EFFECTIVE RESOURCES UTILIZATION IN DISASTER RELIEF EFFORTS FOR FLOOD VICTIMS

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The thesis is submitted in partial fulfilment of the requirement for the degree of Bachelor of Technology Management (Technology Innovation) with Honors

Faculty of Technology Management and Technopreneurship

Universiti Teknikal Malaysia Melaka

JANUARY 2024

DECLARATION OF ORIGINAL WORK

“I admit this report is the result of my own, except certain explanations and passages where every of it is cited with sources clearly.”

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DEDICATION

I would like to dedicate the appreciation to my family members who have been extremely willing to support me and have been a source of inspiration for me to successfully complete this thesis mentally and physically. Thank you for having always been here for me. Then, for my respected supervisor, Dr. Kamarudin Bin Abu Bakar and panel, Mr. Mukhiffun Bin Mukapit that have guided me throughout the research. Finally, also thank you to my fellow friends that assisted me throughout this research.

ACKNOWLEDGEMENT

I want to sincerely thank everyone who helped get this project done, especially the following people and organisations:

First and foremost, I want to express my sincere gratitude to my supervisor, Dr Kamarudin bin Abu Bakar, for his advice, knowledge, and support during this project. The direction and calibre of this work have been greatly influenced by his mentoring and insightful comments.

I want to express my gratitude to the staff and faculty, at University Teknikal Malaysia Melaka for providing the tools, infrastructure, and stimulating environment that made this research possible. Their assistance has been crucial for conducting tests, analysing data, and finding pertinent literature.

I also want to thank my colleagues for their helpful conversations, intelligent criticism, and support during various stages of this project. Their knowledge and viewpoints have had a big impact on this work's overall quality.

I owe a debt of gratitude to my friends and family for their never-ending support, understanding, and encouragement along this journey. They have been a constant source of inspiration because of their love, tolerance, and faith in me.

Finally, I'd want to thank everyone who kindly gave their time, effort, and involvement to this study's participants and volunteers. Their participation has been essential in producing insightful data.

ABSTRACT

Communities are faced with serious difficulties as a result of floods, which cause widespread suffering and the displacement of many people. This abstract is a summary of a study that looked at methods for maximising resource allocation and use in flood disaster relief at Johor. In particular, a unique research framework was created to investigate how disaster relief efforts is impacted by utilization of human, finance, social media, and technology resources. The results of this research study will demonstrate whether resources utilization will become the norm in disaster relief efforts for flood victims in order to survive. The most beneficial and effective aspect of resources utilization for the flood victims was also demonstrated by the conclusion of this. In Johor this investigation was conducted. The subject of the field study was flood victims at Johor district. 370 respondents filled out a questionnaire survey, providing the researcher with 370 sets of data. A quantitative research strategy using the survey research method and sampling was used to investigate the proposed relationships, and the Statistical Package for the Social Sciences (SPSS) was used to analyse the data. Consequently, the results of the Multiple Regression Analysis and Pearson's Correlation Coefficient demonstrated that the factors utilising resources that were most effective in terms of disaster relief efforts were technology resource, which had the highest Beta value, as well as human, finance, and social media. The study concludes that to lessen the pain and vulnerability of flood victims at Johor by enhancing the effectiveness and impact of disaster response activities.

ABSTRAK

Komuniti menghadapi kesukaran yang serius akibat banjir, yang menyebabkan penderitaan yang meluas dan pengusiran ramai orang. Abstrak ini adalah ringkasan kajian yang melihat kaedah untuk memaksimumkan alokasi sumber dan penggunaan dalam bantuan bencana banjir di Johor. Secara khusus, rangka kerja penyelidikan yang unik telah dicipta untuk menyiasat bagaimana usaha bantuan bencana dipengaruhi oleh penggunaan sumber manusia, kewangan, media sosial, dan teknologi. Hasil kajian penyelidikan ini akan menunjukkan sama ada penggunaan sumber akan menjadi norma dalam usaha bantuan bencana bagi mangsa banjir untuk bertahan hidup. Aspek yang paling menguntungkan dan berkesan penggunaan sumber untuk mangsa banjir juga ditunjukkan oleh kesimpulan ini. Di Johor penyelidikan ini telah dijalankan. Subjek kajian lapangan ialah mangsa banjir di Johor. 370 responden mengisi kaji selidik, menyediakan penyelidik dengan 370 set data. Strategi penyelidikan kuantitatif menggunakan kaedah penyelidik kaji selidik dan sampel digunakan untuk menyiasat hubungan yang dicadangkan, dan Paket Statistik untuk Sains Sosial (SPSS) digunakan untuk menganalisis data. Akibatnya, hasil Analisis Regresi Berbilang dan Koefisien Korelasi Pearson menunjukkan bahawa faktor yang menggunakan sumber yang paling berkesan dalam hal usaha bantuan bencana adalah sumber teknologi, yang mempunyai nilai beta tertinggi, serta manusia, kewangan, dan media sosial. Kajian ini menyimpulkan bahawa untuk mengurangkan kesakitan dan kerentanan mangsa banjir di Johor dengan meningkatkan keberkesanan dan kesan aktiviti respons bencana.

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LIST OF ABBREVIATIONS

GIS – Geographic Information System

UNICEF – United Nations Children's Fund

OECD - Organisation for Economic Co-operation and Development

DRFIP - Disaster Risk Financing and Insurance Program

KS - Knowledge Sharing

AI - Artificial Intelligence

VR -Virtual Reality

GPS - Global Positioning technology

PDNA - Post-Disaster Need Assessment

HR - Human Resource

FR - Finance Resource

SMR - Social Media Resource

TR -Technology Resource

SPSS -Statistical Package for Social Sciences

R - Correlation Coefficient

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CHAPTER 1

INTRODUCTION

1.1 Background of Study

Floods are the most frequent catastrophic occurrence and can be caused by heavy precipitation, rapid snowmelt, or a tempest flood from a typhoon or torrent in coastal areas. Every year, floods and other catastrophic disasters affect countless people worldwide. Floods and other extreme weather events are predicted to increase in frequency and intensity as a result of climate change. View of impacted persons as well as financial hardships vary widely. Environmental change is increasing the frequency and intensity of flood disasters globally, which nearly doubled between 2000 and 2009 compared to the previous decade. According to the Organisation for Economic Co-operation and Development (OECD), floods affect as many as 250 million people worldwide every year. Floods in 2019 resulted in financial losses of USD 45.9 billion and about 4500 deaths worldwide. The global death rate from natural disasters, including floods, is depicted in Figure 1.1.

Jansson and Marell (2018) proposed in general resources utilization is known as the process of natural resources extracted, transformed and consumed by human societies as it can be shaped into various factors like social, economic and political. Meanwhile, resources utilization in relief efforts of floods cited as identifying the immediate needs of victims and effectively make use of the available resources. There is an investigation conducted by Yang and Yu (2021) which shows by considering the level of damage in infrastructure and the availability of resources, the negative influence of floods on affected individuals can be minimized.

Besides, a statistical show that starts from the year 1980 until 2000 around 75% population lives in area around the world have been affected at least once by natural disasters like earthquakes, tropical cyclones, floods or droughts (United Nation,2006). It is believed that this kind of natural disasters has become the main reason in contributing high level of stress for affected victims which lead them to live their life in a state of fear (Hull, 2002). For instance, at the earliest, the occurrence of flash flood in India like Kerala Flood in 2016 and Chennai Flood in the year 2018 has been the motivation to provide effective resources, rescue and relief for affected victims.

In Malaysia, according to Salleh et al (2013) states that almost 22% from the overall population has been directly affected by floods due to changes of climate, use of land and frequency of rainfall. Mainly, there are two types flooding exist in Malaysia which are monsoon flood and flash flood. Based on Austin & Baharuddin (2012), Southwest Monsoon flood usually occurs around the month of May until August meanwhile Northeast Monsoon take place at the early month of November until February. Apart from that, flash flood said to happen mostly in the busy city as there are many uncontrolled human activities like infrastructure development near the river area were carried out (Othman et al, 2014). Abram (2014) mentioned that this circumstances definitely will give negative impact on life, property, health and therefore an effective resources utilization needs to be implemented in order to resolve the problem.

Mohit & Sellu (2013) states that the impacts of flood on humans can be reduced by developing dams, seawalls, levees and embankments which exactly alike as the construction of high concrete levees and pump along the Kelantan Rives where it managed to reduce the number of flood victims. Aside from that, according to Khalid and Shafiai (2015), resources utilization is an efficient preparedness during flood disaster by providing relevant information to the public through social media so that they will be more alert about flood risks.

Moreover, short message service (SMS) as well referred as one of suitable tool for using in flood management due to its role in delivering important information to the society, anywhere and anytime (Sahu, 2006). Even, in an article of Abeynayake, R (2020) he suggested that besides emerging of technological resources, use of traditional approaches such as sandbags tend to become an effective disaster relief effort during flood management.

Thus, effective resources utilization for flood victims should be encouraged in order to diminish the detriment of floods on residents and promote their long-term recovery and resilience.

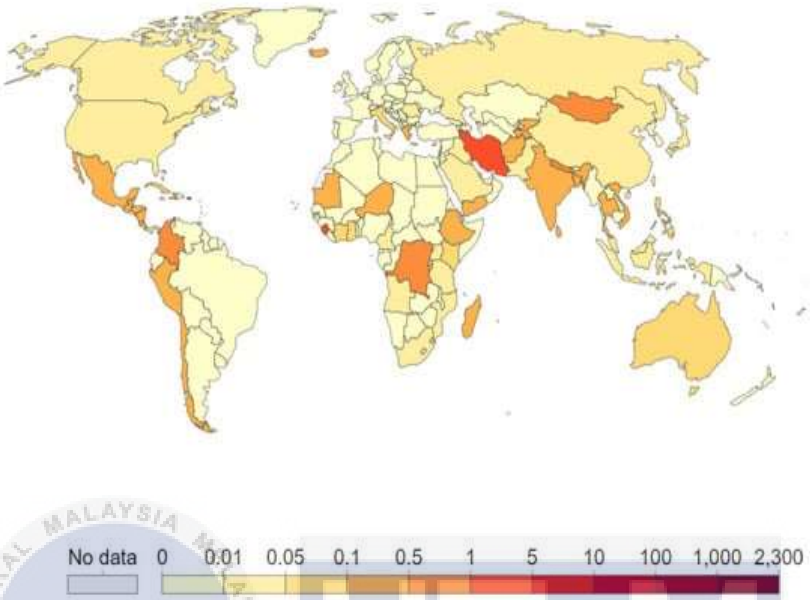

Figure 1.1 World death rate from natural disasters, 1990 to 2017

1.2 Resources Utilization

The term of resources is not recently have come into existence as for centuries humans have been using natural resources namely water, wildlife and forest to fulfil their basic needs. The demand for resources began to increase from time to time parallel to growth of human population. So generally, resources utilization can be explained as the efficient usage of available resources either in the form of assets or materials in order to achieve a specific purpose. It also refers to the measurement of how well resources are being used by the particular parties like organizations, project management and environmental sustainability to produce an expected outcome.

For instance, in business field resources plays a vital role by optimizing its consumption in sequence to maximize the productivity and minimize the waste. Meanwhile, for project management resources utilization is crucial to complete related tasks like completing the projects on time, within budget and to the required quality standards. Above all, in

environmental sustainability especially for flood disaster, resources utilization is dominant. Human, physical, financial and technology are the key resources which mainly involved in flood management.

First of all, human resources in flood management involved emergency responders, healthcare workers, volunteers and community members who responsible in the search and rescue operations, shelter management, distribution of relief supplies and as well in providing emotional support for the victims. Secondly, in the context of physical resources it is dominant too as equipment and infrastructure like pumps, generator and boats play a role in longer-term recovery efforts for flood victims.

Besides, effective utilization of financial resources in this relief efforts has an important function as it may rebuild the damaged infrastructure and provide sufficient support for affected communities in order to manage their future flood risks. On top of that, technology sources including drones, Geographic Information Systems (GIS) and satellite imagery has main role in identifying areas of need other than facilitate communication through social media like Facebook and Twitter.

In conclusion, effectual resources utilization is crucial in managing flood disasters and mitigating its influence on affected victims.

1.3 Flood Victims

Flood victims who have been affected by flood disaster is said they have experienced a range of impacts in the guise of lost their homes, belongings and damages to their property and infrastructure. As the consequence from this tragic incident, it is reputed that they may have to face emotional challenges like trauma, anxiety, and other mental health issues. This is mainly on the basis of not knowing what the future holds for them which can be extremely stressful to manage. Thus, it is vital for relief efforts in addressing the needs of flood victims either in the form or physical or mental.

In numerous cases, besides emotional challenges there are still other long-lasting effects like displacement, physical, economic and environmental impacts which may adept by the individuals affected. Physical impact is related to physical injuries endure by flood victims as a result of being caught in floodwaters. Aside from injuries, floodwaters also can cause

dangerous illnesses and infections. Furthermore, flood victims may suffer from economic and environmental impacts where it can be turn into long-term effects for their well-being and health. Ultimately, displacement can lead an individual to lose their employment and social networks by reason of shift from their houses and look for temporary shelter.

Besides, mental health support, food assistance, donation and fund-raising are known as some of the key components in disaster relief efforts for flood victims. Beyond any doubt this relief efforts have the potential in giving hand for those victims to recover from the impacts of floods. These efforts also involved cooperation from important authorities like governments, relief organizations, and local communities to provide support and necessary resources for flood victims.

It is acknowledged Red Cross and UNICEF are two prominent organizations that have long history of supporting and are actively involved in helping flood victims around the world. For instance, UNICEF come up with special attention to children that mainly affected by floods in the way safe places for them to play and learn. Furthermore, being prepared helps the community avoid the impending disaster by having a backup plan and ways to disperse preparation, ensuring that ready frameworks are operational, and setting up networks for the quick responses.

"Activities and capacity to respond to the abrupt debacle under pressure, vulnerability, different limitations, and restricted assets" is how the response is described. Actions like search and rescue missions, food distribution, medical assistance, and departure support, as well as prompt correspondence and transportation to the affected area, are all included in the recovery process. Lastly, as shown in Figure 1.2, integrated flood management (IFM) is a cycle that promotes an integrated approach to dealing with floods rather than a separated one.

Figure 1.2 Integrated flood management

1.4 Research Questions

RQ 1: Is there a relationship between the use of resources and flood victims' relief efforts?

RQ 2: Are there significant between the resources being used and the relief activities for flood victims?

RQ 3 :Is any resources used in a dominant manner, which is affecting relief operations for flood victims?

1.5 Research Objectives

RO 1: To determine the impact of resources utilization effectiveness on flood victims' disaster relief operations.

RO 2 : To compare the strengths of the of resources variables for flood victims' disaster assistance operations.

RO 3: To confirm which resources used is the most effective for flood victims' disaster relief.

1.6 Problem Statement

Flood which known as the most devastating natural disasters has given big impact on lives of million people worldwide. This disaster also has become a common occurrence in Malaysia as it occurs periodically. Therefore, effective and efficient utilization of resources is supreme to improve the awareness regarding flood management. First and foremost, exploitation of resources has the ability to maximizes the impact of relief efforts by ensuring the flood victims receives enough resources and at the same time the resources are always available when they are needed the most.

Besides, suffering among the flood victims can be reduced by providing them with basic resources like food, water and shelter. This is because generally flood disasters cause significant adversity especially for those who lose their homes, possessions and livelihoods. Furthermore, resources in physical form also essential in flood relief efforts like boats and

helicopters can be used mainly for emergency, search and rescue purposes (Naim, A & Roberts D. J,2009).

Meanwhile, by making use of technology resources in flood relief efforts may improve communication and coordination in the way resources like social media and mobile phones can build up the transmission between relief workers, affected victims and the broader community. Simultaneously, technology resources will enhance the safety due to use of wearable technology and mobile apps which can provide real-time alerts and safety information.

Apart from that, it is critical to note there are few disadvantages of effective resources utilization for flood victims like logistic challenges in the circumstances especially when infrastructure and communication systems involved in relief efforts damaged or disrupted which can bring impact for flood victims. Secondly, insufficient resources can lead to difficult decision about which groups or individuals need to receive aid among all those affected by flood (Alexander, D.,2005). Moreover, the act of political interference as well may bring negative effect in disaster relief efforts for flood victims like the efforts may directed towards only certain groups in political instead based on need.

Another downside of resources utilization is ethical concerns. For instance, there is a risk that resources allocated may not be distributed equitably or unfair which can create misunderstanding or conflict in the midst of affected communities. Last but not least, dependency on external resources also may become a challenge for flood victims when they failed to develop their self-reliance to face the future disasters.

Hence, there is need for research interventions on the effective use of available resources among Johor district flood victims in order to ensure they receive enough support to recover and rebuild in a sustainable and equitable manner.

1.7 Significance of Study

i. To identify strategies and best practices that can help optimize the use of available resources during disaster response efforts

ii. To improve the efficiency and effectiveness of disaster response efforts, minimize wastage, and ensure that resources are allocated where they are needed the most.

iii. To recognize gaps in disaster preparedness and provide insights into how to strengthen the preparedness efforts

1.8 Scope of Study

The study has a few scopes that may influences its findings either directly or indirectly

Primarily, data collection will be limited to people who are involved in the flood disaster like individuals and families whose homes and possessions have been damaged or destroyed by the flood and as well volunteers who tasked with providing support and assistance to affected communities.

Secondly, the research location selected is Johor district. Therefore, data samples and analysis done will not reflect the whole population of Johor and maybe more study can be continued at other areas of the state for better representation of the findings.

Thirdly, certain conditions like consent, confidentiality and cultural sensitivity need to be considered among the respondents in order to make sure the process is ethical and respectful related to the needs and rights of affected individuals. Moreover, it is important to ensure the areas have strong communication lines like internet due to reach flood victims by use multiple channels such as email, social media, phone calls and in person visits.

Based on these factors, the study may encounter difficulty to ensure smooth research process which may affect the time planned

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

An analysis of the literature, according to Creswell (2005), "is a written summary of journal articles, books, and other documents that describes the past and current state of information, organises the literature into topics, and documents a need for a proposed study." Meanwhile, a systematic literature review is described as a "systematic, explicit and reproducible method for identifying, evaluating and synthesising the existing body of completed and recorded work produced by researchers, scholars, and practitioners" by Fink (2014). A literature review can be used to create a research question or hypothesis by synthesising the material that is already accessible on a subject.

Finding, examining, and interpreting pertinent literature on the subject of interest are steps in the literature review process. The research question and the study's scope are established at the outset of the literature review. Through methodical search techniques, such as electronic databases, academic journals, and reference lists of pertinent publications, relevant sources are found. The relevance, quality, and significance of the selected sources to the research issue are then assessed and examined.

A successful literature review should provide a thorough synthesis of the information that is currently accessible, critically analyse the body of research that has already been done on the subject, and identify any research gaps. Along with any biases or restrictions that might have an effect on the results, it should also highlight the advantages and disadvantages of the prior research. A solid literature evaluation can support a research project's legitimacy and serve as a roadmap for future studies.

Reviews of the relevant literature can provide light on successful resource management techniques that have been used in prior catastrophes and point out areas that require additional study and development in the context of natural disasters. This is especially important when dealing with flood disasters, which are frequent and deadly phenomena that impacts millions of people globally.

Communities can be significantly affected by floods, which can disrupt essential services like transportation, water, and electricity and result in property damage and fatalities. In order to minimise the harm caused by a flood disaster and make sure that impacted communities can recover and rebuild, proper resource management is essential both during and after the disaster.

Researchers can better grasp the complexities of flood disasters and the best practises for reacting to them by analysing and synthesising the available literature. This can entail planning relief operations, managing water resources, and figuring out efficient ways to evacuate affected populations. Reviews of the literature can also emphasise how technology, social media, and community involvement play a part in the efficient use of resources during flood catastrophes.

Literature studies can not only reveal how best to use available resources in flood catastrophes, but they can also point out gaps in the body of knowledge and suggest new areas of investigation. The effectiveness of particular resource-use methods in various contexts can be examined, as well as the influence of climate change and other factors in amplifying the effects of flood disasters.

In general, literature evaluations are essential for expanding our knowledge of flood disasters and guiding efficient resource management plans. Literature reviews can help develop more efficient and long-lasting strategies for reacting to flood catastrophes and protecting vulnerable communities by synthesising existing knowledge and highlighting important topics for additional research.

2.2 Effective Resources Utilization

According to Peter Ducker (2004), management author and guru, effectiveness outlined as doing the right thing which has the capability to produce a positive impact. Since 1971, floods in Malaysia have impacted numerous locations. 'Manual Saliran Mesra Alam' (MSMA) is a tool that Malaysia introduced in 2001 to be utilised in integrated flood management Chan (2012). Effective flood forecasting and warning systems, in contrast, are an example of non-structural approaches Jabatan Pengairan dan Saliran (2013). The techniques for managing floods that have been previously released have demonstrated that Malaysia has taken steps to lessen the effects of floods on human health and regions where lives are at risk.

2.2.1 Human Resources

Leon C. Megginson (2011) mentioned human resources as the set of organization's activities which involved knowledge, skills, talents and creative abilities in a way to develop and maintain an effective labour force. It was said that the role of human resources (HR) in managing disasters started to make the grade since the attacks of Tsunami in Japan, Earthquake in Kashmir, hurricanes and heavy floods. Public administration agencies and institutions actively participating in the flood response can be categorised into managing units and executive units from the perspective of human resources. Central state administration authorities, other state administration authorities, self-administration authorities, and personal support by them constituted boards and units are the managing units. The administrator of water-management significant watercourses and their personal support, the integrated rescue system and its personal support, the fire brigade's personal support, the police's personal support, the civil protection units' personal support and the army's personal support are examples of executive units.

2.2.1.1 Joining Salvaging Efforts

Nowadays, many countries support and empower younger generation or youth as they known as the backbone of any nation and their responsibility in bringing changes is crucial to national growth (Lopez, 2012). Until now, it was declared the role of youth in disaster management has received very little attention (Eker & Yilmabaşar,2018) and this situation mainly occurs because the older generation still dominates the movement. In actual fact, youth have a critical role in handling disaster management like floods. They can help their societies in educating them on floods preparedness and mitigation strategies. Besides, they even may take immediate action in the event of emergency owing to higher level of physical energy (Rahman, 2020). For instance, Ahmad (2021) examined the role of youth during the mid-December flood 2021 which happened in the states of Selangor. There were more than 50,000 volunteers and among them around 60 per cent under 35, rushed to help flood victims by providing them food, temporary shelter and as well utilize private boats especially for the victims who are elderly or infirm.

2.2.1.2 Support Services

According to Baharuddin (2015), there are totally four phases in flood management and out of that response are the most important phase which should be given more attention. The phase of flood response requires emergency action that will be taken during the disaster (Khalid & Shafiai, 2015). In general, the management of flood disaster involves cooperation from agencies and communities such as social workers and mental professionals in providing support services for those affected by the devastating flood. There a few responsible agencies of flood management in Malaysia. Police Department, Fire and Rescue Department, Civil Defence Department, Welfare Department, Public Works Department and Health Department are the intended examples of agencies which have different roles and response (Katul et al, 2009). For example, health and medical department like St John Ambulance may give their support services in the form managing the emergency treatment and public health.

2.2.1.3 Education and Training

Thinking and learning organizations can be categorized into two groups (Garvin & Edmondson, 2008). At first, by creating, acquiring, generating and holding knowledge it can be determined and followed by adjusting it according to the performance and knowledge acquired. In flood management, human resources like educators and trainers can play a pivotal role by contributing proper and sufficient training along with educational resources to community in a way to help them for flood preparedness and resilience. This is chiefly on the grounds most disaster victims consist of children, women and older people whom potential to face high hazards level during the disaster (Tearne et al, 2021). According to Sogand (2019), individual who are well educated and trained in disaster preparedness tend to reduce flood risks and as well collaborate with responsible agencies.

2.2.1.4 Managing Stress

In organization level, everyone should pay extra attention to the requirements and issues of employees, but managers and HR professionals in particular. It should be remembered that the secret to controlling stress reactions is preparation. Pre-disaster psychological health and coping mechanisms of the affected person have a significant impact on how they will react to the disaster. Another crucial issue that will affect how someone responds to the challenges of a crisis situation is the stability of his or her home, career, neighbourhood, and country

2.2.2 Finance Resources

From the point of view Oosthuizen (2003), financial management in disaster referred to the distribution and use of money for the purpose of managing financial impact of such disasters on affected individuals and communities. Disaster Risk Finance (DRF) or well known as Disaster Risk Financing and Insurance Program (DRFIP) plays a major role in addressing the fiscal impacts caused by natural hazards like earthquake and floods and as well helps countries to ensure their countries are financially protected. It is said that the increase of built-up regions vulnerable to flooding and the build-up of assets in flood-prone areas have

significantly increased the size of the consequences resulting from flood disasters. By the year 2030, some estimates claim that more than half of the world's population would reside within 100 kilometres of the coast Lloyd's (2008). Given that the number of persons vulnerable to floods is anticipated to expand faster than the general population, the frequency of flood disasters is predicted to rise Keating et al (2014). Growing urbanisation will make this tendency worse since it reduces the ability of urban areas to absorb rainwater and causes water runoff to be substantially higher than it would be in a natural terrain.

2.2.2.1 Insurance Coverage

Insurance has a key role to play in fostering disaster resilience due to its ability in providing financial protection like post-disaster funding. Lucas (2015) indicated government all over the world discover that raising funds when disaster occurs is burdensome. To overwhelm this problem, parametric insurance should be in place. On the report of Kaplan (2017), parametric insurance explained as a type of insurance contract which based on the characteristics of catastrophic event. In parametric insurance, after a catastrophic event happened the actual damage will not be covered by the insured (Artemis, 2017). Moreover, involvement of insurance companies is vital in parametric insurance as a way to transfer big catastrophic risk to international markets (Sirimanne, 2015).

2.2.2.2 Emergency Funds

The main aim of funds provided by governments and several organisations is to support affected individuals by supplying them with immediate and needed financial assistance like food, shelter and clothing. However, it has been noted that the need for more reliable channels for flood response has been emphasized. This is why public emergency reserves must be established by government and business for a quick reaction to unforeseen and extreme disasters like floods. One example of a government emergency fund was the National Flood Insurance Programme, which was created to offer homeowners inexpensive flood insurance

and lessen the dependency on disaster relief funding for towns devastated by flooding. Distribution of aid has also generally been effective and impartial in recent years.

2.2.2.3 Managing Fiscal Cost of Floods

Governments (local, regional, and national) in flood-prone nations incur a large expense managing the financial risk of flooding. This covers both the ex-post expenses of responding to emergencies, rebuilding public property, and providing compensation and financial aid to sub-national governments, businesses, and people harmed by floods, as well as the costs of ex ante risk mitigation investments. For instance, between 2005 and 2013, the federal government of the United States paid out over USD 30- 40 billion annually for assistance with natural disasters Conrad and Thomas (2013). Besides, in Australia, Canada, and New Zealand, sub-national governments receive compensation based on a cost-sharing formula that varies according to the amount of sub-national government expenditure in relation to financial capacity with the federal share rising as the burden on sub-national governments increases). These initiatives pay back a portion of eligible costs incurred by subnational governments for things like disaster relief, restoring and rebuilding public and sometimes private assets.

2.2.2.4 Building and Repairing Damaged Infrastructure

Roads, bridges, structures, and other vital infrastructure can sustain considerable damage from floods. Bridges are crucial for preserving access for evacuation and the provision of emergency services, including medical care. Bridge replacement after a flood is challenging and expensive. Designing the approach roads to be the weakest link in the chain is an alternative tactic that will prevent bridge damage from extreme events that would otherwise wash out the road. After a flood occurrence, approaches can be quickly repaired and transit channels can be reopened. Road designs that run alongside rivers or that lead to bridges need to be carefully considered. The temptation is to raise flood-damaged roads without giving enough thought to the number and size of openings required to pass nearby drainage or tributary inflow. In such circumstances, the road may artificially elevate upstream water levels, increasing the risk of

flooding. When roads run alongside to rivers, they can also serve as levees. Therefore, this infrastructure needs extensive financial resources to be rebuilt and repaired, and not all impacted towns will have access to these resources.

2.2.3 Social Media Resources

Social media is become a common form of communication and vital part of many people's lives in general. Many people have access to a variety of options through social media for content generation as well as consumption, creating easy opportunities for social interaction (Yates & Paquette, 2011). According to Yin & Power (2012), Big Data gathered from social networks can be applied for more serious goals like increasing public awareness of diverse phenomena and world events like natural or manmade disasters among a sizable population on a national or even international level. Utilising online social media will help reduce loss, death, time, expense and administration requirements.

2.2.3.1 Knowledge Sharing (KS)

During flood catastrophes, online social media has developed into a tool for knowledge sharing (KS). KS stand for knowledge management which entails carrying out a single knowledge process or a number of them such as sharing, producing, integrating, combining and utilising knowledge. Information sharing through KS can be improved by using online social media features including personal profiles, group conversation and opinion expression. So, based on the claims by earlier writers, online social media can improve KS when disseminating information and knowledge concerning flooding related accidents (White, 2010). Online networks like Facebook and Twitter, as well as the content sharing websites Flickr and You tube play a significant role.

2.2.3.1.1 Facebook

Facebook is a well- known free social networking website that enables registered users to make profiles, updates statuses, upload pictures and videos, and comments on each other's posts, send messages and join groups with shared interests. The wall which functions as a kind of online bulletin board maybe found inside each member's individual profile. Posts on these Walls may make it simple for users to locate news regarding flooding.

2.2.3.1.2 Twitter

Twitter is an online social media platform that allow users to send and read 140 characters updates or "Tweets" that are text based. Twitter allows users to tag messages with one or more hashtags which are words or phrases that begin with the # symbol. Within Twitter, users can search for hashtags and all postings that contain the desired term or phrase will show up in the search results. During the 2011 Victorian floods, the hashtags #vicfloods and #vicrains were widely used. The twitter '@' sign is used to identify specific user accounts which are then followed by their names. A couple of examples are @victoria_ses and @QPSmedia.

2.2.3.1.3 Whatsapp

The WhatsApp app is one of the most widely utilised messaging tools available tool. WhatsApp Messenger is a cross-platform instant messaging service that enables smartphone users to send text, image, video and audio messages to one another or to groups of people making it possible to easily share information about flooding.

2.2.3.2 Communication

The development of telecommunications networks and technology over the past ten years has provided a promising answer to these problems. Through the extensive use of mobile devices and networking technology in a community, this dynamic technology connected people (Abedin et al, 2015). Social media has the ability to improve the timely and consistent dissemination of important information across the disaster management life cycle, which contributes to the creation of a community that is catastrophe resilient, according to the evidence. According to Houston (2015) social media is thought to be superior and advantageous in disaster communication compared to traditional communications like newspaper and television. Key features of social media include increased capacity, dependability, interaction, affordability, ease of use, scalability, mobility, fast network, various communication channels, and GIS (geographic information systems) capacity.

2.2.3.3 Collaborative Problem Solving and Decision Making

By integrating different information streams from mobile and web-based technologies to fill the perceived sense-making and information gaps as well as to aggregate, analyse, and plot data about urgent humanitarian needs, crowd-sourcing using social media facilitates collaborative problem solving and decision-making. Authorities are more equipped to manage and react to a variety of potential crisis-related circumstances as their knowledge base expands.

2.2.3.4 Disaster Planning and Training

Gamification makes use of social media to encourage scenario preparation, employee training, and cooperation between diverse crisis management organisations from the public, corporate, and civil society organisations. Through ongoing stakeholder training and participation, gamification can improve present crisis management practises.

2.2.4 Technology Resources

Carreño et al (2007) mentioned that the digital development of technology creates more safety precautions for indications of natural disasters. For measuring the disaster management indicators, it's very challenging of conceptual, technical and numerical perspectives for using the indicators. The measurement of indicators must be easily understandable, robust and transparent at the policy level, national and urban level. The assessment of disaster losses and the identification of more precise information on the managing situation following disasters like floods, landslides, tsunamis, and severe rainfalls in some parts of the world are made easier by developed technologies. All actors must be aware of the current situation and what will happen next for emergency operations to be successful (Radziwill, 2017). In times of disaster and emergency, a variety of technologies including drone applications, early warning systems, wireless sensor networks, and digital media are particularly useful (Nohman Khan & Qureshi, 2020).

2.2.4.1 Artificial Intelligence

From the point of view Saravi et al (2019) artificial intelligence (AI) technologies, more notably Big Data Analytics and Machine Learning, have been used to extract patterns and information that may be employed in pertinent disaster management activities. For instance, Desouza et al. (2017) describe how the Cincinnati Fire Department in the United States uses artificial intelligence (AI) to analyse emergency calls and use the call's factors such as type of call, location, weather, whether a person needs to be treated or get to a hospital to find patterns that help recommend an appropriate response and prioritisation, optimising in this way the response times and effectiveness. Even, there are numerous works have been written about the use of AI to anticipate natural disasters and their usefulness in planning, preparation, and other disaster activities. Robots and drones might be included in their own area, but they are also regularly included into the AI technologies. They are widely used for site and situation evaluation, search and rescue operations, as well as for accessing locations where humans cannot.

2.2.4.2 Augmented, Virtual and Mix Realities (Xr)

Systems for training first responders, support responders, or the general public are some of the most popular applications of XR in disaster and risk management. Many of these systems use simulations to attempt to simulate genuine training with less expense and danger. Mossel et al (2015) describes VR is a system that can be used for training purposes to replicate an evacuation from a tube while an evacuation drill training game that uses augmented reality to concentrate on more realistic situational and audio-visual elements of emergency scenarios is described by Mitsuhara et al (2017).

2.2.4.3 Internet of Things (IOT)

The technology enabling disaster and risk management also heavily relies on the ever-expanding network of sensors and software gathering data and interfacing. IoT technology can be utilised to streamline the gathering and prompt dissemination of pertinent data, such as water level during flood disaster, photographs, and videos that could help decision-making for the pertinent processes and stake holders. Data aggregation for decision-making, early warning messages, traffic information that aids first responders in choosing the quickest route to disaster sites. For example, the NASA Finder is a radar that can detect minuscule movements and heartbeats up to 100 feet away and through 30 feet of deep rubble. It has been utilised in search and rescue efforts, such as those conducted during the 2015 Nepal earthquake Greicius (2015).

2.2.4.4 Mobile Technologies

Many times, one or more of the aforementioned technologies are integrated with mobile devices and applications. Different disaster risk management stakeholders offer mobile applications that provide support information everywhere at any time, including readiness and training for various disasters, weather warnings, and hurricane and tornado trackers. Additionally, it is clear that younger mobile phone users are more driven to use their devices frequently during flood, and that satisfaction from entertainment and mobility needs tends to predict increased frequency in using the mobile phone as a communication tool during this

time. Since using a mobile phone keeps flood victims calm and entertained and lowers the stress level associated with dealing with and managing the ongoing flood, it is possible that the stressful environment surrounding the flood period necessitates frequent and varied mobile phone use. Besides, ongoing use of the mobile phone throughout the entire period is possible because it is a versatile and practical communication tool, especially for people who are confined to their houses due to decreased mobility. Users of mobile phones are therefore more inclined to use them frequently during the course of the usage period since they are able to satisfy their needs for mobility and entertainment Ho & Syu (2010).

2.2.4.5 Geographical Information System

A geographic information system is a computer-based system that combines hardware, software, data, people, and methods to answer geographic-related questions as and when needed. The Global Positioning technology (GPS), a satellite-based technology that provides precise location information wherever on earth, may be seen as the evolution of maps. For risk assessment in a specific location, it may be helpful. Using network analysis, GPS can help emergency personnel discover the shortest route and identify dangerous locations. When used in conjunction with GPS and remote sensing, it can be particularly helpful for search and rescue efforts during an immediate emergency of flood. It also can be used to choose emergency operations centres and locate evacuation routes. In order to forecast and simulate disaster occurrences with reference to dangers in specific locations, it is used to organise damage information, evaluate sites for reconstruction, and forecast and simulate disaster occurrences.

2.2.4.6 Web-Based System

According to Katuk et al (2009), information and communication technology (ICT) needs to be used in the flood management process, particularly during the flood response phase, to ensure that the responsible agencies can collaborate and make decisions more effectively and efficiently. Moreover, by using the technology, the process of data documenting and reports generating can be carried out quickly and accurately. In the meantime, a recent study by Khalid and Shafiai (2015) noted that ICT had been used in Malaysia during the preparation stage of flood control to display real-time information about rainfall and river water levels. This is done through the Info Banjir website, which makes the claim that it effectively notifies the public of early flood warnings.

2.2.4.7 Mapping

Maps representing locations vulnerable to natural catastrophes are useful communication and informational tools. They can be used for a wide range of tasks, including as zoning and land use planning, the delineation of flood plains, and the presenting of information at public gatherings. However, zoning maps are static and may need to be updated over time as changes take place. Maps are a helpful reference tool for a wide range of users since they contain static information that does not require frequent updating, such as the delineation of the flood-prone area.

2.3 Disaster Relief Efforts for Flood Victims

2.3.1 Saves Lives

According to a post-disaster need assessment (PDNA) report, families who have been uprooted or affected by calamities sometimes dwell in unsanitary, poorly run shelters with inadequate food supplies. A crisis is an immediate, swiftly evolving occurrence that occurs during flood disasters. Effective emergency planning and response are so essential. Ineffective planning and reaction to catastrophes can have detrimental and protracted effects on a community and increase fatalities. Flood disaster management by having effective resources can improve first responders' capacity to save lives. Communities can withstand the anxiety

and grief brought on by catastrophes when the proper infrastructure is put in place and training is done to improve disaster response.

2.3.2 Improve Community Resilience

The local community is the first to react in the event of any calamity. Therefore, for a catastrophe solution like flood disaster management to be successful, it must be based in the community. Educating a community on how to lower the underlying risk and create preventative measures before a disaster actually occurs is the main strategy of disaster education. Yodmani (2001) refers this as disaster risk reduction. Communities must be educated about Disaster Risk Management in addition to learning about lowering risk to prevent catastrophes from happening. Usually, response teams face the difficult duty of attempting to assist individuals in difficult circumstances when a flood strikes. Because an unprepared and unskilled response team will know little about the people they are working with, the task could be very difficult. A crisis management response team's effectiveness can be increased with training, though. One of the most important aspects of effective resources utilization like is learning the abilities required to assist individuals in difficult situations.

2.3.3 Improves Health

According to Tunstall et al. (2006), flood-affected populations are all directly or indirectly at risk for negative health effects both during and after the event. A community's health may suffer as a result of flood disasters and their aftereffects. Flood disasters can result in a rise in illness, a lack of immunity, and a higher risk of infection along with a shortage of clean water and medical services. As a result, it's critical that communities have access to health professionals, a sufficient supply of water, clean restrooms, and emergency medical care both during and after a disaster.

2.3.4 Reshapes Communities

The local economy might be severely impacted by catastrophes. During the flood, communities frequently sustain significant financial losses and may find it difficult to recover from these losses. The social structure of a community may also be affected by this disaster. Effective resources management can aid in community reconstruction and re-establish interpersonal relationships. After a tragedy, communities can start to repair their local infrastructure, which will help boost their economy. In many instances, this will boost the economy as a whole and enhance the quality of life for people.

2.3.5 Strengthens Social Contracting and Trust

Flood disasters can threaten the stability of society and the government. During or after a disaster, governments, major corporations, and other significant organisations frequently fail to safeguard the populace, which can exacerbate social inequality, mistrust, hatred, and violence. As a result, social institutions may become weaker and people may be more vulnerable to aggression and coercion. In some circumstances, people may seek the help of other authorities to resolve their issues. This might result in the formation of organisations that take advantage of these disparities and hurt some people. Large companies or other unaccountable institutions may serve to reinforce this. As a result, democracy may suffer, and there may be more inequality and poverty

2.4 Research Framework

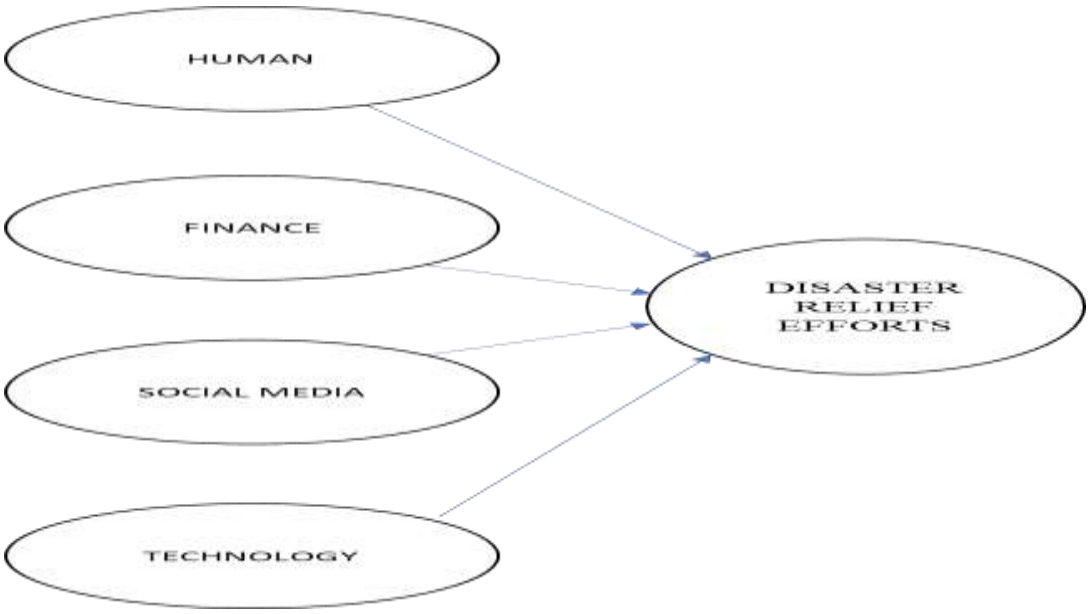

Figure 2.1 Research Framework

2.5 Hypothesis

H1: Human resources have significant relationship with disaster relief efforts for flood victims

H2: Finance resources have significant relationship with disaster relief efforts for flood victims

H3: Social media resources have significant relationship with disaster relief efforts for flood victims

H4: Technology resources have significant relationship with disaster relief efforts for flood victims

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

The methodology used for this study will be explained in this chapter. Research strategy, time horizon, research site, data analysis techniques, and research design are some of the elements that may be engaged in conducting the study.

In everyday speech, the term "research" refers to the pursuit of knowledge. Another way to describe research is as a methodical and scientific search for relevant data regarding a particular subject. In actuality, research is a form of artistic scientific inquiry. The definition of research according to the Advanced Learner's Dictionary of Current English is “a careful investigation or inquiry especially through search for new facts in any branch of knowledge”. Research is described by Redman and Mory (2006) as “a systematic effort to gain new knowledge”.

According to Clifford Woody (2005), conducting research entails defining and redefining problems, formulating hypotheses or suggested solutions, gathering, organising, and analysing data, drawing deductions, and arriving at conclusions. Finally, the conclusions are carefully tested to see if they agree with the hypotheses that were originally proposed. Research adds new information to the body of knowledge already in existence, thereby advancing it. It is the search for the truth via research, observation, comparison, and experimentation. In a whole, research is the process of seeking knowledge through an organised, methodical approach to a subject.

3.2 Research Design

A research design is an arrangement of parameters for data collecting and analysis that seeks to balance procedural economy with relevance to the study goal. The research design serves as the conceptual framework for the research process and as the guide for data collecting, measurement, and analysis (C.R. Kothari, 2008). Research design is necessary because it makes easier for the various research activities to go smoothly, which maximises the amount of information that can be obtained with the least amount of work, time, and money. Adjectives like adaptable, appropriate, efficient, inexpensive and so on are frequently used to describe a good design. A good design is typically one that minimises bias and maximises the reliability of the data collected and processed. In many research, the best design is considered to be the one that results in the minimum experimental error. Similar to this, a design that generates the most information possible while allowing for the consideration of numerous distinct elements of an issue is thought to be the most appropriate and effective design in relation to many research challenges.

This study will implement exploratory research in order to clarify ambiguous problems which are not clearly defined. When the objective is to obtain a deeper understanding of the variables influencing resource utilisation in disaster relief activities for flood victims, an exploratory study would be appropriate. For this kind of study, it would be necessary to conduct interviews, questionnaires, and observations in order to understand the various viewpoints, experiences, and difficulties that different parties involved in relief efforts confront. It would be useful in identifying new themes, gaining fresh perspectives, and producing hypotheses that might assist guide resource allocation methods even further. Exploratory study would be helpful in examining the subtleties and complexities of resource utilisation and in coming up with concepts for improved strategies.

According to Glass & Hopkins (1984), pilot testing of the research tools, such as questionnaires, survey protocols, or data collection techniques, is possible when using an exploratory strategy. Before beginning the more extensive quantitative study, researchers can evaluate the tools' clarity, validity, reliability, and usefulness by evaluating them on a small sample. This aids in improving the research tools and assuring the quality of the data gathered for the primary study.

3.3 Research Methodology

This research will be analysed in the quantitative approaches. The term "quantitative research" is defined differently by many scholars and academics. According to Wikipedia Encyclopedia (2005), the numerical representation and manipulation of observations with the purpose of describing and interpreting the phenomena those observations reflect is known as quantitative research. Besides, Cohen (1980) proposed that social study that uses empirical techniques and claims is referred to as quantitative research. He claims that a descriptive statement about what "is" the situation in the "real world" as opposed to what "ought" to be the case is what is meant by an empirical assertion. In quantitative research, empirical evaluations are used as another factor. Typically, empirical statements are stated in numerical terms. According to the definition of an empirical evaluation, it is a method used to assess how well or how poorly a given programme or policy actually adheres to a given standard or norm.

Using a variety of statistical and graphical methods, quantitative research analyses correlations between variables that are measured quantitatively. A single method of data collection, such a questionnaire, and related quantitative analytical process may be used in a quantitative research design. This is an example of a single quantitative technique study. Additionally, many quantitative data collection methods and associated analytical techniques may be used in a quantitative study design. A multi-method quantitative study is what this is. The subfield of multiple method research known as "multi-method" employs various quantitative or qualitative techniques without combining any of them (Bryman, 1998).

Quantitative research comes in a variety of forms. It can be categorised as survey research, correlational research, experimental research, and causal-comparative research. Each variety has its own distinctive traits. As an example, Creswell (1994) defined that survey research employs statistically precise questionnaire design and scientific sampling to determine population characteristics. It aims to answer queries like "How many people feel a certain way?" and "How frequently do they engage in a particular behaviour?". Research through surveys enables management to compare groups. It is a requirement of survey research that respondents be "randomly" sampled, which means that each member of the population has a known probability of being chosen for the survey. To guarantee a scientific sample, there are established methods such as random digit dialling and sampling protocols.

First of all, I chose this approach due with the help of quantitative approaches, numerical data may be gathered and analysed to produce measurements of variables that are indisputable.

This is especially beneficial when researching quantifiable phenomena, such as the amount of rainfall, water levels, property damage, or the number of affected people, which are all quantifiable phenomena. The validity and dependability of the research findings are increased by objective measurements. Besides, in terms of gathering and analysing data, quantitative research techniques can be effective. Many people can receive surveys or questionnaires, and statistical tools can be used to analyse the results. Due to my efficiency, I can collect a significant amount of data and calculate accurate measurements of variables, which improves the accuracy and precision of my conclusions.

Statistical analysis methods also can be used in quantitative research to look for patterns, connections, and trends in the data. This gives the ability to test ideas, pinpoint important variables, and reach judgements based on statistical data. The robustness of my findings will increase by the rigorous and methodical approach that statistical analysis offers to data processing. Last but not least, findings from quantitative research can significantly influence how policies and decisions are made. Policymakers may allocate resources efficiently and make decisions based on solid evidence when they employ quantitative data. My study can directly influence the formulation of policy and flood management strategies by offering empirical evidence of the effects of flood catastrophes and the efficacy of particular solutions.

3.4 Location Research

Johor, which is sometimes spelt Johore, is a state in southern Malaysia on the Malay Peninsula. To the north, it borders Negeri Sembilan, Malacca, and Pahang. Johor borders Indonesia to the west and east and Singapore to the south across the sea. The state's administrative and commercial centres are at Kota Iskandar, the capital city of Johor Bahru, and the royal capital of Muar.

I chose Johor as my location research due to several reasons like the population density in Johor is including both urban and rural areas. Because more people and infrastructure are at risk due to this density, flood catastrophes may be more severe and have a greater impact. Studying flood disasters in a highly populated area can offer important insights into the difficulties and effects that communities must deal with. Apart from that, Johor includes a variety of landscapes, including metropolitan areas, riverine regions, and coastal areas. Each

of these regions could have a different flood risk profile and specific management and mitigation concerns. By deciding to do my research in Johor, I can examine the many geographic factors and how they may affect flood disasters.

Moreover, the socioeconomic diversity of Johor may have an impact on how vulnerable or resilient its neighbourhoods are to flood catastrophes. The effectiveness of preparedness, response, and recovery operations can be affected by variables like income levels, infrastructure development, and resource accessibility. I can evaluate these policies' efficacy and the coordination of different parties, such as governmental and non-governmental organisations, by concentrating on Johor.

Figure 3.1 Johor map

3.5 Research Strategy

A plan for how a researcher will approach solving a research issue might be considered as a research strategy. The philosophical foundation and subsequent method selection for data collection and analysis are connected methodologically by this (Denzin and Lincoln, 2018). After a research problem has been identified and a research design has been developed, the work of data gathering begins. Two categories of data which known as primary and secondary should be kept in mind while choose the technique of data collecting to be employed for the study. The procedures for gathering primary and secondary data are different since primary data must be gathered initially, but secondary data only require compilation. The collection of data will be done using primary and secondary data sources.

3.5.1 Primary Data

Primary data is collected to address specific research questions. It consists of information that is new or that no one else has ever gathered before. Several research techniques, including surveys, interviews, observations, experiments, or direct measurements, are used to collect primary data. Citing primary sources helps establish the validity and dependability of research. By citing the source of data, it provides readers the opportunity to assess the accuracy and reliability of the data. This boosts the overall credibility of research and makes the findings more reliable.

3.5.1.1 Survey

One of the main methods for gathering quantitative data on the components of a population is the survey method. Even in the public and commercial sectors, surveys are used to gather data in a variety of contexts. The researcher could carry out a survey there. The researcher personally calls, emails, or otherwise contacts the respondents. Although this method is time-consuming, expensive, and labour intensive, the facts that are gathered are very accurate, current, and pertinent to the subject. The survey is referred to as a a survey that was administered by a researcher when the questions were asked. One of three main subtypes of survey strategies are known as census, continuous or regular survey, or ad hoc survey. With the

exception of censuses, continuous and regular surveys are those that are repeated over time (Hakim, 1982).

3.5.1.2 Questionnaire

Cassell (2016) defined questionnaire as a tool for data collection that standardises communication between the interviewer and respondents. The same questions are asked to each respondent in the same order, and they all receive the identical answer options. Private individuals, researchers, private and public institutions, and even governments are utilising it. A questionnaire is made up of a number of questions that are printed or typed on a form or set of forms in a specific order. The questionnaire is mailed to respondents, who are supposed to read, comprehend, and respond to the questions in the area provided on the actual questionnaire.

The questionnaire survey will be held on using online platform which the participants is the flood victims of Johor. The questionnaire link will be sent to participant using social network. The questionnaire will be divided into four parts where the first part covers the demographic information of respondents like age, location and gender. Under the effectiveness section overall there will be four sub parts. Firstly, about their experience during flood disasters. Secondly, I would like to conduct question namely whether how severe was the impact of the flood disaster on their life. Above all, most importantly preparedness and awareness for instance “Did they have a preparedness plan in place before the flood disaster occurred?” or “How informed do they feel about flood disaster prevention and mitigation strategies?”. Even, evacuation and shelter, government and community response and their suggestions for improvements also would be some of my choices of questions for my participants. My respondents would be 370 flood victims around Johor. Although the survey will be explored through online, in the form of time I will try to conduct the questionnaire in person at the convenience of my respondents. As I have encountered a questionnaire survey before it is faster and easy to analyse.

3.5.2 Secondary Data

Data that has already been gathered or created for a different purpose is referred to as secondary data. It is already-existing data that can be examined (Eurostat, 2017). The primary benefit of adopting secondary data for many research questions and goals is the tremendous resource savings, especially in terms of time and money (Vartanian,2011). Generally speaking, using secondary data is far less expensive and time-consuming than collecting the data on own, especially when the data is available for download as a file that is compatible with analytic tools. Due to time restrictions, secondary data are frequently the only option available for conducting longitudinal investigations.

3.5.2.1 Document

Document secondary data are classified as information that, unlike spoken word, endures physically (including digitally) as proof, allowing information to be translated over time and place and reanalysed for a purpose other than that for which it was initially gathered (Lee, 2012). Thus, they encompass text, audio, and visual media. Text media includes announcements, letters (including emails), meeting minutes, shareholder reports, diaries, transcripts of speeches and discussions, administrative and public records, as well as the text of web pages. Books, journal and magazine articles, and newspapers are all examples of text-based media. Although secondary data compilation is frequently stored in books, papers, journals, and reports, the text itself might contain valuable raw secondary data.

Apart from that, the spoken word can be transcribed in order to examine audio media, such as historical recordings of radio shows, speeches, audio blogs, and podcasts, both quantitatively and qualitatively.

3.5.3 Population and Sample

When using probability samples, the likelihood that each instance will be chosen from the target population is known and is typically the same for all examples. Non-probability sampling, often known as non-random sampling, offers a number of additional methods for choosing samples, most of which include some degree of subjective assessment. A non-probability sample might be the most useful in the early phases of some research initiatives, such pilot testing a questionnaire, even though it won't allow the size of the issue to be assessed. In non-probability samples, the likelihood that each example was chosen from the target population is unknow n, making it hard to respond research questions or achieve objectives that call for drawing statistical inferences about the population's characteristics. Although not on the basis of statistics, I could still be able to generalise from non-probability samples about the target population. Additionally, the prevalence of non-probability samples has greatly increased with the explosive rise of internet surveys. Moreover, this study had sample size using Krejice & Morgan table.

Table 3.1: Sample Size Using Krejchie and Morgan

Table 3.1

Table for Determining Sample Size of a Known Population

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	346
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	354
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	191	1200	291	6000	361
45	40	170	118	400	196	1300	297	7000	364
50	44	180	123	420	201	1400	302	8000	367
55	48	190	127	440	205	1500	306	9000	368
60	52	200	132	460	210	1600	310	10000	370
65	56	210	136	480	214	1700	313	15000	375
70	59	220	140	500	217	1800	317	20000	377
75	63	230	144	550	226	1900	320	30000	379
80	66	240	148	600	234	2000	322	40000	380
85	70	250	152	650	242	2200	327	50000	381
90	73	260	155	700	248	2400	331	75000	382
95	76	270	159	750	254	2600	335	1000000	384

Note: N is Population Size; S is Sample Size *Source: Krejcie & Morgan, 1970*

According to the record by (ReleifWeb, 2024), the population of Johor's flood victims was 12,140. Therefore, based on Table 3.1, the minimum sample size for this study was 384.

3.5.4 Pilot Test

The aim of pilot test tested with respondents is to refine questionnaire in order to avoid problem while answering and recording the data. For this research, I have decided to conduct the pilot test under questionnaire part. Then, the items will be developed through design-based research (DBR) an emerging paradigm which specifically used to produce an effective learning environment (Cobb, 2001). The goal of the pilot test is to make the questionnaire better so that respondents will have no trouble responding to the questions and that data collection will go smoothly. Additionally, it will allow me to analyse the validity of the questions and the likelihood that the data will be reliable, both for the individual questions and, when appropriate, scales made up of several questions (Bell and Waters',2014). Furthermore, above all the important element in this research is human and design factors. Human factor mainly victims of flood and design factors consist the resources aspects.

3.6 Time Horizon

Cross sectional approach will be applied for this research. A cross-sectional study studies flood-related variables and their impact on a particular population or area at a particular point of time. It gives a brief account of the circumstances surrounding a specific flood incident. For evaluating immediate effects, such as property damage, casualties, or temporary displacement, cross-sectional studies can be helpful. They are helpful in determining the needs for an urgent response and recovery. Even, cross-sectional research enables comparisons between various impacted populations or places. Based on variables such as geographic location, socioeconomic position, or infrastructure resilience, researchers might examine variations in flood impacts. These comparisons can shed light on inequalities and guide focused solutions. At the same time, researchers that have limited resources or encounter practical difficulties when performing longitudinal research may find it easier to conduct cross-sectional investigations. Even with time or financial limitations, they present a chance to advance our knowledge of flood disasters.

3.7 Data Analysis

Once the whole data has been successfully collected, I would prepare it for analysis and interpretation. Regarding to Marshall and Rossman (1999) data analysis is the process of collecting and analysing a massive collection of data. In this research, my participants would be floods victims of Johor District where I will approach them using online questionnaire and in-person.

3.7.1 Validity

The degree to which a study accurately measures or assesses what it wants to measure or assess is known as validity in research. It serves as a gauge of a study's findings and conclusions' veracity and accuracy. Validity is important because it makes sure that the research is relevant and reliable, which gives people confidence in the findings. There are various validity categories. The ability of questionnaire to measure what to measure is referred as internal validity. Measurement validity is another word for the concern that the results of questionnaire accurately reflect the phenomenon that are trying to assess. The level to which the measurement tool, adequately covers the investigative questions is referred as content validity. A number of criteria can be used to determine what constitutes "adequate coverage." Besides, construct validity is the degree to which a series of inquiries (referred to individually as scale items, and covered in more detail later in this section) accurately reflects the presence of the construct that planned to have them measure while the term "face validity" describes how a measurement equipment seems to be legitimate on the surface. Based on a subjective evaluation, it determines if the instrument appears to measure what it is supposed to measure. Face validity can be a helpful initial evaluation even when it does not offer solid proof of validity.

3.7.2 Reliability

Reliability defined as consistency. In the term of reliability, a pilot study will be conducted among the respondents as it has the ability to provide an indication on my work whether it will be success or not. Then as the following step the results will analyse through Cronbach's alpha. The most commonly used reliability metric is Cronbach's alpha, sometimes known as alpha. In general, Cronbach alpha is the measurement of consistency where mean more than 0.7 is an acceptable level and 0.8 is a very good level. In this investigation, the reliability of questionnaire items will be test by Cronbach's alpha in SPSS. Ensuring a high level of internal consistency indicates that the items are measuring the same underlying concept consistently (Tavakol & Dennick, 2020).

3.7.3 Correlation

A variant of covariance with values constrained to the range of 1 to +1, the Pearson correlation was created by Karl Pearson. The Pearson correlation is most frequently mentioned when discussing correlation. The data can be analysed to find patterns and trends using the Pearson correlation coefficient. When two variables are positively correlated, it means that if one variable rises, the other rises as well. A negative correlation, on the other hand, means that as one variable rises, the other variable tends to fall. Making forecasts and comprehending the underlying dynamics of the variables under study can both benefit from this knowledge stated by Johnson, A. (2015).

3.7.4 Linear Regression Analysis

According to Montgomery, Douglas C (2012) one of the various statistical techniques used to assess the relationship between one or more so-called independent variables (X1, X2, Xk) and a dependent variable (Y) is regression analysis. Regression analysis specifically evaluates how variations in the independent variables account for variations in the dependent variable. One independent variable is all that is present in basic linear regression. A straight line equation (Y = a + bX), where "a" stands for the intercept, "b" for the slope, and "X" for the independent variable, illustrates the link between the dependent variable and the independent

variable. Meanwhile, at least two independent variables are present in multiple linear regression. A multiple regression equation (Y = a + b1X1 + b2X2 +... + bnXn) is used to show the relationship between the dependent variable and the independent variables. In this equation, "a" stands for the intercept, "b1, b2,..bn" for the slopes, and "X1, X2,..., Xn" for the independent variables.

3.7.4.1 R Square

Johnson, M & Smith, P (2018) mentioned that regression analysis uses R-squared, commonly referred to as the coefficient of determination, as a statistical metric to evaluate the quality of fit of a regression model. It shows what percentage of the variance in the dependent variable can be accounted for by the model's independent variables. R-squared is a number between 0 and 1, where a value of 0 means that the independent variables in the model do not explain any of the variation in the dependent variable. A score of 1 means that the independent variables in the model account for all of the variation in the dependent variable. Smith (2022) reports that the regression model's R-squared value was 0.75. However, Jones (2019) also states the study's high R-squared value of 0.85 demonstrates a significant correlation between the independent and dependent variables.

3.7.4.2 F Value

The F-value, also known as the variance ratio, is a statistical measure that "compares the variance between groups to the variance within groups in an analysis of variance (ANOVA) or regression analysis" (Smith & Johnson, 2019). The F-test analyses the full model and determines whether R2 differs significantly from zero. The significance of the F-value for the analysis of variance was established (F (df between) = F-value, p .05.). The F-value in ANOVA enables the comparison of means between more than two groups. Instead of performing numerous pairwise comparisons, it allows researchers to compare the differences across several groups at once, saving time and lowering the risk of Type I error.

3.7.4.3 T-Value

The statistical significance of a t-value tells us whether or not the difference between the averages of two groups most likely represents an actual difference in the population that the groups were drawn from. The difference between two groups is unlikely to have happened because the sample happened to be statistically significant, according to t-test results. The size of the difference between the group averages, the same size, andthe group standard deviations are used to calculate statistical significance"(Coakes & Steed,1999). The independent variable X's t-value was shown to be significant (t = 2.34, df = 45, p .05.)

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSION

4.1 Introduction

The data and discussion for this study are presented in this chapter. It has proven that this research goal has been successfully accomplished. The effects of resources utilization in disaster relief efforts for flood victims at Johor, Malaysia, were the subject of the data analysis conducted with respondents, and the findings were presented and examined in this chapter. The initial step was the pilot test, descriptive, correlation, and regression analysis came next. In this study, 370 questionnaires were gathered via researcher-based surveys and dispersed at random via an online Google Survey Form to respondents at Johor. All of the data was evaluated by the researcher and provided in tabular form using the Statistical Package for Social Science (SPSS).

4.2 Descriptive Statistics of Demographic Background

The researcher in this study analyzed the demographic background of all 370 respondents using descriptive statistics. Table 4.2 provides an overview of the data gathered from the 370 respondents (N=370) whose demographic backgrounds were examined using descriptive frequency analysis. The background information of the respondents including their gender, ethnicity, location, experience, and awareness is examined in this part.

Table 4.1: Total Respondents

STATISTICS						
		Gender	Ethnicity	Location	Experience	Awareness
N	Valid	370	370	370	370	370
	Missing	0	0	0	0	0

4.2.1 Gender

Table 4.2: Frequency and Percentage of Gender

GENDER					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	161	46.2	46.2	46.2
	Male	209	56.5	56.5	100.0
	Total	370	100.0	100.0	

Table 4.2 displays the gender of each of the 370 respondents that completed the survey. There were 370 responders in all; 161 of them, or 46.2% of the total, were female, and 209, or 56.5%, were male. There were somewhat more male respondents than female responders.

4.2.2 Ethnicity

Table 4.3: Frequency and Percentage of Ethnicity

Ethnicity					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Chinese	98	26.5	26.5	26.5
	Indian	120	32.4	32.4	32.4
	Malay	133	35.9	35.9	94.9
	Others	19	5.1	5.1	100.0
	Total	370	100.0	100.0	

The statistics on the number of races are displayed in Table 4.3. With 133 respondents, or 35.9% of the total race, Malay make up the largest percentage of respondents in this research, with 120 respondents, or 32.4% of the total, falling into the Indian group. Apart from that, 98 respondents, or 26.5% of the total, are Chinese, and 19 respondents, or 5.1% of the total, are Others.

4.2.3 Location

Table 4.4: Frequency and Percentage of Location

Location					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Rural	166	44.9	44.9	44.9
	Urban	204	55.1	55.1	100.0
	Total	370	100.0	100.0	

Statistic of the location of respondents is shown in Table 4.3. Mostly answers this survey from urban victims which are contributed to 204 respondents or 55.1%, followed by rural area victims which is 166 respondents or 44.9%. The following result demonstrates that rural people are the least to be affected by flood disaster due to lower population and less infrastructure at risk.

4.2.4 Experience by Flood Disaster

Table 4.5: Frequency and Percentage of Experience by flood disaster

Experience					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	126	34.1	34.1	34.1
	Yes	244	65.9	65.9	100.0
	Total	370	100.0	100.0	

Table 4.5 indicates if the respondents had experienced by a flood disaster. Out of the overall sample size of 370 respondents, 244 respondents, or 65.9% of the sample, reported have experienced while the remaining 126 respondents, or 34.1% of the sample, haven't experienced so.

4.2.5 Awareness of Resources

Table 4.6: Frequency and Percentage of Awareness of the Availability of Resources

Awareness					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Maybe	24	6.5	6.5	6.5
	No	56	15.1	15.1	21.6
	Yes	290	78.4	78.4	100.0
	Total	370	100.0	100.0	

Table 4.6 shows the respondents awareness on the availability of flood disaster resources. Most of the respondents are aware about the resources which represents 290 respondents with 78.4%. The respondents who not aware were in second position which made up of 56 respondents with 15.1%. This is then followed by 24 respondents or 6.5% with whom not sure regarding the availability resources in their residential area during flood disaster.

4.3 Descriptive Statistics on Independent Variables and Dependent Variable

A five-point Likert scale was employed by the researcher to gauge how effective resources utilization in disaster relief efforts for flood victims. There will be five rating points on the Likert scale: 1 for strongly disagree, 2 for disagree, 3 for somewhat agree, 4 for agree, and 5 for strongly agree.

Table 4.7: Descriptive Analysis Independent Variables and Dependent Variable

Variable	Mean	Std. Deviation	Skewness	Kurtosis
Human Resource				
1. HR 1	4.13	0.652	-1.017	3.490
2. HR 2	4.16	0.631	-1.177	5.076
3. HR 3	4.28	0.802	-1.604	3.870
4. HR 4	4.23	0.700	-1.346	4.366
5. HR 5	4.20	0.680	-1.047	3.006
Finance Resource				
1. FR 1	4.24	0.821	-1.198	1.894
2. FR 2	4.35	0.783	-1.422	2.285
3. FR 3	4.37	0.790	-1.484	2.936
4. FR 4	4.32	0.830	-1.420	2.529
5. FR 5	4.30	0.836	-1.456	2.772
Social Media Resource				
1. SMR 1	4.32	0.791	-1.339	2.481
2. SMR 2	4.32	0.790	-1.256	2.025
3. SMR 3	4.29	0.857	-1.460	2.575
4. SMR 4	4.28	0.846	-1.397	2.509
5. SMR 5	4.28	0.826	-1.276	2.001
Technology Resource				
1. TR 1	4.33	0.782	-1.262	2.092
2. TR 2	4.35	0.786	-1.302	2.123
3. TR 3	4.30	0.776	-1.248	2.221
4. TR 4	4.30	0.835	-1.391	2.415
5. TR 5	4.33	0.783	-1.273	2.100

To verify that the variables were normal, the researcher used the values of skewness and Kurtosis that were found. According to theory of George Marsaglia and George Marsaglia Jr.'s paper (2004), a distribution with positive skewness has a longer right tail than a negative skewness, which shows a longer left tail. The skewness of a distribution that is fully symmetric is almost 0. Besides, in Kurtosis three is regarded as the mesokurtic kurtosis (comparable to a normal distribution). Kurtosis values less than three point to platykurtic distributions (lighter tails and less peakedness), whereas values more than three imply leptokurtic distributions.

4.4 Pilot Test

A pilot test with a small sample of respondents is conducted to validate the study topic before sending questionnaires to a larger population. The pilot test's goal is to establish the questionnaire's dependability. Ensuring that the survey participants comprehend and are not confused by the questions posed is crucial. For the pilot test, the researcher created 20 sets of questionnaires in an effort to get respondent input. The Cronbach's Alpha approach was employed to evaluate the data's reliability, and SPSS was employed by the researcher to investigate its dependability. According to Saunder et al. (2016), Cronbach's Alpha levels of 0.7 are acceptable, more than 0.8 is preferred, values of 0.9 and above are considered good.

Table 4.8: Reliability Statistics for Independent Variable 1 (Human Resource)

Case Processing Summary			
		N	%
Cases	Valid	20	100.0
	Excluded [a]	0	.0
	Total	20	100.0
a. Listwise deletion based on all variables in the procedure.			

Reliability Statistics	
Cronbach's Alpha	N of Items
.791	5

Table 4.8 displays the effectiveness of human resource utilization in disaster relief efforts for flood victims as Independent Variable 1. This section of the questionnaire consists of five items. At 0.791, the Cronbach's Alpha value is greater than 0.7. Consequently, it is regarded as appropriate.

Table 4.9 : Reliability Statistics for Independent Variable 2 (Finance Resource)

Case Processing Summary			
		N	%
Cases	Valid	20	100.0
	Excluded [a]	0	.0
	Total	20	100.0
a. Listwise deletion based on all variables in the procedure.			

Reliability Statistics	
Cronbach's Alpha	N of Items
.815	5

The reliability statistics for Independent Variable 2 is finance resource shown in Table 4.9. The questionnaire consists of 5 questions. The Cronbach's Alpha value is 0.815, which is higher than 0.7. As a result, it is considered good.

Table 4.10 : Reliability Statistics for Independent Variable 3 (Social Media Resource)

Case Processing Summary			
		N	%
Cases	Valid	20	100.0
	Excluded [a]	0	.0
	Total	20	100.0
a. Listwise deletion based on all variables in the procedure.			

Reliability Statistics	
Cronbach's Alpha	N of Items
.752	5

The reliability statistics for Independent Variable 3 is utilization of social media resource shown in Table 4.10. The questionnaire consists of 5 questions in this part. The Cronbach's Alpha value is 0.752, which is higher than 0.7. As a result, it is considered acceptable.

Table 4.11 : Reliability Statistics for Independent Variable 4 (Technology Resource)

Case Processing Summary			
		N	%
Cases	Valid	20	100.0
	Excluded [a]	0	.0
	Total	20	100.0
a. Listwise deletion based on all variables in the procedure.			

Reliability Statistics	
Cronbach's Alpha	N of Items
.726	5

The reliability statistics for Independent Variable is social media resource shown in Table 4.11. The questionnaire consists of 5 questions in social media part. The Cronbach's Alpha value is 0.726, which is higher than 0.7. As a result, it is considered acceptable.

Table 4.12 : Reliability Statistics for Dependent Variable (Disaster Relief Efforts)

Case Processing Summary			
		N	%
Cases	Valid	20	100.0
	Excluded [a]	0	.0
	Total	20	100.0
a. Listwise deletion based on all variables in the procedure.			

Reliability Statistics	
Cronbach's Alpha	N of Items
.710	5

The reliability statistics for Dependent Variable is disaster relief efforts shown in Table 4.12. The questionnaire consists of 5 questions. The Cronbach's Alpha value is 0.710, which is higher than 0.7. As a result, it is considered acceptable

4.5 Reliability Test

Reliability testing is a cornerstone that provides vital information on the consistency, dependability, and stability**.** Vulnerabilities, possible points of failure, and areas where resource usage needs to be improved are all identified with the aid of reliability testing. For reliability test researcher used 370 respondents as the sample size.

Table 4.13 Reliability Statistics Test

Variables	Cronbach's Alpha	Number of Items	Result
IV 1 Human Resource	.724	5	Acceptable
IV 2 Finance Resource	.854	5	Acceptable
IV 3 Social Media Resource	.868	5	Acceptable
IV 4 Technology Resource	.890	5	Acceptable
DV Disaster Relief Efforts	.902	5	Acceptable

The five independent variable items and the dependent variable with Cronbach's alpha are displayed in Table 4.13. The average level of correlation is between 0.724 and 0.902. This demonstrated that all of the items have significant relationships.

4.6 Correlation

The correlation test, which explains the relationship between independent and dependent variables, was carried out using Pearson Correlation. The strength of the relationship between independent and dependent variables would be ascertained using the correlation coefficient, according to Saunders et al. (2016). Table 4.15 displays the Pearson's Correlation Coefficients for assessing the R-Values' correlation range.

Table 4.15: Range of Pearson's Correlation Coefficients and the Interpretation

Pearson's Correlation Coefficient (R-values)	Interpretation
± 0.70 to ± 1.0	Very strong relationship
± 0.40 to ± 0.69	Strong relationship
± 0.30 to ± 0.39	Moderate relationship
± 0.20 to ± 0.29	Weak relationship
± 0.01 to ± 0.19	No relationship

Table 4.16: Correlations between variables

CORRELATIONS					
		IV1	IV2	IV3	IV4
Human Resource (IV1)	Pearson Correlation	1	.504**	.499**	.398**
	Sig. (2-tailed)	.000	.000	.000	.000
	N	370	370	370	370
Finance Resource (IV 2)	Pearson Correlation Sig. (2-tailed) N	504** .000 370	1 370	.848** .000 370	.755** .000 370
Social Media Resource (IV3)	Pearson Correlation	. 499**	.848**	1	753**
	Sig. (2-tailed)	.000	.000		.000
	N	370	370	370	370
Technology Resource (IV4)	Pearson Correlation Sig. (2-tailed) N	.398** .000 370	.755** .000 370	.753** .000 370	1 370

The effectiveness of the resource utilization on the independent variables of human, finance, social media and technology resources, as well as the dependent variable of experience and awareness of victims, are displayed in Table 4.16. Human resource and disaster relief efforts have a strong correlation ($r = 0.398$, $n = 370$, $p<0.01$) with each other. Additionally, a very

substantial correlation (r = 0.755, n = 370, p < 0.01) was found between finance resource and relief efforts. Social media coefficient (r=0.753, n=370, p<0.01) revealed a substantial correlation with disaster relief efforts.

Aymar Raduzzi et al. (2010) have demonstrated a noteworthy and affirmative correlation between brand loyalty and user experience. When customers are pleased with the product, they are more inclined to recommend the brand to others and to stick with it. (Albarracin and Wyer, 2000; Lee et al., 2015; Cronin and Taylor, 2018).

4.7 Multiple Regression Analysis

Regression analysis is a collection of mathematical techniques for determining and defending the magnitude of a dependent variable based on the values of one or more independent variables. Regression yields a figure that represents the practical estimate of a dependent variable from a set of independent variables. Multiple regression analysis was utilized to ascertain the degree and importance of the relationship between the variables (independent and dependent variables).

Table 4.17: Model Summary of Multiple Regression

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.889[a]	.790	.787	.30253
a. Predictors: (Constant), Human, Finance, Social Media and Technology Resources b. Dependent Variable: Disaster Relief Efforts				

Table 4.17 shows that the multiple regression analysis's model summary yielded a positive R value. For multiple coefficients of regression, R = 0.899 shows that there is a substantial and favourable correlation between the independent and dependent variables. R was speaking of the robust links inside the framework. Consequently, the R value surpasses ± 0.70, signifying a strong and favourable correlation. In addition, R square has a value of 0.790. This indicates

that 69.4% of the independent variables have an impact on the disaster relief efforts (dependent variable), with the remaining 100% - 79.0% = 21.0% being influenced by additional elements or causes that were not covered in this study.

4.8 ANOVA

Table 4.18: ANOVA Table

ANOVA[a]						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	125.429	4	31.357	342.600	.000[b]
	Residual	33.407	365	.100		
	Total	158.836	370			
a. Dependent Variable: Disaster Relief Efforts						
b. Predictors: (Constant), Human, Finance, Social Media and Technology Resource						

To ascertain whether the model accurately represents the data, the F-test is employed. Considerable investigation is employed to verify the correlation between the variables and the effects. Whether there is a statistically significant correlation between the variables will be shown by the crucial value. The F-test result was 342.600 with a significant level of p=0.000 ($p<0.05$), according to Table 4.18 above. With an F-test value of 342.600, a higher value was demonstrated, indicating that the regression is generally well-fitting to the data and that a meaningful association existed between the independent and dependent variables. It was clear that each independent variable's impact on the dependent variable was statistically significant.

4.8 Regression Equation

In order to determine if the developed hypothesis is accepted or rejected, hypothesis testing is necessary in this study. Regression analysis was selected to assess the hypothesis by evaluating the result of independent variables. To ascertain whether survey or experiment results are relevant, hypothesis testing is frequently utilized. Either that or it is rejected. Regression analysis revealed that user experience was the dependent variable in this study, whereas independent variables included human, finance, social media and technology resources. Table 4.18 shows the hypothesis testing results. There was a positive link between the two variables if the significance value, $p<0.05$. On the other hand, there was no positive link between the independent and dependent variables if the significance level, $p >0.05$. Therefore, for a two-sided test, the value of t needs to be more than 1.96 in order to reach a significance threshold of 0.05 (Puri & Treasaden, 2010).

Table 4.19: Coefficients Table

COEFFICIENTS[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.348	.183		2.276	.017
	Human Resource	.111	.023	.130	4.811	.002
	Finance Resource	.083	.024	.097	3.454	.001
	Social Media Resource	.022	.026	.051	5.844	.000
	Technology Resource	.313	.042	.410	8.316	.001
a. Dependent Variable: Disaster Relief Efforts						

The outcome of the coefficient for multiple regression analysis is shown in Table 4.18 above. Human resource had a beta value of 0.111 and a significant value of 0.001, finance resource had a beta value of 0.083 and a significant value of 0.001, social media had a beta value of 0.022 and a significant value of 0.000, and technology resource had a beta value of

0.313 and a significant value of 0.001. When compared to the other three factors, technology resource has the largest beta value, indicating that it is the most effective factor in enhancing the effectiveness of disaster relief efforts during flood.

Based on table 4.18, the linear equation was developed as below:

$$\mathbf{Y = 0.348 + 0.111X_1 + 0.083X_2 + 0.022X_3 + 0.313X_4}$$

Where: Y = Disaster relief efforts

X1 =Human Resource

X2 = Finance Resource

X3 = Social Media Resource

X4 = Technology Resource

Based on the linear equation above, there was a strong relation between human, finance, social media and technology resource on disaster relief efforts. Researcher has made four hypotheses to analyze the which factors was the most effective on disaster relief efforts as shown in below:

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 Introduction

The conclusion and recommendation of this study will be explained in this chapter. The recommendation section is an important part of the research when the empirical results are carefully examined, explained, and placed in the context of the larger study. According to Smith et al. (2019), conversations are essential for clarifying the implications, importance, and constraints of research findings because they offer a framework for combining and analysing the collected data with pre-existing theoretical frameworks and empirical data. The main objective of this section is to provide a thorough examination of the implications that arise from the data analysis. By connecting these results with existing literature and ideas, the section aims to enhance our comprehension of the subject matter.

This thesis concludes by summarising the most important discoveries, contributions, and ramifications from the thorough investigation that was done. Consistent with Johnson's (2020) ideas, this part functions as a culminating analysis of the research journey, summarising the key findings and emphasising their importance in accomplishing the research goals. It also gives a brief synopsis of the key points and conclusions made throughout the thesis, finishing with thoughts on the study's overall significance and suggestions for future lines of inquiry.

To put it briefly, this thesis's conclusion and recommendation sections come together to offer a thorough analysis of the empirical data, their theoretical ramifications, and their possible effects on my study about effective resources utilization in disaster relief efforts for flood victims. This synthesis aims to further the field's continuing discourse by providing a foundation for future research and advancements, supported by established literature and grounded in empirical facts.

5.2 Conclusion of the Demographic of Respondents

The total number of respondents from this research was 370. The male respondents are 210 or 56.8% and 160 or 43.2% female respondents. The questionnaire is selected to flood victims in Johor district.

The most respondents are malay residents which they are 35.9%. The least respondents were from others ethnicity (5.1%). While there are 120 (32.4.%) respondents who are indian and 98 (26.5%) respondents are chinese. Apart from that, most respondents are from urban area (55.1%) compared to rural respondents around 166 or 44.9%. According to Birkmann, J., & Welle, T. (2015), urban areas with dense populations may experience increased vulnerability due to factors such as impervious surfaces, inadequate drainage systems, and altered hydrological cycles caused by urbanization.

Furthermore, there were 244 respondents or 35.9% who had experienced or been directly affected by flood disaster. From the perspective of Cutter, S. (2008), local experiences contribute to the development of more effective early warning systems. Resident familiar with the signs and precursors of floods can provide critical information for the timely evacuation and mitigation of risks.

The majority of the respondents are also aware of the availability of resources in their community during flood disaster. They were 290 respondents with 78.4%. This is because their experience during the disaster holds key information about resources used.

5.3 Conclusion on Research Objective Achievement

The fundamental cornerstone of each research project is its clearly specified study objectives, which serve as the foundation for direction and control during the entire investigation. According to Taylor et al. (2015), clearly defining the research objectives helps to determine the path of the investigation as well as the methodology, data collection, and analysis techniques used in the study. Within the framework of this senior project thesis, the stated research goals were crucial in directing and defining the course of inquiry.

This study's main goal was to determine the impact of resources utilization effectiveness on flood victims' disaster relief operations, to compare the strengths of the efficiency of resources used for flood victims' disaster assistance operations and to confirm which resources are used in the most effective way for flood victims' disaster relief. These goals were painstakingly and precisely designed to guarantee a methodical and organised approach to solving the study problem.

5.3.1 Conclusion on the impact of resources utilization effectiveness on flood victims' disaster relief operations.

The multiple regression analysis model summary yielded a positive R value. For multiple coefficients of regression, R = 0.899 shows that there is a substantial and favourable correlation between the independent and dependent variables. R was speaking of the robust links inside the framework. Consequently, the R value surpasses ± 0.70, signifying a strong and favourable correlation. In addition, R square has a value of 0.790. This shows that objective was accomplished. As well, 65.9% from the respondent demographic sample, reported have experienced by flood disaster

According to Chaplin (2019), the impact of resources has a significant and complex influence on disaster relief efforts for flood victims. Effective resource management is crucial to maximising the good effects of relief efforts, from prompt deployment and efficient logistics to community involvement, resilience-building, and long-term rehabilitation. Increasing the overall efficacy and sustainability of disaster relief activities requires recognising the importance of resource allocation and making the most use of it.

For instance, especially for communities devastated by flooding, effective resource management promotes long-term recovery and restoration initiatives. In addition to giving immediate assistance, funding for livelihood restoration, infrastructure reconstruction, and psychosocial support adds to the afflicted areas' overall recovery. The effective use of resources guarantees communities' continued support in regaining stability and functionality.

5.3.2 Conclusion on the strengths of the efficiency of resources used for flood victims' disaster assistance operations.

Research goal 2 was accomplished, as evidenced by the results of the finance resource's correlation value in the table Pearson's Correlation analysis. The number is 0.755, which is primarily the outcome of elements utilising relief efforts that affect flood victims. This indicating that the majority of respondents believed that finance resource has the biggest influence on the relief efforts during flood disaster. The results showed that the item "Human resource enables to diminish the detriment of floods on residents". At the same time, 78.4% or 290 respondents agreed that they are aware about the resources uses during flood disaster.

In addition, UNICEF (2021) states that the provision of long-term assistance to flood-affected vulnerable people requires financial resources the most. Amounts are set aside for specific assistance initiatives that target underprivileged groups, the elderly, children, people with disabilities, and marginalised communities. By addressing the unique needs of vulnerable groups, this kind of focused aid guarantees equal access to relief operations.

Other than that, the efficient and effective allocation of financial resources is vital in tackling the complex issues presented by floods and bolstering relief endeavours for impacted areas. Financial resources are important to disaster relief efforts since they enable the provision of immediate aid as well as infrastructure reconstruction, preparatory measures, and assistance for vulnerable populations. Acknowledging the importance of financial resources and guaranteeing their effective distribution is essential for enhancing resilience and reducing the catastrophic effects of floods on communities across the globe.

5.3.3 Conclusion on which resources are used in the most effective way for flood victims' disaster relief.

According to the findings of Coefficient Analysis s, technology resource has proven to be the most effectiveness on flood victims' disaster relief operations at Johor in order to reach the first aim. According to the results of the correlation study presented in Chapter 4, technology resource has a significant impact on the flood relief operations. This is due to the fact that, in the coefficient analysis, technology resource demonstrated the most positive link

with user experience, with the highest beta value of 0.410 when compared to other independent variables like human, finance and social media resources. This also can relate to most of the respondents from this survey are from urban victims (55.1%).

This result has been proved there is significant and positive association between technology resource and flood disaster relief efforts. The research "Application of GIS and Remote Sensing Technologies in Disaster Management and Relief: A Case Study of the Wenchuan Earthquake" by Zhiyuan Liu et al. (2020) contains a citation endorsing this influence. This study examines the ways in which the use of GIS and remote sensing technology aided in disaster management and relief efforts following the Chinese Wenchuan earthquake. The study highlights how important technology is for effectively evaluating the areas affected by disasters, identifying populations that are at risk, and directing relief efforts.

Furthermore, technology-driven solutions improve accountability and transparency in resource distribution. One example of this is supply chain management systems that rely on blockchain technology. Aid resources can be tracked by these technologies, guaranteeing their delivery to the intended recipients and lowering the possibility of mishandling or resource diversion. Hence, technology resource was proved as most effective factor in disaster relief efforts towards flood victims in Johor.

5.4 Conclusion on Hypothesis Achievement

Table 5.1 Summary of Hypothesis Testing

Hypothesis	Result
H_1: There is a positive relationship between effectiveness of human resource utilization towards disaster relief efforts for flood victims in Johor.	**Accepted** p-value =0.002 ($p<0.05$)
H_2: There is a positive relationship between effectiveness of finance resource utilization towards disaster relief efforts for flood victims in Johor.	**Accepted** p-value =0.001 ($p<0.05$)

H_3: There is a positive relationship between effectiveness of social media resource utilization towards disaster relief efforts for flood victims in Johor.	**Accepted** p-value =0.000 (p<0.05)
H_4: There is a positive relationship between effectiveness of technology resource utilization towards disaster relief efforts for flood victims in Johor.	**Accepted** p-value =0.000 (p<0.05)

The test hypothesis summary results were displayed in Table 5.1. The hypothesis's test findings indicate that all four hypotheses agree on a p-value of less than 0.05. Thus, it can be concluded that human, finance, social media and technology resource have a major impact on disaster relief efforts for flood victims.

The positive correlation between resource utilization and disaster relief efforts is indicated by the significant value of human resource, p=0.002, which is less than 0.05 and from the percentage of flood victims based on their experience during flood disaster in demographic background. Respondents who had experience is more which is 66% compare to respondents who not. The results of the previous study by Chapin, T (2019) corroborate hypothesis 1, which states that experts in this fields, such as engineers, doctors, emergency responders, and volunteers, are essential in carrying out a variety of duties, from conducting rescue operations to administering medical attention and reconstructing infrastructure.

Besides, the significant value of finance resource, p=0.001 which is smaller than 0.05 indicates that it has a positive relationship on relief efforts. Moreover, the value of mean of finance resource that impact on disaster relief efforts, is 4.0 above. The researcher also accepted the hypothesis 2 as the finance resource is a significant and positive hypothesis. Support by Kapur & Smith (2018), explained that financial resources allow for quick action and can provide flood victims with aid right away like giving adequate fundings for them.

Other than that, social media also shows significance value smaller than 0.05 which 0.000. The researcher agreed that hypothesis 3 has a positive relationship towards relief efforts given to flood victims as 56.8% from demographic background are male respondent . Starbird (2018) states that men might be more inclined to use social media for content consumption, networking,

and information sharing. They might be more engaged in discussions related to specific interests or professional networking.

Last but not least, the study's significant technology resources value, p=0.001, which is less than 0.05, suggests that there is a positive correlation between technology resource and relief efforts as well like other resources. Thus, hypothesis 4 is approved with survey by Rufat in the year of 2020 explained that technology like communication tools and internet connectivity makes remote sensing and geospatial analysis possible, which is helpful in determining the size of areas affected by floods and the amount of damage that results. This is also can be connected to demographic background of this research like location. A bulk percentage of flood victims (55.1%) are from urban area which contributes them to the development of smart infrastructure.

5.5 Research Implication

In this study, the finding was analysed to determine the effectiveness of resources utilization like human, finance, social media and technology on flood victims during flood disaster relief efforts. The results obtained from the thorough examination of the efficient use of resources in flood victims' disaster relief operations have important ramifications for the development of policies, operational plans, and humanitarian interventions. As Comfort (2007) pointed out, developing resilient and effective disaster relief methods requires a grasp of and optimisation of these varied resources.

5.5.1 Implication on Knowledge

One of the critical implications of incorporating technology into disaster relief efforts is the enhancement of knowledge acquisition and dissemination. Advanced satellite imaging, geographic information systems (GIS), and remote sensing technologies enable authorities to assess the extent of flooding, identify vulnerable areas, and plan evacuation routes more accurately. Real-time data analytics and machine learning algorithms process vast amounts of information swiftly, providing actionable insights to decision-makers. Moreover, social media platforms and communication technologies play a pivotal role in disseminating timely

information to affected populations. Mobile applications and alerts can be employed to deliver evacuation notices, weather updates, and safety guidelines, empowering individuals to make informed decisions and seek shelter promptly. By leveraging technology, relief agencies can bridge information gaps and foster a more proactive and informed response.

5.5.2 Implication on Industry

Effective resource utilization in disaster relief efforts involves more than just providing immediate aid. Industries can contribute significantly to sustainable development by leveraging their research and development capabilities to create innovative solutions for long-term recovery. This includes investing in renewable energy sources, developing eco-friendly construction materials, and implementing smart technologies that enhance community resilience. For example, the construction industry can adopt sustainable building practices that incorporate flood-resistant designs and materials. The energy sector can explore the use of renewable energy sources to power essential services in disaster-prone areas, ensuring that communities have access to electricity even during crises. Such innovations not only aid in recovery but also contribute to the overall sustainable development goals of the affected regions.

5.5.3 Implication on Nation

The ability of a nation to effectively respond to flood disasters hinges on the quality of governance and crisis management strategies in place. When resources are utilized efficiently, the government can execute swift and coordinated responses, mitigating the immediate impact of floods on affected populations. This implies a need for robust disaster preparedness plans, well-defined roles for various government agencies, and streamlined communication channels. Furthermore, effective resource utilization demands the integration of technology and data-driven decision-making. Utilizing satellite imagery, real-time data analytics, and artificial intelligence allows governments to assess the extent of flooding, identify vulnerable areas, and allocate resources strategically. As nations enhance their governance structures, they not only improve their response to immediate crises but also fortify their ability to manage future disasters more effectively.

5.6 Limitation of Study

Due to the restricted study location, which is limited to Johor, there is limited understanding of the effective of resources utilization such as human, finance, social media and technology resource on flood victims experience. Second, the respondents (44.9%) to the study's sample size were from rural area. The data was collected through an online panel. Because of this, the study's applicability may be restricted to respondents from rural area as they face difficulties in internet connectivity and hard to complete the online survey.

Secondly, the tracking and analysis of financial resources also limited by the intricacy of financial documentation in relief organisations. The level of analysis addressing the allocation and use of financial resources may have been limited by issues related to confidentiality or accessibility. Acquiring thorough and complete financial data from various aid organisations would have improved knowledge of financial resource usage procedures.

In conclusion, although this study provided insightful information about how to use technological, financial, human, and social media resources in flood victims' disaster relief efforts, it is crucial to recognise these limits. Future studies can advance our understanding of resource utilisation dynamics in various crisis scenarios by addressing these constraints.

5.7 Recommendation of Research

Several important recommendations are made in light of the study's conclusions and implications about the efficient use of resources in flood victims' disaster relief operations. Response efforts can be made much more successful and efficient by including these suggestions into disaster relief plans.

First and foremost, utilizing a large sample size is the amplification of statistical power. Statistical power refers to the likelihood of detecting a true effect when it exists. With a larger sample size, researchers increase their ability to detect significant relationships or differences, reducing the risk of false negatives. Moreover, a substantial sample size contributes to greater precision in estimating population parameters. Confidence intervals become narrower, allowing researchers to pinpoint the range within which the true population parameter is likely

to fall. This precision in stills greater confidence in the validity of the study's results and facilitates more accurate interpretations.

Besides, one compelling recommendation for constructing research in a new way is to promote interdisciplinary collaboration. Traditional research often unfolds within the confines of a single discipline, limiting the scope of inquiry. By breaking down these silos and encouraging collaboration across diverse fields, researchers can tap into a wealth of perspectives, methodologies, and expertise. Interdisciplinary research not only broadens the horizons of inquiry but also allows for a more holistic understanding of complex phenomena. For instance, environmental issues could be addressed collaboratively by scientists, engineers, economists, and sociologists, creating a comprehensive approach that considers both natural and human systems.

Even, continued and deliberate use of face-to-face data collection methods in research. By embracing the depth, richness, and nuanced insights that personal interactions offer, researchers can enhance the validity and reliability of their findings, ensuring a more comprehensive understanding of the phenomena under investigation.

5.8 Summary of Study

In conclusion, the aim of the research on effective resource utilization in disaster relief efforts for flood victims is to investigate past disaster relief efforts to understand how resources have been allocated, identify areas of improvement in the allocation of funds, manpower, and materials and develop strategies for optimizing resource distribution for a more targeted and impactful response. This research also can lead to the development of more efficient and targeted disaster response strategies. By optimizing resource allocation and enhancing preparedness measures, communities and authorities can respond more effectively to flood disasters. In summary, the three main objectives of this study had been achieved by researcher. The most significant factors was technology resource then followed by finance, social media and human resource

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APPENDIX 1

GANTT CHART FOR FYP 1

Procedure for FYP 1	Week																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
PSM 1 talk																	
Search PSM topic																	
Conversation with PSM supervisor through WhatsApp																	
Modify research topic																	
Topic confirmation																	
Identify problem statement and background of study																	
Identify research objective and research question																	
Find information for literature review																	
Preparation and completed for chapter 1																	
Preparation and completed for chapter 2																	
Preparation and completed for chapter 3																	
Preparation of slide presentation																	
PSM 1 presentation																	
Make correction for the proposal																	
PSM 1 report submission																	

MIDSEMESTER BREAK

APPENDIX 2

GANTT CHART FOR FYP 2

Procedure for FYP 2	Week															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Meeting FYP supervisor								M								
Create questionnaire								I								
Distribute questionnaire								D								
Data gathering																
Data Analysis								B								
Complete Chapter 4								R								
Complete Chapter 5								E								
Preparation of slide presentation								A								
Presentation								K								
FYP 2 submission																

APPENDIX 3

QUESTIONNAIRE

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

SURVEY QUESTIONNAIRE

EFFECTIVE RESOURCES UTILIZATION IN DISASTER RELIEF EFFORTS FOR FLOOD VICTIMS

Greeting to all respondents,

I am Sanjulla A/P Sudhagaran, final year student from Faculty of Technology Management and Technopreneurship (FPTT) at the Universiti Teknikal Malaysia Melaka (UTeM). Currently conducting a survey for my research paper on " Effective Resources Utilization in Disaster Relief Efforts for Flood Victims." I would like to invite your participation in this survey by filling up the following questionnaire. This questionnaire takes only a few minutes to complete. I hope that all of you can cooperate in helping to answer the question that have been prepared.

The questionnaire is divided into three sections which are Section A, Section B, Section C, Section D, Section E and Section F. Section A demonstrates the respondents' demographic profile and qualifying questions, while Section B, Section C, Section D, Section E and Section F depicts the 5-item scales for each question (1= Strongly Disagree, 2= Disagree, 3= Somewhat, 4= Agree, 5= Strongly Agree).

Your input and insights are crucial in helping me achieve my research objectives. Thank you for your valuable time and participation

SECTION A (DEMOGRAPHIC)

1. Gender
    - Male
    - Female

2. Ethnicity
    - Malay
    - Chinese
    - Indian
    - Others

3. Location
    - Urban
    - Rural

4. Have you personally experienced or been directly affected by a flood disaster?
    - Yes
    - No

5.Are you aware of the availability of resources in your community during flood disaster?
    - Yes
    - No

Please rate the question by using 5 Likert Scale :

1 – Strongly Disagree

2 – Disagree

3 – Somewhat

4 – Agree

5 – Strongly Agree

SECTION B : HUMAN RESOURCES UTILIZATION FOR FLOOD VICTIMS

NO	ITEMS	1	2	3	4	5
1	Volunteers help create temporaryshelters					
2	Support services minimise suffering					
3	I understand flood risks					
4	Managing stress improves my emotional health					
5	I can get essential items					

SECTION C : FINANCE RESOURCES UTILIZATION FOR FLOOD VICTIMS

NO	ITEMS	1	2	3	4	5
1	Insurance is vital to cover damages					
2	Efficient government spendingcan result in economic growth					
3	Infrastructure repairs enhance safety					
4	Emergency funds overcome my financial stress					
5	I receive money to cover my bills					

SECTION D : SOCIAL MEDIA RESOURCES UTILIZATION FOR FLOOD VICTIMS

NO	ITEMS	1	2	3	4	5
1	I receive real time updates					
2	Quick decisions save lives					
3	Collaboratio n allows rapid response					
4	Social media give me emotional support					
5	I'm capable to engage with emergency management agencies					

SECTION E : TECHNOLOGY RESOURCES UTILIZATION FOR FLOOD VICTIMS

NO	ITEMS	1	2	3	4	5
1	Maps able to identify high-risk areas					
2	Mobile technology helpsreporting emergencies					
3	Web platform offers me evacuation guidance					
4	AI contribute to long term resilience					
5	Wearable technology makes mesafer					

SECTION F : DISASTER RELIEF EFFORTS FOR FLOOD VICTIMS

NO	ITEMS	1	2	3	4	5
1	Early warning systems help save lives					
2	Making best use of resources canmake a community stronger					
3	Health concerns protect me from diseases					
4	Educational programs help to shape community					
5	Digital platform builds my socialtrust					