergency plan which outlined specific actions to be undertaken to provide humanitarian support.

Through assessment, the government formally declared a state of emergency after the cyclone Idai disaster in Chimanimani and Chipinge. This declaration allowed the government to mobilise resources quickly which included food, water, medical supplies and temporary shelters and see international assistance (Westermann, 2019). Post-disaster, the government prioritised repairing of crucial infrastructures such as roads, bridges, schools and hospitals to facilitate relief efforts and support community recovery.

International organisations such as the UN played a significant role during and after the Cyclone Idai disaster. The UN offered technical support in disaster management which facilitated the government to enhance its capacities for disaster response. The UN also coordinated funding from various donor countries and organisations to support relief efforts which ensured that adequate resources were available to tackle the needs of the affected populations that were immediate. UN agencies such as the WFP and the UNICEF deployed emergency response team to the affected areas especially in Chimanimani to assess the needs, distribute food and ensuring that access to essential services was available at Skyline camp and temporary housing at Ngangu Primary School (UNICEF, 2019).

Local NGOs also contributed significantly to Cyclone Idai disaster. Organisations such ActionAid and Christian Aid Zimbabwe provided immediate assistance through food distribution, clean water and hygiene kits in in which they worked or collaborated with local communities to identify their needs and deliver humanitarian aid effectively. According to IOM (2019), besides immediate relief to the disaster, local NGOs focused on long-term recovery and capacity building initiatives which included agricultural support, skills training and infrastructure rehabilitation to facilitate communities to recover and prepare for future disasters.

Challenges faced humanitarian assistance in Zimbabwe during disasters. The response to natural disasters in Zimbabwe such as Cyclone Idai faced significant challenges such as funding shortages. The government suffered with limited resources to allocate for disaster relief. According to TimesLive (2019), the government's budget was constrained that even when the cyclone Idai emergency occurred, there was less disaster response funding which meant that it was not able to provide assistance immediately such as search and rescue. Zimbabwe's reliance on international aid to supplement its local resources created delays in response to Cyclone Idai disaster.

Poor infrastructure is also a challenge for Zimbabwe to respond to natural disasters. Many areas including Chikukwa, Nyahode and Biriri rural in Chimanimani District has poor infrastructures such as roads and transportation networks which hindered the timely delivery of relief and aid supplies to vulnerable populations (Mangwamya, 2025). Communication infrastructures were also poor which delayed coordination efforts, making it difficult to assess the full extent of the Cyclone Idai impact especially in the rural areas of Chimanimani and Chipinge.

Public awareness and preparedness were also a challenge faced during Cyclone Idai disaster in Zimbabwe. The communities in Chimanimani and Chipinge Districts lacked sufficient awareness on disaster preparedness measures which led to community panic. The communities in the districts were also not made aware of the Cyclone Idai disaster which prone to impact them, hence due to their unpreparedness worsened the impact and harm to the communities (Munsaka et al, 2021).

Climate change also hinders humanitarian efforts in Zimbabwe during natural disasters. According to the Government of the Zimbabwe and the UN (2017), climate change has led to more frequent and severe weather events which includes floods and droughts in Zimbabwe, hence, requiring the government to be fully prepared for any disaster. The increasing unpredictability of natural disasters such due to climate change makes preparedness and response efforts more crucial but also more challenging. Degradation of ecosystems by climate change and natural disasters compromises the livelihoods of many communities which further exacerbate the effects or impact of the disasters, making recovery more difficult (Chatiza et al, 2018).

2.5 Summary.

The chapter focused on the reviewing the literature for humanitarian assistance using case studies from Japan and Mozambique. The literature was based on the objectives of the research study. The chapter pointed out that due to the impact of disasters, both the communities and the government face challenges in which by introducing digital innovations, helps facilitate in improving humanitarian aid delivery. The theories used to explain the importance of harnessing digital humanitarian innovations are the liberalism theory and the ICT for Development theory.

CHAPTER THREE

RESEARCH METHODOLOGY AND DESIGN

3. Introduction

This chapter presents the methods that were used to conduct the research. Research methodology ensures the validity and reliability of the study findings. This chapter describes the research design, methodology and the procedures used to collect data. The validity and reliability of findings is also examined highlighting any errors or biases during the research process. The research methodology explores or examines the importance of harnessing digital humanitarian innovations in Zimbabwe.

3.1 Research Philosophy.

An interpretivism research philosophy guides this study in understanding the subjective meaning of harnessing digital innovations in humanitarian assistance. According to Babones (2016), interpretivism is a valuable tool in qualitative research. It enables the exploration of the importance of digital tools in humanitarian assistance and addressing social interaction problems. Kouam (2024) states that the central principle of interpretivism is that individuals can construct knowledge based on their experiences and interpretations in a subjective and perspective understanding of a social phenomenon.

3.2 Research Methodology

A qualitative data analysis method was used in conducting the research on the importance of harnessing digital innovations in humanitarian assistance; Case of Manicaland, Zimbabwe. Qualitative data analysis is a method that is used to interpret non-numerical data such as texts (secondary data), images and/or audios to reveal patterns, themes and meanings so as to understand perception or experiences in the humanitarian environment (Tenny, Brannan & Brannan, 2022). Data collection tools which are used are key informant interviews, questionnaires and review of secondary data.

3.3 Research Design

A descriptive research design is used to understand the importance of harnessing digital innovations in humanitarian assistance. Descriptive research design is a research methodology

that is aimed at providing accurate information of a phenomenon (Suryani, 2019). It is mainly focused on answering the who, what, when and why questions of the research. According to Croswell (2014), a descriptive research design facilitates in providing rich accurate and detailed information about the phenomenon that offers systematic observation of events as they occur naturally in this case, understanding the importance of digital humanitarian innovations. McCombes (2019) supported that descriptive research provides a detailed rich information that is qualitative in leveraging of digital innovations in humanitarian assistance. A descriptive research design facilitates. Descriptive research design is vital in qualitative study as it offers a framework for understanding the importance of leveraging digital innovations in humanitarian assistance through the collection and analysis of detailed data. By prioritising context, depth and participants engagement, it enhances the understanding of the details of human behaviour and experiences in response to natural disasters, fostering richer insights that can positively impact the leveraging of digital innovations in humanitarian assistance.

3.4 Population and Sample

A sample population of 15population was selected which included 8 key participants in humanitarian assistance and 7 from questionnaires for the study. The research population was focused on key informant interviewees which includes Ministry of Public Affairs, Labour and Social Welfare, Ministry of Local Governance and Public Works,, UNOCHA, UNDP, WFP, UNICEF, UNFPA and UNHCR. The key informants were the heads of departments focused on humanitarian assistance, country representatives', transport and logistics managers, and department of Civil Protection. A purposive sampling method was used to select the key informant interviews. Questionnaires were distributed through the WhatsApp and Email platforms to different stakeholders to share their own views about harnessing digital humanitarian assistance.

3.5 Sampling Methods.

A purposive sampling method was used to identify the key informants interviewed. This sampling method utilises a non-probability sampling technique where the researcher deliberately selected for their participation in humanitarian sector in Zimbabwe. (Tajik, Golzar, Noor, 2024). According to Palinkas et. al. (2015), the goal of using purposive sampling is to

gather in-depth understanding from the targeted group rather than generalising findings to a larger population which is efficient.

3.6 Data Collection Methods

A questionnaire is identified as a structured tool for research that is used to collect data from respondents in the humanitarian setting through a series of written questions. Questionnaires ensure efficiency, consistency and encourages anonymity which encourages responses which are honest and accurate (Bhandari, 2021). Questionnaire were distributed among the UNICEF, WFP, UNDP, Oxfam, Ministry of Local Governance and the Ministry of Social Welfare that plays a role in humanitarianism.

Key informants are individuals who has specialised knowledge about digital innovations in humanitarian assistance who are selected to provide insights and information for research. these induvial often have direct expertise which makes their perspectives valuable in understanding complex issues within a social context. Key informant tools facilitate in identification of themes, validity and credibility of the research The key informants who were interviewed where from UNICEF, WFP, UNDP, Oxfam, International Medical Corps, Ministry of Local Governance and the Ministry of Social Welfare

Secondary data is the information that is already been published by other researchers, organisations and/or institutions for purpose other than the current study in harnessing digital innovations in humanitarian relief (George, 2023). Secondary data sources that are revisited or reviewed are Journals, research papers, government reports, digital sources (UN, Red Cross, World Bank), and media and news which provides large scale of data that can be used in comparing trends or validating finding in the humanitarian contexts of harnessing digital innovations.

3.7 Validity and Reliability.

To ensure the validity and reliability of research fundings, the researcher utilised qualitative data collection and analysis methods. Key informant interviews and questionnaires provided in-depth knowledge of the research topic. According to Mazhar (2021), a qualitative methodology is accurate and consistent facilitating in understanding the cause of the phenomenon and its impacts to the community. Qualitative methods in data collection and

analysis are mostly suitable in exhuming the reliability of the research question in the social science department as it does not require any numerical data to implemented but only the perceptions of human behaviour (Bhandari, 2020). Interviews provide real-time firsthand information which promotes information reliability and accuracy through feedback provided. To ensure clarity, a proper introduction to the research topic was made to avoid any misinterpretation of the research topic, thus promoting data reliability.

3.8 Ethical Considerations.

The proceedings of this research strictly adhere to established academic guides and principles in conducting research. Consent will be obtained voluntarily without any coercion. Measures will be implemented to anonymize data and ensure that sensitive information is stored and obtained securely. By engaging with local communities in understanding their perspectives and ensure that the study aligns with their needs and cultural norms. The study will maintain transparency about the goals of the research and affiliations which helps builds trust with participants. The research will also ensure that the study is adhering to local laws and ethical standards regarding human rights and data protection.

3.9 Summary.

This chapter presents the research methods used and instruments used to gather information on the topic. A qualitative research method was also employed to collect and analyse the data collected. Key informant interviews, questionnaires and secondary data sources were used to provide the validity and reliability of the research findings.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSION OF FINDINGS

4. Introduction

The chapter presented the research findings and the data collected was descriptively analysed and discussed. The study findings are organised into themes that are answering the research questions addressed in Chapter one of the research.

4.1 Challenges experienced by people who were affected by Cyclone Idai in Zimbabwe.

The Cyclone brought with it a number of challenges which heavily affected the communities and populations in Chimanimani and Chipinge.

The World Food Program Report highlighted that;

***"Over** 2000 people were displaced with many taking refuge in camps which lacked basic amnesties and privacy. Rebuilding efforts have been slow and with many families still living in temporary accommodation for two years".*

The International Federation of Red Cross and Red Cresent Societies reported on the displacement of populations due to the disaster specifically in Chimanimani as it stated that;

"As many as 5000 people were displaced, living in makeshift shelters with little access to clean water, sanitation and healthcare in the immediate aftermath of the cyclone"

The immediate displacement of people highlighted the immediate and acute need for shelter for all who have been impacted by the disaster. Many individuals were forced into temporary shelters in camps which significantly revealed the vulnerability of affected populations during the Cyclone Idai disaster. The devastation caused by the Cyclone Idai resulted in many families homeless the entire neighbourhoods were destroyed and the survivors found themselves living in temporary shelters or in displacement camps such as the Skyline camp. The fact that many populations remained in the camps months later the cyclone impact raised concerns about the long-term social and psychological effects of instability and uncertainty. Leaving in temporary shelter can also lead to mental health issues, disrupts family

structures and causes lack of community cohesion which exacerbates the trauma caused by the cyclone.

The World Food Program (WFP) reported on the devastating effect of the Cyclone Idai disaster on food security to communities in Chimanimani and Chipinge as it detailed that;

"The cyclone has destroyed food production in Manicaland. It was not just about emergency relief; we were looking at long-term recovery, many families were facing hunger and we were striving to provide them with emergency food assistance. But we need sustainable solutions to facilitate community resilience".

The resulted to loss of crops and livestock which was critical for many families' sustenance. As a result, food shortages became widespread, thus, exacerbating issues of malnutrition and hunger, directly affecting the livelihoods of farming communities. With many populations in Chimanimani and Chipinge projected to be food insecure in the aftermath of the cyclone disaster, this illustrated the magnitude of the disaster impact that extended beyond the immediate victims to the broader population. The persistency of food insecurity led to greater dependency on humanitarian aid, which created a cycle of vulnerability and hindered long-term recovery efforts in local communities.

The Zimbabwe Ministry of Health, Childcare and Social Services reported on the diseases that were posed as a result of the cyclone disaster. The report detailed that;

"The risk of disease outbreaks in the affected areas is extremely high, with an urgent need for clean water, sanitation and health services to prevent further loss of life".

A local health official from Ministry of Health reported on ZBC News in 2019, the damage which was done by the disaster which was a challenge to the populations of Chimanimani and Chipinge that;

"The aftermath of the cyclone brought a wave of health problems which was witnessed by an increase in waterborne diseases and the local medical facilities are stretched thin. Many people still needs treatment, but getting to health services is challenging due to damaged roads and ongoing flooding" .

The aftermath of the Cyclone Idai presented significant health risks including outbreak of waterborne diseases like cholera and dysentery due to contaminated water supplies. Reported outbreaks of these waterborne diseases highlighted significant health risks in the wake of the cyclone Idai. The destruction of health facilities such as Ngorima Clinic and Mutambara Mission Hospital, compounded the existing health care challenges, such as access to medical which was already strained in many rural communities. The physical and psychological health of affected individuals could not deteriorate in a short space of time because they were not provided with adequate support and resources for recovery which included not only physical health care but also mental health services to address trauma and stress experienced by the affected populations.

4.2 Zimbabwe Government's response to Cyclone Idai

Besides the challenges which the government and humanitarian responders, the government of Zimbabwe responded in providing aid to the communities in Chipinge and Chimanimani.

Zimbabwe Disaster Management Report stated that;

"The government of Zimbabwe declared Cyclone Idai a national disaster. This declaration allowed for the mobilisation of resources at both national and local levels, triggering emergency protocols to facilitate emergency assistance"

A representative of Local Governance commented on the response to the cyclone disaster that;

" As soon as we assessed the damage, we declared Cyclone Idai a national disaster. This allowed us to quickly mobilise resources and funds to commence immediate relief efforts"

The declaration by the government paved way for contingency plans that the government had reluctantly established for natural disasters which enabled faster resource allocation and efficiency of humanitarian relief. The declaration also allowed response from other neighbouring countries to facilitate in provision of aid and evacuation processes to be undertaken.

Collaboration during a disaster is of vital importance as the affected country or regions during a disaster requires support from organisations and other countries.

As remarked by the UNFPA respondent;

"The government recognised the necessity of collaborating with NGOs and International Organisations or agencies which was essential in ensuring that aid could reach remote areas and vulnerable populations effectively. Together they worked on assessments and coordinated relief operations"

As noted by the Ministry of Local government report that;

"The collaboration with organisations like the Red Cross was vital. Their expertise and additional resources complemented our efforts which ensured that aid reached the most affected populations efficiently"

Working in collaboration with NGOs, aided additional access to resources and logistical support which was essential for reaching isolated communities that were cutoff or separated from the supply routes by the Cyclone Idai in Chimanimani and Chipinge. The undermined disaster risk management system of Zimbabwe was facilitated by its collaboration with organisations and agencies which promoted efficiency in humanitarian aid delivery.

Collaborating with different stakeholders during disasters ensures efficient humanitarian aid delivery.

A UNOCHA report supported by noting that;

"Following the cyclone, rapid assessments were conducted by the government officials in collaboration with humanitarian partners to identify the extent of the disaster impact. The reports they compiled confirmed the devastating impact on infrastructure and livelihoods highlighting areas of urgent needs."

Zimbabwe Civil Protection report on Cyclone Idai stated that;

"The government supported by the army, local authorities and the police, initiated rescue operations to reach those trapped by the landslides and floods. This decisive action was vital for saving lives in the immediate aftermath"

Respondent from the Disaster Management Team member (Local Government) pointed out that;

"Conducting rapid assessment was challenging due to adverse weather conditions and damaged infrastructures. However, we prioritised this to understand the extent of the cyclone disaster and the resources required for recovery"

Assessments were significant to evaluate the immediate needs for food, medical care and shelter which guided the allocation of resources and prioritising areas for emergency aid distribution. This promoted the effectiveness and efficiency of the government in response to the Cyclone Idai disaster. Assessment of the disaster also facilitated in ensuring that required or needed resources are provided neither from the local government and its NGOs nor from other countries and international agencies which enhanced aid delivery.

Engaging with local authorities and communities during a disaster promotes relief delivery in a fashionable manner which enhances capacity building and resilience to natura; disasters.

The Zimbabwe National Resilience Strategy report details that;

"The government emphasized the importance of involving local communities in recovery efforts. It was recognised that local knowledge could enhance recovery strategies and ensures that aid is relevant to its beneficiaries"

A Community Development Officer for the Ministry of Local Governance supported by stating that;

"We involved the community leaders in the planning stage of relief efforts. They knew best what the locals needed and how to address them. This engagement facilitated and built trust and ensured that the relief efforts were grounded in local realities."

This approach in engaging the community facilitated in a more tailored response that took into account their needs and capacities of affected communities which fostered a sense of ownership among the Chimanimani and Chipinge residents involving communities in recovery efforts also fosters a resilient community towards disasters as they are mostly prone to be

affected by the disaster and where prioritisation should be made for disaster response and management

In the aftermath of a disaster, resilient and capacity building efforts are put into place to facilitate communities affected by the disaster to recover.

An official from the Local Governance respondent.

"We are not just focused on immediate relief but we are also looking at long-term recovery to rebuilt better structures. This means improving infrastructure and preparing communities for future disasters."

The Ministry of Transport and Infrastructural Development Report (2020) supported the need for rehabilitation efforts by stating that;

"In the aftermath of the cyclone, the government focused on rehabilitation projects to restore road access and essential services. The Ministry of Transport outlined plans to repair damaged infrastructure such as roads and bridges to reinstate connectivity for affected communities."

These insights reflect on the government's commitment to sustainable recovery which was aimed to enhance resilience against future cyclones and other natural disasters. Long term efforts were to ensure that transport and infrastructure are constructed with the capability to withstand the adverse impacts of disasters such as cyclones and /or floods in the future. The government effectively worked to ensure that transport and internet networks are re-established to ensure access to resources and services in a timely period and also to facilitate the long-term recovery of the communities in Chipinge and Chimanimani.

4.3 Challenges faced in implementing digital humanitarian assistance in Chimanimani

There were various challenges that were faced by the government and humanitarian responders in response to the Cyclone Idai disaster.

Among those who responded to the disaster, a local NGO coordinator stated that;

"The telecommunication infrastructures were severely affected by the cyclone and many areas were left without any form of connectivity during the response phase"

As supported by Oxfam coordinator on the impact of the disaster to the delivery of humanitarian assistance;

"The damage to our roads, coupled with the existing gaps in telecommunications between rural and urban areas, limited our ability to effectively utilise digital tools which meant that means to communicate or deliver aid was made difficult"

The Zimbabwean Government Report on Cyclone Idai disaster also noted on the vulnerability of communications to deliver aid to affected communities as it pointed out that;

"The damage to physical infrastructure severely limited the ability to use digital tools in some areas like Nyahonde, Rural connectivity was virtually non-existent."

The UN Report (2019) pointed out the damage that was done by the cyclone to the infrastructures as noted below;

"Over 1 000 kilometres of road networks were rendered impassible, which further exacerbate humanitarian needs."

The International Federation of Red Cresent Societies supported in its report by stating that;

"Thousands of homes were either partially or completely destroyed, leaving families vulnerable and displaced."

The cyclone caused major damage to infrastructures such as roads, bridges and houses which isolated communities and also hindering aid delivery. Cyclone Idai further weakened the existing infrastructures in Chipinge and Chimanimani especially in the rural areas which struggle with telecommunications, poor infrastructures not only at impacted delivery and efficiency of humanitarian assistance, but also meant that many digital solutions could not be implemented where they were required (TimesLive, 2019)

Advancement in digital technologies have come with challenges especially to the communities in which they are being deployed.

A field Officer from Oxfam noted that;

"Many community members were not familiar with digital platforms. We had to hold numerous meetings to explain how to use the applications we introduced such as Kob Tool Box".

A field officer for UNICEF supported that;

"In many cases, we found scepticism among community members regarding systems. Building trust was crucial and it often took time to show benefits."

Community Development Officer for the Ministry of Local Governance responded in noting that;

"Engaging communities to embrace or accept new technologies requires time and patience in which due to circumstance we did not poses. Traditional methods were deeply rooted in local practices."

This ideally shows that some communities are initially resistant in adopting new technologies, hence, preferring traditional methods of engagement. Use of digital innovations also faces resistance or lack of familiarity with these digital tools under their acceptance and affect the overall success of these innovations in humanitarian assistance.

Digital humanitarian tools requires more funding to be efficient and effective for sustainability.

As stated by the Ministry of Social Welfare;

"Funding for digital tools was not previously prioritised, which undermined the technologies we could deploy in the ground."

A key informant from the Ministry of Local Governance also supported the need for sustainable funding in digital tools as detailed that;

"While there was recognition for digital tools in both DDR and humanitarian assistance, lack of funding often left our plans unrecognised. We had ideas for innovative solutions but without resources, they remained on paper."

An emergency response coordinator at the Ministry of Social Welfare commented on the challenges that are faced in harnessing digital innovations during natural disasters as he stated that;

"While technology provides great potential in humanitarian assistance, the limited funding and resources for training and equipment hindered our operations on the ground"

Budgeting and resources for investing in digital innovation is often limited in Zimbabwe as evidently shown above. This affects the capacity to acquire advanced innovations and training for optimal use. Securing adequate funding for digital technologies can prove to be of more importance in humanitarian assistance. Many departments may struggle to allocate budgets for the necessary technology and training that is required for effective implementation, but through a targeted budget, digital humanitarian innovations are achievable.

Digital literacy should be considered when introducing new technologies to affected populations either during or after a disaster has occurred to ensure effective and efficiently information timey delivery.

A key informant from UNICEF responded (capacity building specialist) in pointing out that;

"There was an urgent need for training on digital technologies. Local volunteers had varying levels of technological knowledge which hindered the effective utilisation of digital innovations."

Although humanitarian technologies exists, there are challenges which are faced by responders in harnessing them such as digital literacy.

A responded from WFP supported by pointing out that;

"While technology in humanitarian assistance exists, we faced a challenge among our volunteering team. Training programs were needed urgently to ensure that everyone could utilise these digital innovations effectively."

NGO Action Plan (2019) report distinguished the gap in digital literacy by detailing that;

"Many of the local volunteers and community members were not adequately trained on the use of technology being deployed, which reduced their overall effectiveness."

This shows that community members and volunteers faced challenges in leveraging digital innovations due to different levels of digital literacy, which limited the effective engagement with digital tools. Lack of technical skills required in operating digital innovations in humanitarian assistance created a significant hurdle in the use of these innovations to ensure efficiency in aid delivery.

Health facilities are major infrastructures that are required in a community, without them the community is faced with a number of challenges.

According to humanitarian assessment by the WHO;

"Numerous health facilities were rendered non-operational, leading to increased morbidity and mortality risks."

As reported by the Zimbabwe National Water Authority (ZINWA) on the outbreak of waterborne diseases in the aftermath of the Cyclone Idai disaster, it stated that;

"There was a substantial risk of cholera and typhoid outbreak due to contamination of water bodies by the Cyclone Idai."

The cyclone negatively affected healthcare facilities which made it difficult for communities in Chimanimani and Chipinge to receive medical care service. As essential as medical care facilities are, their day-to-day operations were halted, which further increased the vulnerability of the communities. Contamination and destruction of water supply systems especially in the urban areas of Chimanimani led to a heightened risk to waterborne diseases, thus, with poor sanitation this was further worsening the aftermath of the cyclone disaster.

One of the major devastating impacts of the disaster was the destruction of livelihoods of communities in Chimanimani and Chipinge.

The Government of Zimbabwe's report on Cyclone Idai stated that;

"The livelihoods of thousands were disrupted leading to increased poverty levels and economic instability"

As highlighted by the FAO in its report on the cyclone;

“ An estimate of about 70% in crop loses in Chimanimani were severely damaged, leaving many foods insecure”.

The cyclone made a greater impact on the livelihoods of people in Chimanimani and Chipinge with many populations who were reliant on agriculture suffered severe loses especially those in the rural areas. The greater agricultural land was damaged which also increased food shortages in many villages. Access to food as a basic service was undermined leaving many reliant on donor aid from the international agencies and NGOs.

Humanitarian aid responders faced significant challenge in providing aid to affected populations in Chimanimani and Chipinge.

A Humanitarian Aid Assessment Report from UN pointed out that;

“We encountered significant challenges in data consistency and accuracy between various digital platforms. This made it difficult to get a holistic view of the response status”

Data analysis systems can be effective during times of disaster, hence, without a purposive system for data analysis, it is challenging to specifically address or note the exact challenge.

A CPU report pointed out that;

“We had data coming in from different sources but without a cohesive system, it was challenging to make sense of it all. This led to duplication of efforts and some communities being overlooked”

The Government of Zimbabwe report supported the need for a unified system as it stated that;

“We struggled with data collection. The lack of a unified system meant that information was scattered and not easily accessible”

The absence of a centralised system in data coordination platform made it difficult for various stakeholders to share crucial information and coordinate their efforts to support communities in Chipinge and Chimanimani. The lack of a standardised disaster data

management system made the use of digital tools difficult, which hindered or hampered effective decision making showing a poor disaster risk management by Zimbabwe.

4.4 Impact of digital innovations on humanitarian outcomes in Zimbabwe.

The rapid growth of digital technology is reshaping humanitarian aid particularly filling-in the loopholes where traditional methods are failing short. Prevalent challenges posed by natural disasters including Cyclone Idai (2019) in Zimbabwe can be addressed through leveraging digital technologies which have significantly improved humanitarian outcomes.

According to report by the UNOCHA;

"Mobile technology has proven to be crucial for coordinating response during emergencies, enabling timely information sharing between field workers and decision makers."

The IFRC report noted by acknowledging that;

"A robust data management system can significantly enhance the efficiency of humanitarian operations by providing a centralised source of information that helps in decision making process."

A humanitarian worker at UNDP added that;

"Digital innovations have drastically improved our response times. By using mobile applications, we quickly assessed the needs on the ground and deploy resources effectively. This was particularly evident during the 2019 Cyclone Idai response in Chimanimani"

The above quotations shows that digital innovations play a crucial role in enhancing communication and coordination among humanitarian agencies, local authorities and affected communities' Mobile platforms such as WhatsApp and Facebook, enhances coordination of information which ensures that decisions made are based on feedback collected. This also ensures that during disasters, having a reliable communication system facilitates in ensuring that everyone is included. Henceforth, this is vital for effective responses and provision of humanitarian aid. According to Zimbabweland (2019), establishment of centralised platforms for data collections also enhances coordination. This is crucial where multiple organisations are involved in providing relief such as during the Cyclone Idai Disaster in Chimanimani and

Chipinge. Henceforth, collaboration and coordination are positively influenced by sharing of information in real-time by organisations and stakeholders.

Geographical Information Systems facilitates in targeting regions which are most affected by disasters in provision of aid during disasters.

According to UNDP report.

"GIS technology allowed responders to identify areas which were most in need of assistance by analysing geographical data"

Logistics Coordinator at WFP mentioned that;

"Using geolocation technologies helped us to map areas that require immediate assistance in Zimbabwe. By optimising our routes and logistics through digital solutions, we ensured that aid reached those in need without further delays"

Using digital technologies ensured that humanitarian organisations and local government visualise data and make decisions which are informed regarding resource allocation and distribution. GIS facilitated in Chimanimani to pinpoint where resources such as food and medical assistance where urgently required. Real-time satellite imagery also facilitated in the coordination of evacuation processes for those who were trapped by the cyclone disaster impact proving to be more efficient in humanitarian assistance. GIS and remote sensing tools have revolutionised aid targeting and delivery as they are used to accurately determine the extent of damage that has been caused by the disaster, which promotes relief panning and targeting assistance delivery to the communities directly. Though there is limited digital literacy and internet access in rural communities, early warning systems facilitates populations to adapt to climate shocks and supports proactive humanitarian planning, henceforth, strengthens the country's capability to respond to disasters or crisis efficiently and ensures food security. According to Ramadurai and Bhatia (2018), this approach facilitates in visualising potential impacts based on existing vulnerabilities which ensures that preparedness measures are tailored to the specific context of Zimbabwe's disaster.

Training local communities in digital humanitarian skills enhances humanitarian aid delivery through equipping them with the knowledge that they can leverage during disasters.

Program Officer from Oxfam remarked;

"Training local volunteers in digital skills has been a game changer. They utilised their skills during the disaster to not only gather data but also teach others about available resources and programs"

A report from Mercy Corps detailed that;

"Training communities to use technology not only aids in immediate response, but also equips them with skills to manage future crises more effectively"

Digital technologies do not only offer immediate solutions, but rather contribute to the long-term resilience of the affected communities. By empowering local communities through digital literacy and access to digital tools, these communities will be better equipped for potential future disasters. Training local members on the use of innovations facilitates in impowering them to participate in disaster response and provide valuable information or feedback. By including local voices, this does not only enhance the accuracy of needs assessments, but also strengthens the relationship between relief organisations and communities

Engagement with local communities during humanitarian aid delivery empowers communities to provide valuable information that responders can use to specifically provide relief.

A UNICEF Zombabwe representative shared;

"Engaging local communities through digital platforms has allowed us to empower them in decision making process. We provided them with information and tools which enabled them to voice their needs more effectively"

Social platforms can enhance humanitarian aid delivery in times of disaster. **As stated in research by the Havard Humanitarian initiative;**

"Social media acts a channel for real-time updates on emergencies and enables communities to share critical information about their needs"

The role played by social media especially during the Cyclone Idai cannot be overlooked in engagement with communities through platforms like Facebook and WhatsApp allowed organisations and/or the government to reach out and gather feedback quickly from the impacted communities. This two-way communication between the responders and impacted communities empowered communities by ensuring that their voices or needs are addressed, which is important for effective humanitarian assistance in Zimbabwe. This approach leads to a more impactful use of resources while minimizing waste. As noted by Singh (2025), digital collaboration tools facilitate not only operational coordination but also ensures that all stakeholders are aligned on the objectives and can adopt to changing circumstances that are posed by a disaster.

Efficient data collection and analysis timely through the use of digital platforms promotes humanitarian aid delivery.

As stated by the CPU department report;

"The ability to collect and analyse data in real-time using digital tools has changed the landscape of humanitarian work. We were able to identify vulnerable populations faster and tailor our responses accordingly"

A program's coordinator at UNICEF supported that;

"Remote monitoring through digital platforms has enhanced our ability to oversee and adapt our interventions as required. We were able to track progress and make decisions based on accurate updated information ".

Digital innovations enabled effective data collection and analysis which was significant for understanding the needs of the affected populations. When humanitarian agencies and local authorities utilise this data, they are able to create targeted interventions that suitable addresses the requirements of communities which are specific to them rather than implementing a to-down approach. Streamlining data sharing ensures collaboration and coordination of resources and disaster response initiatives both pre and post disaster. Digital innovations also promote future preparedness through predictive analytics from the information that is provided in the register systems. According to Maximillan (2024), advanced data analytics empowers organisations to exploit post data to predict potential future emergencies

4.5 Chapter Summary

This chapter addressed the challenges that were faced by the communities and also on utilising digital innovations in humanitarian assistance in the wake of the Cyclone Idai disaster. The impact of the digital innovations utilised during the Cyclone Idai was effective though it faced some challenges such as infrastructure damage and digital knowledge gaps. The Zimbabwean government's response to the Cyclone Idai disaster was effective and its declaration to the state of emergency earmarked the response action taken by the country in assessing and providing aid to the affected communities.

CHAPTER FIVE

SUMMARY, CONCLUSIONS, RECOMMENDATIONS AND AREAS FOR FURTHER RESEARCH

5. Introduction

This chapter is focused on summary of the study, its findings, conclusion and the recommendations for harnessing of digital technologies in humanitarian assistance. It also provides areas that needs further research and discussion on the leveraging of digital humanitarian tools.

5.1 Summary

5.1.1 Summary of findings

The challenges that were faced in Chimanimani and Chipinge following the Cyclone Idai disaster were multifaceted causing infrastructural damage, affecting health services, food security, and the economy itself. The experience of the cyclone disasters serves a vivid reminder to integrate digital innovations into humanitarian assistance efforts. While these digital technologies hold an immense potential to enhance coordination, communication and resource allocation, successfully leveraging these innovations requires addressing infrastructural gaps by ensuring compatibility, enhancement of skills, security funding and fostering strong community engagement. Although digital technology played a pivotal role in aiding response to cyclone Idai the challenges faced underscored the need for comprehensive planning, better infrastructure and targeted capacity building efforts.

The response by the Zimbabwean government to cyclone Idai highlighted government`s immediate action to declare the disaster a national emergency which was a crucial step mobilization of resources and coordination with various stakeholders including NGOs and international agencies. Collaboration with NGOs ensured rapid assessment mechanisms and community involvement which was a crucial aspect of this approach. Community engagement played a pivotal role in ensuring that aid reached those in need effectively, although significant logistical challenges such as those concerning infrastructure

were acknowledged as of significance in rebuilding and enhancing resilience against future disasters.

Harnessing of digital innovations in Chimanimani and Chipinge for humanitarian assistance was of significance in enhancing communication, improving resource allocations, community engagement and supporting economic recovery. As highlighted in chapter 4, the adoption of digital innovations in humanitarian assistance has the potential to significantly transform humanitarian efforts and outcomes in disaster affected areas. By harnessing these innovations, the government and organisations provide a more effective and efficient timely response, ultimately improving resilience of communities. In evaluating the digital innovations utilised during the response to cyclone Idai, it's clear that while there were significant challenges as well. The integration of innovation aided in improving efficiency and response times, but issues such as network disruptions and insufficient infrastructures highlighted the need to continue investing in digital capabilities.

5.1.2 Summary of the Research

The study was aimed at investigating the importance of harnessing digital innovations to improve humanitarian assistance in Zimbabwe. The first chapter addressed the background of the study focusing on how Zimbabwe have been impacted by natural disasters such as cyclones and droughts. The chapter also highlighted the delimitations and limitations of the study in which some were met during the research. The study questions were also posed which were answered in chapter four through research data collection.

Chapter two of the research focused on the literature review of the study topic. It revealed how digital tools are transforming humanitarian assistance in Japan and in Mozambique particularly how they utilised digital tools and their response to natural disaster. The literature showed that digital humanitarian innovations have the potential to promote effectiveness and efficiency in humanitarian aid response and preparedness. Theories which support the importance of harnessing digital innovations in humanitarian assistance were also noted which includes the Liberal theory and the ICT for Development theory.

Chapter three of the study addressed the research tools which were used in conducting the study. These were key informant interviews, questionnaires and the review of secondary

data, through a qualitative descriptive research design. The research tools were aimed at answering the importance of harnessing digital technologies in humanitarian assistance.

The fourth chapter of the research through a descriptive design, focused on analysing the research findings. The research findings were presented using direct quotations from the key informants, questionnaires and review of secondary data. Discussions and analysis of data collected was through a descriptive approach. Analysis of the importance of leveraging digital innovations in humanitarian assistance was also done in this chapter.

The last chapter of the research concluded the research with recommendations based on the challenges presented in chapter four and provided areas that requires further research in leveraging of digital innovations in humanitarian assistance.

5.2 Conclusions.

The conclusions are based on the research findings which are presented in the previous chapter. The study concludes that besides the efforts to harness digital tools in humanitarian assistance, there are challenges which impedes the leveraging of humanitarian technologies at full capacity. These challenges often lead to failed capacities in harnessing digital technologies in the humanitarian sector which henceforth, traditional methods in humanitarian assistance will be the only methods that are implemented. The 21st century have seen rapid changes in technological shifts, in which harnessing of digital innovation in humanitarian assistance will transform how relief or aid is delivered. Digital innovations have impacted humanitarian assistance in Zimbabwe. They have enhanced efficiency and effectiveness in humanitarian aid response, data collection, coordination and collaboration between humanitarian agencies such as the government, international organisations and local NGOs. These tools have the potential to change how humanitarian assistance is delivered in Zimbabwe. Introduction of AI powered systems to the humanitarian sector influences humanitarian assistance positively as they can assess, and provide decisions in real-time which can be utilised in responding to natural disasters. Digital humanitarian tools in Zimbabwe are yet to be fully scaled up to support relief or aid delivery. Zimbabwean government's efforts to implement digital innovations in humanitarian sector ensures the commitment of the country to digitise relief response and delivery by ensuring real-time information, alerts and awareness to communities. Therefore, equipping populations with information ensures preparedness and community participation in

disaster response. The results presented the efficiency and effectiveness of digital tools in humanitarian assistance in Zimbabwe.

5.3 Recommendations.

Zimbabwe, frequently experiences natural disasters such as floods, droughts and cyclones. To effectively manage these challenges, harnessing and leveraging digital innovations can intensely enhance humanitarian assistance efforts which ensures Zimbabwe's capacity to respond to natural disasters.

The study findings also pointed the need for continuous evaluation and adaptation to digital innovations in the humanitarian sector. Implementation of systems to evaluate the effectiveness of digital innovations in real-time through gathering feedback from the communities that are involved in disaster response efforts facilitates in understanding what works, what doesn't and how these digital innovation processes can be improved.

The research revealed lack of awareness and real-time updates on disasters in which it is recommended to leverage social media and communication platforms. Social media platforms such as Facebook, Twitter, WhatsApp or even SMS services can be used for educational awareness on disaster alertness, send-out alerts and real-time updates during emergencies of natural disasters.

The study findings also pointed out the need to establish robust data collection systems. Investing in Geographical Information Systems (GIS) to create detailed maps of the natural disaster affected areas. This mapping can also facilitate in identifying hotspots for relief delivery, track the movement of the displaced populations and analyse vulnerability patterns.

5.4 Areas of Further Research

While the study focused on the importance of digital innovations in humanitarian assistance, further research should be focused on the implementation of digital innovation tools in humanitarian assistance and to assess how these innovations influence the recovery and development of communities over time. Larger and longitudinal research is needed on the role that is played by local stakeholders in the development and use digital innovation in humanitarian assistance.

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A,ENDIX 1: Key Informant Interview Guide

My name is Cleopas T Mutema, studying towards Master of Science in International Relations at Bindura University of Science Education. I'm conducting a study on **The importance of harnessing digital innovations in humanitarian assistance: Case of Manicaland Province, Zimbabwe.**

Section A:

NAME OF ORGANISATION:……..

DEPARTMENT:…….

Section B:

1. What digital tools or platforms were utilised during the response to Cyclone Idai? Please describe their function.
2. What digital tools or platforms are you currently using in humanitarian work in Zimbabwe or with other partners in responding to natural disasters?
3. In your own view, which sectors or programs have been most affected by digital innovation e.g. Access to services, targeting and outreach, logistics efficiency, financial inclusion?
4. What tangible benefits has digital innovation brought to humanitarian aid in handling natural disasters that have ha,ened in Zimbabwe in the past)?
5. What factors have most efficiently enabled successful use of digital innovations in humanitarian relief environment during the natural disasters in Zimbabwe?
6. How do you measure and ensure long-term impact of digital tools on humanitarian outcomes that are targeted towards natural disasters in Zimbabwe?
7. What specific skills or knowledge related to digital innovation do you think are essential for effective humanitarian assistance?
8. Can you provide examples of how learning digital innovations has improved humanitarian responses in the past natural disasters, particularly with Cyclone Idai?

Section C:

1. How does Zimbabwe's unique context shape digital humanitarian work?

2. How did your organisation or local authorities respond to the Cyclone Idai disaster?
3. How is digital inclusion addressed to ensure vulnerable groups (women, children, people living with disability, rural communities) benefit from digital tools?
4. How efficient are the digital infrastructures in Zimbabwe in providing humanitarian information and accessibility?

Section D:

1. What challenges do humanitarian organisations face in integrating digital innovations into their operations
2. How can these challenges be overcome?
3. What are the main barriers to adopting digital innovations in humanitarian assistance in Zimbabwe?
4. How effective are current coordination mechanisms for digital initiatives among stakeholders (data sharing, joint procurement and joint evaluation)?

Section E: (optional)

1. Which partnerships are most critical for scaling digital innovations in Zimbabwe?
2. What funding models or sustainability a,roaches do you think are most effective for harnessing digital humanitarian tools that are intended for natural disasters?
3. How have parentship or collaboration with other organizations facilitated in addressing digital humanitarian assistance in Zimbabwe?
4. Was the government of Zimbabwe and NGOs response to natural disasters efficient in humanitarian response? Provide comment.

A,ENDIX 2: QUESTIONNAIRE.

My name is Cleopas T Mutema, currently studying towards Master of Science in International Relations at Bindura University of Science Education. I'm conducting a study on **The importance of harnessing digital innovations in humanitarian assistance: Case of Manicaland, Zimbabwe.** The questionnaire aims to understand how digital innovations are perceived, used and valued in humanitarian work in Zimbabwe, identify barriers, collaborations/partnerships and context-specific considerations for scaling digital a,roaches.

Consent and ethics.

The research questionnaire is based on voluntary participation, which will ensure anonymity or confidentiality and the intended use of data is for research only. Compliance with local data protection and humanitarian information governance standards will be adhered to.

Section A: Informed consent.

1. I understand the purpose of this research and agree to participate. YES/NO
2. I understand that my participation is voluntary and I can withdraw at any time without penalty. YES/NO
3. I understand that my responses will be anonymized and reported in aggregate. YES/NO
4. I agree to be contacted for follow up questions or future related studies (optional). YES/NO

   If YES, please provide preferred contact method (e.g., email, phone etc).

<u>Section B: Respondent Background.</u>

1. Name of Organisation
2. Role in humanitarian work (select one).

   Program/project manager

   Monitoring and Evaluation

   IT/Digital systems developer or su,ort

   Field officer or operations staff

   Policy advocacy

   Research or academic

Other (please specify)

Section C: Awareness and perceived importance of digital innovation in humanitarian aid.

1. In your view, how important are digital innovations in improving humanitarian outcomes in Zimbabwe?
2. Which digital innovation tools do you consider most effective for humanitarian assistance natural during disasters like Cyclone Idai?(select all that a,ly)
   Mobile Cash transfers and logistics
   Early warning and Disaster risk reduction
   Remote sensing technology
   Data collection, analytics and dashboards
   Online Coordination and Information sharing among responders
   SMS-based alerts and information systems
   Accountability to affected populations(feedback and complaints)
3. How important do you believe digital innovations are improving humanitarian assistance's effectiveness particularly targeted towards natural disasters in Zimbabwe?
   Not important
   Somewhat important
   important
   very important
4. What benefits do you see from using digital innovations in humanitarian assistance? (Select all that a,ly)
   Improved communication and coordination.
   Faster response times
   Better resource allocation
   Enhanced data collection and analysis
   Other (Please specify)

Section D: Current Use and impact

1. Have you implemented any digital solutions in your humanitarian work in Zimbabwe?
   YES/NO

If No, skip to E6. If Yes, continue with E2–E5.

2. Which digital tools have you implemented during any natural disaster? (Select all that a,ly)

   Mobile data collection a,s

   Digital cash transfer systems

   SMS-based communication or reporting

   WhatsA, or other messaging for coordination

   GIS/ma,ing tools

   Data dashboards or visualization tools

   Open data portals

   Drone imagery or satellite data

   Other (please specify)

3. What demonstrated impact have you observed from these digital tools?
4. Please estimate changes attributed to digital tools (where a,licable);

   Time to complete needs assessments or response planning (percentage reduction or qualitative note)

   Number of beneficiaries reached or served

   Accuracy/quality of data

   Cost efficiency

   Coordination among partners

5. What risks or unintended consequences have you observed with digital tools in Zimbabwe?
6. How effective are the current digital technologies in humanitarian assistance in Zimbabwe? Effective, somehow effective, not effective
7. If you currently do not use digital tools, what are the main reasons? (Select all that a,ly)

   Lack of funding

   Limited capacity or skills

   Connectivity or electricity constraints

   Data privacy concerns

   Regulatory or policy barriers

   Interoperability issues

Beneficiary accessibility or acceptance

Other (please specify)

Section E: Barriers and challenges

1. Which barriers most hinder effective use of digital innovations in your operations? (Select all that a,ly)

   Internet connectivity and bandwidth

   Electricity reliability

   Costs of devices and data

   Limited digital literacy or training

   Data privacy and protection concerns (Cybersecurity)

   Lack of interoperable systems and standards

   Regulatory or bureaucratic barriers

   Mistrust or cultural barriers among beneficiaries

   Other (please specify)

2. Which factors enable successful use of digital innovations? (Select all that a,ly)

   Capacity-building and training

   Clear data governance and protection policies

   Sustainable funding and cost models

   Local partnerships and community engagement

   Government su,ort and enabling environment

   User-centered design and beneficiary involvement

   Other (please specify)

3. Have you encountered any specific challenges when using digital tools for humanitarian assistance during cyclone Idai or any other natural disaster

   Yes (please elaborate)

   NO

4. What would most improve the effectiveness of digital innovations in Zimbabwean humanitarian work?

Section F: Zimbabwe-specific context

1. How would you rate the current digital infrastructure in Zimbabwe to su,ort humanitarian work? (1–5 scale)1 (Very poor) to 5 (Excellent)
2. How do you view data privacy, consent and data ownership in humanitarian data within Zimbabwe? (Very problematic) to 5 (Very positive)
3. Are there regulatory or policy barriers specific to Zimbabwe that affect digital initiatives? (Please describe.)
4. Are there any success stories or best practices from Zimbabwe that you can share?

Section G: Partnerships and governance (optional)

1. Which partnerships are most critical for scaling digital innovations in Zimbabwe?
2. What funding models or sustainability a,roaches do you think are most effective for harnessing digital humanitarian tools that are intended for natural disasters?
3. How have parentship or collaboration with other organizations facilitated in addressing digital humanitarian assistance in Zimbabwe?
4. Do you have a formal data governance framework for digital aid data? (Yes/No) I**f Yes, please summarize key elements**

NB: Questionnaire available at

Research Questionnaire for Cleopas T Mutema – Copy form