Collaborative Planning for the Environmental Sustainability of the Hajj

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In the name of Allah,
Most gracious, Most Merciful

Abstract

Every year, millions of Muslim worshippers visit Mecca in Saudi Arabia to perform Hajj, which is the fifth and last pillar of Islam. Mecca generally hosts more than 2,300,000 people from approximately 183 different countries and cultures every year. Tourism, especially a religious tourist attraction such as the Hajj, is expected to boost the economy and create new jobs for Saudi youth in the services sector. Despite the many benefits of pilgrimage, the Hajj itself has adverse environmental impacts. The activities of Hajj generate considerable solid and liquid waste, use large quantities of scarce freshwater and produce high levels of greenhouse gases.

The government of Saudi Arabia has established many strategies and policies, such as a the 'prepared meal project', to reduce the impacts of the Hajj activities on environmental sustainability. However, these environmental strategies have not achieved their goals. For example, several hospitality agencies refused to collaborate on the prepared meal project for pilgrims established by the government to reduce waste. The wider literature demonstrates that the success of sustainability plans and projects in the tourism context requires collaboration between stakeholders from all sectors. This collaboration does not occur in the Hajj.

The overarching aim of this research is to investigate how the environmental sustainability of the Hajj can be improved. The particular focus, however, is on how stakeholder collaboration in planning can be improved to achieve sustainability goals. This study applies Gray's (1989) collaborative planning model to investigate the nature of the collaboration process between Hajj stakeholders and identify the drivers that will support collaboration. This model establishes a three-phase planning process necessary to successfully achieve stakeholder collaboration and the strategic goals.

To achieve the aim, this research employed a qualitative methodology to investigate the nature of collaboration between Hajj stakeholders and the drivers that induce their collaboration while planning for environmental sustainability of the Hajj. Both primary data and secondary data were used. A qualitative approach was adopted and specific methods used included unstructured and semi-structured interviews. Interviewees were selected to be representatives of public and private sector stakeholders, and interviews

were conducted in a face-to-face setting at a time and location convenient to them. The qualitative analysis program ATLAS was used to analyse the data and define the themes.

Research findings identified many barriers to collaboration between Hajj stakeholders at each stage of Gray's (1989) collaboration model. Centralised governance, poor leadership and a lack of adequate resources in the planning process created obstacles to the achievement of environmental sustainability in the destination.

The results show that the level of collaboration between stakeholders in the Hajj is fragile and requires significant improvement. Thus, from an analysis of findings, ways to improve the collaborative network between Hajj stakeholders when planning for protecting the environmental sustainability of the destination are explored.

This study contributes to theory by applying Gray's (1989) model to a new and unique context, thereby revealing barriers and drivers to effective planning and the implementation of environmental policy and strategy. The study reveals opportunities for improvement and future research.

The practical contribution of the study is that it can inform policymakers of the importance of changing their traditional approach in the planning process, especially because the government of Saudi Arabia has made a commitment to environmental sustainability, as detailed in the national document *Vision 2030*. In addition, the results may guide Hajj stakeholders from all sectors to understand the barriers and drivers that affect the development of collaboration. Thus, they may review and re-establish their collaborative network for the Hajj planning process.

Student Declaration

I, Abdullah Abonomi, declare that the PhD thesis entitled *Collaborative Planning for the Environmental Sustainability of the Hajj* is no more than 100,000 words in length, including quotes and exclusive of tables, figures, appendices, bibliography, references and footnotes. This thesis contains no material that has been submitted previously, in whole or in part, for the award of any other academic degree or diploma. Except where otherwise indicated, this thesis is my own work.

I have conducted my research in alignment with the Australian Code for the Responsible Conduct of Research and Victoria University's Higher Degree by Research Policy and Procedures. All research procedures reported in the thesis were approved by the Victoria University Ethics Committee (HRE19-003).

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Publications Associated With This Thesis

The research undertaken as part of this thesis has resulted in several publications including:

Journal articles

Abonomi, A., De Lacy, T., Pyke, J. 2022, 'Environmental impact of the Hajj', International Journal of Religious Tourism and Pilgrimage, vol. 10, no.1, pp. 133-151.

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Conference presentations

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Contents

List of Figures

List of Tables

List of Abbreviations

ADR	alternative dispute resolution
CP	collaborative planning
Env	environment
GDP	gross domestic product
GHGs	greenhouse gases
GWP	global warming potential
ICT	information and communication technology
IPCC	Intergovernmental Panel on Climate Change
LA 21	Local Agenda 21
MENA	Middle East and North Africa
MSF	multi-stage flash
MSW	municipal solid waste
NGO	non-government organisations
PbS	public sector
PBUH	peace be upon him
PrS	private sector
RO	reverse osmosis
SEA	Sustainable Event Alliance
STK	stakeholder
TA	thematic analysis

UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
WCED	World Commission on Environment and Development
WHO	World Health Organization
WTO	World Tourism Organization

Chapter 1: Introduction

1.1 Environmental Sustainability of the Hajj

1.1.1 The Hajj as a hallmark event

The Hajj is one of the world's largest religious events and mass gatherings, with participation by millions of Muslims around the world. Mass gathering events are defined as a large number of people who attend a site-focused event for a limited period (Memish et al. 2012). Rock concerts and religious and sporting occasions are examples of such events. The events vary depending on many factors, such as the time, purpose and the organisation involved. Hajj is a unique and deeply historical mass event that has significant negative environmental impacts. This research is an investigation of the nature of planning by Hajj stakeholders and its relationship with the environmental sustainability of the event. This chapter provides background and context to the research and offers an overview of the thesis contents.

Every year, millions of Muslim worshippers visit Mecca in Saudi Arabia to perform Hajj, which is the fifth and last pillar of Islam. Muslims perform the rituals of the Hajj following the guidance and tradition of the Prophet of Islam Mohammed peace be upon him (PBUH). As the fifth pillar of Islam, the Hajj is an obligatory religious duty for adults who have the financial and physical ability to perform the rituals. The Hajj occurs annually on the twelfth month of the Islamic lunar calendar. To perform the Hajj, people from approximately 183 different countries and cultures visit Mecca because the Hajj needs to be performed in the specific place of Mecca, known as Al Mashaaer Al Mugaddassah and Al Kaaba Al Musharrafah in AL Masjed Al Haram (Parker & Gaine 2019). The city of Mecca is the host city, and according to the General Authority of Statistics in Saudi Arabia, in 2018, more than 2,300,000 pilgrims performed the Hajj (Gastat 2018a). According to the objective of Vision 2030 of the Saudi Arabian government, the number of pilgrims was expected to grow to 2.5 million in 2020, and the rate of increase would be 13% per year (Arabnews 2016). This goal, however, has not been achieved because of the COVID-19 pandemic. The pandemic forced the government to severely reduce the number of pilgrims in 2020 to 10,000. Muneeza and Mustapha (2021) investigated the pandemic's impact on the Hajj and found it had serious religious,

economic, social and psychological effects on Hajj stakeholders. Ultimately, it is reasonable to assume that this situation will not last and visitor numbers will rise again in future.

The Hajj is a major event and can be categorised as a 'hallmark event' (this is discussed in detail in Chapter 3). As a major event, the Hajj attracts millions of people from around the world in one place at a specific and short period. Major events have both positive and negative economic, social and environmental impacts on the host country (Mair 2015). The Hajj also contributes to the Saudi Arabian economy, which is particularly important in the context of dwindling oil prices and the need for Saudi to diversify its economic base. In 2017, the revenue of the Hajj was between $US 5.3 and $6.7 billion and it is expected to reach more than $10 billion by 2030 (Gridini 2018). From a social perspective, the Hajj gathers millions of people from different races, cultures and languages, increasing the sense of unity and equality with others (Clingingsmith et al. 2009). However, Hajj activities have a significant and damaging impact on the environment (Simpson et al. 2014; Pasha & Alharbi 2015).

1.1.2 The environmental impact of the Hajj

As indicated in Section 1.1.1, the government of Saudi Arabia aims to increase the number of pilgrims each year. This strategy of rapidly growing the number of pilgrims in the Hajj will result in increased environmental pollution of the holy sites (Urton 2014) and make the event a contributor to climate change (El Hanandeh 2013; Hassan et al. 2016). The mass gathering of pilgrims in one place in a short period (4–5 days) causes intense impacts on the environmental sustainability of the destination because of the generation of waste (Seroji 2012; Simpson et al. 2014; Hassan et al. 2016). For example, the General Director of Holy Mecca Municipality stated that around 30,000 tonnes of municipal solid waste were extradited by the city to landfill and 80% of the waste was generated in the first five days of the 2017 Hajj. The food waste was estimated to be sufficient to feed the pilgrims for at least 15 days (Al-Dhass 2017). In addition, Khwaja et al. (2014) revealed that in the 2012 Hajj, the level of combustion tracer carbon monoxide and volatile organic compounds was very high. Butenhoff et al. (2015) asserted that during the Hajj, the environmental pollution level is low in most Saudi Arabian sites, but in Mecca it is very high owing to the gathering of millions of people. Noise pollution from road vehicles and pilgrims also constitutes a major problem during the Hajj

(Alhazmi et al. 2020). The level of environmental pollution in the Hajj is concerning and needs to be addressed, especially given that the number of pilgrims is forecast to increase in the future.

Measures to manage and protect the environment in the Hajj have been implemented by the Saudi Arabian government (see Chapter 2). Despite these efforts, there is weak compliance by Hajj stakeholders, which has been a source of friction.

For instance, during the 2015 Hajj, the Minister of Hajj and Umrah indicated that numerous Hajj hospitality agencies contributed to environmental damage by their non-compliance with environmental policy (Makkahnews 2014). Moreover, the head of the institutions of Hajj authority blamed the Secretariat of the Holy City by requiring Hajj hospitality agencies to pay the expenses of cleaning the holy sites (Bin-Gursan 2014). In addition, there is a call by Hajj stakeholders from the private sector to reduce the waste produced from donation institutions (Makkahnews 2018). This continued lack of collaboration between Hajj stakeholders is an essential consideration in addressing the environmental damage created by the Hajj activities.

1.1.3 Collaborative planning for sustainable tourism

While theories of destination management are diverse, there is agreement that strong stakeholder collaboration is key (Jamal & Getz 1995; Graci 2013; McComb et al. 2017). Since planning is necessary to achieve sustainability in a tourism context (DEH 2004), collaboration is one of the most important elements of the process. This was asserted by Byrd (2007), who reviewed different studies that described many forms of stakeholder participation in tourism processes and found that stakeholder collaboration in planning processes resulted in substantial benefits by enhancing the involvement of different stakeholders, including the community, during the planning process. Such an inclusion of various tourism stakeholders will educate all tourism stakeholders to understand the concerns and issues involved in the development of tourism. Further, collaboration allows stakeholders to harness diverse knowledge, techniques and scientific approaches to contributing to tourism management (Freeman et al. 2011). Moreover, it can assist in addressing conflict between key stakeholders of the destination (Wood & Gray 1991) and reaching consensus between stakeholders on how short- and long-term objectives should be defined (Gajda 2004). This may aid stakeholders to achieve environmental

sustainability of the tourism destinations. Indeed, it has been argued that a collaborative planning approach allows greater stakeholder participation than do other types of planning approaches (Vogt et al. 2016). Hence, if all key stakeholders engage in collaborative and collective efforts to achieve the sustainability goals, the destination will have a better chance of achieving them (Getz & Timur 2004). Accordingly, the need for effective stakeholder collaboration is the starting point for this thesis.

While there is a body of literature that relates to collaboration between stakeholders in tourist destinations (Jamal & Getz 1995; Ladkin & Bertramini 2002; Graci 2013; Vogt et al. 2016), these frameworks have not been applied to any investigation of the Hajj. Hence, this research adopted the three-stage collaboration model developed in the seminal work of Gray (1989) to understand the nature of collaboration between Hajj stakeholders. The rationale for adopting Gray's (1989) model is that it is widely cited and considered one of the most effective models to analyse the collaboration between stakeholders in the real world (Fyall & Garrod 2005). Moreover, the model can be applied to understand any form of collaboration. As Gray argues, 'while there is not a clearly prescribed pattern that characterises every collaboration, there appear to be some common issues that crop up repeatedly' (1989, p. 55). Austin and Baldwin (1991) agreed that this theoretical model is one of the most useful lenses through which to examine and understand the form of collaboration between stakeholders. This is illustrated through its application in research undertaken in both developing countries (Kenawy 2015; Ferede 2019) and developed countries (Parker 1999; Kernel 2005). On this basis, this study adopted Gray's (1989) framework to understand the nature of collaboration between Hajj stakeholders in terms of planning processes to preserve environmental sustainability in the Hajj.

1.2 Aims and Objectives

There were two key drivers for undertaking this research. First, despite the growing interest in stakeholder management in the tourism literature (Graci 2013; Charleen et al. 2014; Roxas et al. 2020), the process of involving stakeholders in decision-making has been neglected, particularly in developing countries, owing to the dominance of centralised decision-making systems (Siti-Nabiha & Saad 2015; Kala & Bagri 2018). Therefore, investigation of the planning process is needed, especially in a country such as Saudi Arabia, where collaboration in tourism planning between stakeholders is limited (Al-Tokhais & Thapa 2019; Alyusuf 2021). Hence, it is important to study the planning

process in real-world tourist destinations and studying the case of the Hajj may increase our understanding of collaboration in tourism planning.

Second, while numerous studies have shown the importance of stakeholder collaboration in tourism destinations and how such a network can improve the sustainability of the destinations (Erkuş-Öztürk & Eraydın 2010; Graci 2013), there is observable conflict between Hajj stakeholders in implementing environmental projects and plans, as shown in Section 1.1.2. Such an issue has been proven to hinder efforts towards improving the sustainability of tourism destinations (Ladkin & Bertramini 2002; Wondirad et al. 2020). Therefore, investigation of this issue may produce knowledge on how to improve the sustainability of a major event such as the Hajj, especially given that no study has investigated this issue in this context.

Accordingly, the overriding aim of this research was to investigate how the environmental sustainability of the Hajj can be improved. The particular focus is how stakeholder collaboration in planning can be enhanced to achieve this sustainability improvement. To achieve this aim, four research objectives were formulated (see Table 1, which also describes the data requirements that flow from each objective).

Table 1. Overview of the objectives, questions and data to be obtained

Objectives	Questions	Data needed	Data obtained
Describe and estimate the environmental impact of the Hajj	Q1. What is the impact of waste generation, water and energy consumption and how much Co_2 does the Hajj produce?	1. Sources that affect the environmental sustainability of the Hajj 2. Quantity of waste generated by Hajj activities	Secondary data Primary data
Review and analyse planning related to environmental sustainability	Q1. What plans have been created by Hajj stakeholders to enhance environmental sustainability in the Hajj?	Information about the plans that have been developed to protect the environment of the Hajj	Secondary data
Analyse the extent to which key stakeholders collaborate in planning processes for sustaining the environment of the Hajj	Q1. To what extent does the collaboration between key stakeholders exist in the planning processes for sustaining the environment of the Hajj?	All information about the nature of collaboration between Hajj stakeholders	Primary data
Identify the drivers of sustainable practice by key Hajj stakeholders involving in planning	Q1. What are the drivers to attain collaboration in the planning stage from the perspective of key stakeholders?	All information about the drivers that affect collaboration between Hajj stakeholders	Primary data

1.3 Research Methodology

This research employed a qualitative methodology. A qualitative approach was adopted as the best strategy to understand why things occur, as opposed to what occurs in the social world (Jennings 2001). The specific methods used include collection of secondary data, personal observations, collection of primary data via unstructured and semi-structured interviews, and a range of data analysis of both secondary and primary data. Secondary sources, such as government reports, academic studies and newspapers, were

used to provide an overview of the environmental impacts created by 2018 Hajj activities and estimate the carbon dioxide equivalent (CO_2-e) emissions from these activities using a range of estimation techniques.

Primary data were collected in two rounds. Interviewees were selected to be representatives of public and private sector stakeholders, and interviews were conducted in a face-to-face setting. The qualitative analysis program ATLAS was used to analyse the primary data and define the themes. Justifications of the reasons for selecting the qualitative paradigm, methodology, technique and procedure are discussed in Chapter 3 (research methodology) of the study.

1.4 Research Applications and Contribution

This study makes two key contributions to collaboration theory. First, while the collaborative planning framework has been applied in other developed and developing economies, it has not been applied previously in Saudi Arabia. Thus, this study contributes to the theory by applying it to an unexplored context such as the Hajj. The application of the framework offers a view of how collaboration can be enhanced in developing countries that share similar political and structural systems to those of Saudi Arabia.

Second, this study identifies the drivers that enhance collaboration between stakeholders and that can inform future planning efforts in Saudi Arabia and beyond. Ultimately, these insights may contribute to enhanced environmental sustainability of the Hajj. Further, the findings may be beneficial to Hajj stakeholders through providing them with greater understanding of the weaknesses within existing event planning and how this might be improved in the interests of environmental sustainability. Moreover, the research may be useful for other countries in the Middle East and North Africa (MENA) region that have similar social, economic, environmental conditions and religious events which also generates significant environmental damage such as that in Karbala, Iraq (Abdulredha et al. 2017).

1.5 Thesis Structure

1.5.1 Chapter 1 Introduction

This chapter discussed the key issues and concepts related to this study. First, this chapter provides a background of the issues related to the environmental sustainability of the Hajj. This is followed by justifying the reason for applying Gray's model to understand the nature of collaboration between Hajj stakeholders. The chapter then provides an overview of the aim and objectives of this study. The chapter concludes with a brief discussion of the implications and the methodology that this study applies.

1.5.2 Chapter 2 Contextual background and environmental impacts of the Hajj

This chapter provides the context for the study with a history of both Saudi Arabia and the Hajj. The chapter also provides a comprehensive overview of the components that contribute to affecting the environmental sustainability of the Hajj and includes an estimation of the CO_2-e emitted from different sources arising from the Hajj 2018.

1.5.3 Chapter 3 Literature review

The first part of this chapter presents an overview of the definition of events and the effect event activities have on environmental sustainability. This is followed by a discussion of the reason for classifying the Hajj as a hallmark event. The chapter then reviews the literature on how sustainable development relates to events and tourism destinations. This is followed by an analysis of literature about tourism planning and the concept of stakeholder collaboration—as an important component of such planning. Finally, a collaborative planning framework developed by scholars is discussed, including justifications for applying Gray's (1989) model as a theoretical lens to guide the research.

1.5.4 Chapter 4 Research methodology

This chapter explains the research methodology used for this study, which outlines the constructivist theoretical perspective, ontology, epistemology and methodology underpinning the thesis. In addition, this chapter clarifies the qualitative research methodology, sampling design, research procedure, data analysis methods and limitations used in the data collection and analysis.

1.5.5 Chapter 5 Research analysis and findings

This chapter analyses the data through the lens of Gray's (1989) collaborative model. It clarifies the nature of collaboration between Hajj stakeholders and the drivers that may induce their level of collaboration in the planning stage. The results and analysis of this chapter are based on primary data derived from interviews with key Hajj stakeholders.

1.5.6 Chapter 6 Research discussion

The objective of this chapter is to draw on the findings to respond to the core research question of how the environmental sustainability of the Hajj can be improved. The response draws on the literature, information and data gathered and analysed over the course of the project, including a literature review, a review of environmental policies and strategies, an estimate of greenhouse gases (GHGs) generated by the 2018 Hajj and in-depth interviews with Hajj stakeholders.

1.5.7 Chapter 7 Conclusion

This chapter provides an overview of the research findings, discusses the applicability of Gray's (1989) framework in developing countries and identifies implications for collaborative planning in tourism development in Saudi Arabia and beyond. It also explains the limitations of the research and offers recommendations.

Chapter 2: Contextual Background and Environmental Impacts of the Hajj

This chapter provides background to Saudi Arabia, the Hajj and its process. In addition, this chapter illustrates how the operation of the Hajj affects the environment through the generation of waste and other forms of pollution. The estimation of CO_2-e emissions of these activities will also be provided in this chapter.

2.1 Background to the Study

Since the establishment of the modern Saudi state in 1932, the Kingdom of Saudi Arabia has been well known for its conservative approach to tourism. This is because of the close relationship between the monarchy and the religious establishment, which feared negative impacts of non-Muslim tourists changing the cultural and religious values, as observed in other secular Arab countries such as Egypt (Thesiger 2007). Thus, the Saudi government avoided promoting the official tourism sector for decades. Religious tourism, which is well known as Hajj and Umrah, was the only form of tourism that the country promoted.

The economy of Saudi Arabia is one of the 20 largest in the world and depends mostly on oil and related industries. However, the country's regulation system has changed since 2015, when oil prices underwent a steep decline, and with the COVID-19 pandemic, prices fell around 30% between Jan 2020 and Apr 2020 (Byrne 2020). After a period of sustained oil price increases from 2000 to 2013, the fluctuation of oil income has highlighted the Kingdom's need to generate alternative fixed sources of local development and address climate change issues by using renewable energy sources, such as solar and wind energy (Vision 2030 2016).

In 2016, the Crown Prince of Saudi Arabia, Prince Mohammed bin Salman, published plans to transform his country's economy through Vision 2030, along with actions to be taken by national entities, including the government and private sectors, to achieve the 2030 Sustainable Development Plan (KPMG 2017). The goal of the vision is to boost foreign direct investment, reduce the Kingdom's reliance on oil, and increase the proportional contribution to gross domestic product (GDP) by the private sector from 40% to 65% (Vision 2030 2016). Thus, Prince Mohammed bin Salman has set 24 goals

towards this vision, one of which is to grow the tourism industry, including religious tourism, such as the Hajj (Al Surf & Mostafa 2017).

The Hajj provides one important opportunity for the Kingdom of Saudi Arabia to reduce economic dependence on oil revenues. According to the Mecca Chamber of Commerce, 25%–30% of the income of private sectors in the holy cities areas (Mecca and Madinah) derive from pilgrimage (ACCA 2018). Currently, religious tourism contributes approximately 3% to Saudi Arabia's GDP. However, this percentage is expected to increase (Daye 2019). Therefore, one of the pillars of the government's vision is to increase the number of pilgrims every year in order to diversify and strengthen its economic status. This has led to efforts to improve Hajj services, such as by expanding construction, improving transport and implementing a number of measures to control and prevent disease (Taibi 2016). Despite the promising future benefits of pilgrimage, such as improving socialisation, interaction and international trade (Adama 2009), the Hajj contributes adversely to the environment of the country. For instance, Butenhoff et al. (2015) noted that air pollution in Saudi Arabia becomes higher in Mecca than in other cities because of the Hajj. In addition, Khwaja et al. (2014) found that the level of air pollution during the Hajj exceeded World Health Organization (WHO) standards.

Despite the significant impact of the Hajj on the environment, this issue has been given little attention by scholars. In fact, the issue requires intensive consideration because the country will not achieve its goals without sustaining the environment, and it can affect the future viability of the tourism industry (Tourism Victoria 2012). Thus, in accordance with the Saudi Vision 2030 objective, the aim of this study is to improve the environmental sustainability of the Hajj.

2.2 Contextual Background

2.2.1 Saudi Arabia

Saudi Arabia is in the southwestern part of Asia and the Tropic of Cancer cuts through the middle. Saudi Arabia covers about four-fifths of the Arabian Peninsula (Gastat 2015), with a total area of approximately 2,149,690 km^2 (830,000 sq. miles) (Worldometers 2018), making it the third-largest country in the Middle East and the thirteenth-largest state in the world. It is predominantly a Muslim country, with a population of 35,013,414 people (Gastat 2021). The official language of the country is Arabic, which is believed to

be the language of the *Quran*, the holy book for Muslims. It is the home of Mecca, the holiest city in Islam, and the birthplace of the Prophet Muhammad (PBUH). Therefore, Saudi Arabia is an important destination for more than 1.65 billion Muslims around the world who perform the rituals of the Umrah and Hajj (Kettani 2010). For example, in 2018, more than 10 million Muslims visited the city of Mecca to perform the rituals of the Umrah and Hajj, and it is anticipated that the number will increase to more than 30 million visitors in 2030 (Al-Dhass 2018).

The Umrah is another form of pilgrimage that is undertaken in Mecca by Muslims. It is sometimes called 'minor pilgrimage' (Rubin 1982). However, there are many different processes between the Hajj and Umrah rituals. For instance, the Hajj is one of the five pillars of Islam, and every Muslim who has the financial and physical ability should perform it. Umrah is not a mandatory ritual but is highly recommended for all Muslim people. In addition, the Hajj is undertaken in a specific period of the Islamic calendar, while Umrah can be performed at any time. Moreover, Umrah rituals take only a few hours to be completed, whereas the Hajj requires a longer time (days) and has more rituals.

2.2.2 City of Mecca

Mecca is located about 75 miles east of Jeddah (see Figure 1). The total area of Mecca is about 550 km^2, with an average height of 273 m above sea level (Alkhuzai 2014). Its population is more than two million (al-Thaqafi 2015). Mecca has been mentioned under many names and meanings in the *Quran*, such as al-Balad, Um-Alqura, Mecca, Becca and Al-Qarya (al-Ken 1995). For Muslim people, it is considered the spiritual centre of Islam because they believe that the Prophet Muhammad (PBUH) received his first proclamation in Mecca in the early seventh century. Moreover, it is considered the home of the Kaaba, which is inside the Haram Mosque, also called the Great Mosque of Mecca (see Figure 2).

The Haram Mosque is one of the largest mosques in the world. It is surrounded by the Islamic Qibla (direction for prayer) called Kaaba, which is located in the city of Mecca, Saudi Arabia. The Haram Mosque is magnificent in size and architecture. It has been decorated and expanded many times by the government of Saudi Arabia since the late

twentieth century. The Haram Mosque can accommodate up to 1.8 million prayers at one time (ASA 2015).

All Muslims look forward to performing the Hajj; therefore, they must go to the mosque of the Haram once in their lives. This is because one of the fundamental principles of the Hajj is praying inside the Sacred Mosque and circling around the Kaaba (Tawaf in Arabic) which is also within the boundaries of the Haram Mosque. Pilgrims cannot complete the rituals of the Hajj without turning around the Kaaba seven times, following the approach of prophet Muhammed (PBUH).

Figure 1. The location of Mecca

Source: NOP (2018).

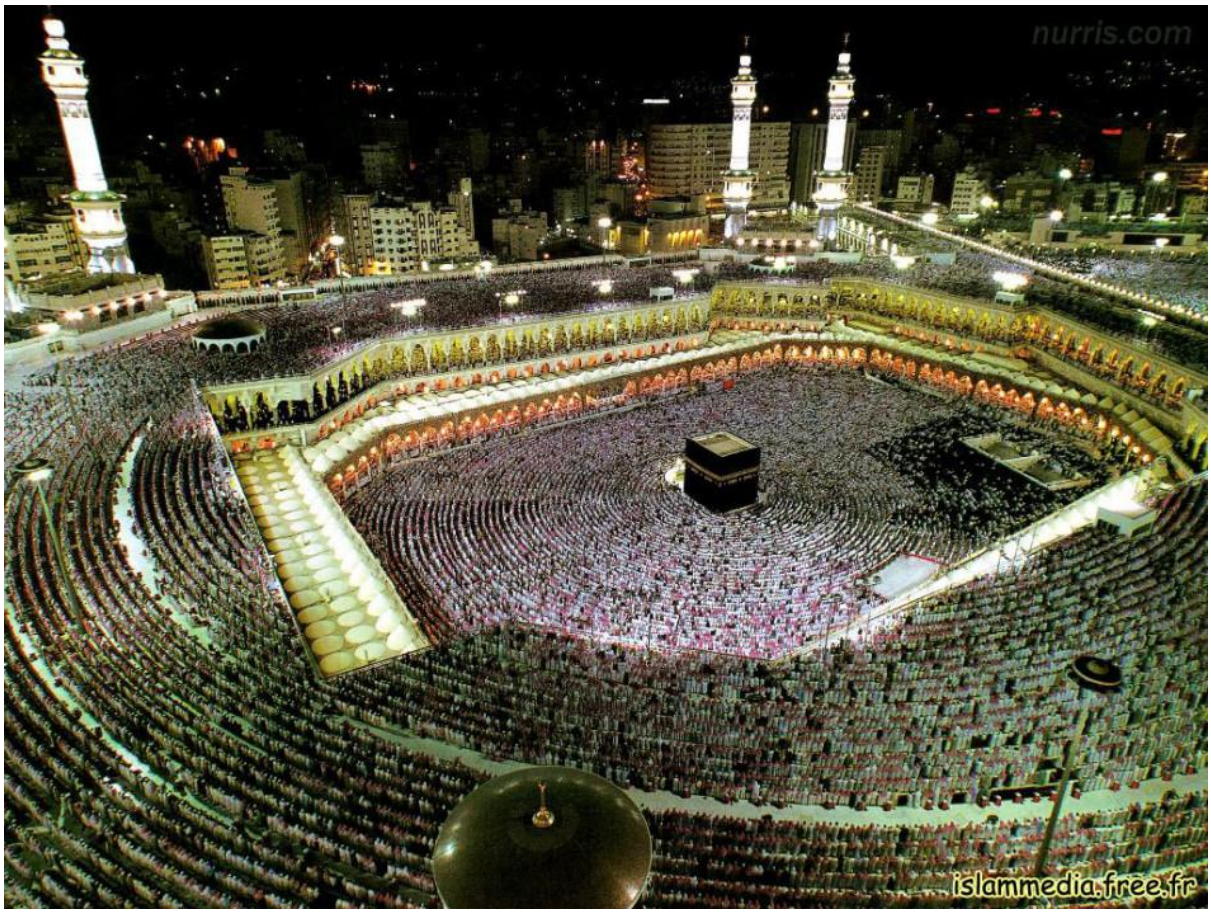

Figure 2. The Haram Mosque

Source: WFT (2018).

2.2.3 Al-Kabba Al-Musharfa

In the heart of Mecca is Al-Kabba Al-Musharfa (see Figure 3). The Kaaba is a large black stone building located in the heart of the Holy Mosque in Mecca. It is a cubic stone structure made of granite. Its height is 13.1 m (43 feet), with sides of 11.03 m (36.2 feet) and 12.86 m (42.2 feet) (Petersen 1996). Inside the Kaaba, the floor and the walls are made of white and coloured decorated marble and milestones (see Figure 4) (al-Hussein 2016). Kaaba is considered by Muslim people to be a house of God (Allah). Thus, all Muslims must face the Kaaba when performing Salah (prayer of Islam) wherever they are in the world. Moreover, Kaaba once a year hosts pilgrims during the Hajj season. Many parts of the Hajj require pilgrims to circle seven times around the Kaaba in a clockwise direction. Muslims revolve in harmony around the Kaaba because they believe it refers to the unity of believers in the worship of one God. The circle begins with a black stone on the corner of the Kaaba if possible (see Figure 5). Muslims usually attempt to kiss or touch the black stone, but this is often not possible because of the large number of

pilgrims, so it is acceptable for them to simply raise their hands to the stone in each circle. At the end of the circling, the Muslims travel to the Ibrahim prayer station and drink water from the well of Zamzam, before embarking on the following rituals of the Hajj. Because the Hajj period is 5–6 days, Muslims circle seven times around the Kaaba twice. The first time is when they start the ritual of the Hajj, and the second time is when they finish the Hajj rituals.

Figure 3. Al-Kabba Al-Musharfa

Source: Gazette (2018).

Figure 4. Internal photo of Kaaba

Source: al-Hussein (2016).

Figure 5. The black stone

Source: Ali (2014).

2.3 Hajj Process

Religious tourism or events are a special occasion for followers of many kinds of faiths. They are usually celebrated on specific dates and are associated with rules and rituals. The rules governing the Hajj, as compared with many other religious events, are particularly strict. To illustrate, pilgrims dress in simple white garments called Ihram (see

Figure 6). Men wear non-woven and smooth clothes, and women wear normal white clothes and dresses. The idea behind wearing the same clothes is to hide any differences in wealth and prestige. In addition, in the Hajj it is forbidden to wear perfume and to make conjugal relations. Moreover, another difference between the Hajj and other events is that all pilgrims from 183 countries with different languages, cultures and nationalities are required to perform the rituals in certain places at specific times and following specific process steps.

Figure 6. Pilgrims dress in the Hajj (Ihram)

Adapted from Al-Arabiya (2013).

The Hajj occurs in Mecca, Saudi Arabia, once every year from 8–12 (or sometimes 13) Dul-Hijja, which is the last month of the Islamic calendar. Pilgrims from 183 countries congregate in one place to perform the ritual of pilgrimage. The processes of pilgrimage are as follows (see Figure 7).

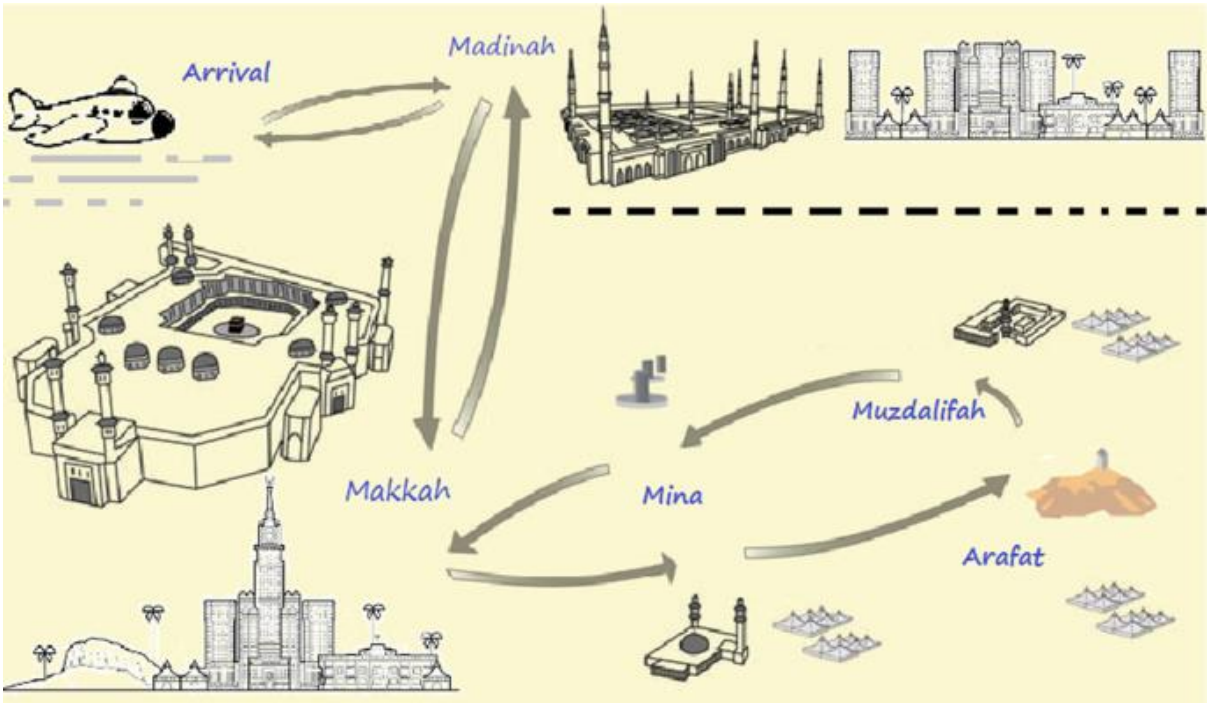

Figure 7. The Hajj processes in Mecca

Source: Shambour & Gutub (2021).

Day 1: Pilgrims travel from Mecca to Mina either on foot or in buses. It is an 8 km journey. Pilgrims will remain in Mina until dawn the next morning.

Day 2: Arafat's day is one of the most important days for pilgrims. On that day, pilgrims move from Mina to Arafat, which is another place that each pilgrim should go to and practise the ritual of pilgrimage. It is a 14.4 km journey. Pilgrims remain in Arafat until sunset; then they move to a place called Muzdalifa and remain there until the sun rises.

Day 3–5: On day 3 of the journey, pilgrims return to Mina to perform certain religious practices for 3–4 days. In this period, pilgrims remain at Mina inside the tents. On day 5 after finishing rituals from Mina, pilgrims return to Mecca to perform the last ritual of pilgrimage. After the completion of the pilgrimage rituals, pilgrims visit other important places, such as Madinah, the second-holiest city in the Islamic faith, about 457 km north of Mecca.

Section 2.4 discusses how Hajj activities affect the environment. This is followed by an estimation of CO_2-e emissions that these activities produce.

2.4 Overview of the Environmental Sustainability Problems Caused by the Hajj

The environment is one of the three pillars that comprise the context for sustainability (the others are economic and social pillars). Sustainability is defined as a:

> …condition of balance, resilience, and interconnectedness that allows human society to satisfy its needs while neither exceeding the capacity of its supporting ecosystems to continue to regenerate the services necessary to meet those needs nor by our actions diminishing biological diversity (Morelli 2011, p. 5).

The relationship between tourism and environmental sustainability is complex because tourism involves numerous activities, such as transportation, accommodation, events and attractions resulting in energy consumption (Becken & Hay 2007), the production of waste (Murphy et al. 2018), significant use of scarce freshwater resources and a negative impact on biological diversity (UNWTO 2010). Most importantly, tourism and travel activities produce significant GHG emissions (De Lacy et al. 2014).

Religious tourism is one form of tourism that the literature reveals to have significant impacts on the environmental sustainability of destinations (Singh & Bisht 2014; Abdulredha et al. 2017) and the Hajj is a prime example. Section 2.4.1 elaborates and describes the environmental damage caused by the Hajj activities.

2.4.1 Waste generation

Like other industrial activities whose operations cause harm to and pressure on environmental sustainability, the tourism industry has a series of impacts (McKercher 1993; Mieczkowski 1995). Waste generation is one of the main causes of environmental degradation (May 1995; Mieczkowski 1995).

Tourism generates different forms of waste, including solid, liquid, agrochemical among others. Each can significantly affect human health and the environment (Lal & Takau 2006). Although there are different types of waste, in the context of the Hajj, municipal solid waste and liquid waste are considered the major contributors to environmental damage (Johansson et al. 2012; Hassan et al. 2016). Each one of the forms is described in greater detail in Sections 2.4.1.1–2.4.1.2.

2.4.1.1 Municipal solid waste generation

The generation of municipal solid waste (MSW) is one of the more significant environmental impacts of tourism (Mateu-Sbert et al. 2013). In fact, the tourism sector generates more MSW than any other sector, such as manufacturing or agriculture (Arbulú et al. 2015). For instance, in 2011, the UN Environment Programme estimated the generation of solid waste worldwide and found that international tourism was responsible for generating about 14% of the total MSW generated during that year (Muñoz & Navia 2015).

In the context of the Hajj, managing MSW is considered one of the most complex challenges that organisers encounter (Nizami et al. 2017). Every day, the landfill of Mecca receives approximately 4.6 thousand tonnes of MSW during the Hajj period (Nizam et al. 2016). Food (50.6%) is the highest component of MSW, followed by paper and cardboard (18.6%) and plastic waste (17.4%) (Khan & Kaneesamkandi 2013; Nizam et al. 2015). However, the quantity of waste is expected to grow annually at 3%–5% (Galaly & Guido 2017), according to the projected growth of the number of pilgrims. To illustrate, a study by Arbulú et al. (2017) showed that an increase of 1% of visitors would increase waste generation by 1.25%.

There is no waste recycling project in Mecca to recycle the MSW of the Hajj. All MSW is disposed of without any recycling (Nizam et al. 2015; Shahzad et al. 2017). The landfill receives on average throughout the year about 2,750 tonnes of waste per day, while during the Hajj season, these quantities increase to about 4,706 tonnes per day (Nizam et al. 2015). Within 20 years, Mecca is expected to produce 44 million tonnes of MSW per day owing to an increase in the number of pilgrims (Osra & Kajjumba 2019). Thus, the government of Saudi Arabia is encountering a very sensitive issue because the gases emitted from the biological activity of MSW in landfills, mainly methane, are a major contributor to climate change (Zhang et al. 2019). With the rapid increase of pilgrim numbers, the issue will become much worse.

2.4.1.2 Liquid waste from sewage and slaughterhouses

Like many industries, the operation of the tourism industry generates a significant amount of liquid waste, as shown by numerous studies (Zappino 2005; Mensah 2007; Akis 2011; Łapko et al. 2019). Similarly, one of the important environmental impacts of the Hajj is

the generation of liquid waste from sewage (Mekkahnews 2014b). In Mecca, there are two tertiary sewage treatment plants, which are in the Uranah and Hedda valleys (Mekkahnews 2014a). Both plants can treat around 300,000 m^3 per day of sewage; however, during the Hajj, sewage production is estimated to be much more than that per day, though accurate figures are not available (Al-Salman 2018). The rest is disposed of in the valley and the Red Sea with inadequate treatment (Sulyman 2012), causing significant environmental degradation (Kim et al. 2019; Whitmore & De Lacy 2005). Alharthy (2001) and Bahabri (2011) evaluated the contamination of different components in the Uranah valley, such as underground water and soil. Both studies found that the level of contamination in underground water is extremely high because of untreated sewerage discharge. They also revealed that agricultural crops are polluted and are not safe for human use because they are irrigated with untreated sewage.

Liquid waste from animal slaughter is a further issue (Hassan et al. 2016). With more than two million Muslims performing Hajj, it has been estimated that more than 1.5 million sheep, goats and camels are slaughtered during the Hajj period (Almasri et al. 2019). Approximately 12% of waste is produced per sheep and goat weight, and 43% of waste is produced per cattle weight (Ali et al. 2021). Like sewage, however, there is an absence of data on the actual levels of liquid wastes from slaughtered animals that are disposed of without treatment (Shahzad et al. 2017). One study, however, showed that the slaughterhouses discharge the untreated waste from animals, including liquid waste such as blood and cleaning water, in the valley of Al-Harman, which is in the north-eastern part of Mecca (Hussein 2018). This discharge has been proven to harm the quality of soil, air and water (Al-Fattly 2013; Olayinka et al. 2013; Demattê et al. 2016). Thus, it is not surprising to find that the air quality inside and outside the slaughterhouse in Mecca during the Hajj is contaminated above the permitted levels set by the WHO (Hassan et al. 2016).

2.4.2 Water use in the Hajj

The tourism sector is well known as a large consumer of water (Cole 2012). It is expected by 2050 that tourism globally will generate an increase of freshwater consumption of 152% (Gaol et al. 2018). Thus, water use in tourism has become a matter of concern for governments and local communities (Hall et al. 2015).

Water, especially freshwater, is one of the most important and scarce natural resources for the tourism industry (UNWTO 2003, Gössling et al. 2012). The demand for water for tourism in some cases can cause problems for the local community. For instance, during a period of drought (1994–1996), the city of Tangier in Morocco suffered from a severe shortage of freshwater because water supplies for tourist facilities had priority over the local water needs (De Stefano 2004). Tourism operations in many countries may put a strain on the supply of freshwater to local communities (Gössling et al. 2012). To illustrate, in Bali, Indonesia, it was found that tourism consumes 65% of local water resources (Cole 2012). Moreover, it was estimated that tourists in Spain use up to 440 L per day, more than twice the average use of a Spanish citizen (De Stefano 2004). Thus, one of the consequences of rapid tourism expansion is sudden pressure on local resources such as water (Wells et al. 2016). This is particularly the case in tourism destinations in developing countries because the water consumption of tourists compared with local people is two to three times the demand for water in developed countries (Page et al. 2014) and 10 to 15 times greater than that of the local population in developing countries (UNWTO 2005). This was confirmed by Becken (2014), who compared the use of water in tourism in 21 countries (developed and developing) and found that developing countries generate substantial water waste compared with developed countries.

While tourism is a potential factor in total water consumption in some tourist destinations, the overall importance of local or regional water resources depends on the context (Gössling 2013). For instance, water may be scarce in some destinations and abundant in other destinations. Moreover, weather conditions (hot and cold) can also affect the consumption of water by tourists (Becken 2010). Thus, numerous factors can affect the consumption of water in tourism destinations.

In Mecca, extreme heat causes pilgrims to use vast amounts of water for drinking, showering and making ablutions known as ‘wudu’. Two main sources of water are provided to pilgrims during the Hajj: Zamzam water and desalinated water (Amirahmadi 2017). Zamzam is underground sacred water for the Muslim community; it has been mentioned in the holy book (*Quran*) (Khalid et al. 2014). Hence, Muslims drink Zamzam water for reasons other than hydration. They believe that Zamzam has numerous benefits, such as recovering from different types of diseases (Abu-Taweel 2017).

During the Hajj 2018, more than five million bottles of Zamzam water were consumed by pilgrims (Alsolami 2018). Despite the huge amount of Zamzam water distributed to pilgrims, it is not enough to meet the quantities required by pilgrims during the Hajj. This has led the government to rely substantially on desalinated seawater during the Hajj (Malek 2019).

In Mecca, desalinated water is pumped from Shuaiba (140 km south of Mecca) at a rate of 670,000 m^3 per day on normal days (Arabnews 2013). During the Hajj, the quantity of water pumped exceeds this number per day to cover the pilgrims' water demands at Mecca sites (Malek 2019). For example, in 2018 alone, because of the increase in the number of pilgrims, there was an increase in supply of desalinated water of 40,000,000 m^3, with a daily consumption that exceeded 900,000 m^3 (MEWA 2018).

Consequently, the Hajj is putting considerable pressure on the available water resources and the energy to supply desalinated water. This pressure is expected to rise because the government aims to increase the number of pilgrims in coming years with increasing numbers of pilgrims (Malek 2019).

2.5 Climate Change and Tourism

Climate change is defined as 'a change in the state of the climate that can be identified (e.g. by using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer' (IPCC 2013, p. 126). Climate change is one of the most complex issues that our world encounters and encompasses many aspects, such as science, economics, culture, politics and ethical issues (Hulme 2009; NASA 2020). The topic has been controversial. The debate revolves around whether global warming and climate change are caused by human activities or are naturally occurring. Although the scientific community agrees that climate change is caused by human activity (Myers et al. 2021; IPCC 2021), this reality has not been universally accepted in the political sphere. For instance, former president of the United States Donald Trump denied the reality that GHGs and human actions cause climate change. Thus, he withdrew from the Paris Agreement (Holden 2019), despite the previous president Barrack Obama admitting the existence of climate change and the importance of taking actions to reduce the impacts on the climate (Goldenberg 2012). In fact, many countries' governments, such as Turkey and Iran, believe that global warming and climate

change is occurring naturally, and that human actions do not contribute to climate change. Therefore, they did not ratify the Paris Agreement in 2015 (Apparicio & Sauer 2020). The denial by some countries stems largely from the desire to protect powerful economic and political interests. For instance, former US president Trump indicated that the action on climate change costs the US a huge amount of money (BBC 2018). Simultaneously, the Trump administration had an agenda to be one of the largest producers and exporters of oil (Whitehouse 2020).

Despite the intensity of conflict and tensions around climate change, the Intergovernmental Panel on Climate Change (IPCC) has provided scientifically conclusive evidence that the climate has changed when compared with the pre-industrial period because of human activities (IPCC 2021). The report shows that the temperature is 1.1 °C higher than in the pre-industrial era. Further, between 2015 and 2020, the temperature was at least 0.9 °C warmer than the average of the 1850–1900 period. This has caused many global threats, such as the increased vulnerability of small islands, increasing saltwater intrusion, destructive floods, storms and bushfires, and the extinction of many species (IPPC 2021).

GHG emissions, such as methane (CH_4), carbon dioxide (CO_2), nitrous oxide (N_2O) and chlorofluorocarbons (CFCs), are the main contributors to climate change (NASA 2020). Notably, studies have found that for over 50 years, human activities have been primarily responsible for releasing GHGs into the atmosphere (Rosa et al. 2015; Chen & Sun 2017; IPPC 2021) and their impact on the climate has increased year after year. Thus, the Paris COP21 in 2015 was held with governments to set agreements and plans to limit the increase of global warming to be no greater than 1.5 °C above pre-industrial levels (UNFCCC 2015). More recently, in 2021, COP26 convened in Glasgow, Scotland, to discuss world leaders' climate pledges and determine how to unite efforts to tackle future climate change (UNFCCC 2021).

The United Nations Framework Convention on Climate Change (UNFCCC) established two strategies to address climate change: adaptation and mitigation (Simpson et al. 2008). Adaptation refers to 'adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities' (IPCC 2007, p. 6). The goal of adaptation is to improve the resilience of society to climate change and to make the most of any possible advantageous climate

change benefits (Klein et al. 2005). Mitigation refers to efforts to change and substitute technological, economic and social factors that lead to a decrease in GHG emissions (IPCC 2007).

Mitigation and adaptation can be implemented via a variety of approaches and options. The IPCC has set different approaches for adaptation, such as spatial, social, institutional, technological and education aspects (IPCC 2014b). Similarly, the organisation has set approaches for mitigation, such as ways to reduce GHGs and energy intensity by improving technology, infrastructure and operations (IPCC 2014b). However, both approaches require effective policies and collaboration from all sectors (IPCC 2014b). This means that all sectors are required to set mitigative and adaptive strategies to reduce the negative impacts from climate change.

Tourism is one of the sectors that has been contributing to climate change (Kaján & Saarinen 2013; Lenzen et al. 2018). Hence, it has been asserted that the responsibility of tourism to reduce GHG emissions is important to prevent future damage (Conrady & Buck 2012).

To reduce the impact of tourism on climate change, different mitigation and adaptation approaches have been proposed by tourism stakeholders and institutions. For example, the UNWTO (2019b) report provided different sets of mitigating approaches for reducing the transportation emissions on tourism destinations. Similarly, the World Travel and Tourism Council provided different strategies and policies to reduce the emissions from tourism activities, such as from waste and transportation, hence lessening the impact on destinations (WTTC, 2019). Despite these global initiatives, until very recently there has been little effort to address climate change in Saudi Arabia (UNEP 2019). This is particularly evident in the context of the Hajj with no concerted effort to reduce emissions (Simpson et al. 2014; Ali et al. 2021). Interestingly, despite the notable contribution of the Hajj to climate change, no recent studies have estimated GHG emissions from the Hajj activities.

Accordingly, Section 2.6 provides an approximate estimation of GHG emissions from the Hajj activities to contextualise Hajj sustainability challenges.

2.6 Estimating CO_2-e Emissions from the Hajj

This section focuses on estimating GHG emissions produced by the Hajj activities. The term carbon dioxide equivalent (CO_2-e) has been used as a measurement for depicting other different GHGs' global warming potential (GWP) in a common unit (Brander & Davis 2012). This is because measuring only CO_2 and disregarding other GHGs may underestimate the GWP of emissions into the atmosphere. GWP is an indicator of the number of times that GHGs cause global warming compared with CO_2 (Brander & Davis 2012). The 1992 *Kyoto Protocol on Climate Change* provided a list of GHGs and their GWP (see Table 2). For example, 1 kg of nitrous oxide (N_2O) emissions can be expressed as 289 kg of CO_2-e.

To estimate the GHGs, this study uses the Greenhouse Gas Protocol Corporate Standard because it is the most relevant standard for tourism and travel and has been widely used in tourism studies (Becken & Bobes 2016; WTTC 2021b). This is because Greenhouse Gas Protocol Corporate Standard was designed in accordance with the Intergovernmental Panel on Climate Change (IPCC) Guidance on National Greenhouse Gas Inventories (Becken & Bobes 2016). The Greenhouse Gas Protocol Corporate Standard is divided into three scopes for estimating GHG emissions from a particular business or destination or activity (such as the Hajj). Scope 1 covers the direct emissions from controlled sources (e.g. emissions produced from burning the fuel of vehicles to transport pilgrims). Scope 2 covers the indirect emissions from activities that are released into the atmosphere remote from the activity but that would not occur if the activity stopped (e.g. room heating from electricity for rooms the pilgrims stay in). Scope 3 covers all other indirect emission sources that are not covered in scope 2. It encompasses the emissions from activities that at least partly would still occur if the activity stopped and are more appropriately estimated in different sectors or jurisdictions (e.g. building buses or aeroplanes that transport pilgrims) (Becken & Bobes 2016).

Sectors including tourism typically manage and estimate the scope 1 and 2 emissions due to ease of monitoring and measuring its activities (Wiedmann et al., 2009; Becken & Bobes 2016). Estimating scope 3 emissions receive little attention despite its importance in providing more details to tourism sector (Becken & Bobes 2016). In fact, the emissions of scope 3 sometimes produce the majority of the carbon footprint. It accounts for between 54% and 94% of emissions in some tourism sectors such as accommodation

sector (Sun 2014). Yet, compared to scope 1 and 2 emissions, the estimation of scope 3 emissions is more difficult due to number of variables such as lack of stakeholder's awareness about managing scope 3 emissions, lack of collaboration between stakeholders for managing the activities of scope 3 emissions, and lack of data transparency (Erhard et al. 2019). Hence, with the difficulties in getting the emissions data, this study used scopes 1 and 2 to estimate emissions resulting from Hajj 2018. Although scopes 1 and 2 approaches do not estimate the total direct and indirect emissions from an activity, such as a major event, it does allow a comparison between similar activities (Becken & Bobes 2016) and contextualises the Hajj's sustainability challenges.

Table 2. Kyoto gases on GHGs and its GWP

GHGs	GWP
Carbon dioxide (CO_2)	1
Methane (CH_4)	25
Nitrous oxide (N_2O)	289
Hydrofluorocarbons (HFCs)	124–14,800
Perfluorocarbons (PFCs)	7,390–12,200
Sulphur hexafluoride (SF6)	22,800
Nitrogen trifluoride (NF3)	17,200

Source: Brander and Davis (2012).

2.6.1 CO_2-e emissions produced from municipal solid waste

This study estimated the CO_2-e emissions of MSW produced in the Hajj 2018. Emissions produced by liquid waste were not estimated because there are no robust data about the quantity of liquid waste generated during the Hajj.

For the municipal and rural affairs of the Kingdom of Saudi Arabia in 2018, there were around 120,860 tonnes (120,860,000 kg) of MSW produced in five days of the Hajj season (Alyaum 2018). In the Hajj, all types of waste are mixed together because there is no waste sorting system (Alsebaei 2014). Thus, dividing the types of waste was impossible. Therefore, the National Green Emission (NGA) approach was applied because it provides a methodology to estimate the weighted average emission factors to the unknown composition of MSW (NGA 2017). The NGA approach is designed by the Department of the Environment and Energy in Australia for individuals and firms to

estimate their GHG emissions from different components, including MSW. The NGA followed the IPCC guideline and has set default emission factors for unknown compositions of MSW. The emission factor of unknown composition can be expressed as each tonne of unknown composition of MSW generates 1.4 tonne of CO_2-e.

To estimate the CO_2-e emissions of MSW produced in the Hajj, the formula is:

CO_2-e MWS = Qt x EF

Where:

CO_2-e MWS = CO_2-e emitted from MSW

Qt = quantity of MSW by tonnes

EF = the emission factor (t CO_2-e/t waste) of mixed MSW which is 1.4

Accordingly,

CO_2-e MWS = 120,860,000 * 1.4 = 169,204 t CO_2-e which is 169,204,000 kgCO_2-e.

2.6.2 Transportation

Transportation is a fundamental driver in the tourism industry to grow the economy and employment rates in tourists' areas (UNWTO 2018). Conversely, transportation emissions are significant and well documented in the literature (Davenport & Davenport 2006; Gössling & Peeters 2007; Peeters et al. 2007; UNWTO 2019b).

Various transportation modes are used in tourism to provide accessibility, such as aviation, cruises, trains, cars and buses. Factors influencing the choice of transportation mode in tourism can be determined by many factors, such as time, distance, comfort and cost (Fletcher 2013). In the Hajj, the most used transportation modes are air travel and land transportation (Gastat 2018a). Thus, this study focused on estimating the CO_2 emissions produced by these two modes of transport.

2.6.2.1 Aviation

Air travel produces a significant amount of the world's GHGs. This is illustrated by numerous studies that have estimated the ecological carbon footprint from tourism in

destinations and revealed that air transportation is considered the major driver of GHG emissions from tourism (Becken 2002; Dwyer et al. 2010).

The aviation sector is estimated to contribute 4.9% of global warming (CAN-ICSA 2018). Therefore, several initiatives have been taken by the aviation industry to reduce its emissions by enhancing technology and setting strategies. For instance, Becken and Pant (2019) investigated the initiatives of the largest airlines to reduce their GHG impact on climate change. They discovered that most airlines have implemented many strategies to improve aircraft efficiency, such as renewing fleet and retrofitting winglets to reduce their GHGs. Other strategies, such as mitigating the weight of cabin items and decreasing engine operating time on the ground and providing carbon offset for passengers, have also been used to reduce GHG emissions from aviation (DITRDC 2019). Despite the initiatives of the aviation industry, the saving of GHG emissions is considered relatively small compared with overall emissions (Becken & Pant 2019) and not adequate to conform with the Paris Accord (CAN-ICSA 2018). However, the industry may witness positive movement in the future towards reducing its impact on global warming. This is because green hydrogen is predicted to play a significant role in refuelling aircrafts by 2030 (Yusaf et al. 2022). The green hydrogen relies on renewable energy sources to ensure that the supply of fuel to aircrafts is as environmentally-friendly as possible (Janic 2010). If implemented, the aviation sector may significantly reduce its impact on global warming.

In the Hajj, aviation is the main form of transport used by foreign pilgrims to travel to the Hajj (Gastat 2018a). At the 2018 Hajj, 6,969 flights landed in Saudi Arabia from different countries, 3,939 of which landed at King Abdul Aziz International Airport in Jeddah and 3,030 arrived at Prince Mohammed bin Abdul Aziz International Airport in Madinah (SPA 2018a). While such flights increase the economy of the country and generate employment, their impact on the environment can be significant.

Since Saudi Arabia plans to rapidly increase the number of aviation trips because of its aim to increase the number of pilgrims by three to four times compared with the 2018 Hajj (CAPA 2018), it is timely to estimate the CO_2-e emissions of aviation. It should be noted that the number of pilgrims on each flight and its type is confidential in Saudi Arabia. Hence, the data were obtained from El Hanandeh (2013). The number of pilgrims

from each country in 2011 was estimated by El Hanandeh (2013) and these numbers from 2011 were extrapolated to 2018 (see Table 3).

The number of international passengers attending the Hajj increased by 22% from 2011 (1,362,083) to 2018 (1,656,936) (Gastat 2018a) and hence 22% was added to the number of passengers from each destination reported by El Hanandeh (2013).

Different methodologies have been employed to estimate the CO_2-e emissions (Sausen & Schumann 2000; Pejovic et al. 2008; Larsson et al. 2018). This research applied the UNWTO (2019b) average estimation of CO_2-e emissions per passenger kilometre.

The equation to estimate the CO_2-e emissions from aviation is:

CO_2-e = 0.1042 kg/p-km (UNWTO 2019b).

Where:

p = passenger

km = kilometre

Table 3. CO_2-e emissions from aviation

Country	Number of pilgrims in 2011(as per allocated quota)	Distance travelled round trip (km)	Number of estimated pilgrims in 2018 (+22%)	CO_2-e = 0.1042 kg/p-km
Afghanistan	29,047.00	6,488.00	35,437	23,957,169.68
Albania	2,601.00	6,256.00	3,173	2,068,400.01
Algeria	34,780.00	7,732.00	42,432	34,186,376.14
Angola	195.00	15,240.00	238	377,945.90
Argentina	1,000.00	31,066.00	1,220	3,949,234.18
Australia	399.00	27,464.00	487	1,393,671.67
Austria	475.00	7,294.00	580	440,820.18
Bahrain	655.00	2,504.00	799	208,472.52
Bangladesh	148,607.00	10,454.00	181,301	197,492,412.15
Belgium	638.00	8,840.00	778	716,637.58
Benin	2,259.00	11,632.00	2,756	3,340,421.93
Bosnia-Herzegovina	1,564.00	6,572.00	1,908	1,306,602.98

Country	Number of pilgrims in 2011(as per allocated quota)	Distance travelled round trip (km)	Number of estimated pilgrims in 2018 (+22%)	CO_2-e = 0.1042 kg/p-km
Brazil	204.00	27,136.00	249	704,065.23
Brunei	211.00	16,650.00	257	445,877.01
Bulgaria	1,002.00	5,720.00	1,222	728,341.33
Burkina Faso	9,600.00	12,462.00	11,712	15,208,505.16
Burma (Myanmar)	1,900.00	17,460.00	2,318	4,217,211.58
Burundi	184.00	6,226.00	224	145,319.82
Cameroon	3,276.00	10,842.00	3,997	4,515,556.39
Canada	623.00	20,908.00	760	1,655,746.34
Central African Republic	570.00	7,354.00	695	532,569.33
Chad	5,011.00	5,536.00	6,113	3,526,291.39
China	37,230.00	16,308.00	45,421	77,183,614.61
Cocos (Keeling) Islands	1.00	6,904.00	1	719.40
Comoros	658.00	7,702.00	803	644,446.37
Democratic Republic of the Congo	6,009.00	8,764.00	7,331	6,694,733.71
Republic of the Congo	61.00	8,762.00	74	67,562.03
Cote d'Ivoire	6,487.00	14,124.00	7,914	11,647,198.41
Croatia	58.00	7,058.00	71	52,216.50
Cyprus	140.00	15,540.00	171	276,894.83
Denmark	109.00	8,884.00	133	123,119.80
Djibouti	448.00	2,366.00	547	134,855.85
Eritrea	2,190.00	1,378.00	2,672	383,666.07
Ethiopia	34,700.00	2,778.00	42,334	12,254,321.38
Fiji	71.00	33,802.00	87	306,428.65
France	4,549.00	8,884.00	5,550	5,137,706.04
Gambia, The	1,434.00	13,030.00	1,749	2,374,662.77
Georgia	463.00	7,508.00	565	442,018.48
Germany	3,050.00	8,294.00	3,721	3,215,817.69
Ghana	3,365.00	11,002.00	4,105	4,706,006.48

Country	Number of pilgrims in 2011(as per allocated quota)	Distance travelled round trip (km)	Number of estimated pilgrims in 2018 (+22%)	CO_2-e = 0.1042 kg/p-km
Greece	139.00	4,668.00	170	82,688.95
Guinea	8,048.00	11,964.00	9,819	12,240,844.57
Guinea-Bissau	637.00	14,556.00	777	1,178,503.25
Guyana	77.00	28,604.00	94	280,170.46
India	129,632.00	7,760.00	158,151	127,879,633.39
Indonesia	212,937.00	15,916.00	259,783	430,836,388.96
Iran	66,658.00	3,866.00	81,323	32,759,929.62
Italy	581.00	6,757.00	709	499,192.29
Japan	127.00	19,330.00	155	312,198.83
Kenya	3,383.00	5,096.00	4,127	2,191,450.21
Lebanon	2,284.00	2,832.00	2,786	822,133.00
Liberia	696.00	12,554.00	849	1,110,599.65
Libya	5,593.00	5,952.00	6,823	4,231,613.68
Macedonia	346.00	5,990.00	422	263,394.68
Madagascar	1,263.00	9,640.00	1,541	1,547,916.01
Malawi	2,432.00	7,996.00	2,967	2,472,054.55
Malaysia	22,600.00	14,100.00	27,572	40,509,333.84
Maldives	349.00	8,330.00	426	369,762.04
Mali	11,062.00	13,030.00	13,496	18,323,870.10
Mauritania	3,087.00	13,128.00	3,766	5,151,653.00
Mauritius	204.00	11,244.00	249	291,734.58
Mayotte	188.00	82,400.00	229	1,966,212.32
Mongolia	112.00	17,450.00	137	249,105.73
Morocco	32,300.00	9,510.00	39,406	39,049,060.45
Mozambique	3,881.00	11,762.00	4,735	5,803,217.89
Nepal	1,052.00	9,432.00	1,283	1,260,950.88
Netherlands	722.00	9,156.00	881	840,522.63
Niger	9,333.00	14,348.00	11,386	17,022,771.38
Nigeria	64,386.00	9,290.00	78,551	76,038,781.92
Pakistan	157,547.00	5,748.00	192,207	115,120,768.11
Philippines	4,393.00	17,174.00	5,359	9,590,095.56
Romania	179.00	5,648.00	218	128,297.71
Russia	20,079.00	7,628.00	24,496	19,470,341.85

Country	Number of pilgrims in 2011(as per allocated quota)	Distance travelled round trip (km)	Number of estimated pilgrims in 2018 (+22%)	CO_2-e = 0.1042 kg/p-km
Rwanda	388.00	16,290.00	473	802,878.71
Senegal	10,459.00	13,390.00	12,760	17,803,236.88
Serbia and Montenegro	2,058.00	6,080.00	2,511	1,590,808.90
Sierra Leone	3,611.00	11,736.00	4,405	5,386,835.74
Singapore	664.00	14,670.00	810	1,238,177.34
Slovenia	48.00	7,306.00	59	44,915.83
Somalia	8,592.00	4,528.00	10,482	4,945,592.08
South Africa	887.00	10,876.00	1,082	1,226,208.09
Sri Lanka	1,405.00	9,282.00	1,714	1,657,754.06
Sudan	28,131.00	1,916.00	34,320	6,851,891.90
Suriname	86.00	26,786.00	105	293,065.63
Swaziland	117.00	11,056.00	143	164,741.03
Sweden	270.00	10,740.00	329	368,186.53
Switzerland	322.00	8,110.00	393	332,109.37
Tanzania	12,868.00	6,788.00	15,699	11,104,053.41
Togo	1,136.00	11,066.00	1,386	1,598,165.00
Trinidad and Tobago	63.00	23,682.00	77	190,010.16
Tunisia	9,873.00	6,534.00	12,045	8,200,751.53
Turkey	69,521.00	4,744.00	84,816	41,926,652.24
Uganda	4,363.00	9,148.00	5,323	5,073,998.58
United Kingdom	1,632.00	9,524.00	1,991	1,975,869.99
United States	7,393.00	22,372.00	9,019	21,024,753.69
Vietnam	67.00	14,646.00	82	125,141.28
Western Sahara	273.00	11,260.00	333	390,706.24
Zambia	2,815.00	8,672.00	3,434	3,103,039.32
Zimbabwe	127.00	12,816.00	155	206,991.22
Egypt	72,855.00	2,467.00	88,883	22,848,388.42
Kuwait	2,636.00	2,468.00	3,216	827,044.57
Qatar	1,168.00	2,656.00	1,425	394,376.16
Oman	2,547.00	3,992.00	3,107	1,292,407.60

Country	Number of pilgrims in 2011(as per allocated quota)	Distance travelled round trip (km)	Number of estimated pilgrims in 2018 (+22%)	CO_2-e = 0.1042 kg/p-km
United Arab Emirates	3,577.00	3,392.00	4,364	1,542,440.09
Total	1,362,083.00	1,186,776.00	1,661,741	1,561,190,021.20

Source: Adapted from El Hanandeh (2013). *The data were obtained from El Hanandeh (2013). The number of pilgrims from each country in 2011 was estimated by El Hanandeh (2013) and these numbers from 2011 were extrapolated to 2018.

2.6.2.2 Land transportation

In tourism, land transportation is one of the dominant transport modes used for tourism travel (Witt et al. 2014). Similarly to aviation, land transportation produces considerable CO_2-e emissions in tourist destinations and contributes to climate change (UNWTO 2019b). Thus, planning of tourist areas must be integrated with efficient transportation, especially in developing countries, which emit more GHGs per passenger kilometre than developed country destinations (Paramati et al. 2017).

Land transportation is also a dominant transport mode to the Hajj (Al-Omari 2014). For example, in the 2018 Hajj, there were 32,298 vehicles (mostly cars and buses) carrying domestic pilgrims (Gastat 2018a). In addition, the main transport mode for transferring international pilgrims from airports to Mecca was bus. For instance, in the 2018 Hajj, more than 18,000 buses transferred more than 1.5 million pilgrims from the airport to Mecca (SPA 2018b). These transport activities contribute significantly to emissions (Seroji 2011; Al-Omari 2014). Hence, this research estimated the average of CO_2-e emissions produced by cars that domestic pilgrims used to travel to Mecca and the buses that domestic and foreign pilgrims use for the Hajj purposes.

Although the average fuel consumption of cars and buses is determined by many factors, such as traffic conditions, driving style, load factors and models, these variables have not been considered because these data are not available or published (Gastat 2018a). Therefore, this study applied the estimation of UNWTO (2019b), which indicates that each car passenger emits around 0.1135 kg of CO_2-e per km in the tourism context. The CO_2-e emissions were estimated by multiplying the number of pilgrims who travelled by car from their cities to Mecca with the distance and the default emission factor that

was proposed by UNWTO (2019b). The estimation of CO_2-e emissions from vehicles used by internal pilgrims is provided in Table 4.

Table 4. CO_2-e emissions of vehicles used by internal pilgrims (round trip)

Destination	Sharae'a–Mecca (32 km)	*South–Mecca (1307.4 km)	Madinah–Mecca (914 km)	Taif–Mecca (180.2 km)	Jeddah–Mecca (132 km)	Jeddah–Mecca (old road) (132 km)
Number of pilgrims (total)	70,600	21,304	42,775	10,014	91,678	3,591
CO2e emissions (0.1135 kg/p-km)	256,419.20	3,161,298.43	4,437,435.73	204,813.34	1,373,519.80	53,800.36
Total	9,487,286.86 kgCO2-e					

Source: Adapted from Gastat (2018a).

Note: kg = kilogram). *There are three main cities in the south (Jazan 707.3 km–Aseer 404 km–Najran 850 km). Thus, the average distance of the three cities was considered in this study which is (707.3 + 404 + 850)/3 = 653.7 km (one round).

To estimate the CO_2-e emissions of buses that transport both domestic and international pilgrims, the estimation of the UNWTO (2019b) that the CO_2-e emissions from buses = 0.0300 kg/p-km was applied in this study. Moreover, the governmental data do not provide the number of pilgrims in each bus that travelled to Mecca. Therefore, this study adopted the assumption of El Hanandeh (2013) that each bus in the Hajj holds approximately 40 passengers. For example, in the 2018 Hajj, 3,685 buses travelled from Madinah to Mecca. Assuming that each bus holds 40 passengers, approximately 147,400 travelled from Madinah to Mecca by bus.

The CO_2-e emissions were estimated by multiplying the number of pilgrims who travelled by bus from their cities to Mecca with the distance and the default emission factor that was proposed by the UNWTO (2019b). The estimation of CO_2-e emissions from buses that transported domestic pilgrims is provided in Table 5 and international pilgrims in Tables 6, 7 and 8.

Table 5. Bus transportation for domestic pilgrims (round trip)

Destination	Sharae'a–Mecca (32 Km)	South–Mecca (1,425.2 km)	Madinah–Mecca (914 km)	Taif–Mecca (130 km)	Jeddah–Mecca (132 km)
Bus	5,436	2,582	3,685	2,356	5,729
Passengers (number of buses*40)	217,440	103,280	147,400	94,240	229,160
CO2e emissions (0.0300 kg/p-km)	208,742.40	4,415,839.68	4,041,708.00	367,536.00	907,473.60
Total	9,941,299.68 kgCO2				

Source: Adapted from Gastat (2018a).

Note: p = passenger, km = kilometre, kg = kilogram.

According to the deputy minister of the Hajj and Umrah, there were 17,000 buses for transporting foreign pilgrims inside the Hajj areas (Arabnews 2018). There are two places that most international pilgrims visit (Jeddah and Madinah) because they have the two main airports. In addition, Al Madinah is considered the second most important place for Muslims because it holds the mosque of the Prophet Mohammed (PBUH). Thus, many pilgrims visit the mosque either before or after performing the Hajj rituals. This study estimated the CO_2-e emissions from the movement start of buses from the airports located in Jeddah and Madinah (see Figure 8).

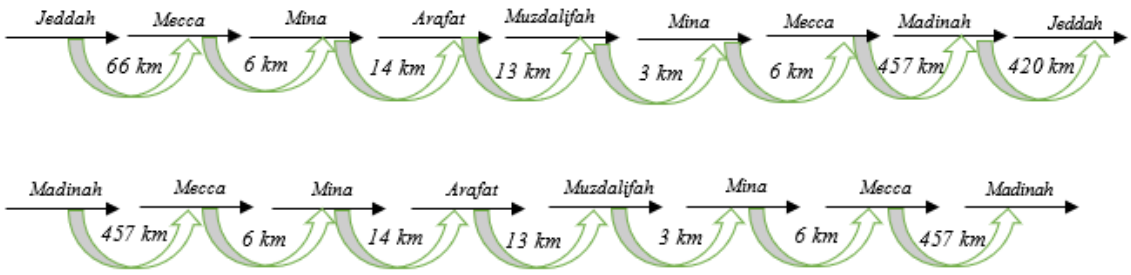

Figure 8. The international pilgrims' journey (before, during and after) performing the Hajj rituals

Note: km = kilometre.

As outlined previously, 57% of flights landed (3,939) at King Abdul Aziz International Airport in Jeddah, and 43% (3,030) of flights arrived at Prince Mohammed bin Abdul Aziz International Airport in Madinah. Therefore, this study assumes that the number of buses was equally divided based on the number of flights that landed in Saudi Arabia. According to this assumption, the number of buses (17,000) that transported international pilgrims from Jeddah and Madinah was 9,690 (57%) and 7,310 (43%) respectively.

Starting point (Jeddah)

Table 6. Bus transportation for foreign pilgrims during the Hajj starting from Jeddah (round trip)

Destination	**Jeddah–Mecca (66 km)**	**Mecca–Mina (6 Km)**	**Mina–Arafat (14 km)**	**Arafat–Muzdalifah (13 km)**	**Muzdalifah–Mina (3 km)**	**Mina–Mecca (6 km)**	**Mecca–Madinah (457 km)**	**Madinah–Jeddah (420 km)**
Number of buses	9,690 (57%)							
Passenger (Number of buses*40).	387,600							
CO_2-e emissions (0.0300 kg/p-km)	767,448	69,768	162,792	151,164	34,884	69,768	5,313,996	4,883,760
Total	11,453,580 kgCO2-e							

Note: p = passenger, km = kilometre, kg = kilogram.

Starting point (Madinah)

Table 7. Bus transportation for foreign pilgrims during the Hajj starting from Madinah (one trip)

Destination	**Madinah–Mecca (457 km)**	**Mecca–Mina (6 km)**	**Mina–Arafat (14 km)**	**Arafat–Muzdalifah (13 km)**	**Muzdalifah–Mina (3 km)**	**Mina–Mecca (6 km)**	**Mecca–Madinah (457 km)**
Number of buses				7,310 (43%)			
Passenger (Number of buses*40).				292,400			
CO_2-e emissions (0.0300 kg/p-km)	4,008,804	52,632	122,808	114,036	26,316	52,632	4,008,804
Total				8,386,032 kgCO_2-e			

Note: p = passenger, km = kilometre, kg = kilogram.

2.6.2.3 International pilgrims travel to Mecca by bus

Despite aviation being the main transport mode that international pilgrims use to travel to Saudi Arabia, some pilgrims arrive by bus (see Table 8) (El Hanandeh 2013). Similarly to aviation data, robust data on the number of buses that travel to Mecca are not available. Therefore, El Hanandeh's (2013) figures on the total number of pilgrims who arrived by bus for the Hajj (110,924) was used in this study with an assumption that the number of pilgrims using bus transport decreased by approximately –23% equally in each country. To illustrate, 85,623 pilgrims arrived by bus to perform the Hajj in 2018 (Gastat 2018a), which is 77% of the number of pilgrims who arrived in 2011 (110,924). It should be noted that pilgrims who arrived by bus from Yemen were excluded from the ratio allocated owing to the war that was underway. Yet, 25,000 pilgrims from Yemen arrived by bus in Saudi Arabia to perform the Hajj rituals in 2018 (Alarabiya 2018).

Since pilgrims from different countries use buses to travel to Saudi Arabia and there is an absence of robust data, this study estimated the CO_2-e emissions following the assumption of the UNWTO (2019b) that each bus passenger emits 0.0300 CO_2-e kg per km.

Table 8. International pilgrims arrived at Mecca by bus in Hajj 2018 (round trip)

Country	Distance to Mecca (km)	Number of passengers (2011)	Number of buses (2011)	Approximate passenger number that each bus holds (2011) (number of passengers/number of buses). [40]	Assumption of number of passengers (2018). (–23 %).	Assumption of number of buses (2018) (Number of passengers in 2018/ approximate passenger number that each buses hold).	CO_2-e emissions = (0.0300 kg/p-km)
Jordan	2,700	5,299	132	40	4,080	102	330,480.00
Syria	3,120	16,604	415	40	12,785	320	1,196,676.00
Tajikistan	10,980	6,447	161	40	4,964	124	1,635,141.60
Kyrgyzstan	12,320	3,860	96	40	2,972	74	1,098,451.20
Kazakhstan	13,400	7,137	178	40	5,495	137	2,208,990.00
Israel	Banded from performing Hajj in 2018 (Khoury 2018).						
Azerbaijan	8,920	8,795	220	40	6,772	169	1,812,187.20
Turkmenistan	7,978	4,407	110	40	3,393	85	812,080.62
Uzbekistan	9,346	23,629	591	40	18,194	455	5,101,233.72
Yemen	3,140	20,520	513	40	25,000*	625	2,355,000.00
Palestinian territory	2,700	4,298	107	40	7,478	83	605,718.00
Kuwait	2,468	2,636	66	40	3,309	51	244,998.36
Qatar	2,656	1,168	30	40	2,030	22	161,750.40

Country	Distance to Mecca (km)	Number of passengers (2011)	Number of buses (2011)	Approximate passenger number that each bus holds (2011) (number of passengers/number of buses). [40]	Assumption of number of passengers (2018). (–23 %).	Assumption of number of buses (2018) (Number of passengers in 2018/ approximate passenger number that each buses hold).	CO_2-e emissions = (0.0300 kg/p-km)
Oman	3,992	2,547	64	40	899	49	107,664.24
United Arab Emirates	3,392	3,577	90	40	1,961	69	199,551.36
Total				kg CO_2-e17,869,922.70			

Source: Adapted from El Hanandeh (2013).

Note: * The number of Yemenis pilgrims was not decreased by the assumed percentage (–23%). km = kilometre, P = passenger, kg = kilogram.

2.6.3 Electricity generation

The tourism industry depends on electricity (Becken 2001). There is a positive relationship between tourism growth and electricity consumption (Pablo-Romero et al. 2017; Pablo-Romero et al. 2019). However, the contribution of electricity generated in tourism destinations to climate change is well documented in the literature (Sunlu 2003; Jones & Munday 2007; Huang & Wang 2015).

Globally, coal is the dominant source of electricity, comprising about 40% of generation, followed by natural gas at 22% and oil at 4%; nuclear and renewable energy make up the remaining generation (Ritchie & Roser 2020). The burning of coal, gas and oil (fossil fuels) produces carbon dioxide, hence the objective of moving away from fossil fuels to renewable sources of energy to generate electricity (EIA 2018; Perera 2018). However, despite large investments from various countries to use renewable energy, developing countries' use of renewable energy for electricity generation is still very small (Moorthy et al. 2019).

In Saudi Arabia, the share of renewable energy sources in primary energy supply and electricity is close to 0% (CT 2019). Almost all electricity is generated in Saudi Arabia using fossil energy sources such as crude oil, diesel oil and natural gas (Demirbas et al. 2017). Since 1991 a significant increase in CO_2-e emissions owing to electricity generation in Saudi Arabia is distinctly evident (Khondaker et al. 2015). It has also been found that Saudi Arabia is one of the G-20 countries with the highest per capita GHG emissions and a trend of no declining emissions over the previous five years (CT 2018). Hence, this research estimated the CO_2-e emissions generated by electricity used for desalination of water and accommodation as a result of Hajj 2018.

2.6.4 Seawater desalination in the Hajj

As demand for water rises, there is an increasing need for alternative water supplies to reduce consumption of conventional water resources. Accordingly, some countries have switched to desalination systems to meet the growing demand for water (Cornejo et al. 2014). Desalination is the process that removes salt from water to transform saline water into potable water (Krishna 2004). Desalination has been employed in many parts of the world, such as North America, North Africa and the Middle East (Jones et al. 2019). In

fact, in 2018, more than16,000 desalination plants output more than 86.5 m^3 each day for over 300 million people around the world (Voutchkov et al. 2019). This significantly reduces pressure on freshwater resources (Shatat & Riffat 2014). However, the operation of desalination plants requires large amounts of energy, producing significant amounts of GHGs and contributing to global warming (Gössling et al. 2012; Pérez et al. 2018).

Tourism heavily consumes freshwater, which has generated numerous conflicts with local communities because of the drain on water resources (Becken 2014). This conflict is worse in tourism destinations where natural resources are scarce and insufficient for the needs of both tourists and locals (Pérez et al. 2020).

Water resources are particularly important in Saudi Arabia because it is one of the world's driest areas. Average annual rainfall is very low; it has no seasonal rivers or lakes and has a total of 95 m^3 per capita of renewable water supplies, which is below the level widely used to indicate water scarcity of 1,000 m^3 per capita (Almutaz et al. 2012). Consequently, seawater desalination plants are the largest contributor to potable water in Saudi Arabia by 56% (Marshad 2014). This percentage is expected to increase in line with the increased number of pilgrims in future years (Malek 2019).

Different technologies have been applied to desalination, such as multi-effect distillation, electrodialysis (ED), multi-stage flash (MSF), reverse osmosis (RO), hybrid and others (Pankratz 2013). However, the type that is used most in Saudi Arabia is MSF (see Table 9) (Marshad 2014; Napoli & Rioux 2015). The simple basic principle of MSF is to heat the water to produce as much steam as possible at low pressure and temperature in a series of successive stages (Shatat & Riffat 2014).

The process of seawater desalination via MSF consumes typically 2.5 to 3.5 kWh of electricity per m^3 of water (IRENA 2012). Therefore, this study used the average, which is 2.5 + 3.5/2 = 3. According to this assumption, this study estimated the CO_2-e emissions of electricity generation due to desalinating 40,000,000 m^3 of seawater that was consumed in the 2018 Hajj (MEWA 2018).

To estimate the CO_2 emissions, the following formula was applied:

EC = WC * ECMSF

Where:

(EC) = electricity consumed of desalinating seawater by using the MSF technique

(WC) = water consumed in the Hajj.

Thus,

EC = 40,000,000 * 3 = 120,000,000kWh

According to the CDMDNA (2011), per kWh of electricity grid mix in Saudi Arabia will produce 0.654 (kg CO_2-e /kWh).

Accordingly,

CO_2 of electricity =

EC* 0.654 =

120,000,000* 0.654 = 78,480,000 kg CO_2-e /kWh.

Table 9. Desalination plants in Saudi Arabia

Plant	*Coast*	*Desalination technique*
Jubail 1	Arabian Gulf	MSF
Jubail 2	Arabian Gulf	MSF
Jubail RO	Arabian Gulf	RO
Khobar 2	Arabian Gulf	MSF
Khobar 3	Arabian Gulf	MSF
Jeddah 2	Red Sea	MSF
Jeddah 3	Red Sea	MSF
Jeddah 4	Red Sea	MSF
Jeddah RO- 1	Red Sea	RO
Jeddah RO - 2	Red Sea	RO
Yanbu 1	Red Sea	MSF
Yanbu 2	Red Sea	MSF
Yanbu RO	Red Sea	RO
Shuiba 1	Red Sea	MSF
Shuiba 2	Red Sea	MSF
Shugaig	Red Sea	MSF

Source: Marshad (2014).

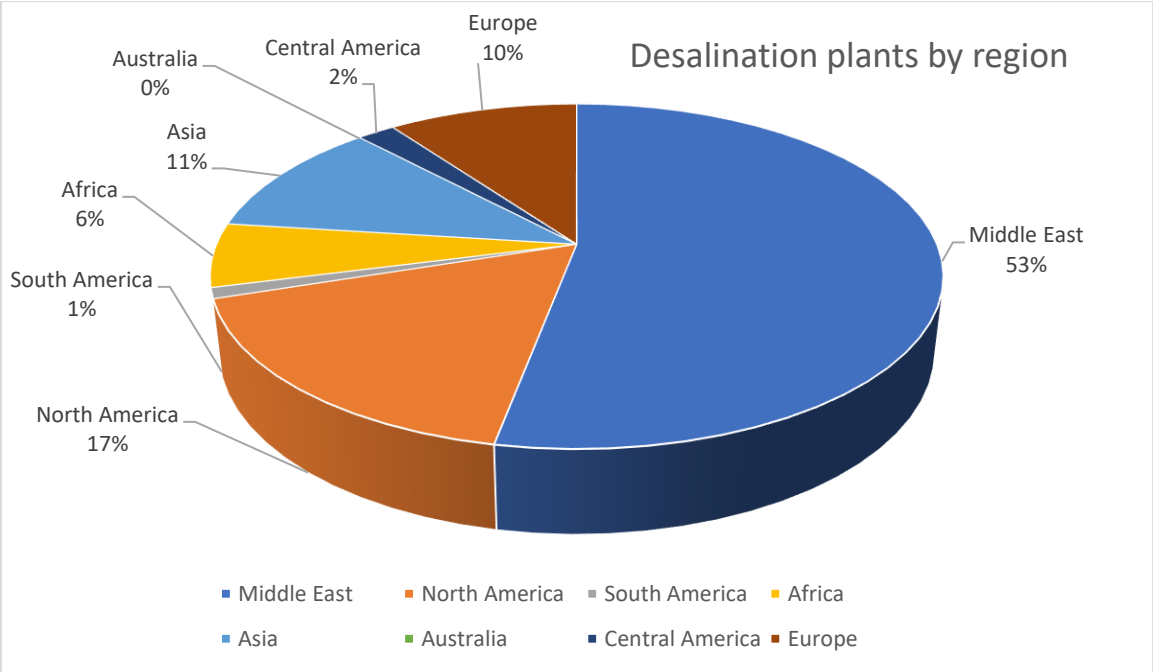

Figure 9. Production of desalination plants by region

Source: Zotalis et al. (2014).

2.6.5 Accommodation

Among the tourism industry subsectors, the accommodation sector is one of the major consumers of energy and producers of GHGs (Becken 2009; Tsai et al. 2014; Hu et al. 2015; Li et al. 2019). Accordingly, estimating the CO_2-e emissions from accommodation has received more scholarly attention.

Hajj accommodation consists of services ranging from the most basic to the very sophisticated, although most pilgrims share public facilities and stay in tents. The operation of this accommodation sector contributes to GHGs (El Hanandeh 2013).

Different approaches have been applied by scholars to estimate CO_2-e emissions of accommodation in tourism destinations. These approaches include the bottom-up approach (Wu & Shi 2011), life cycle assessment (El Hanandeh 2013), the input–output method (Yujie 2013) and the carbon footprint approach (Luo et al. 2018). Moreover, different types of components have been calculated to estimate the CO_2-e emissions of the accommodation sector within tourism areas. To illustrate, Li and Yang (2007), Yang et al. (2011) and Filimonau et al. (2011) calculated many components, such as solid waste, water waste, food and energy use to estimate the carbon dioxide produced by the accommodation sector. Others concentrated mainly on estimating the CO_2-e of water

waste (Tortella & Tirado 2011; Hadjikakou et al. 2013) or energy used in the accommodation sector (Scott et al. 2010; Huang & Wang 2015). In this study, GHG emission calculations focused on the electricity produced to serve tents in the Hajj in three areas—Mina, Arafat and Muzdalifah (see Table 10)—where reliable accommodation data were available. No data were available on pilgrim numbers in hotels; hence, GHG emissions from hotels were not estimated.

2.6.5.1 Mina (3–4 days)

Mina is a valley surrounded by mountains, and is located to the east of Mecca about 6 km from Mecca (Al-Kodmany 2013). A large portion of the Hajj is performed in Mina over 3–4 days (see Figures 10–11).

In Mina the electricity consumed in 2018 was 556 megawatts. According to the CDMDNA (2011), per kWh of electricity grid mix in Saudi Arabia produces 0.654 ($kgCO_2$-e /kWh).

556 MWh = 556,000kWh

Accordingly,

556,000 kWh * 0.654 = 363,624 ($kgCO_2$-e /kWh) produced in Mina

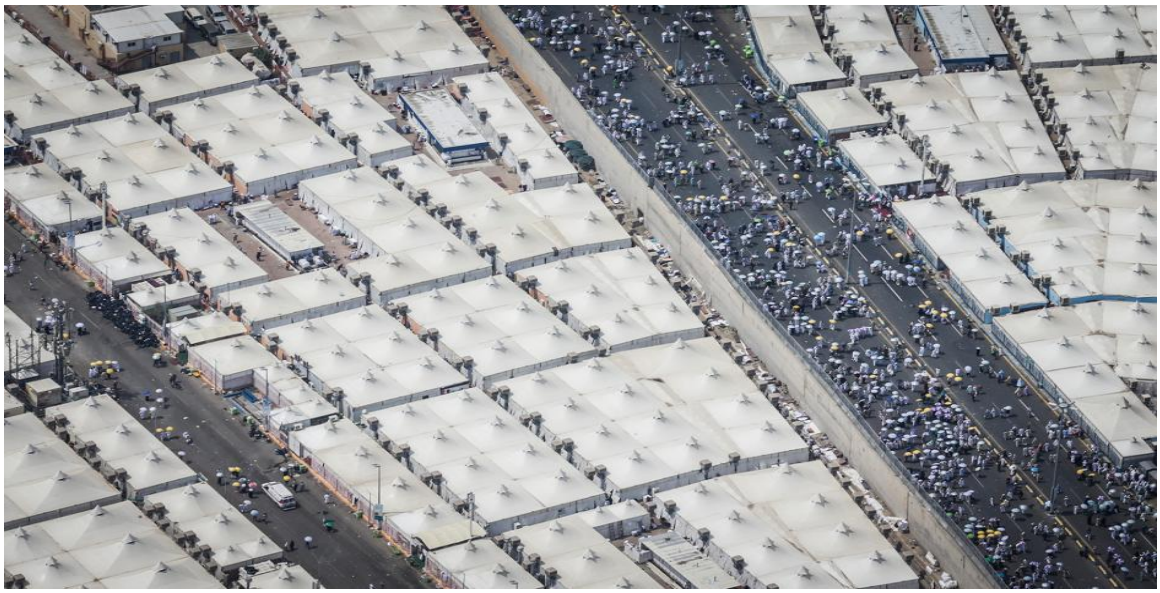

Figure 10. Tents in Mina

Source: Simon (2018).

Figure 11. Tents in Mina

Source: Simon (2018).

2.6.5.2 Arafat (approximately 12 hours)

The day of Arafat is an Islamic day that falls on the ninth day of Dhu al-Hijjah of the lunar Islamic calendar. This is the second day of the Hajj. Muslim pilgrims will travel from Mina to Arafat and will remain there until sunset (see Figure 12), Arafat is 14 km southeast of Mina (Al-Kodmany 2013).

Figure 12. Arafat

Source: Simon (2018).

In Arafat, the electricity consumed in 2018 was 75 megawatts. According to the CDMDNA (2011), per kWh of electricity grid mix in Saudi Arabia produces 0.654 ($kgCO_2$-e /kWh).

75 MWh = 75,000 kWh

Accordingly,

75,000 * 0.654 = 49,050 ($kgCO_2$-e /kWh) produced in the day of Arafat

2.6.5.3 Muzdalifah (approximately 12 hours)

After sunset on the ninth day of the Islamic month of Dhu al-Hijjah, Muslim pilgrims travel to Muzdalifah (see Figure 13). Muzdalifah is an open area located about 3 km southeast of Mina (Alsolami et al. 2017). Pilgrims will remain in Muzdalifah until the dawn of the next day.

In 2018, the electricity consumed in Muzdalifah was 40 megawatts. According to the CDMDNA (2011), per MWh of electricity grid mix in Saudi Arabia produces 0.654 ($kgCO_2$-e /kWh).

40 MWh = 40,000 kWh

Accordingly,

40,000 * 0.654 = 26,160 ($kgCO_2$-e /kWh) produced in the day of Muzdalifah

The total emissions of CO_2 produced of electricity generation in the Hajj event 2018 was

363,624,000 + 49,050,000 + 26,160,000 = 438,834,000$kgCO_2$/kWh.

Figure 13. Muzdalifah

Source: MOM (2018).

Table 10. CO_2-e emissions of electricity generation during the 2018 Hajj in three main areas

City	Consumption of electricity (kWh)	CO_2 emissions (kgCO2/kWh)
Mina	556,000	363,624
Arafat	75,000	49,050
Muzdalifah	40,000	26,160
Total	438,834 kgCO2-e /kWh.	

2.7 Government Policies and Strategies for Protecting the Environment of the Hajj

As shown in Section 2.6, the activities of the Hajj contribute to affecting environmental sustainability by producing emissions and generating waste. Hence, this study estimated the GHG emissions from different components of the Hajj activities, such as MSW, transportation and electricity generation. The results show that at a minimum, the activities of the 2018 Hajj produced around 1,866,450,976.40kgCO_2-e (see Table 12).

While this study provides only an estimate of the average amount of GHG emissions, this is sufficient to show that the Hajj activities contribute significantly to global warming.

Thus, developing plans and policies for the Hajj are of major importance to the future sustainability of the destination.

Until 2007, the environmental degradation that occurred because of the Hajj activities were not considered a critical issue (Al-Lahibi 2007). At that time, the only environmental strategy that the government implemented was increasing environmental awareness by distributing brochures to Hajj stakeholders, such as hospitality agency workers and pilgrims. The brochures contained information on the importance of conserving the Hajj environment and the consequences of ruining the environment. However, it has been realised that increasing environmental awareness on its own is insufficient to protect the environment (Al-Lahibi 2007), and that other environmental strategies need to be formulated and implemented within a comprehensive policy framework. Thus, since that time, many initiatives have been taken by governmental institutions to reduce the environmental impacts of the Hajj, and these are outlined in Table 11.

Table 11. Initiatives for reducing the environmental impact of the Hajj activities

Environmental strategies and polices	Description
Distributing brochures	The government distributed brochures to the hospitality agencies and pilgrim stakeholders to increase their environmental awareness (Al-Lahibi 2007).
Development of the Environmental Charter	Governmental stakeholders and academics conducted a conference to set plans and strategies to conserve the environmental sustainability of the Hajj. Outcomes included: • recommended imposing environmental fines to all Hajj stakeholders, including pilgrims • set strategies to increase environmental awareness to all Hajj stakeholders by using billboards and brochures • requested that academics conduct studies on the environmental impacts of transportation • recommended increasing the number of supervisors who monitored the restaurants inside Mecca to ensure that they follow the environmental policies and rules (Suleiman & Aldelwai 2010).
Implementing the train project	In 2010, a train project was partly operated to transport pilgrims to the Hajj areas (Mina, Arafat and Muzdalifa) (Al-Kanani 2010). In 2011, the final phase of the train was implemented (Al-Qurashi 2011). The project reduced the use of more than 50,000 cars and buses (Al-Kanani 2011).
Improving waste infrastructure	The municipality in 2013 improved the waste infrastructure (see Figures 15–16), such as by placing 150 additional compactor boxes in

Environmental strategies and polices	Description
	the Mina area and adding eight underground containers to contain the waste of the pilgrims (Al-Zaharani 2013). Before 2013, there were around 1,000 compactor boxes (Alsebaei 2014).
Transportation policy restrictions	The government set a national standard to reduce gasoline levels in petrol by a factor of five and restricted single-car vehicles in Mecca during the Hajj. The aim was to reduce the emissions from petrol and increase the air quality of Mecca during the Hajj (Urton 2014).
Implementing the prepared meals project	The government implemented the prepared meals project to increase the quality of the food and reduce the waste produced from the traditional method that hospitality agencies use, which is cooking inside the tents. The prepared meal is sterilised and saved in a container and contains a variety of food such as fish, meat and chicken.
	The project was designed in several phases. In the first phase, 15% of hospitality agencies adopted the prepared meal project. In the second phase, in 2019, another 15% of hospitality agencies adopted the project. Hence, it was expected that by 2020 around 45% of hospitality agencies would implement the project (Al-Kinani 2018; Al-Rajhi 2018). However, because of COVID-19 the project was not implemented as expected. As indicated in Section 1.1, the number of pilgrims was 1,000 or fewer.
Implementing the shuttle buses	This project was launched in 1995 and was designed in several phases (Al-Thaqafi 2018). The fourth phase was implemented in 2019 (Almadina 2019a).
	The government developed special bus routes to help pilgrims make a quick transfer from their camps to Hajj areas. It was estimated that around 60% of emissions from buses was reduced because of the shuttle system (AL-Kanani 2014).
Green Hajj project	Place recycling bins inside accommodation (tents). This was implemented in 2018 (Halabi 2019) and has been initially adopted by only 316 hospitality agencies (Almadina 2019b).

As shown in Table 11, environmental protection initiatives that have occurred during the Hajj have increased year after year and have become a priority for the government of Saudi Arabia. However, it seems that there is a lack of collaboration between private and governmental stakeholders in the implementation of the projects. For example, several hospitality agencies did not adopt and implement the prepared meal project (Hossain 2019). In addition, many tent managers did not collaborate with the municipality by throwing their trash inside the compactor boxes placed in the Hajj areas (Alsebaei 2014). Further, many hospitality agencies did not collaborate in implementing the Green Hajj project (Al-Hakim 2019).

Since the success of sustainability plans and projects in the tourism context requires collaboration between stakeholders from all sectors (Graci 2013; Lin 2021), it is particularly important to investigate this issue. Therefore, this study investigates the nature of collaboration between Hajj stakeholders and the drivers that motivate their collaboration in the planning process in order to contribute to increasing the environmental sustainability of the destination.

Figure 14. Compactor boxes

Source: Alsebaei (2014).

Figure 15. Underground waste containers

Source: SPA (2016).

Figure 16. Transferring the underground waste container

Source: SPA (2016).

2.8 Chapter Summary

This chapter discussed the background of the Hajj context in general and explained the process of the rituals of the Hajj. Further, it described how environmental damage is created by the activities of the Hajj and provided an approximate estimation of the CO_2-e produced during the Hajj from MSW, transportation and electricity generation (see Table 12). While this is only an estimation of GHGs, the result indicated that the Hajj activities in 2018 produced millions of tonnes of GHGs emissions.

This chapter also explained the strategies and initiatives that have been taken by the government of Saudi Arabia to reduce the adverse impact of the Hajj activities on the environmental sustainability of the destination. However, these initiatives have failed to reduce the environmental damage of the event. Thus, this study aims to understand the planning process of the Hajj with a particular focus on stakeholder collaboration and the drivers that induce stakeholder collaboration when planning for environmental sustainability.

Chapter 3 provides a comprehensive overview of the literature and identifies several key aspects, including the role of adopting a collaborative planning theory in guiding this study to achieve its aim.

Table 12. Approximate estimation of CO_2-e emissions raised from the Hajj 2018

Activity	kgCO_2-e emissions	%
Aviation	1,561,190,021.20	87
MSW	169,204,000.00	9
Electricity generation (water desalination and accommodation)	78,918,834.00	4
Land transportation (car and bus)	57,138,121.20	3
Total	1,866,450,976.40	100

Chapter 3: Literature Review

3.1 Introduction

This chapter provides an overview of the literature relevant to collaborative planning and the environmental sustainability of the Hajj. The first part of this chapter discusses how events are defined and the effect of events activities on environmental sustainability. This is followed by a discussion of how the Hajj can be classified as an event type.

The second part discusses the background to the emergence of sustainable development and sustainable tourism. Third, the chapter presents a comprehensive background of the emergence of collaborative planning, barriers/drivers and the benefits of adopting the collaborative planning approach in the tourism context generally and the Hajj specifically. This section also provides a holistic overview of the collaborative frameworks that have been developed by scholars with a rationale for the adoption of Gray's collaboration model as a lens through which to understand the nature of collaboration between Hajj stakeholders when planning for environmental sustainability.

3.2 Event Definitions

Events are an important catalyst for tourism and are at the forefront of the development and marketing plans of most destinations. Events can attract tourists, create positive images of the destination and contribute to a wider marketing effort (Getz & Page 2016). Moreover, they generate income, employment and potentially contribute to sustainable development (Janeczko et al. 2002; Irshad 2011). This is one of the reasons events today play an essential role in economic planning and tourism development in many regions and cities (Diedering & Kwiatkowski 2015).

Although events are one of the growth sectors in the tourism industry, there is no standard definition of an event. That is because there is a wide range of event types and perspectives of events can be vary when viewed from a local, national and international level (Jago & Shaw 1998; Damster 2005). Getz (2008) proposed the concept of 'planned events', which includes almost all event types. The author defined planned events as 'spatial—temporal phenomenon and each is unique because of interactions among the setting, people, and management systems—including design elements and the program'

(Getz 2008, p. 4). There are many types of planned events; 'pilgrimage event' is one of the classical examples of a planned event (Getz 2007). Accordingly, the Hajj event falls under this category.

3.3 Environmental Impact of Events

The events industry has increasingly become one of the most important sectors for many destinations due to its positive economic impact and capacity for jobs creation (Li & Petrick 2005; Irshad 2011). For instance, according to the Office of National Statistics, the London Olympics and Paralympics event that was held in the United Kingdom in 2012 contributed 1.1% to the country's GDP (ONS 2016). In addition to the economic benefit, events also have been used as a destination marketing strategy (Getz & Page 2016). Thus, because of the popularity and proliferation of events, more attention has been paid by scholars to events with explicit calls to conduct studies on their assessment and management (Collins & Cooper 2017).

Historically, event organisers and scholars were concerned only with the impact of events on the economy, society and culture, neglecting the environmental dimension (Case 2013). For example, Sherwood (2007) reviewed 224 articles on the effects of events and found that there is scarcity of studies on the environmental impacts of events. The author found that most studies are concerned with the economic effects of events (30%), social impacts (less than 20%), event management (13.4%) and tourism effects (13%). This scarcity of studies on the effect of the events on environmental sustainability lasted until 2012 (Mair & Laing 2012). However, in following years, the focus on the environmental outcomes of event activities has expanded and has received increasing attention by different stakeholders (Mair & Whitford 2013). This includes politicians, event leaders, promoters and academic researchers (Collins & Cooper 2017). For instance, many studies have attempted to comprehend the environmental footprint that occurs because of event activities (Collins et al. 2007; Dolles & Söderman 2010; Collins et al. 2012). Other studies have been conducted to assess the carbon footprint produced from event activities such as sports events (Dolf & Teehan 2015; Dingle & Mallen 2021) and religious events (Madan & Pallavi 2010; El Hanandeh 2013; Sharma & Raina 2014). All these studies found that events can significantly contribute to reducing the environmental sustainability of the host destinations. Concurrently, different approaches and strategies have been set by different institutions, such as an International Standard ISO 20121 and the Sustainable

Event Alliance (SEA) to improve the environmental sustainability of events (Collins & Cooper 2017). However, despite the increasing focus on improving the environmental sustainability of events, it seems that part of the event industry still does not provide effective measures to improve the environmental sustainability dimension in its destination (Case 2013). This is evident in the case of the Hajj, as shown in Chapter 2.

All types of events can have negative environmental impacts if inadequate measures are taken by the event's stakeholders (Mair 2014). Each type of event has different impacts on the environment, depending on the event's size and scale. For instance, mega events and hallmark events can significantly damage environmental sustainability more than local or regional events (Mair 2015). Accordingly, it is vital to understand which type of events that the Hajj falls in to comprehend the significance of its effect on environmental sustainability. Section 3.4 clarifies how the Hajj can be typified.

3.4 Hajj Classifications

There are different criteria for categorising planned events. If events are classified according to their type, season and target market, it is possible to distinguish between the following four types: mega event, hallmark event, regional event and local/community events (Getz et al. 2012). Each type has its own characteristics and measures of value. However, the difference between mega events and hallmark events is not very clear. Some scholars referred to mega events as hallmark events (Spilling 1998; Olds 1998; Byers et al. 2012), while others distinguish between these two types of events (Jago & Shaw 1998; Getz et al. 2012). Both events share similar attributes in terms of scale and fall under major events (Damster 2005). Moreover, they have a significant impact on the host city because they attract a large number of tourists in that particular period (Mair 2015). In contrast, regional and local events are based in one site, often conducted for residents and usually are not tourism-oriented (Getz & Page 2016). Hence, local and regional events will be excluded from the discussion of this research because they do not share the same attributes as the Hajj.

3.4.1 Mega events

Mega events have been defined variously by many scholars. Most definitions refer to the size and scale of the event in terms of its social and economic impact, as well as its capacity to attract international participation (Hall 1992; Bladen et al. 2012; Bowdin et al. 2012). For instance, Damster (2005, p. 12) described mega events as 'events that can attract very large numbers of event visitors or have a large cost or psychological effect'. Other definitions are more specific. For example, Marris (1987) proposed that a mega event meet two criteria; it must attract at least one million visitors in one place and the capital cost must be at least US$500 million. Different criteria are used to consider an event as a mega event. However, Jago and Shaw (1998) identified the characteristics of mega events and hallmark events (see Table 13). Most attributes are like hallmark events. Yet, a major distinguishing characteristic is that mega events are global in nature and require a competitive bid to 'win' them as a one-time event for a specific venue, such as sporting events like the Olympic Games or the FIFA World Cup (Damster 2005; Oklobdžija 2015). In general, a mega event can yield many outcomes for a city that reach beyond economic benefits. These could include an increase in public participation in civic affairs and intercultural interaction (Dunn & McGuirk 1999).

3.4.2 Hallmark events

Like mega events, hallmark events have also been defined variously by scholars (Ritchie 1984; Hall 1989, 1992). Getz et al. (2012) studied the definitions proposed by different authors of hallmark events and provided a comprehensive definition of hallmark events. The authors defined hallmark events as:

> …the function of events in achieving a set of goals that benefit tourism and the host community, namely: attracting tourists; creating and enhancing a positive image that is co-branded with the destination/community; and delivering multiple benefits to residents. Over time, the hallmark event as a tourist attraction also becomes an institution and its permanence is taken for granted. Its traditions generate a stronger sense of community and place identity. The event and city images become inextricably linked. Hallmark events can also exist within the context of social worlds and for special-interest groups as iconic tourist attractions that facilitate communities and identity building. (Getz et al. 2012, p. 52).

A hallmark event is a traditional event that occurs once or periodically at a certain location (Getz 2005). The main function of this unique event is to provide the host community with an opportunity to ensure a prominent position in the tourism market (Hall 1989). Moreover, hallmark events participate in building the environment and aiding the recognition of urban locations (Hiller 1999). In fact, Getz (2005) emphasised the importance role of a hallmark event in image making, marketing of places and branding of host communities. In the long term, the event and destination can be inseparably correlated. In other words, hallmark events are well known so that they become synonymous with the name of the place, gaining widespread recognition and awareness. A classic example of such an event is Carnival in Rio and the Kentucky Derby in the United States (Bowdin et al. 2012). Even though a one-time event can enhance a destination in terms of exposure and positive image, it cannot easily be the 'hallmark' of that destination (Getz 2005). Thus, Jago and Shaw (1998) identified the most representative attributes of the hallmark event (see Table 13). The major characteristic to distinguish between mega event and hallmark event is that hallmark events are tied to a specific destination, which is unlike mega events. Accordingly, since the hallmark event is a major periodic celebration that is co-branded with the destination or city, the Hajj event is categorised as a hallmark event owing to the huge quantity of visitors during Hajj in one place over a limited period, its significant impacts on the economy and social of the country and its attachment to Mecca city.

Based on the previous discussion, the Hajj can be clearly categorised as a hallmark event and the Hajj's impact on the environmental sustainability and climate change is significant (Mair 2015). However, given the scale of the Hajj and its global religious significance, it is necessary to consider the Hajj within the wider tourism context (Henderson 2011) since the government aims to enhance tourism and hallmark events comprise an important tourism attraction (Getz & Page 2016). In addition, between all event types, hallmark events remain a key asset in tourism-oriented investment portfolios (Getz 2016). This considered, this study investigates the sustainability of the Hajj from the tourism destination perspective.

Table 13. Attributes of mega events and hallmark events

Mega event	Hallmark event
Large in scale	Large in scale in a relative sense only
Held on an international scale	Can be held on an international or national scale
Attracts funds to the region	Attracts funds to the region
Attracts large crowds—usually over a million visitors	Attracts large crowds
Is a one-off occurrence	Is an infrequent occurrence
Incorporates festivals or other events	Incorporates festivals or other events
Stimulates demand for related services	Stimulates demand for related services
Incurs large costs	Incurs large costs
Involves prestige and status, usually a political approval process	Involves prestige and status
Involves traditions or symbolism	Involves traditions or symbolism
Leaves legacies or results in urban renewal	Leaves legacies or results in urban renewal
Has a reputation of a ‘must-see event’	Results in the event and destinations becoming synonymous
	Tied to specific places

Source: Adapted from Jago and Shaw (1998, pp. 28–30).

3.5 Sustainable Development

The concept of sustainability emerged in 1970 when environmentalism was gaining prominence (Liu 2003). Over time, sustainability has evolved from a narrower focus on preservation or conservation until the late 20th century, when environmental movements have become wider (Sharpley 2000). The new movement of environmentalism was inspired by Boulding’s theory, which proclaimed the Earth to be a closed system with limited resources and little ability to absorb waste, and subsequently, environmental destruction has become a global problem (Sharpley 2009). Environmentalism has become a mainstream philosophy that delves beyond basic concerns about species protection and natural resources. Therefore, the term ‘sustainable development’ emerged as environmental awareness and interest has increased (Hall 1998; Du Pisani 2006).

Post-World War II, there was an appetite for change and economic growth (Bramwell & Lane 1993). This lasted until the late 1960s and early 1970s, when diverse ideas on

sustainability began to signal a new path (Du Pisani 2006). It was recognised that economic growth models failed to identify the environmental implications of economic expansion. Therefore, sustainable development was viewed as necessary to remedy the past and improve institutional behaviour by shifting the emphasis from achieving only short-term economic growth targets to incorporating environmental and social aspects (Brundtland 1987). Sustainable development is not a new term, but the increasing strain on the world's limited natural and environmental resources has led to a deeper reformulation of theory, together with the emergence of strategies to apply it (Murphy & Price 2005).

In 1987, the World Commission on Environment and Development (WCED), the Brundtland Commission, was the first to propose the concept of sustainable development. It was defined as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (WCED 1987, p. 43). Moreover, the Commission set out sustainability principles, which include the need for better equilibrium of resources between nations, the need to conserve both human heritage and ecosystems, the need for strategic planning and strategy-making and the value of sustaining environmental processes (Hall & Lew 2009; Scott et al. 2012). In fact, the Commission's report has met with almost global approval from various sectors (private and government) including the community and has since produced a wide range of policies, reforms and applications (MacLellan 1997; Farley & Smith 2020).

The topic of sustainable development has been a key theme of the global agenda and has gained support from corporations and policymakers. For example, in 1992, the United Nations (UN) initiated the dialogue on sustainable development through Local Agenda 21 (LA21) (Cotter & Hannan 1999; Van der geest & Ros 2007). The LA 21 plan is a system aimed at addressing the cultural, social and ecological needs of a given community or society (De Lacy et al. 2002). The policy system of LA 21 originated from the real-life development activities that have taken place around the world. As a result, LA 21 has become internationally known and there are currently more than 6,400 LA 21 local governments in 113 countries (Delgado 2007). Following this year, many conferences have been conducted by UN Conference on Environment and Development to assess the progress of implementation of sustainable development and address new obstacles (Linnér & Selin 2013; Tsalis et al. 2020). However, despite the general acceptance of the fundamental philosophy of sustainable development, the concept and application of

sustainable development has been criticised as vague, contradictory and lacking clarity around how sustainable development can be achieved (Murphy & Price 2005; Robert et al. 2005).

Unsurprisingly, sustainable tourism development has also been subject to critique by numerous scholars owing to the ambiguity of the term, a lack of practical applications of theory and the lack of solid strategies and methodologies for reaching sustainable tourism development (McMinn 1997; Twining-Ward 1999; Welford et al. 1999; Liu 2003). Nevertheless, amid these criticisms, the sustainable development of tourism has been adopted as a framework in tourism planning and policy documents (Guo et al. 2019).

3.6 Tourism History and Development

By the early 21st century, international tourism had become one of the fastest growing economic drivers in the world and its influence became increasingly evident from the Arctic to Antarctica. Tourism has had a profound impact on destinations around the world, and in 2018, the 1.4 billion international arrivals illustrate the scale and economic importance of global tourism activity (UNWTO 2019a). Undoubtedly, tourism can generate employment and can greatly stimulate the macroeconomy of destination countries (Harcombe 1999). For instance, in 2019, tourism and travel contributed directly and indirectly 10.4% of global GDP and 10.6% of total global employment (WTTC 2021a). In addition, it is anticipated to increase its share to the economy by 10.5% of GDP and add 35,611,000 jobs by 2025, which is equivalent to 10.7% of total global employment (Van Truong & Shimizu 2017). Thus, the history of tourism and sustainable development is important to consider for this study.

After World War II, tourism and travel progressively grew, mass tourism was accepted, and countries began to promote themselves as tourist destinations. At that time, large tourism developments were taking place in both Europe and the United States, particularly in the 19th century. It was the time of increasing knowledge and technology (McLean & Hurd 2011). It also was the period in which the middle class began to travel owing to improved technologies and means of travel (Gyr 2010). For instance, the first commercial flight travelled from London to South Africa in 1952 (Northrup et al. 2004) and innovation in transportation led to the globalisation of tourism.

The decade that followed was a significant period in the development of tourism because of the advent of more travel companies, leading to new tourist destinations. Hence, with high wages and low transport costs, travel for tourism purposes increased (Gyr 2010). However, by the mid-1960s, more cautious views and critiques of tourism were broadcast (Jafari 2003). At that time, scholars recognised both the positive and negative impacts of tourism on the environment (Mason 2015). Later, in response to growing concerns about the negative impact of the tourism industry, new approaches to the tourism industry were considered and the concept of sustainable development in the tourism sector emerged (Theobald 2016).

3.7 Sustainable Development in Tourism

As previously indicated, the WCED discussed the values and issues related to sustainable development concepts, principles and applications. However, the Brundtland report did not address sustainable development in the tourism context (Burns & Novelli 2006). Later, at the UN Conference on Environment and Development in 1992, the discussion on sustainable development was further elaborated and articulated in Agenda 21, including mention of the negative environmental impacts of tourism (Giaoutzi & Nijkamp 2006). In the 30 years since, considerable research and practice has driven the tourism sector to become more sustainable (Gössling et al. 2015; Spenceley 2021). Within this context, it was noted that tourism can significantly contribute to sustainable development and the concept of sustainable tourism was perceived as suitable concept to be adopted and implemented in the tourism industry (Swarbrooke 1999; Murphy & Price 2005).

3.8 Sustainable Tourism

As discussed previously, within the tourism literature, there are many concepts presented for sustainable development. Similarly, defining sustainable tourism has encountered the same dilemma. For instance, some scholars identify sustainable tourism from a sectoral perspective. Instead of using the term ‘sustainable tourism’, these scholars prefer to use the term ‘sustainable development’ in the context of tourism to prevent the parochial presumption implied in the notion of sustainable tourism. They proposed that ‘although the concept may have areas of mutual concern with sustainable development, it has its own specific tourism-centric agenda’ (Hardy et al. 2002, p. 483). Conversely, others define sustainable tourism as a broader concept, conveying the principles of sustainable

development in the context of tourism needs (Hardy et al. 2002). Others apply the concept of sustainable development in a slightly amended form of 'sustainable tourism' (Wall 1997). Such differences arise since the concept of sustainable development proposed by the Brundtland Commission was subjected to a broad variety of interpretations (Butler 1999). Therefore, different definitions of sustainable development in tourism were influenced by the variances in attitudes, interpretations, principles and applications that have led to confusion in understanding the meaning of sustainable tourism (Butler 1999; Hardy et al. 2002).

However, after proposing the sustainable development concept for environmental management in the late 1980s, the World Tourism Organization (WTO) later introduced the most cited concept of sustainable tourism (Guo et al. 2019). The organisation defined sustainable tourism as that which:

> …meets the needs of present tourists and host regions while protecting and enhancing opportunities for the future. It is envisaged as leading to the management of all resources in such a way that economic, social and aesthetic needs can be fulfilled while maintaining cultural integrity, essential ecological processes, biological diversity and life support systems. (Inskeep & WTO 1998, p. 19)

Nevertheless, despite widespread adoption, the definition has also been criticised for being versatile and allowing for a variety of approaches and interpretations (Cernat & Gourdon 2007).

It is noted that there have been many challenges in the development of one universal definition of sustainable tourism. However, it has been argued that this has occurred because enforcing one definition may result in marginalising some stakeholders' opinions when they do not meet the definition (Sharpley 2009). Moreover, developing sustainable tourism is a contextual matter, which means that it is virtually impossible to provide one direction that suits every context (Wall 1997). Thus, with such diversity of opinion, tourism research is no longer concentrated on finding a single universal definition. Instead, there has been a focus on moving the tourism sector towards sustainability objectives (Clarke 1997). While there is continued debate about the meaning of the term, the basic principles of sustainable tourism are more generally accepted (Waas et al. 2011).

3.9 Sustainable Tourism Principles

Unlike the apparent contention around the concept of sustainability in other fields, there is relative agreement within the tourism literature about the meaning and importance of the term. After sustainable development became a mainstream term for environmental management in the late 1980s, the focus turned to sustainable tourism development principles (Hunter 1997).

Over 10 years, various sustainable tourism principles have been developed by governmental, non-governmental sectors and many academic scholars (McKercher 2003; Lu & Nepal 2009). To illustrate, in 1992, Tourism Concern and the Worldwide Fund for Nature (WWF) set 10 principles for sustainable tourism accompanied by recommendations, which include stakeholder involvements and the integration of tourism into planning (cited in Weaver 2001) (see Appendix 1). Moreover, UNWTO (2005) set 13 sustainability principles (see Appendix 2), including broad stakeholder engagement and long-term planning. Other principles have been placed and discussed in many different international forums, such as *The World Charter for Sustainable Tourism of Lanzarote* (1995), *Agenda 21 for the Travel & Tourism Industry* (1996), *European Charter for Sustainable Tourism in Protected Areas* (1997), *Global Code of Ethics for Tourism* (1999) and so on (UNWTO 2014). Such principles have been set as a direction for the tourism industry to achieve sustainable development in destinations; thus, the goal of tourism stakeholders is to achieve them.

In this context, stakeholder engagement in tourism planning is fundamental to the achievement of sustainable tourism goals (Inskeep & WTO 1998; Simpson 2001; UNWTO 2013), which is relevant to this study issue. As such, both elements will be discussed in Section 3.10.

3.10 Planning in Tourism

As outlined in the previous discussion, sustainability requires economic development and environmental preservation to be viewed as integrated, not separated components. This cannot be achieved without planning of tourism development (UNWTO 2005). This was evident given the history of many tourism experiences which showed that unplanned development of tourism resulted in degrading the sustainability of its destinations

(Inskeep 1991; Smith 1992; Formica & Uysal 1996). Conversely, tourist destinations that were well planned and managed are more likely to improve the economy and quality of life of the local community, especially when they consider the natural and cultural environment (Connell et al. 2009; Edgell & Swanson 2019).

Planning practices developed in the Greek and Roman eras have remained dominant for centuries (Gunn 1988; Gunn & Var 2002). At that time, planning was mostly a 'reactive process' that deals and react with unexpected events after they occur rather than a 'proactive process' that attempts to anticipate the future events and find optimal solutions to address the challenges (Mason 2015). Planning has been largely reactive until modern town planning emerged in the United Kingdom at least 200 years ago when the population became more urbanised and the growing environmental and social negative impacts escalated (Gunn 1988).

While traditional planning was developed in a more bureaucratic manner, more modern planning was developed with greater consideration of the value of other dimensions such as community opinions and environmental protection (Dredge 1999). Such an approach tended to encourage greater stakeholder involvement and enable them to influence decision-making for the next level of development (Mason & Leberman 2000).

Against this background, it is necessary to mention that planning processes and methods have not remained static, but have adapted in the context of political, cultural, environmental, social and economic change (Simão & Partidário 2012). There has been a significant development in tourism planning models from focusing on physical planning to more sophisticated models that realise the value of environmental conservation and community engagement (Getz 1986; Murphy 2012). The traditional approach towards tourism planning was originally outlined by Getz (1986), who identified four approaches to tourism planning (boosterism, economic, physical/spatial and community). Later, Hall (2000) added a fifth dimension, 'sustainable planning', which is characterised by engaging tourism stakeholders in the planning stage (Simão & Partidário 2012).

Collaboration between stakeholders has been widely accepted as being key to the achievement of sustainability in tourism destinations (Jamal & Getz 1995; Hall 1999; Caffyn 2000; Graci 2013). Although cooperation among stakeholders is an essential aspect for achieving sustainable development in tourist destinations (Pjerotic 2017),

collaboration encompasses broader conditions and more complex interpretations than cooperation (Jamal & Getz 1995). This was emphasised by Himmelman (1996), who argued that collaboration is a more advanced type of relationship between organisations than cooperation because collaboration attempts to enhance the relationship between stakeholders by sharing risks, responsibilities, resources and rewards. In addition, Ladkin and Bertramini (2002) view cooperation as stage of the collaborative process. The authors argue that gathering multiple stakeholders is the first stage in developing a successful collaborative process.

Thus, with multiple Hajj stakeholders connected through a complex network of interorganisational relationships, this study focuses mainly on collaboration between Hajj stakeholders because it is a critical aspect for achieving environmental sustainability of the Hajj.

3.11 Stakeholder Collaboration in Tourism

In 1963, the first definition of stakeholders was coined by the Stanford institution, which defined it as groups on which the organisation relies for continued survival (Freeman 2010). However, this definition was broadened by Freeman's seminal work in which he defined stakeholders as '…any group or individual who can affect or is affected by the achievement of the organisation's objective' (Freeman 1984, p. 46). The theory focuses on managing the relationship between stakeholders in destinations (Sautter & Leisen 1999) and it has been widely used in different areas and domains, including tourism (Parmar et al. 2010).

In tourism, stakeholders can be defined as any person or group that can affect, or be affected by the tourism development, either positively or negatively (Aas et al. 2005). In a tourist destination, stakeholders include government agencies, tourism institutions, the local community, tourism developers, businessmen and operators (Saito & Ruhanen 2017).

Religious tourism is one of the tourism forms that consists of different activities that requires the involvement of different stakeholders from various sectors to success in the development of the event (Lin 2021). Thus, it is vital to understand the influence and the interest of each stakeholders group in the event (Jamal & Getz 1995; Freeman 2010). Without understanding the interest of stakeholders and their influence on the event, it is

complicated to manage the relationship with stakeholders and induce stakeholder engagement (Lin 2021), which has been proven by numerous studies (Araujo & Bramwell 1999; Ladkin & Bertramini 2002; Adu-Ampong 2017). Thus, it is vital in the first step to identify the right stakeholders and their perceived interests for attaining an effective management of stakeholders (Freeman 1984).

In the literature, there are numerous attempts to categorize and identify stakeholders using different criteria such as primary vs secondary (Clarkson 1995), direct or indirect (Friedman & Miles 2006), passive or active (Mahoney 1994), etc. In addition, Mitchell et al. (1997) developed the salience model and classified stakeholders based on three criteria; power of stakeholders to influence, the legitimacy of stakeholder, and the urgency claim on the organisation. The authors contend that stakeholders can be recognized by one, two, or all three of the implications of power, legitimacy, and urgency. All these categories have been developed to determine the right and legitimate stakeholders in the organisation.

Accordingly, the main stakeholders in the Hajj can be classified within four main categories:

Primary stakeholder: "is one without whose continuing participation the corporation cannot survive as a going concern" (Clarkson 1995 p.106). In the case of the Hajj, primary stakeholders would be government ministries with varying responsibilities for environmental activities; community members who live on the 'frontline' of the pilgrimage and are most directly exposed to the activities that take place; private sector businesses; charities involved directly with the welfare of pilgrims; and the pilgrims themselves.

Secondary stakeholders: are "those who influence or affect, or are influenced or affected by, the corporation, but they are not engaged in transactions with the corporation and are not essential for its survival" (Clarkson 1995 p.107). In the case of the Hajj, secondary stakeholders would be residents who live at a distance from the centres of pilgrimage activity, businesses that do not directly provide services for pilgrims, and some government departments that have only an indirect interest in the Hajj and the environmental issues.

Those that affect vs those that are affected by: Ex. visitors to the Hajj, residents whose normal activities are disrupted by congestion, noise and anti-social behaviour such as littering, and the police directed to patrol the area during day and night.

Active versus passive stakeholders: active stakeholders can be defied as all those Hajj stakeholders who seek to participate in the mediation meetings. In contrast, passive stakeholders are those which their interest in the situation is marginal (Mahoney 1994).

Involving these stakeholders in strategic planning in a collaborative and coordinated fashion can be an instrumental in the success of the planning process and the success of the destination (Bramwell & Lane 2003; Baggio 2011). Yet, this collaboration does not occur in Hajj (see Section 2.7).

Over the recent decades, the issue of multi-stakeholder collaboration has received increasing attention among tourism researchers and policymakers (Bramwell & Lane 2003; Bramwell 2013). Although the term 'collaboration' in the context of planning has been variously defined (Gieseke 2019), Wood and Gray's definition is widely attributed: 'Collaboration occurs when a group of autonomous stakeholders engage in an interactive process, using shared rules, norms, and structures to act or decide on issues related to a particular problem domain' (Wood & Gray 1991, p. 146).

Two vital principles of collaboration can be extracted from the definition. First, collaboration involves relationships between independent stakeholders when they interact with each other in the problem domain (Bramwell & Lane 2003). The problem domain refers to a condition in which problems are complex and demand multi-inter-organisational stakeholder engagement (Ritchie & Campiranon 2014). Hence, collaboration can be developed when the problem domain is identified and recognised by stakeholders (Gray 1989).

Second, the interactive process among stakeholders requires that they share common rules, norms and structures to solve problems and which power is distributed among them so that they share collective responsibility for their decisions, actions and subsequent consequences of those actions (Gray 1989). Through this process, stakeholders develop holistic approaches to improve the sustainability of tourism destinations. A lack of collaboration among stakeholders has been shown to be the reason many destinations have not been able to achieve sustainability goals (Ladkin & Bertramini 2002; Wondirad

et al. 2020). In contrast, enhancing the collaborative stakeholder network has resulted in improved destination sustainability (Graci 2013). Section 3.12 discusses the emergence of collaborative planning, barriers/drivers, benefits and collaboration models.

3.12 Emergence of Collaborative Planning Approach

Collaborative planning (CP) emerged in the 1990s in response to the failure of traditional planning (Gunton & Day 2003). As discussed previously, traditional planning was based on a bureaucratic approach; it relied on experts who employed objective scientific analysis to design plans and strategies (Gunton & Day 2003). As early as the 1960s, this approach was critiqued for failing to recognise the diverse nature of stakeholder values. This critique stemmed from the observation that no optimal or effective plan can be developed without amalgamating stakeholders' interests (Gunton et al. 2006). The result was the emergence of different models from planning theorists recognising the role of goals and objectives set through democratic political processes to create the framework within which plans were prepared (Davidoff 1965; McLoughlin 1969). Planning models such as the advocacy planning model and the alternative dispute resolution model (ADR) emerged between the 1970s and 1980s to define how stakeholders, including communities, should be involved to define planning objectives and build agreement among them (Gunton & Day 2003). The advocacy planning model recognises competing interests and suggests communities should hire their own experts who develop plans and act as advocates in support of a particular group of stakeholders (Davidoff 1965). This approach has been criticised for not developing a framework for resolving contentions between competing interest stakeholders' group (Gunton et al. 2006). Another model, ADR, has emerged as a means of engaging stakeholders in the development of plans by permitting stakeholders to negotiate for resolving their dispute (Susskind & Cruikshank 1987; Bacow 2013). Like advocacy planning, this approach has also been criticised for being reactive rather than proactive in response to conflicts that have already arisen between stakeholders, which limits its usefulness as a planning tool (Gunton et al. 2006). Consequently, the CP approach emerged as an extension of both models, which also combined the feature elements that made both models a success (Gunton & Day 2003). To illustrate, the CP model recognises the competing interests between stakeholders and acknowledges that these different stakeholders should negotiate to reach an agreement during planning process for resolving a particular problem.

3.13 Collaborative Planning in Tourism and Barriers/Drivers

CP in tourism has been defined as 'a process of joint decision-making among autonomous, key stakeholders … to resolve planning problems … and/or to manage issues related to the planning and development' (Jamal & Getz, cited in Bramwell & Lane 2003, p. 273). CP has received considerable attention as a way of proactively managing development in tourism destinations (Byrd 2007). It has been considered a more comprehensive approach than other planning models in tourism because it encourages stakeholders to build consensus and define planning directions and goals (Aicken et al. 2006).

Yet, the CP approach to tourism planning can be complex because of the need to incorporate multiple stakeholder perspectives and special interests (Ladkin & Bertramini 2002; Almeida et al. 2018). Since there are multiple different stakeholders involved in tourism, debate exists around which stakeholders should participate (Byrd 2007). In fact, identifying the right stakeholders is a critical first step in the stakeholder engagement process and has consequences for outcomes (Araujo & Bramwell 1999). Failure to identify the right stakeholders would affect the success of the development of collaboration and the outcome of the project (Jamal & Stronza 2009).

After stakeholders have been identified and involved, the legitimacy and distribution of power among stakeholders is another challenge (Araujo & Bramwell 1999; Aas et al. 2005). The issue of legitimacy and power is crucial when selecting stakeholders for collaboration because they can affect the success of the CP process (Jamal & Getz 1995). These two issues are considered critical in the CP process. For example, the exclusion of legitimate stakeholders from the CP process has been proven to hinder the implementation of the plans (Araujo & Bramwell 1999; Adu-Ampong 2017). In addition, even when the legitimate stakeholders have been identified, an imbalance of power between stakeholders can reduce the effectiveness and success of collaboration (Almeida et al. 2018). Hence, Gray (1985) argued that this issue needs to be resolved at an early stage in the CP process.

A further obstacle in the development of CP is the role and characteristics of the convener (Jamal & Getz 1995; Nardi et al. 2015). A convener is an individual or organisation with the role to gather all legitimate stakeholders to work on a common issue, increase

transparency, integrate resources and enhance accountability (Gray 1985). The term ‘convener’ is also known by a wide range of names, such as interveners, brokers, orchestrators (van Hille et al. 2020) and leaders (Gray 1989). Therefore, the terms ‘convener’ and ‘leader’ are used interchangeably in this study. This is because the convener is assigned by AMA, which is the highest authority in Mecca. An effective convener is necessary to facilitate collaboration, build trust and support stakeholders to agree on a common vision and plan. This role requires the high-level exercising of key attributes and skills.

The literature identifies a broad range of skills and attributes necessary to perform a convener’s position effectively. For instance, it has been indicated that a successful convener should have the authority, legitimacy and skills to convene stakeholders to enable the exchange of ideas that lead to a common vision and plan (Gray 1989, Jamal & Getz 1995). Many studies have shown that failure to appoint a skilled convener impedes the development of collaboration between tourism stakeholders in the planning process (Olsen 2016; Kenawy et al. 2017). Thus, this issue needs to be addressed at early phases of the CP process to ensure the success of collaboration between tourism stakeholders (Jamal & Getz 1995; Munanura & Backman 2012).

A further issue in the development of CP between tourism stakeholders is the absolute authority and resources available to conveners. An imbalance of power and resources between stakeholders and convener can turn the convener from being a facilitator to inhibitor of the collaboration process (Kozak & Kozak 2015). This was evidenced by Marzano (2007), who found that on the Gold Coast, Australia, a convener hindered the development of collaboration between tourism stakeholders owing to the undue power and resources that were given to the convener. This hindered the collaborative network between stakeholders because they attempted to use their positions to push their personal agendas. This issue can be addressed by applying different strategies, such as checklist factors to evaluate the convener’s quest (Chon 2000). However, this issue might not be easily addressed particularly in the Arab world due to the fact that these countries are ascriptive-oriented societies (Klein et al. 2009; Trompenaars & Greene 2016).

In sociology, the concepts of “ascription status” and “achieved statues” was developed by Linton (1936). The ascription status is “assigned to an individual without reference to their innate differences or abilities”, while achieved status is “determined by an

individual's performance or effort" (Linton 1936, cited in Foladare, p. 53). These two concepts have provided the sociologists with valuable insights into the nature of the human system (Foladare, 1969). Basically, the concepts attempt to explain the nature of a person's attainment of a position within a particular society. According to Trompenaars & Turner (2021) ascription status refers to "being", while in contrasts achievement status refers to "doing". In ascriptive societies like in the Arab worlds, people assign power and status to individuals based on certain traits such as family status, gender, race, etc. In contrast, achievement-oriented societies such as many countries in the developed world's confer power and status based on a person's knowledge and skills (Ngowi 2000). Accordingly, it is logical to find that assigning leader or convener on the base of ascribed status only without considering the achieved status such as experience and knowledge would hinder the development of successful collaborative network between tourism stakeholders for increasing the sustainability of the destinations (Kenawy 2015, Kenawy et al. 2017). On the other hand, in developing countries, appointing convener on the base of achieved status only may not give the convener the respect to facilitate the collaborative network between tourism stakeholders. This is because the cultural, political, and structural nature in developing countries don't give the convener with achieved status the same power that a convener with ascribed status have to bring different stakeholders to the same point of view by the authority vested in that status (Tosun 2000).

Other potential factors that can hinder the development of CP in the planning stage are outlined in Table 14.

Table 14. Potential barriers that hinder collaboration

Barrier factors	Author/s
Stakeholders' capacity to participate in planning	(Araujo & Bramwell 1999)
Lack of stakeholder participation from different sectors	
Stakeholders' scepticism about strategic planning and committees	
Intense political competition	
Corruption	
Problems with control and accountability in the bureaucracy	
Lack of funding and resources	
Competing interests and demands	(Jiang & Ritchie 2017)
Poor relationships between stakeholders	
Lack of consistency in collaboration	
Lack of regional planning	
Local political structures	(Healy et al. 2012)
Lack of recognising different local stakeholders' interests	
Culture of secrecy	
Centralisation	
Political expediency	
Self-interests	
Maintaining control and changing priorities	(Wong et al. 2011)
Territoriality in individual government	
Lack of a collaborative mindset	
Competition among members	
Lack of private sector involvement	
Lack of financial resources and expertise	
Development gap and a fair agenda	
Diversity	
Geographical distance and delay	(Yuksel & Yuksel 2005)
Limited resources, meeting venue and location	
Lack of sharing information	
Language if there are international stakeholders participating in the meeting	
Administrative culture	
Level of representation and continuity of employee/staff	
Short range/timespan	
Form of existing local interorganisational relations.	
Lack of trust and scepticism	
Institutional jealousy and limited commitment	
Lack of trained workers in the public sector	(Ladkin & Bertramini 2002)
Centralisation and limited decision-making power	
Lack of shared vision	
Cultural barriers	

Barrier factors	Author/s
Limited budget	
Lack of clarity in defining the roles	
Multiplicity of public agencies with tourism-related functions	
Political constraints and frequent changes of public officials	
Lack of information on tourism policies from the government	
Slow decision-making processes and implementation of decisions	
Absence of long-term strategy	
Absence of an organisation to manage and clarify CP efforts	
Lack of a clarity of policies on tourism development in the region	(Adu-Ampong 2017)
Overlaps in mandates and activities	
Lack of defining roles	
Limited financial resources and budget	
Low levels of participation in the planning process	
Lack of institutional structures	(Hatipoglu et al. 2016)
Leadership	
Stakeholders narrow vision	
Lack of strategic orientation	
Financial focus based on self-interest by stakeholders	
Imbalanced power	(Selin & Chevez 1995)
Institutional culture	
Relational factors between stakeholders	

Simultaneously, drivers that induce collaboration between stakeholders are well documented in the literature (see Table 15). Over the past two decades, numerous studies have identified drivers that underpin collaboration in tourism contexts (Ladkin & Bertramini 2002; Jenkins & Dredge 2016; Adu-Ampong 2017). Many of these studies owe their work to Gray's (1985) collaboration model (Choi 2005). Gray (1985) proposed different drivers that facilitate each stage of collaboration process (see Table 15). Later, using her work, Jamal and Getz (1995) advanced a set of drivers that facilitate collaboration between stakeholders (see Table 15).

Although both authors provided a set of drivers that affect the CP, they omit some essential factors, such as trust building and others (Choi 2005), which have been proven to be vital in improving collaboration between stakeholders (Wong et al. 2011; Jiang & Ritchie 2017). In fact, the literature identifies various factors that facilitate collaboration between tourism stakeholders (Theobald 2016), and in each context, the drivers can differ. Table 15 summarises potential drivers that induce the CP between stakeholders.

Table 15. Potential drivers for inducing collaboration

Driver factors	Author/s
Stakeholder share perception of legitimacy	(Gray 1985)
Stakeholders' identification	
Recognition of interdependences	
Skilled and legitimated convener	
Share access power between stakeholders	
Stakeholders positive beliefs about the result and outcome of collaboration	
External mandate	
Influencing contextual environment	
Stakeholders share values	
Political volition and support from national leaders	(Wong et al. 2011)
Building trust	
Sub-regional collaboration	
Shared vision and strategy	(Jenkins & Dredge 2016)
Effective communication between stakeholders and leadership	
Clarity of stakeholders	
Responsibilities and roles	
Well established network nature between stakeholders	
Level of existing shared understanding of interdependence among stakeholders	
Establishment of an organisation to lead tourism collaboration	(Ladkin & Bertramini 2002)
Participation of the wider community	
Clarity of defining the roles	
Development of strategic partnership	
Unification of public institutions with tourism-related functions	
Development of indicators to measure the results of collaborative efforts	
Stakeholders' recognition of interdependencies	(Jamal & Getz 1995)
Existence of skilled convener	
Stakeholders' recognition of the mutual benefit of the collaboration	
Inclusion of key stakeholders	
Recognition of legitimacy among stakeholders	
Perceptions of stakeholders of the implementation of collaboration	

Driver factors	Author/s
Stakeholders' shared vision/goals/objectives/ and strategies	
Balanced power between stakeholders	
Consistent and open communication	(Jiang & Ritchie 2017)
Relationship and trust building	
Good leadership	
Shared views and goals	
Effective coordination and planning	
Effective and open communication between stakeholders	(Adu-Ampong 2017)
Community involvement in collaboration process	
Formalisation of the CP	
Shared vision between tourism stakeholders	

3.14 Benefits of Collaboration

The advantages of collaboration between stakeholders in planning are many and well documented. For instance, Hall (1999) argues that although a collaborative approach consumes more time than a top-down approach, it can lead to many beneficial outcomes. First, stakeholders are likely to have a greater degree of ownership of the process and the resulting plan. Second, the CP may establish a collaborative and cooperative relationship between the interested stakeholders, which leads to support of the goals of tourism destinations. Third, it can create social capital, which is defined as 'the norms and networks that enable people to act collectively' (Woolcock & Narayan 2000, p. 226); this has the potential to contribute to the development of sustainable tourism.

In addition, Yuksel et al. (1999) identifies several advantages of CP, including the possibility to avoid or reduce conflicts between stakeholders, the perception that it is more politically legitimate and the ability to build on the knowledge and capacities of stakeholders. Further, Bramwell and Lane (2003) provided a comprehensive summary of potential benefits of tourism stakeholder collaboration in the planning stage (see Table 16).

Accordingly, with the potential benefits of collaboration and its importance to drive the tourism industry toward sustainability (Graci 2013), a number of proposed conceptual collaboration models have been applied to measure CP in tourism contexts. These models

have provided approaches to comprehend possible steps involved in collaboration (Bentrup 2001).

Table 16. Collaborative planning benefits

CP benefits
There may be a range of stakeholders, all who are affected by multiple issues of tourism development and may be well placed to introduce change and improvement.
Decision-making power and control may diffuse to the multiple stakeholders that are affected by the issues, which is favourable for democracy.
The involvement of several stakeholder may increase the social acceptance of policies, so the implementation and enforcement may be easier to affect.
More constructive and less adversarial attitudes might result in consequences of working together.
The parties who are directly affected by the issues may bring their knowledge, attitudes and other capacities to the policymaking process.
A creative synergy may result from working together, leading to more innovation and effectiveness.
Parties involved in policymaking may have a greater commitment to putting the resulting policies into practice.
There may be improved coordination of the policies and related actions of the multiple stakeholders.
There may be greater consideration of the diverse economy, environmental and social issues that affect the sustainable development of resources.
There may be greater recognition of the importance of non-economic issues and interests if they are included in the collaborative framework and this may strengthen the range of tourism products available.
There may be a pooling of the resources of stakeholders, which might lead to their more effective use.
When multiple stakeholders are engaged in decision-making, the resulting policies may be more flexible and also more sensitive to local circumstances and changing conditions.
Non-tourism activities may be encouraged, leading to a broadening of the economic, employment and social base of a given community or region.

Source: Adapted from Bramwell and Lane (2003, p. 7).

3.15 Collaborative Planning Models

Numerous collaboration processes models have been developed (Gray 1985, 1989; Jamal & Getz 1995; McCann 1983; Selin & Chavez 1995) for application in a destination planning context (Parker 1999; Graci 2013). These collaborative models generally consist of several phases, from analysing the situation and key issues involved, moving to defining key objectives, a shared vision and a strategy to achieve the vision, goals and

objectives, concluding with the monitoring and evaluation of the plan. The operational processes of collaboration are not simple or straightforward. According to Gray (1989), the process of collaboration has five characteristics:

1. Stakeholders are interdependent.
2. Solving the problems initiates when stakeholders constructively address differences.
3. Stakeholders have joint ownership of the decisions.
4. Stakeholders share collective responsibility of the consequences and the future of the domain.
5. Collaboration is perceived by stakeholders as an emergent process.

In 1983, one of the first collaboration models was developed by McCann (1983). The author outlined three phases of collaboration: problem setting (which includes stakeholders' identification and understanding of common problems), direction-setting stage (which is the stage in which stakeholders understand each other's perceptions and opinions) and structuring stage (which is the stage in which stakeholders design the implementation process, distribute roles and tasks and monitor and measure the implemented plans).

Later, building on McCann, Gray (1985) developed three stages of collaboration with a set of key collaborative steps at each stage. In Gray's model, the stages are classified as problem setting, direction setting and the implementation phase rather than the structuring phase. Jamal and Getz (1995) advanced the model and proposed six propositions that facilitate collaboration in the community-based tourism level. Further, Selin and Chavez (1995) developed a five-stage collaborative process. Two additional stages were proposed. Phase 1, named 'antecedents', was added before the problem-setting phase to identify precondition elements that initiate collaboration between stakeholders. Phase 5, 'outcomes', was added at the end after the implementation stage, which aims to assess the impacts and benefits of the implementation stage. Although these models can be useful, Gray's collaboration model is one of the most widely used and considered most effective (Fyall & Garrod 2005). To illustrate, Austin and Baldwin (1991) indicated that this model is one of the most useful to examine and understand the forms of collaboration between stakeholders. One of its key features is its practical applicability to many contexts, such as environmental dispute resolution and public policymaking (Purdy et al.

2018). Thus, Gray's three-stage model is applied to understand the nature of collaboration in the Hajj context. The process of Gray's collaboration model is classified into three stages (see Figure 17).

3.15.1 Problem setting

This phase is about identifying key stakeholders that should collaborate to set plans to solve the key problems and build commitment between stakeholders. The six main issues that need to be addressed in this stage are:

(1) Stakeholders reach a shared understating of the issues and problems, including acknowledgement of interdependence between them.

(2) Stakeholders build commitments to address the problems and issues.

(3) Stakeholders recognise and accept the legitimacy of other participants.

(4) Stakeholders identify other stakeholders whose involvement may be vital in the process.

(5) Stakeholders assign a convener who effectively guides them to collaborate.

(6) Stakeholders define the necessary resources needed to advance the CP.

3.15.2 Direction setting

This is the stage at which stakeholders discuss the issue in depth, define their priorities and interests and set common shared goals and solutions. This phase is characterised by six steps:

(1) Stakeholders set rules.

(2) Set the agenda.

(3) Organise subgroups, especially when there are large numbers of stakeholders.

(4) Stakeholders conduct a collective search of information and consider essential facts of the matter at issue.

(5) Stakeholders explore different options for future solutions by creating a consensus to achieve a shared vision or strategy.

(6) Stakeholders reach consensus on the course of action and the developed plans.

3.15.3 Implementation

This is the final phase of CP, which encompasses agreement between stakeholders to implement the plans. In this phase, the necessary four steps are:

(1) Stakeholders manage constituencies that are not directly participating in the planning process by informing them of the outcomes to gain support from them.

(2) Stakeholders collaboratively set structures for implementing the plans.

(3) Stakeholders ensure compliance by monitoring and measuring the plans.

(4) Stakeholders provide support to those mandated with implementing the plans.

Since the government has taken measures to address the issues related to environmental sustainability of the Hajj and the goal of these initiatives has not been effectively achieved owing to the lack collaboration between Hajj stakeholders, this study applied Gray's (1989) collaboration model to comprehend the nature of collaboration between stakeholders when planning for improved environmental sustainability of the Hajj. In addition, the drivers that induce the level of collaboration in each stage will be identified. By understanding the nature of collaboration and the drivers, this study may contribute to improving environmental sustainability of the Hajj.

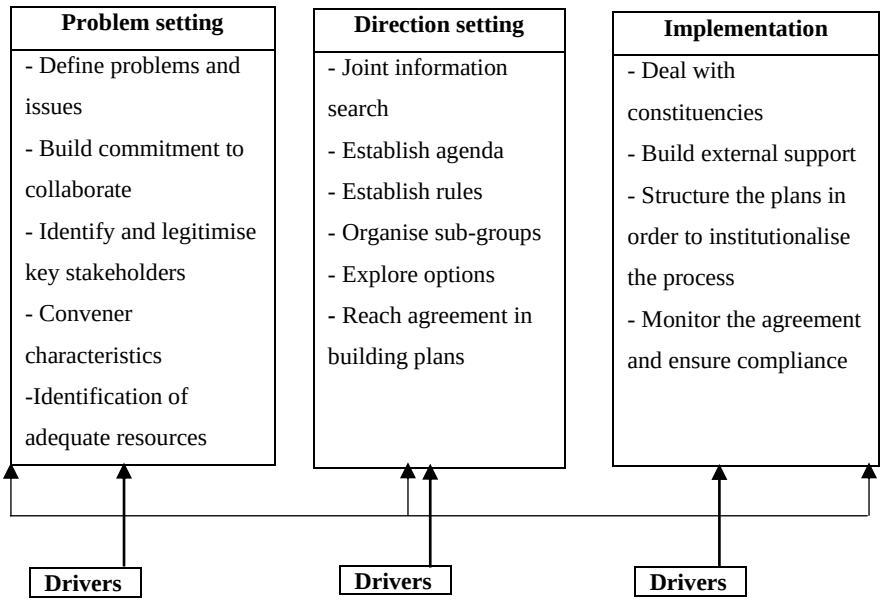

Figure 17. Author summary of the three-phase collaboration model developed by Gray (1989)

3.16 Chapter Summary

This chapter discussed the relevant literature on sustainable tourism and the CP approach to attain sustainability in tourism destinations. It reviewed the definitions, types of events and which type of event the Hajj should be considered.

This was followed by the history of the emergence of the sustainable development concept, highlighting the various definitions of sustainable development and sustainable tourism. Following this, the principle of sustainability in tourism was discussed, identifying the importance of engaging multi-stakeholders in the planning process to achieve sustainable tourism. Then, this chapter reviewed the types of planning in tourism, and the history of CP.

The chapter concludes with a discussion of the drivers/barriers and benefits of the CP approach, and the collaborative models that have been developed by scholars. The reason for adopting Gray's (1989) collaboration model as a lens for this study was also justified. Chapter 4 includes a comprehensive discussion of the methodology that this study adopted in the data collection and the analysis stages.

Chapter 4: Methodology

4.1 Introduction

In this chapter, the methods, design and procedures used to conduct the investigation are described and justified. Since the aim and objectives of this research require exploring and explaining the nature of Hajj stakeholder collaboration when planning for improving the environment of the Hajj and the drivers that may induce their collaboration, an interpretive and qualitative approach was adopted in this research.

This chapter explains in detail the theoretical assumptions that this study applied, including the ontology, epistemology and the methodology underlying this investigation. Moreover, qualitative research methodologies, sampling design, data analysis methods, ethical considerations and limitations of the research methodology are discussed in this chapter.

4.2 Research Paradigm

The word paradigm or *paradeigma* originated in Greek, meaning patterns, and was originally coined by Kuhn (1962) (Antwi & Hamza 2015). A paradigm can be defined as 'basic belief system or world view that guides the investigation' (Guba & Lincoln 1994, p. 105). A paradigm can include various components, such as patterns, structures, frames, values and theoretical assumptions (Antwi & Hamza 2015). A paradigm is a common global view that represents beliefs and values in disciplines and guides scholars in solving issues under investigation (Schwandt 2005).

In research, there is a strong debate between advocates of empiricism (positivism) and interpretive paradigm (constructivism) because both paradigms represent very different ways of thinking about the world and reality. From a positivist paradigm, reality can be described and found through using measurable variables and a normality by employing research techniques, statistics and experiments (Holliday 2007). Positivists aim to test a theory or describe an experience of the social world by assuming that the social world is value free, and that explanations of a causal relations between variables can depict the reality of the phenomena (Mackenzie & Knipe 2006). In contrast, constructivist approaches (also referred to interpretivist) (Cohen et al. 2000) do not observe phenomena

outside the entities but are closely related to the entities being studied (Walliman 2017) (further discussion in Section 4.2.1). Typically, a positivistic paradigm is associated with a quantitative methodology while a constructivist or interpretative paradigm employs a qualitative methodology (Chilisa & Kawulich 2012).

Qualitative and quantitative approaches are both widely applied. However, the quantitative approach is deductive in nature, employs different methods to collect the data, such as surveys and experiments, and uses statistical sampling methods. In contrast, a qualitative approach is inductive in nature, uses different approaches to collect the data, such as observation and interview, and uses non-numerical methods (Al-Busaidi 2008). Thus, qualitative researchers do not aim to generalise their results to larger numbers of the population, but seek to find examples of behaviours, clarify the feelings of participants, explain the experiences of interest to find answers of human behaviour in a given context and provide rich descriptions of the social world (Austin & Sutton 2014). In contrast, quantitative researchers are less interested in such details (Denzin & Lincoln 2018), particularly the voice of participants to express their feelings and thoughts about the phenomena (Austin & Sutton 2014). Accordingly, qualitative research is viewed as a more suitable approach to improve researchers' understanding of the phenomenon than the quantitative approach because it provides deeper answers to questions about participants' opinions, feelings and experiences that may not be easily answered by using the quantitative approach (Al-Busaidi 2008).

In the field of social science, qualitative approaches have become increasingly important research methods and have been applied in many different areas, such as management, social work, education, regional planning (Marshall & Rossman 2014) and tourism (Xin et al. 2013). More precisely, many studies have addressed CP issues in the tourism context through the application of qualitative approach by conducting interviews with multi-stakeholders in the planning process (Araujo & Bramwell 1999; Yuksel et al. 1999; Ladkin & Bertramini 2002; Vogt et al. 2016). This approach allows researchers to discover the deeper meanings about the phenomena in tourism destinations by asking 'how' and 'why' questions to participants (Holloway & Wheeler 2002). This position aligns with the nature of this study, in which the aim is to understand the nature of collaboration between Hajj stakeholders from the participants' perspective in the environmental context in which it occurs.

4.2.1 The interpretivism/constructivism paradigm

Owing to their interest in sociological phenomena, interpretive or constructivist research is particularly applied in fields such as sociology history, philosophy and anthropology (Mohajan 2018). Interpretivism/constructivism are related notions that address the understanding of the world as experienced by others (Chilisa & Kawulich 2012). Interpretivists/constructivists differ from positivists from different theoretical and philosophical assumptions in terms of discovering the reality, knowledge and methodologies undertaken to discover findings (Antwi & Hamza 2015). The main difference between the philosophy of constructivism and positivism relates to the fact that while positivists claim that knowledge can be generated by applying the rules of the natural sciences, constructivism affirms that knowledge is built by the scientist themselves bringing their own subjective perspective to the research, shaping every aspect of the research process. As such, there are multiple truths rather than one fixed set of facts (Pouliot 2004). Moreover, positivists' views of reality can be explained by eliminating the influence of personal opinions, experiences and feelings on research while interpretivists/constructivists accept the impact of their inclusion in their research to explain the reality (Greenbank 2003). They concentrate on words rather than numbers to interpret the situation of the phenomena (Mohajan 2018). Thus, interpretivists'/constructivists' approaches recognise all available evidence on the realities that cannot be discovered and explained by positivists (Walle 1997). According to Denzin and Lincoln (2008, p. 32):

> The interpretivist constructivist paradigm assumes a relativist ontology (there are multiple realities), a subjective and constructivist epistemology (knower and subject create understandings), and a naturalistic qualitative (in the natural world) set of methodological procedure.

These principles will determine how the qualitative researcher views the world. The interpretivists/constructivists view of the world is that the world is socially constructed, and reality is built through the eyes of insiders (Lincoln & Guba 1985). Reality lies in people's experiences and feelings of the outside world; thus, the goal is to understand or interpret the subjective meanings of social life rather than develop objective measurement instruments that can be used in the same manner with different people (Rubin & Babbie 2012). In fact, Gibson and Morgan (1985, p. 28) argued that the interpretivist paradigm

'seek[s] explanation within the realm of individual consciousness and subjectivity, within the frame of reference of the participants as opposed to the observer of the action'. Hence, since this research aims to extract the opinion and perspective of participants to understand the nature of their collaboration, an interpretivist stance is applied in this study. The interpretivism paradigm is underpinned by a different ontological perspective and epistemological assumptions than positivism which will be discussed in Section 4.2.2.

4.2.2 Ontology and epistemology

Every paradigm is built upon ontological and epistemological assumptions (Easterby-Smith et al. 2008). Ontological assumptions relate to the nature of existence and value or, what is reality (Scotland 2012) and what it means to know the reality (Gray 2013). Following from the previous discussion relating to paradigms, there are similarly two different aspects of ontology: subjectivism (known as constructivism or interpretivism) and objectivism (known as positivism) (McManus et al. 2017).

Constructivists assume that there is no supreme objective truth. Rather, each point of view has its own truth (Baghramian 2004; Boghossian 2006). Moreover, they assume that there is no rational basis for beliefs to be superior to other beliefs and that the knowledge uncovered by methods generated by natural science methodologies is only one of a number of potential perspectives (Rubin & Rubin 2011). In other words, an ontological relativism proposes that reality is determined by the concepts of entities who live within it; therefore, there are numerous socially constructed realities (Green 2002). Through this approach, the researcher will commence study in the experimental world to develop interpretations and meanings of the phenomena under investigation (Jennings 2001).

In contrast, objectivists (or positivists) differ from constructivists because they understand social phenomena's existence as being external or separated from the social world (Saunders et al. 2012). Objectivism approach social phenomena as concrete and measurable (McManus et al. 2017). Hence, the researcher is a separated entity from the research. The most common methodology they employ is quantitative methods and that the truth of all phenomena can be represented by measurable indicators (Sale et al. 2002).

Epistemology is concerned about how we 'know' and the way of capturing the reality (Cohen et al. 2000). Epistemological assumptions are concerned with how knowledge or

reality can be obtained and communicated. In other words, what it is and what it means to know (Scotland 2012). The same key ontological positions flow into epistemology. An interpretive approach is that the insider's view provides the best knowledge about the phenomenon under study, because the insider's view allows for identifying and acquiring multiple realities (Jennings 2001). The philosophical view of interpretive perspective is that social work is inherently meaningful and before the researcher can understand the cause of a particular behaviour or interaction, they must first understand the meanings that participants attribute to related phenomena because they believe that the way social actors interpret and build the world around them will affect their behaviours (Sarantakos 2012). Thus, researchers from interpretive position are devoted to involvement in the social setting to understand the issues and the phenomena (Jennings 2001).

In contrast, the positivist stance is that the world should be viewed as an objective entity. Their stance is that researchers are independent entities from the study because they believe that knowledge and truth are a set of fixed and indisputable realities from which our beliefs can be inferred (McManus et al. 2017). Positivists emphasise that the truth and reality can be obtained scientifically and empirically and can be elucidated by employing rational investigation and analysis (Aliyu et al. 2014). Therefore, positivists view that knowledge of reality can be deductively attained from hypothesis and theory and measured by analytical testing (Mack 2010).

Based on the above discussion, the study adopts an interpretive approach, through which this study described and interpreted the participants' feelings and experience towards a phenomenon as they perceive it. Since collaboration between Hajj stakeholders has not been investigated, and the context of this research was conducted to create meanings and interpretations about the phenomena through the participants' views and experiences, a qualitative approach is necessary, especially when there is little known of the phenomena (Creswell & David 2018). Consequently, the ontological and epistemology stance of this study will be of an interpretivism/constructivism nature.

4.2.3 Methodology

Methodology can be defined as 'the strategy or plan of action which lies behind the choice and use of particular methods' (Crotty 1998, p. 3) Methodology is the research strategy, plan of action, process or design that is behind the selection and use of certain methods

(Punch 2013). Methodology is concerned with more than just data collection methods; it is the type of approach best suited to achieving the intended search results (Bailey 2018). Thus, following from the previous discussion on ontological and epistemological assumptions, this research is guided by methodology to gather an in-depth interpretive understanding of the specific environmental context in which the Hajj operates.

As described previously, interpretivists/constructivists generally use qualitative methods in which the aim is to investigate the phenomenon, rather than viewing the phenomenon as quantifiable variables from which causal relationships can be identified (Jennings 2001). The main aim of the interpretive paradigm is to 'get into the head' of the entities being studied and interpret their opinions and feelings of the phenomena under study. The intention is to generate rich and deep understandings of social phenomenon by attaining the knowledge from the experienced participants in the real world (Bisman & Highfield 2012). The focus of qualitative methodology is to understand 'how and why' phenomena occur and interpret it according to the meaning obtained from the entities (Holloway & Wheeler 2002). This is particularly in contexts for which there has been little previous research (Ospina 2004), which is the case of the Hajj. Therefore, this research is informed by a constructivism (interpretivist) paradigm and utilises qualitative methods to enable an in-depth understanding of the nature of CP between Hajj stakeholders.

4.3 Research Methodology and Approach

As previously outlined, qualitative methods have been employed to study stakeholder collaboration in planning in the tourism context. That is because qualitative approaches help researchers understand complex phenomena that are difficult to capture in quantitative research (Mohajan 2018). For instance, it allows researchers to explore and capture rich information to gain insights into the world on the basis of participants' opinions and experiences by letting the data speak by using (down-top) inductive approach. Conversely, quantitative researchers aim to isolate the phenomenon to reduce the complexity in the analysis and to test the hypotheses derived from previous studies (Ospina 2004). However, that does not mean that quantitative method is not useful but is sometimes viewed as limited to explaining 'what' occurs rather than explaining 'how' or 'why' phenomena occur (Holloway & Wheeler 2002).

Consequently, this research applies a qualitative approach to gain a deep understanding of the collaborative relations of Hajj stakeholders in ways that cannot necessarily be observed or absorbed in a formal questionnaire.

4.4 Data Collection Design

This section describes secondary data, data collection phases and method, research participants and procedures used in this study.

4.4.1 Secondary data

Both primary and secondary data were employed in this study to address research questions. Secondary data were used for this study to estimate CO_2 emissions arising from the Hajj and initiatives relating to environmental sustainability of the Hajj. This was found through government reports and statistics, reports from various agencies, media reports and academic studies.

4.4.2 Selection of qualitative data collection technique (face-to-face, in-depth unstructured and semi-structured interview)

This section provides the rationale for the selection of unstructured and semi-structured interviews as a technique for collecting qualitative data. While there are many options available for qualitative data collection, the most common techniques used in qualitative research are focus groups, observation and interviews (Halcomb 2016).

Focus groups were not chosen because individuals in Saudi culture have a strong sense of hierarchy, which can limit the full and open discussion between group members. Focus groups can be controlled by powerful personalities, which may lead to a biased response (Harrison et al. 2015). Moreover, observation was not an applicable approach in this study because meetings are very confidential in Saudi Arabia, and attendance at Hajj for stakeholder meetings was not permitted. Hence, this study used *interviews*—one of the most *common methods used in qualitative* studies (Qu & Dumay 2011) and the most applicable method for this study.

The research interview is a method for obtaining oral information from individuals and groups through questions and answers to verify hypotheses or to describe phenomena (Cheia 2010). It is viewed as the best way to elicit an individual's perspective and develop

dense descriptions of a particular social world, which can then be analysed for cultural patterns and themes (Jennings 2001). Moreover, it helps to gain in-depth information about the phenomena from the participant viewpoint (Grbich 1999). In tourism studies, qualitative interviews are widely employed to gain a deep understanding of the phenomena under study (Richards & Munsters 2010; Jiang & Ritchie 2017; Picken 2018).

There are three main types of interviews: structured, unstructured and semi-structured (Richards & Munsters 2010). The structured interview involves asking standardised questions, almost like a questionnaire (Mathers et al. 1998), while the unstructured interview pursues knowledge and realities from participants' perspectives and usually follows an interpretative paradigm (Jennings 2001). This type of interview is conducted without a pre-existing theoretical framework, or hypotheses that construct the social realities under investigation. Instead, the researcher talks to interviewees and generates questions in response to interviewed participants' narrations (Zhang & Wildemuth 2009). Thus, this technique was used in this study in the first round of conducting interviews to gain deep insight into the issues that are related to planning for environmental sustainability of the Hajj (further discussed in Section 4.4.3).

The third type is the semi-structured interview, which is a combination of structured and unstructured methods. The semi-structured interview is a more flexible version of the structured interview because it allows researchers to gain in-depth information of the phenomena. This is because it helps researchers gain more information from participants by expanding their responses (Jong & Jung 2015). In addition, it allows researchers to follow the path of the participant's experiences (Jennings 2001). This type of interview allows the researcher to gather open data, explore the participants' views and beliefs on a particular subject and discuss sometimes personal and sensitive topics (DeJonckheere & Vaughn 2019). Hence, a semi-structured interview technique was applied in the second round of interviews.

There are different means to conduct unstructured and semi-structured interviews, such as telephone, online and face-to-face. Each has their relative merits. The telephone interview is a way of communication that allows researchers and participants to communicate when distance or other logistics prevent face-to-face meetings. However, the disadvantage of telephone interviews is that it should remain short compared with face-to-face interviews, which may reduce the richness of information (Chapple 1999;

Sweet 2002). It also fails to convey non-verbal communication that may provide deeper insight. Alternatively, the researcher may choose to interview online. However, since both the interviewer and the interviewees are Saudi Arabian, it was important to be mindful that people in Saudi Arabia usually prefer not to conduct official meetings over the internet. Therefore, this approach was considered less appropriate in this study. Conducting face-to-face, in-depth unstructured and semi-structured interviews was considered the best method for this study. The advantage of this method is that it encourages participants to feel free to express their knowledge and experiences, which promotes learning about individual experiences and perspectives on a particular set of issues (DiCicco-Bloom & Crabtree 2006). Moreover, it helps the researcher observe the non-verbal cues of the participants, such as body language, gestures and reactions, which may complement the verbal response of the researcher and can provide evidence to the interviewer (DeJonckheere & Vaughn 2019).

4.4.3 Research participants and sampling

The population or key informant interviews of this study was identified as Hajj stakeholders and interviews were conducted in Saudi Arabia, Mecca and Jeddah. The key informant interviews "are in-depth discussions with persons who have special or expert knowledge." (Taylor & Blake, p.153). In this study, participants were selected because of their participation in Hajj activities and/or Hajj planning.

Qualitative sampling requires targeting specific people or settings to attain a deep comprehension of certain phenomena experienced by a selected participant (Maykut & Morehouse 1994). Qualitative research sampling generally adopts non-probability or non-random sampling techniques (Jennings 2001). The sampling method adopted for this study was the purposive snowball sampling technique. Purposeful sampling refers to the notion that the researcher deliberately selects participants who fit certain criteria for the study (Patton 2015). This includes the identification of participants who are knowledgeable and experienced in the phenomenon being studied (Creswell & Clark 2018). The key criterion for this study was to identify participants who have the knowledge to answer the research questions and were familiar with Hajj issues.

Snowball sampling is a well-known technique that begins with a small group of participants selected by the researcher, and then expands the sample size through referrals

gained through the initial selected participants (Tashakkori et al. 2021). The main benefit of the snowball sampling strategy was to detect potential participants who may not have been detected in another way, except through recommendation and suggestion of the participants (Babbie 2019). This technique allows selected participants in the study to help the researcher interview future participants on the basis of their knowledge and experience. Hence, with the accumulation of the sample by using 'snowball' technique, enough data were collected to be useful for this research (Sharma 2017).

The procedure for identifying participants through 'snowball sampling' by the researcher occurred at the end of each interview. The researcher asked selected participants whether they were willing to recommend other stakeholders who also participated in the Hajj activities and planning as a potential participant. This technique permitted the researcher to identify key stakeholders involved in different sectors of Hajj sectors and interviewees were largely supportive and willing to introduce their colleagues who were working in similar sector or in other sectors.

In qualitative studies, there is no agreement about the ideal sample size (Boddy 2016; Dworkin 2012). Instead, the sample size depends on what and why the researcher wants to explore and how the result of the study will be employed, and the available resources of researchers (i.e. time) (Patton 2015). Therefore, it is possible to conduct in-depth interviews with a small number of appropriate participants if they can provide valuable knowledge about the research issues (Hay 2000). However, it has been argued that the concept of saturation is the suitable approach when considering sample size decisions in qualitative studies (Morse 2000; Guest et al. 2006). Data saturation refers to the point in the research process when new information is no longer being obtained (Faulkner & Trotter 2017). It can be reached when information is recurrent and when the feasibility of adding further coding is not possible (Mason 2010; Fusch & Ness 2015). Hence, if the researcher observes that the subsequent interviews produce the same information and the initial results appear to meet the objectives of the study, there is no need to conduct further interviews.

In practice, 27 interviews were conducted in the two phases. Although the number of interviews in this study was smaller than anticipated, this was mainly because there were very few stakeholders in the public sector who were aware of or involved in environmental planning. Thus, all interviews with Hajj government stakeholders were

conducted with senior level officials. Hoteliers and donation institutions stakeholders did not have any knowledge about how planning is conducted or the nature of collaboration because they do not have the legitimacy to participate or discuss the plans and decisions made with public stakeholders. Although hospitality agency and catering institution stakeholders do not have the right to participate in planning with public stakeholders, they are aware of the nature of collaboration because they are considered the main implementation arm for public sector and the sector has responsibility to serve and guide all pilgrims during the Hajj until they leave the country. Thus, they have the knowledge to explain some aspects of the nature of collaboration between Hajj stakeholders and could identify drivers that influence their collaboration. Accordingly, a sample of 27 participants was considered suitable for achieving the objectives of the study, especially since stakeholders from the public sector were senior managers with the authority to make decisions about Hajj. Section 4.4.4 will discuss the interview procedure.

4.4.4 Research procedure

The primary collection of data was conducted in two phases. Both phases were held in Mecca–Jeddah, Saudi Arabia, because most Hajj stakeholder offices and institutions are in these two regions. Jeddah is located around 70 km from Mecca. The interviews were unstructured in the first phase and semi-structured in the second phase.

In the first phase, interviews with Hajj stakeholders were conducted in Saudi Arabia during March–April 2019. The reason behind conducting the first round of interviews was to inform the researcher about the real issues related to planning for environmental sustainability of the Hajj (see Appendix 3). For the first time, potential participants were contacted by their official telephones through Umm Al-Qura University, Department of Business administration of Hajj and Umrah, to discuss the purpose of the study. Arrangements were made for interviews with participants who consented to participate, and 15 interviews were satisfactorily completed. It should be noted here that not all the 15 participants were arranged by the university. Nine participants from both sectors (public and private) were reached through snowballing technique. After conducting the first round of interviews, all transcripts were read several times to gain deep understanding of the key issues related to planning for environmental sustainability of the Hajj. It was found that most stakeholders answers revolved around the issue of collaboration between Hajj stakeholders. Hence, the researcher identified the theoretical

framework that would guide this project and went to Saudi Arabia again in December 2019 to conduct the second round of interviews with Hajj stakeholders.

In the second round, 20 interviews were conducted in Mecca and Jeddah between December 2019 and February 2020 with key stakeholders from both public and private sectors. Four interviews were conducted with senior managers from hospitality agencies, including the representative of hospitality agencies in the second phase.

Of the participants from the public sector, 16 interviews were conducted in the second round with senior officials because they are the main stakeholders who have the power to participate and develop environmental plans. Eight participants from the public sector who participated in the first round also participated in the second round. However, one participant who participated in the first round could not make it again and apologised to the researcher. The process of interviews in both rounds were conducted using similar steps, except that in the second round, all participants were directly contacted by the researcher. Also, in this phase, 12 participants from both sectors were identified through snowballing technique.

Each interviewee was provided with the research background, assurances of research ethics and was asked to complete an approval form. Interviews began with introduction of the study and background of the researcher. In addition, the aim and the objectives of the research was discussed with participants. Before starting any interviews, the researcher attempted to build friendly relations with participants to commence an interview in a friendly manner. This is because many people do not feel comfortable when an unfamiliar person asks them with about what they think (Holloway & Galvin 2016). Hence, the researcher began with, ‘Can you tell me please about your role in the Hajj?’ (see Appendices 3 and 4).

All interviews in the first and second phases were conducted in a face-to-face setting at the participant’s preferred time and location. During the interview, especially in the second round, the researcher attempted to ensure coverage of all relevant subjects related to the nature of collaboration between Hajj stakeholders when planning for sustaining the environment of the Hajj.

The researcher attempted to manage any bias that may have occurred during the interviews by keeping personal opinions hidden because revealing the researcher's

opinion can make some participants amend their answers to satisfy the researcher (Holloway & Galvin 2016). The questions, particularly in the second round, were developed to be as undirected as possible by asking open ended questions to open the opportunity for the participants to express their opinions and attitudes. This approach opened new avenues of investigation and made the researcher ask new questions to interpret the participants answers (Qu & Dumay 2011). The researcher recorded all the interviews that were conducted with hospitality stakeholders. However, all participants from the public sector preferred not to record their voices and instead suggested to write their answers in both rounds.

At the end of interviews, all participants from hospitality agencies were offered a copy of the data transcripts. None of the interviewees asked for the transcript. Regarding participants from public sector, at the end of each interview, the researcher handed them their written answers to understand their views and ensure the credibility of the data.

Interviews were recorded by smartphone and MP3 recorder. These tools were appropriate because they are small and convenient to the researcher and the participant. In fact, their present during the interviews did not bother participants. Moreover, notes of non-verbal communication such as body gesture were taken during the interview. All notes were recorded immediately after the interviews' end.

Numerous factors enhanced data collection. First, the researcher is a native Arabic speaker, from Saudi Arabia, and has participated in the Hajj in recent years. Therefore, the direct and indirect answers of participants could be easily understood. Second, since this study focuses on the issue of environmental sustainability of the Hajj, the research was warmly supported because Hajj areas are considered the most sacred places for Muslims. Despite its importance, the event activities contribute in harming the environmental sustainability of the destination. Thus, many stakeholders were supportive and helpful hoping by that this study may contribute in solving some issues that impact the environmental sustainability of the destination.

Nonetheless, there were some practical constraints during interviews. The topics related to planning and strategies that are extremely sensitive in a conservative culture such as Saudi Arabia, and although stakeholders from both the public and private sectors were highly responsive, all participants from public sector refused the request of the researcher

to record the interviews. This is because all of them were in a senior position and fearful of criticism by other Hajj stakeholders on environmental actions. They asked the researcher to write the interviews and after the end of each interview they read the written interview.

Another consideration was that since most of the participants were in senior positions, few were able to give much time, particularly participants from the public sector. However, most interviews ranged from approximately 30 to 45 minutes. After the end of each interview, recorded and written interviews were transcribed electronically via ATLAS program. It should be noted that interviews were transcribed into Arabic but translated by the researcher into English at the analysis stage. The names of participants and the transcription of the interviews were maintained separately and securely in different locations. Only the researcher had permission to access them.

In general, in the second round, at the last interview, the additional data collected from the participants appeared to be recurrent. Thus, the researcher reached 'data saturation' (Faulkner & Trotter 2017). In addition, the data gathered through these participants were rich and knowledgeable enough to answer the research questions and achieve the aim of this study. It should be noted that the first-round interviews were also used in the analysis stage because they were very useful in answering the questions of this study.

4.5 Ethical Considerations

Since the interview necessitates human involvement and participation, ethics is fundamental element of human research (Guraya et al. 2014). The key consideration is to ensure that no participant is exposed or imperilled by the consequences of the research activities (Cooper & Schindler 2014). Thus, an ethics application was lodged in December 2018 and by the end of February 2019, the application was approved by Victoria University Ethics Committee (HRE19-003). This research was guided by university ethics protocols.

To comply with ethical issues, the researcher asked participants' permission before starting recording. As indicated previously, all participants from private sectors agreed to record their voices. In contrast, all participants from public sector refused to record their voices and asked the researcher to write their answers instead of recording them.

The researcher explained the purpose of this study and provided the consent form to each participant before conducting any interviews (see Appendix 5 and 6). All participants were informed that they have the right to not answer any question or to stop the interview at any time they want. Moreover, all interviews were conducted after gaining approval and permission from the participants from both governmental and private sectors.

4.6 Data Analysis

This section discusses the research approach to analysing qualitative data to identify the issues of stakeholder collaboration in planning for sustaining the environment of the Hajj. In qualitative research, the analysis of responses consists in assessing, arranging, coding and categorising responses into themes (Braun & Clarke 2012). Data coding and categorisation assists the researcher to identify the views, impressions and thoughts of participants (Bryman 2016), and identify the main themes that will appear in the research (Sutton & Austin 2015). The processes of data analysis will be discussed in Sections 4.6.1–4.6.2.

4.6.1 Data labelling

Since qualitative studies often contain rich descriptions of study participants, breaches of confidentiality through deductive disclosure are of particular concern to qualitative researchers (Kaiser 2009). Deductive disclosure occurs when the characteristics of individuals or groups make them identifiable in research reports (Sieber & Tolich 2013). It is also widely known as internal confidentiality (Tolich 2004). Thus, anonymity of participants is crucial in qualitative studies.

There are many strategies to protect the participants confidentiality. The most common one is anonymisation (Leavy 2014). Anonymisation is an approach to replace the name of participants with an invented one. Thus, since Hajj stakeholders can easily be identified, especially seniors from the governmental sector because Hajj ministries and organisations are located in specific places and stakeholders who are responsible in this field are very well known to public, this research labelled all participants' information such as their names, workplaces and responsibilities to protect their anonymity and confidentiality. The demographics of the participants are described in Tables 17–18.

Table 17. Key stakeholder 1: Governmental sector

Participant*	Position level	Sector	Location	Phase
PbS1	Senior	Government	Mecca	1& 2
PbS2	Senior	Government	Mecca	1& 2
PbS3	Senior	Government	Mecca	1& 2
PbS4	Senior	Government	Mecca	1
PbS5	Senior	Government	Mecca	1& 2
PbS6	Senior	Government	Mecca	1& 2
PbS7	Senior	Government	Mecca	1& 2
PbS8	Senior	Government	Mecca	1& 2
PbS9	Senior	Government	Mecca	1& 2
PbS10	Senior	Government	Jeddah	2
PbS11	Senior	Government	Mecca	2
PbS12	Senior	Government	Mecca	2
PbS13	Senior	Government	Mecca	2
PbS14	Senior	Government	Mecca	2
PbS15	Senior	Government	Mecca	2
PbS16	Senior	Government	Mecca	2
PbS17	Senior	Government	Mecca	2

* PbS = public stakeholders.

Table 18. Key stakeholder 2: Private sector

Participant*	Position level	Sector	Location	Phase
PrS1	Senior	Catering agency	Mecca	1
PrS2	Senior	Transportation company	Jeddah	1
PrS3	Senior	Hospitality agency	Mecca	1
PrS4	Senior	Hospitality agency	Mecca	1
PrS5	Senior	Hospitality agency and catering agency	Mecca	1
PrS6	Senior	Hospitality agency	Jeddah	1
PrS7	Senior	Hospitality agency	Mecca	2
PrS8	Senior	Hospitality agency representative	Mecca	2
PrS9	Senior	Hospitality agency	Mecca	2
PrS10	Senior	Hospitality agency	Mecca	2

* PrS = private sector stakeholders.

4.6.2 Data analysis approach

Inductive and deductive approaches are well-documented strategies for analysing qualitative data (Fereday & Muir 2006; Suter 2012). Deductive is a ‘top-down’ approach in which the themes emerge driven by an existing theory or hypothesis (theory driven). An inductive approach is ‘bottom-up’, in which the themes emerge from the raw data and without exiting theory (data driven) (Creswell & Clark 2018). Hence, inductive analysis is the process of coding data without trying to fit it within a pre-existing theoretical framework. In contrast, a deductive approach is a less prescriptive approach of analysing the data since its coding process is driven by the researcher’s theoretical framework and research interest in context. Therefore, it is more explicitly driven by the analyst (Braun & Clarke 2006). Both approaches can be considered a strategy to find answers to research questions and developing themes. However, there is a third approach, which is called the ‘hybrid approach’ or ‘abductive approach’ (Rambaree 2014). This approach is a combination of deductive and inductive approaches (Fereday & Muir 2006). This approach is useful for supplementing research questions by allowing the principles of social phenomena to be an integral part of the deductive thematic analysis (TA) process, while allowing subjects to appear directly from data using inductive coding (Fereday &

Muir 2006). This was asserted by Xu and Zammit (2020), who found that one of the advantages of applying abductive approach is its flexibility in allowing researchers to identify themes derived from pre-existing theory, but simultaneously allows them to identify new themes from the data itself. In this sense, this research used the abductive approach to analyse the nature of collaboration between Hajj stakeholders, which is the third objective of this study. Hence, the process of analysing the nature of collaboration will not be purely deductive but inductively analysed as new themes emerged driven by the raw data with the progress of analysis. By applying this approach, new themes will be created from the raw data to reveal fundamental meanings of the phenomenon that were not covered in the theory or the hypothesis (Yukhymenko et al. 2014). However, the fourth objective of this study, which is identifying the drivers that affect collaboration between key stakeholders of the Hajj, was achieved through an inductive approach. This is because although that there are many studies that identified the drivers that affect collaboration between tourism stakeholders in both developing and developed countries, each context identified different drivers that affect CP between tourism stakeholders in the literature, as indicated in CH3. Since the Hajj is considered a different and unique context, it is more suitable to use an inductive approach to identify drivers from the participants in the real field. By applying such an approach, this study would provide a rich description of the situation and identify the most important themes and categories relevant to the research objectives (Yukhymenko et al. 2014). The application and process of coding and developing themes will be discussed in further detail in Sections 4.6.2.1–4.6.2.8.

4.6.2.1 Coding

To conduct qualitative research, consideration must be given to the process of data coding. A code is the label specified to specific parts of the data that contribute to identify a theme (Wong 2008). The codes may depict a word, attribute or a theme that exists in a series of paragraphs (Neuman 2007). Data coding is an interpretive method employed to organise the textual data in so that these textual data make sense (Basit 2003). It is a necessary stage in qualitative research because it helps reduce a large amount of data into a small number of words or phrases (Miles et al. 1994) and provides an overview of the disparate data that permits the researcher to understand it in relation to their research questions (Elliott 2018). Moreover, it is used to verify concepts and relationships between concepts defined in the conceptual framework (Yin 2017). Since this study adopts a

qualitative approach to gain a deeper insight of the participants' opinions and feelings of the phenomena under investigation, the use of codes, open categories and TA is the most common in the exploration of these phenomena (Lim 2011).

Analysis software can be a supportive tool to manage the data (Moser & Korstjens 2018). It offers researchers numerous advantageous in terms of organising, retrieving and sharing, and for coding, sorting and transcribing the data (Baralt 2012). It should be noted that the computer programs do not analyse data on behalf of the researchers, but computers provide connections for the researcher to consider during the analysis process (Weitzman & Miles 1995).

Different software programs can be employed to conduct analysis in qualitative studies such as NVivo, MAXqda, ATLAS.ti and N6 (Zamawe 2015). However, the software package that was used in this study to analyse the data is the ATLAS program, owing to its compatibility with any language such as Hebrew and Arabic (Friese 2015). Since the interviews were conducted in Arabic, the ATLAS program is the most suitable program to analyse the data.

In this thesis, the content of the transcripts of the interview will be grouped into themes and interpreted with reference to the key issues discussed in the previous chapters and the conceptual framework. The analysis will attempt to provide deeper interpretations of the findings to explore and understand the issues related to the collaboration of the Hajj stakeholders in developing plans to preserve the Hajj environmental sustainability as perceived by the main Hajj stakeholders from public and private sectors. Themes will then be checked against the literature review to illustrate how views corresponded or presented different perceptions.

4.6.2.2 Thematic analysis (TA)

To analyse the complications of collaboration among Hajj stakeholders in planning to enhance the environmental sustainability of the Hajj, a TA of the collected data will emerge. TA has been defined as 'a method for systematically identifying, organising, and offering insight into, patterns of meaning (themes) across a dataset' (Braun et al. 2019, p. 57). A theme may be an element, descriptor and perception (Ayres et al. 2003). Themes are different than codes because themes often have broader meaning than codes (Braun & Clarke 2006). Themes comprise codes with a common reference idea and a high level

of generality that bonds the thoughts on the subject under study in more details (Vaismoradi et al. 2016). Different approaches have been used in qualitative studies, such as interpretative phenomenological analysis, grounded theory and discourse analysis (Starks & Susan 2007). However, TA is one of the most flexible and accessible methods used to identify and analyse patterns (themes) that have emerged from the data (Braun & Clarke 2012). In fact, TA not only provides a flexible way to analyse data in qualitative research, but also creates the most systematic and clear form without compromising the depth of analysis (Javadi & Zarea 2016). Also, it provides rich depiction and interpretation of different aspects of the subject under study (Braun & Clarke 2006).

TA is one of the suitable methods that can be used in qualitative research to provide answers to the issues under investigation, such as understanding people's perspectives and experience about the phenomena, because of its flexibility to be applied to a wide range of theoretical frameworks—from fundamentalist to constructivist. This method does not require adherence to follow any specific theory of language, or explanatory framework that provides meaning to human beings, practices and experiences (Clarke & Braun 2013). Thus, this study used TA to understand the issues related to collaboration between Hajj stakeholders when planning for sustaining the environment of the Hajj.

In qualitative analysis, several versions underpin many different types of TA and each one of them differs in terms of processes (Clarke & Braun 2013). However, one of the most effective approaches to TA was developed by Virginia Braun and Victoria Clarke because while there are various ways of conducting TA, it seems that there is confusion about the nature of TA. One of these causes of confusion is how TA differs from content analysis (Maguire & Delahunt 2017).

The six steps established by Braun and Clarke have been argued to be the most influential framework that can be applied at least in social science because their approach provides a clear and usable framework that distinguishes between TA and content analysis (Maguire & Delahunt 2017). In their approach to TA, they employ a process of coding whether deductively, inductively or both, in six phases to identify meaningful themes: familiarisation with data, generating initial codes, searching for themes among codes, reviewing themes, defining and naming themes and producing the final report (Braun & Clarke 2006). This research followed the six-step framework for data analysis, as outlined in Sections 4.6.2.3–4.6.2.8.

4.6.2.3 Familiarisation with the data

This stage revolves around knowing the data gathered from the researcher (Braun & Clarke 2006). It involves reading and re-reading the data, listening to the audio recording or watching video data until they become intimately familiar with the content of the data and identify ideas that might be relevant to the research questions (Braun et al. 2019). Hence, after finishing the first phase of interviews, all data transcripts were read several times until the issue of this study, collaboration between Hajj stakeholders when planning for sustaining the environment of the Hajj, was identified. After finishing the second phase of interviews, all data from the entire interviews were read multiple times until the researcher identified initial ideas for codes that can describe the content.

4.6.2.4 Generating initial coding

This phase revolves around the production of primary codes of data (Braun & Clarke 2006). This stage involves assigning codes that detect essential features of the whole data that may be relevant to the answer to the research question (Braun et al. 2019). By coding all data, relevant data appeared (Aarabi et al. 2015).

Thus, at this stage, the data were organised in a systematic way and minimised to small portions of the meaning. As indicated previously, codes can be formed depending on the type of analysis, such as inductive, deductive, or according to the type of researcher questions (Javadi & Zarea 2016). In this study, a combined technique of inductive and deductive TA was used in the third objective, and inductive approach was used in the fourth objective. Therefore, line-by-line coding was used in this study to code all data gathered from the participants. Open coding was also used, which means that there were no pre-test codes. Instead, codes emerged and were modified as the researcher worked thorough coding the data. When first transcript was accomplished, modifications to the codes were made before moving to the next transcripts. This process was done to all other transcripts. As the researcher continuously worked on coding the transcripts, new codes developed and some codes were modified again.

4.6.2.5 Searching for themes among codes

This stage is when the researcher ends coding and develops themes. Researchers begin to analyse their codes and consider how to combine different codes to identify themes

(Braun et al. 2019). At this stage, qualitative data should be sorted and coded into themes by analysing the developed codes and connecting relevant codes to identify the possible themes (Braun & Clarke 2006). Sorting codes comes from detailed work, reflection on data and what the data tell the researcher (Seers 2012).

In this study, after the initial coding process was done, the transcriptions were re-examined to ensure that no code was ignored or missed. At the end of this step, all codes developed form the primary data were analysed and the relevant codes were connected together to identify the themes that seemed to answer the questions asked in this research.

4.6.2.6 Reviewing themes

This phase included the review of the themes emerged from the coded data. It involves two levels of review and modification: the level of revising the developed codes and the level of revising the whole dataset (Braun & Clarke 2006).

During this stage, extracts related to the codes should be reviewed to ensure whether they support the theme or not. In other words, codes within themes should incorporate together meaningfully, while there should be clear discrepancy between themes (Braun & Clarke 2006). Thus, in this study, each theme was reviewed against extracts of data to ensure that the theme was representative of the data and worked in the entire dataset.

4.6.2.7 Defining and naming themes

At this stage, researchers identified and refined the themes (Braun & Clarke 2006). By define and refine, the author meant as 'the "essence" of what each theme is about (as well as the themes overall), and determining what aspect of the data each theme captures' (Braun & Clarke 2006, p. 22). Thus, at this phase, the name of each theme in this study was identified after revising the previous processes several times to ensure that the codes connected were relevant. The descriptive map to illustrate the process of developing each theme is drawn in Chapter 5.

4.6.2.8 Producing the final report

The purpose of this stage is that researchers depict a clear and convincing story about their data based on their analysis (Braun et al. 2019). It is essential that the story that

emerged from the data is consistent, rational, non-recurrent and interesting (Braun & Clarke 2006).

In this study, the story of each border theme and sub-theme was written after following each step of the Brown and Clark thematic framework. After writing the first draft of the themes, each theme was reviewed to ensure that there was no interference, repetition or inconsistency in the story that might affect its clarity and consistency.

4.7 Validity and Reliability in Qualitative Studies

Validity and reliability are vital concepts for assessing quality (trustworthiness or rigour) in both qualitative and quantitative studies. Yet, since qualitative methods are of a different nature to quantitative methods in terms of philosophical positions, there are alternative criterion for evaluating trustworthiness in qualitative research (Sandelowski 1993). Trustworthiness can be defined as the degree of clarity and confidence of the accuracy of the data and the methods that are employed to ensure the quality of research (Polit & Beck 2009). The term has been referred to as 'goodness criteria', which is a synonym for the term 'rigour' in quantitative studies (Sale & Brazil 2004). Lincoln and Guba (1985) suggested four criteria (***credibility, dependability***, ***transferability*** and ***confirmability*****)** for evaluating the trustworthiness in qualitative research, whether collected from direct observations, focus groups or interviews. Since the four criteria have been accepted widely between scholars in qualitative studies (Connelly 2016), this research adopted these criteria for evaluating the data trustworthiness.

By following the aforementioned procedures, it is hoped that the trustworthiness of this study has been successfully attained. Each criterion is described in detail in Sections 4.7.1–4.7.4.

4.7.1 Credibility

Credibility refers to the evaluation of the study results to determine whether the data described represent a true and reliable depiction of the participants' data (Lincoln & Guba 1985). It is more linked to the internal validity used in quantitative research (Shenton 2004). According to Connelly (2016), it is considered the most important criteria because it presents the accuracy of the truth and the findings.

In qualitative studies, there are different techniques that can be used to ensure credibility, such as prolonged engagement, persistent observation, member checks, triangulation, peer debriefing and participants' honesty (Lincoln & Guba 1985; Shenton 2004). It is not necessary to apply all of them in one study (Sandelowski 1993). In this study, to ensure credibility, two techniques were employed: prolonged engagement and participant honesty.

Prolonged engagement is technique in which the researcher spends sufficient time in the context under study to gain more depth understanding of the phenomena as insiders understand and view it (Barusch et al. 2011). Lincoln and Guba (1985) indicated that this technique is needed in qualitative studies to increase the credibility of the study. According to this view, the researcher conducted two rounds of interviews. The researcher made initial visits (first round) to the Kingdom of Saudi Arabia March 2019 – April 2019 and interviewed 15 participants from both the public and private sectors to gain a deep understanding of the issues related to environmental planning. The main objective of the first visit was to define three main pillars in the context of the Hajj:

(1) the organisational structure of the Hajj

(2) the real issues related to environmental plans

(3) the environmental plans and how are they developed (process).

These interviews provided valuable information to the researcher to comprehend the planning processes in the Hajj.

The credibility of this research was further enhanced by ensuring the integrity of the participants when conducting the interviews. This was achieved when all participants from the public sector asked not to record their voices. Therefore, the participants who requested not to record their voices felt more comfortable to express their opinions and experiences. Moreover, what made all participants feel more comfortable in expressing their opinions was the promise that their identities will be confidential and will not be recognised, observed or known by anyone other than the researcher.

4.7.2 Dependability

Dependability refers to the 'stability (reliability) of data over time and over conditions' (Polit & Beck 2009, p. 492). It is closely linked to the notion of 'reliability' in quantitative studies (Shenton 2004). It is mainly concerned with the determination whether the results of the investigation will be repeated continuously if the investigation is repeated with the same or similar participants in a similar or the same context (Lincoln & Guba 1985). Dependability can be established when the researcher follows an accepted criterion (Holloway & Wheeler 2002). It is an analysis process that provides detailed descriptions of research design, data collection methodology and methods employed in studies to allow examiners and readers to assess the extent to which possible appropriate practices have been pursued by the researchers (Shenton 2004). However, to ensure the procedure is dependable, one of the major techniques to assess dependability is called audit trial (Lincoln & Guba 1982), which will be used in this study to ensure that the process of this research and the result is consistent and dependable. This technique includes the presence of 'outsider' researchers to scrutinise the data collection process, methodology used, data analysis and determine whether the results of the study can be relied upon as a platform for further investigation (Carcary 2009). Therefore, the design of the research was carefully selected and followed the accepted procedures. These steps are discussed in detail in Section 3.3 and was examined in the third milestone by academic researchers from Victoria University who were not involved in the research. By that the quality and trustworthiness can be represented as audit trial is considered a mean of measuring the quality of qualitative studies (Akkerman et al. 2008).

4.7.3 Transferability

Transferability (also referred to generalisability) has been defined as the applicability that the result of qualitative studies can be generalised to other times, settings, situations and contexts (Lincoln & Guba 1985). It is a form of external validity in quantitative studies (Shenton 2004). Despite generalisability playing a major role in quantitative studies, it is not an objective in qualitative studies (Carcary 2009). In fact, Lincoln and Guba (1985, p. 316) described the transferability in qualitative studies:

> It is, in summary, not the naturalist's task to provide an index of transferability, it is his or her responsibility to provide the data base that makes transferability judgements possible on the part of potential appliers.

Thus, the author suggested to use a technique for measuring transferability which is called 'thick description' for participants. This technique refers to the need to provide detailed information about the context of the research, the subjects who participated in the researcher and the process the researchers experienced. This enables the reader to assess whether and make judgements that the findings of the qualitative studies are applicable to be transferred to their own settings and contexts (Polit & Beck 2009). This is called 'transferability judgement' (Korstjens & Moser 2018). Considering this, a rich description of data such as the research context, sample strategy/size, and interview procedures were provided in this research so that readers determine and judge the possibility of transferability themselves. It should be noted that the qualitative interviews were conducted with participants from the public and private sectors. This sectoral structure is evident in numbers of studies that examine tourism stakeholders' collaboration (Ladkin & Bertramini 2002; Adu-Ampong 2017).

4.7.4 Confirmability

Confirmability refers to the degree to which research findings of the study can be confirmed by others (Lincoln & Guba 1985). It largely linked to objectivity in quantitative studies (Shenton 2004). Essentiality, it is concerned with the neutrality aspect (Lincoln & Guba 1985). Thus, confirmability affirms that the results of any qualitative studies are not based on the researcher's own interpretations and opinions, but are mainly derived from data (Korstjens & Moser 2018). There are different techniques to increase confirmability in qualitative strategies, such as reflexivity, triangulation and trail audit (Chilisa & Preece 2005). However, similar to dependability, audit trail technique has been suggested to enhance confirmability because it permits other researchers to assess the significance of the research (Carcary 2009).

Academics' assessment can be used to assess the confirmability of a qualitative study by revising interviews and analytical processes and procedures (Goodson & Phillimore 2004). Since this study was sent to academic researchers from Victoria University, an assessment of the research design, interview procedures, data analysis and findings enhanced the confirmability and trustworthiness of this study. Moreover, the comments that were given enhanced the quality of this research and helped the researcher to understand the interview data through the views of other researchers.

4.8 Chapter Summary

This chapter illustrates the research paradigm and design employed that this study used to gain a deeper understanding of the nature of collaboration between Hajj stakeholders when planning for sustaining the environment of the Hajj. Moreover, the data collection methods for the qualitative data have been discussed in detailed, while clarifying the process of data collection.

Further, this chapter explained the data analysis approaches and laid out the reliability and validity of the data. Chapter 5 provides the findings of this study in detail.

Chapter 5: Analysis and Findings

5.1 Introduction

This chapter presents the research findings. As shaped by the research questions, the findings relate to the nature of collaboration and the drivers that may enhance their collaborative relationship when planning for sustaining the environment of the Hajj.

The structure of this chapter is aligned with Gray's (1989) model and the key research questions, including 'to what extent does collaboration exist between key Hajj stakeholders in the planning process?' and 'what are drivers to attain collaboration in the planning stage from the perspective of key stakeholders?'. The chapter is organised within four sections.

The first section examines the collaboration between stakeholders in terms of the first stage of Gray's (1989) collaboration model (problem setting) and the drivers that motivate this stage. The second section analysis the collaboration based on the second stage of Gray's (1989) model (direction setting) and identifies the drivers that enhance this stage. The third section scrutinises the collaboration in terms of the third stage of Gray's (1989) collaboration model (implementation).

In the fourth section, the perception of the nature of collaboration between key stakeholders when planning for sustaining the environment of the Hajj in the future will be discussed, which was generated from the data when using the abductive approach in the analysis stage.

5.2 Problem-Setting Stage

As discussed in Chapter 3, the main concerns of this phase are that key stakeholders are legitimised and identified. Stakeholders reach a common definition of an issue or problems that affect them and need to be addressed. Stakeholders build a commitment to collaborate and solve problems, identify a convener who has the power to convene a meeting and induce stakeholders to participate and collaborate, and determine the adequate resources to collaborate.

Five main themes emerged from the interview data. These include a lack of private stakeholder participation, a lack of environmental awareness, a lack of commitment by public stakeholders to collaborate, a lack of convener attributes and a lack of sufficient resources, which encompasses two sub-themes: a lack of financial support and a lack of environmental specialists. The drivers that induce collaboration between Hajj stakeholders encompass four main themes: engaging hospitality agencies in meetings, increasing environmental awareness, a collaborative leadership and the financial support needs of the public sector. Each theme is discussed in Sections 5.2.1–5.2.6.

5.2.1 Lack of private stakeholders' participation

This theme explains the imbalanced power between the public sector (PbS) and the private sector (PrS) in making decisions and plans. The model development of the relationships of this theme is presented in Figure 18.

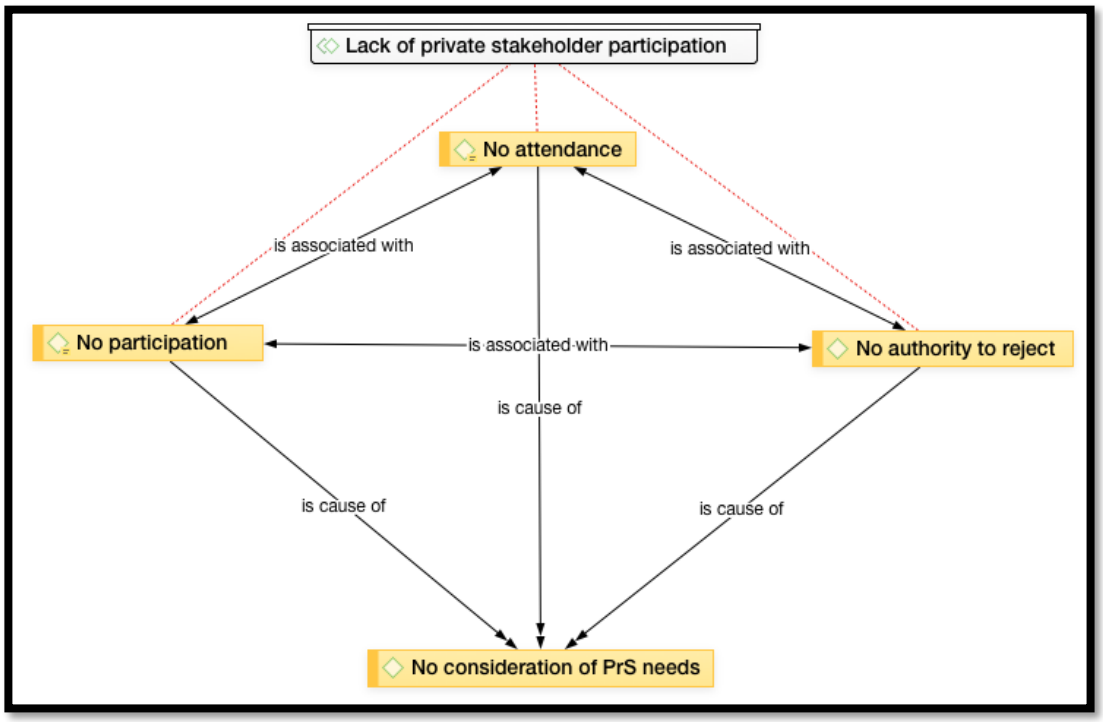

Figure 18. The structure of the development of the theme (lack of private stakeholder participation)

Note: PrS = private sector.

Similar to non-government organisations (NGOs) and hoteliers, this study finds that the PbS plays a key role in developing environmental plans and making decisions and the

level of participation of the PrS is almost non-existent. Even though hospitality agencies have representative agencies from the PrS (Majls Tanseqe- and Hayya Tansqy), both representatives cannot engage in meetings with PbS stakeholders as MnH. MnH is a PbS, one of its roles being to supervise hospitality agencies in the Hajj:

> MnH represents the hospitality agencies in our meetings, then MnH conducts meetings with them (referring to hospitality agencies). (PrS-11)

Another participant confirmed what (PrS-11) had said:

> Look, to clear the picture for you, there is Majls Tanseqe which represents the internal hospitality pilgrim agencies, and Hayya Tansqy which represents the external hospitality agencies of which there are six… MnH is responsible for supervising all the hospitality agencies including Majls Tanseqe and Hayya Tansqy and represents them in meetings. (PbS-5)

Even when meetings are held to discuss problems affecting hospitality agencies, such as the waste issue, they are not invited to attend meetings with public stakeholders:

> No, hospitality agencies don't attend the meetings, the people who attend meetings to discuss the problem of waste are from the public sector and it is these people who make the decisions. (PrS-11)

> No, we don't attend meetings even though we are the ones in the sector who will implement the Green Hajj project. (PrS-10)

As discussed in Chapter 2, the Green Hajj project is an initiative of stakeholders from the PbS to implement recycling during the Hajj by distributing recycling bins inside tents. However, another participant from the PbS had a different perspective and expressed the view that the workshops are a sufficient forum in which to discuss environmental projects and plans with hospitality stakeholders.

> There are some meetings that private stakeholders attend, like when we wanted to implement the Green Hajj program and the prepared meal project and other initiatives, of course some people would say this is just a workshop, I would say no, this can be considered a meeting to discuss the projects and the issues of the private sectors. (PbS-13)

Although PbS-13 argued that workshops are really meetings to discuss projects such as the prepared meal project with the hospitality agencies, it seems that the workshops were not conducted for discussions. Rather, they were conducted to provide instructions for PrS to implement the environmental plans and projects that were developed by the PbS. This is evident from the statement of one of the participates:

> No, we were told of the decision that in season 39, 15% of hospitality agencies will have to adopt the prepared meal project and they did not consult us or discuss the decision with us. (PrS-8)

The prepared meal project is a government initiative to replace traditional catering; meals are cooked in the kitchen inside the tents during the Hajj with the provision of pre-prepared meals to the pilgrims (frozen and sterile). To further clarify, these prepared meals are packaged and similar to the food provided by airlines.

Another participant confirmed that the workshops conducted with the hospitality agencies were not for discussing environmental projects such as the prepared meal project:

> No, they did not discuss the prepared meal project with us. The subject of prepared meals was raised in the workshop and it was imposed on us. (PrS-10)

Moreover, this study finds that not only are hospitality agencies not allowed to attend meetings, they also do not have the authority to participate in environmental decisions, plans or projects. One participant from the PbS indicated:

> Let us talk about the relation between the governmental sector and the private sector. The governmental sector uses the private sector to implement tasks, so we can say that the private sector is the implementation arm of the government. (PbS-8)

Other participants explained the communication channel process between the PbS and the private sector in terms of relaying meeting outcomes:

> No, never, the idea is that when they (the PbS) conduct meetings and studies everything, the decision is sent to the MnH and the MnH sends it to Hayya Tansqya and Hayya Tnasqya sends it to us. (PrS-10)

> No, they don't participate, we make the decisions and the hospitality agencies are informed of the decisions by the MnH. (PbS-14)

Yet, although the PbS makes decisions and relays these to hospitality agency stakeholders as recommendations, it has been stated that:

> No, we are the executive sector, but we can only make recommendations, we cannot participate in designing the plans. (PrS-9)

It is evident that the final decision belongs to the PbS only and the PrS has no influence in terms of altering PbS decisions and plans:

> We gather all the hospitality agencies and then we give (PbS) our recommendations but in the end, they will make the final decision. (PrS-8)

In addition, the PrS does not have the power or authority to reject any decisions or projects that are imposed on them by the PbS. This was asserted by one of the participants who works in the PbS and owns a hospitality agency:

> You can say whatever you want. Once I was invited to a meeting as a consultant and I rejected some decisions. They (referring to PbS stakeholders) in the end made the decision because they have the authority to decide. You can say whatever you want but they will do whatever they want, and we, as the private sector, will implement their final decisions because we are the executive arm of the public sector. (PrS-11)

Another participant from a hospitality agency stated:

> Look, if any decision is made by the public sector, we have to implement it whether it benefits us or not. It has to be implemented. The private sector does not have any impact on their decisions. Once the decision is made, it has to be executed. Then after this, they may change some aspects of the decision after they look at the outcome of the decision. (PrS-9)

This statement corresponds to one made by a participant from the PbS when asked if the decisions they made were rejected by the hospitality agencies. The participant stated:

> No they cannot, they have to implement them even if they reject them because we are a higher authority. However, decisions can be amended if the MnH ministry is convinced that decisions need to be amended. (PbS-15)

On the basis of the response of the participants, it is evident that relations between PbS and PrS stakeholders are formed on a top-down approach and decisions are centralised in

the hands of PbS stakeholders. Thus, it is not surprising to find that many plans and decisions made by the PbS did not satisfy the hospitality stakeholders, nor are their needs and interests considered:

> No, they don't consider our interests. They (referring to the PbS) made a decision to implement the prepared meal program and it is expected that next year 45% of hospitality agencies will provide pilgrims with prepared meals, but the issue is that you cannot force pilgrims to eat such food. (PrS-8)

> It is hard to provide prepared meals for pilgrims. Some pilgrims pay around 20,000 SR (around $AU8.00) and they expect to get a VIP buffet. We cannot force them to eat prepared meals. (PrS-4)

> Now, they (referring to the PbS) have forced us to place desert air conditioning inside the tents, but they don't work efficiently because the weather in Mecca is very hot and the desert air conditioning does not cool the tents. So, you will find many of them (referring to hospitality stakeholders) provide a split air conditioner even though it is not permissible for us to do so. But what can we do? The desert air conditioning does not cool the tents at all. (PrS-5)

Although some of the decisions made by the PbS were not compatible with the needs of the stakeholders of the hospitality agencies, they were obliged to implement them, especially if they were legislated by the government.

5.2.2 Lack of environmental awareness

This theme elucidates the impact of lack of environmental awareness on hindering stakeholders to collaborate in planning and solving the environmental issues that occur in the Hajj from the perspective of PbS and private sector. Since there is no clear terminology or one universal definition of environmental awareness (Ham et al. 2016), this study defines environmental awareness as the stakeholder's knowledge and belief towards the environmental issues and the actions taken as a result. The structure of developing the theme is presented in Figure 19.

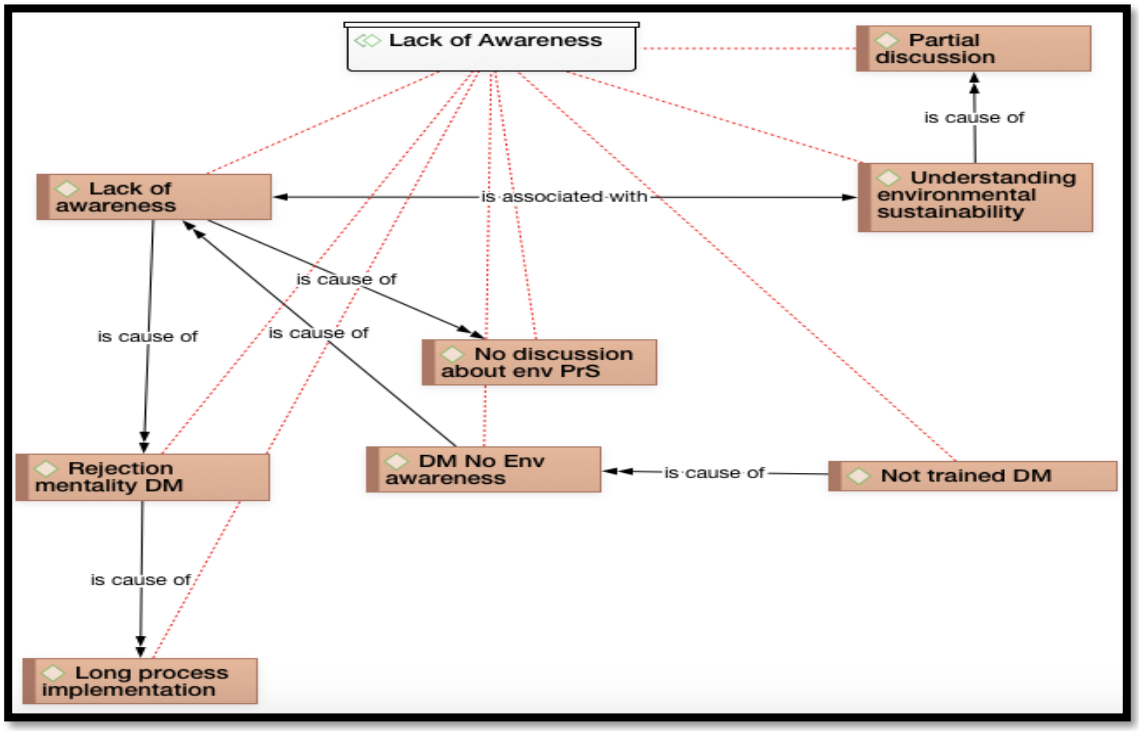

Figure 19. The structure of the development of the theme (lack of environmental awareness)

Note: DM = decision-makers, PrS = private sector, Env = environment.

When participants were asked whether all stakeholders define environmental problems as a critical issue, this study found that a lack of environmental awareness was a major factor impeding collaboration among stakeholders in defining the environment as a critical issue. This in turn influenced their motivations to collaborate in developing plans to solve the environmental problems that occur during the Hajj periods.

> The lack of awareness is the primary reason that they (referring to some PbS stakeholders) have no interest in the environment. (PbS-12)

Another participant corresponded to the previous response and declared:

> There is no obligation from some stakeholders (referring to some PbS stakeholders) on environmental issues because they do not care about the environmental dimension, because many of them lack environmental awareness. (PbS-16)

In fact, what makes the situation more complicated is that some stakeholders who do not have the sufficient awareness or knowledge about the consequences of neglecting the

environmental problems hold centric and powerful positions and have the authority to make decisions:

> The problem is that sometimes you need to look at who makes the decision. There are some decision-makers don't have the environmental knowledge to make decisions. (PbS-3)

Consequently, many environmental projects and plans were either rejected or took a long time to be implemented:

> Look, many ideas and projects to reduce the wastes in the Haj were proposed. Although they did not cost high, but unfortunately, unfortunately, there are some decision-makers who have old mentality, they rejected these ideas. (PbS-7)

> Until now they have not decided a specific time of implementing the Green Hajj project, why, because they need to belief and aware of the environmental projects. For instance, the prepared meal project took 10 years to be approved. Last year it was approved and applied to 15% of hospitality agencies, after that 30% of hospitality agencies will apply them until we reach 100%. (PbS-8)

The data show that there is a lack of environmental awareness among some decision-makers, which has had an impact on disrupting environmental development in the Hajj. This has occurred because some participants believe that some decision-makers are not well prepared to make environmental decisions because they have not had any form of environmental education:

> Unfortunately, many decision-makers have not attended environmental courses except those who are responsible for the environment. Thus, they (referring to stakeholders from environmental sector) are aware of the environmental aspect. (PbS-1)

> Some decision-makers did not take any environmental courses, and there are no environmental courses offered neither theoretically nor practically. (PbS-11)

Hence, it is logical to find that many of Hajj stakeholders from the PbS do not have sufficient awareness to understand all aspects of environmental sustainability except those who work in the environmental fields. This was evident because many of the respondents think that waste and bus pollution are the only environmental problems that affect the Hajj sustainability:

> The environmental pollution in the Hajj is waste. Waste is causing the most environmental pollution during Hajj period. So, if you want to increase the protection of the environment you have to get rid of the wastes. (PbS-4)

> The environmental problems that occur in the Hajj are the pollution that produced from the buses which can suffocate sometimes, and the huge quantity of waste generation. (PbS-5)

Therefore, most of the meetings conducted between MnH and private stakeholders or AMNH to discuss the environmental issues were mostly held for discussing the waste issues only:

> Every year we conduct one or two meetings with hospitality agencies about environmental issues to discuss the waste issues and compressor boxes, but to be honest there has not been any meeting that is conducted for discussing the entire aspects of environmental issues. (PbS-15)

> No, there are no meetings that have been conducted for discussing the environmental issues only. Usually, meetings conducted with AMNH and convened by the MnH to discuss the issues of compressor boxes. (PrS-5)

> Yes, there are meetings to discuss the methods of transferring wastes in Mina, Mozadlifah, and Arafat. (PrS-4)

AMNH is a PbS that is responsible for the operation of compressor boxes and removing the waste in the Hajj areas.

Although meetings were conducted with AMNH under the supervision of MnH, these meetings did not address environmental issues. Instead, they were conducted to discuss the operational dimension of collecting waste and using the compressor boxes:

> We have discussed the issue of transferring waste because this is a big issue that we have encountered with AMNH for many years. (PrS-8)

> There are managemental issues between us and we meet to attempt to solve them with AMNH because every year we encounter the same problem in transferring the wastes as the quantity of wastes is very huge. (PrS-9)

> Meetings for environmental issues, no, but there are some topics we discuss such as wastes and the cleanliness of bathrooms. (PrS-10)

In fact, this study found that the lack of environmental awareness is not only limited to PbS stakeholders; private stakeholders similarly lack awareness:

> Hospitality agency stakeholders don't have any awareness of the environment (PbS-10)

> The bins are too many in the Hajj, but the level of awareness of hospitality agencies is absent. (PrS-1)

> Honestly, the level of hospitality managers and our people around environmental awareness is zero. (PbS-6)

Another participant from the hospitality agency believed that both hospitality agencies and the PbS do not have sufficient knowledge or awareness of recycling to direct and lead pilgrims to throw the recycling wastes in the recycling bins:

> We unfortunately don't have the awareness to guide pilgrims, like telling them to throw the plastics in the recycling bins. (PrS-5).

However, a participant from a hospitality agency believes that the low level of environmental awareness of Hajj stakeholders is attributable to the education system of the country:

> We have a fundamental problem in the education program. There are no environmental subjects in our education program at school, so there is no environmental awareness, so don't expect from me or from hospitality managers to pay for saving the environment because in the first place I did not study that at school. (PrS-4)

In fact, this statement is implicitly linked to other participants who have indicated that environmental sustainability affairs are a relatively new topic for the country. This may explain why many decision-makers and hospitality agencies do not obtain sufficient awareness about the importance of sustaining the environment of the Hajj:

> Let us be realistic, the environmental subject is new in the country, they just started to considerer it few years ago. (PbS-6)

> The environmental issues are considered a new domain to us. (PbS-1)

5.2.3 Public stakeholders lack of commitment to collaborate

This theme describes the lack of commitment of Hajj stakeholders to collaborate in planning for solving the environmental problems owing to their self-interest and different priorities (see Figure 20). This theme explains the lack of commitment between stakeholders from the perspective of public stakeholders because private stakeholders do not have the right to participate in meetings and the authority to develop and design plans.

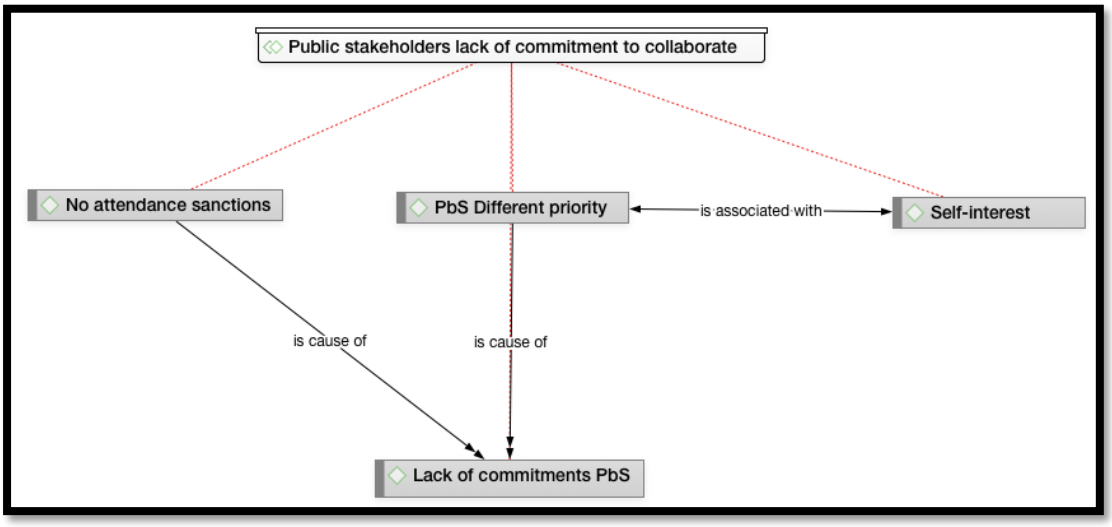

Figure 20. The structure of the development of the theme (public stakeholders lack of commitment to collaborate)

Note: PbS = public stakeholders.

A commitment is a crucial component in collaborative relationships. It requires extended relationship building and stakeholder engagement to develop creative solutions to solve problems (Randolph 2004). In addition, a formal commitment between stakeholders can resolve tensions (Bramwell & Lane 2003). Yet, in the case of Hajj, this study found that there was a lack of commitment by PbS stakeholders to collaborate to solve environmental issues. The failure to attend meetings is one of the commitment issues that some stakeholders from environmental sectors encounter with some public stakeholders.

> There are some solutions that we have developed, but there is a problem with compliance in attending the meetings. Sometimes, some delegates of other public stakeholders don't attend. So, we postpone the meeting because their attendance is important. (PbS-14)

> The lack of commitment of some stakeholders to attend meetings and collaboration impairs the quality of results. (PbS-16)

Sanctions for not attending the meetings are weak or do not exist:

> There is no sanction imposed to them because they are public sector like us. So, what we do is sending a letter to AMA the that the delegate of that sector did not attend. AMA then talks to them to attend the meetings or sometimes scolds them if the meeting was critical. (PbS-14)

> If a delegate did not appear and attend the meeting, there are no sanctions imposed to him. (PbS-16)

However, even if all Hajj stakeholders from the PbS attend the meetings to discuss the environmental issues of the Hajj, it seems that not all of them have a sincere commitment to resolve the environmental issues of the Hajj:

> You always will hear yes, we will do plans, we will do that and that, but when it comes to reality you won't find any commitment from them to take any action to protect the environment. (PbS-17)

Another participant responded to this statement and declared that many stakeholders procrastinate in implementing the meetings agreements about environmental projects:

> They meet with us and we discuss with them the slaughter waste issue. For instance, when we asked them about the reason why they have not operated the waste incinerators, they always procrastinate and put the blame on the company that they deal with to operate the waste incinerators. (PbS-14)

Participants noted that the lack of commitment occurs between stakeholders because each of them have different priorities:

> Sometimes, we hear positive responses, and everyone is singing for loving Mecca (Arabic idiom which means everyone shows care and interest) but in reality, there is no commitment as they are too busy to accomplish their priorities. (PbS-12)

> Every sector has it is own priority which is the most important thing for them to be accomplished. (PbS-8)

As a result, some stakeholders were more reluctant to commit to environmental plans and projects because self-interest dominates the collective interest among Hajj stakeholders as each sector seeks its own benefit and priorities. Because of this, many stakeholders from the PbS try either to evade or not commit to collaboration with stakeholders who work in the environmental sectors because the environmental plans may affect their priorities and goals.

> They say we can support but there are limitations that we cannot exceed. Always, they (referring to stakeholders from PbS) try to ensure that environmental plans and projects don't impact their plans priorities. (PbS-14)

> In the meeting we discuss everything, and we agree, but when the Hajj starts you will find many stakeholders are looking for their own interests. (PbS-12)

> Conflict of interests impacts the decisions. Every time we have made environmental plans, you'll find some people (referring to the PbS) trying to evade from implementing the plans because it may impact their own interest and priorities. (PbS-11)

5.2.4 Lack of convener attributes

This theme describes the absence of convener attributes to convene the meetings and motivate the collaboration between Hajj stakeholders (see Figure 21).

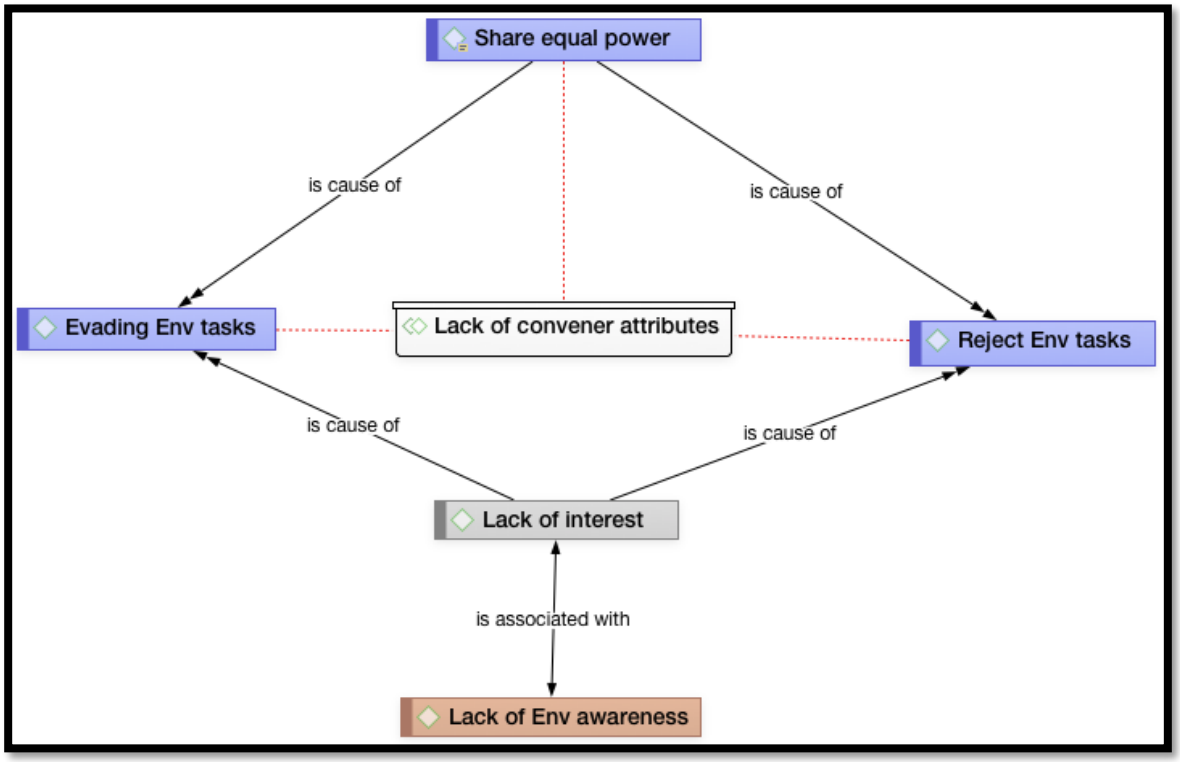

Figure 21. The structure of the development of the theme (lack of convener attributes)

Note: Env = environment.

As indicated in Section 3.13 the terms ‘convener’ and ‘leader’ are used interchangeably in this study. This is because the convener is assigned by AMA, which is the highest authority in Mecca.

According to collaboration theory, the role of the convener in inducing collaboration between stakeholders is critical (Gray 1985). This is particularly the case in tourism, in which the fragmented nature requires the existence of convener between stakeholders to facilitate collaboration (Jamal & Getz 1995). However, as indicated, it is important that conveners have attributes such as power, legitimacy and expertise to induce collaboration between stakeholders. More importantly, stakeholders should believe that these attributes exist in the convener (Gray & Purdy 2018).

This study found that the convener of the meetings between key stakeholders of Hajj does not have the sufficient attributes to convene the meeting between Hajj stakeholders. For instance, a convener who is assigned by AMA, which is PbS that has authority in Mecca, shares equal power and authority with other stakeholders from the PbS.

> The power is equal between us. Each one of us has the authority on his domain that he works in. (PbS-11)

> The power is shared between us, but the convener roles are sending the outcomes of the meetings to AMA to identify our roles and missions in the meetings. (PbS-14)

According to Wood and Gray (1991), one of the central attributes of the convener is having formal power to initiate collaboration between stakeholders. They argue that if the convener does not have formal power, the knowledge about the problem domain can be one of the keys to persuade stakeholders to participate and collaborate. However, in the context of the Hajj, all of these attributes are lacking.

Coupled with low environmental awareness, the shared authority among stakeholders and the feeling that the convener will not take coercive action if the environmental tasks were not implemented effectively have contributed to providing little incentive to act. This has resulted in some Hajj stakeholders either evading or rejecting the environmental missions and tasks:

> AMA assigns the roles and missions, but stakeholders try to evade them. (PbS-11)

> Everyone has their own missions, but when they are told (referring to the convener) to add extra environmental missions to their missions, they reject. (PbS-15)

The development of collaboration between Hajj stakeholders to solve environmental issues will be difficult with the current convener. This was evident because one participant indicated that the issues of removing waste from the Hajj areas have not been solved:

> The problem between us has not been resolved yet. Man, we have met with AMNH many times. For instance, last year we met with them with the present of a person from AMA and we finished the meeting without any agreements. (PrS-8)

Until recently, the convener has not been able to facilitate collaboration between Hajj stakeholders in the planning process. Coupled with other barriers, solving the remaining issues are unlikely.

5.2.5 Lack of sufficient resources

It was argued that the presence of a convener, by itself, is not sufficient to spark collaboration. There must be other adequate resources, such as skilled stakeholders, time and funds to ensure that collaboration is effective (Gray 1985; Jamal & Getz 1995). This theme (see Figure 20) explains that limited resources impede collaboration between key stakeholder in the Hajj. Two sub-themes emerged related to the lack of sufficient resources (lack of financial support—lack of environmental specialists). Figure 22 shows the elements of this theme.

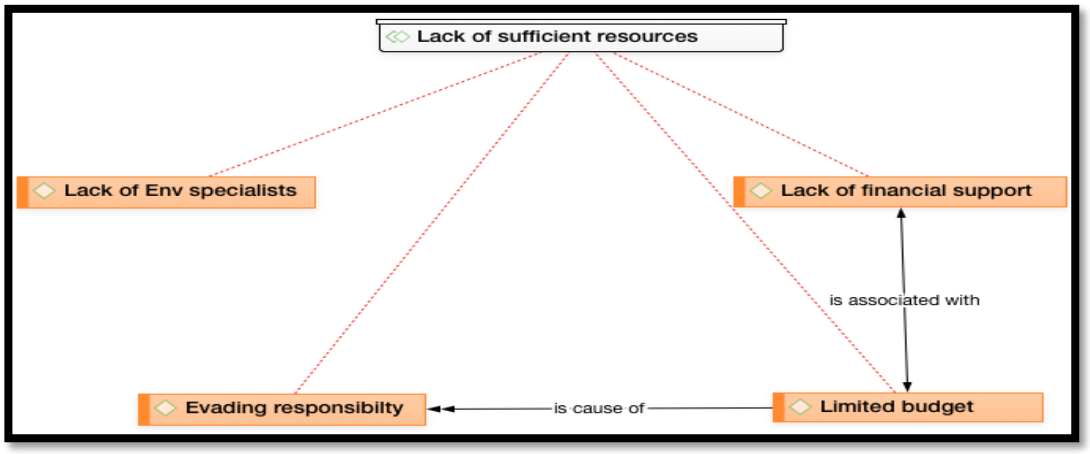

Figure 22. The structure of the development of the theme (lack of sufficient resources)

Note: Env = environment.

5.2.5.1 Lack of financial support

Interview responses revealed that one of the major barriers to collaboration between stakeholders is the lack of financial support. Most participants claimed that many environmental plans and projects were not adopted. This caused disagreement between public stakeholders in meetings about who should take the responsibility for adopting and executing the environmental plans and projects:

> Everyone has a specific amount of budget and they work based on their budgets. So, when we talk to them to collaborate, they say we cannot because we have certain budget. (PbS-15)

> Yes, we meet (referring to stakeholders from PbS) to discuss the environmental projects but in the end, we conclude in who is going to take the responsibility to adopt this project. For example, the fertiliser bins project was discussed between us but in the end, we concluded who is going to pay the expenses of the bins because the project may cost 100 million Saudi Riyal and everyone has certain budget and have different projects and tasks. (PbS-14)

The fertiliser bins project aims to place fertiliser bins in front all hotels and apartment units where pilgrims live during Hajj. The main objective of the project is to treat organic waste for composting. In this way, they reduce the amount of GHG emissions and produce a fertiliser:

> They discuss (referring to public stakeholders) environmental projects, but unfortunately, they do not agree on a solution because of financial matters. Like AMNH, they don't treat wastes in effective way because they don't have enough budget to apply waste treatment unit. (PrS-11)

Another participant indicated:

> They say we cannot implement the project because it costs too much, and it is over our budget capacity. (PbS-17)

In fact, the lack of financial support not only hinders collaboration between PbS agencies, but the private sector also encounters the same dilemma:

> The idea of the Green Hajj project is to put recycling bins inside the tents during the Hajj. In the first stage, some hospitality agencies applied the project, but unfortunately in the second stage the project was intensely rejected because the project is very costly to them, so the project was discontinued. (PbS-7)

This issue was also raised by one of the participants who work in MnH who claimed:

> Many environmental projects were proposed as an initiative, but they (referring to hospitality agencies) could not apply them because of money. It costs a lot of money. (PbS-5)

5.2.5.2 Lack of environmental specialists

Interviews also revealed that a lack of environmental expertise is another significant factor that impedes collaboration between public stakeholders during the problem phase when stakeholders meet to consider environmental issues and attempt to find solutions. Many participants claimed that there is a lack of environmental expertise among those who attend meetings:

> Lack of environmental specialists and knowledge is an issue that we encounter as some delegates who attend the meetings don't have any expertise or knowledge about environmental subject. (PbS-15)

> One of the problems is shortage of existence of environmental specialists. (PbS-16)

In fact, the same participant claimed that some sectors do not have environmental consultants (employees) that have knowledge about environmental protection:

> Some sectors don't have a consultant who is an expert in environment. (PbS-16)

That is why some sectors send delegates who do not have any knowledge about environmental subjects:

> Once, in our meeting with one of the public stakeholders they sent two delegates and both of them were not experts about the environmental affairs. One of them was a chemist and the second one was a lawyer. (PbS-17)

As a result, it was suggested that the discussion of environmental issues can sometimes result in conflict. For example:

> One time, one public sector sent a delegate who did not have any environmental expertise. He said in the meeting 'Oh man we always live like that' (which means why we should consider or discuss the environmental issues). (PbS-16)

5.2.6 Drivers that affect collaboration between key stakeholder in the problem-setting phase

This section discusses the drivers that enhance collaboration between stakeholders when planning for the environmental sustainability of the Hajj in the first phase of collaboration in Gray's (1989) model (problem setting). Four key themes (see Figure 23) were

identified: engaging hospitality agencies in meetings, increasing environmental awareness, collaborative leadership and gaining financial support needs for the PbS.

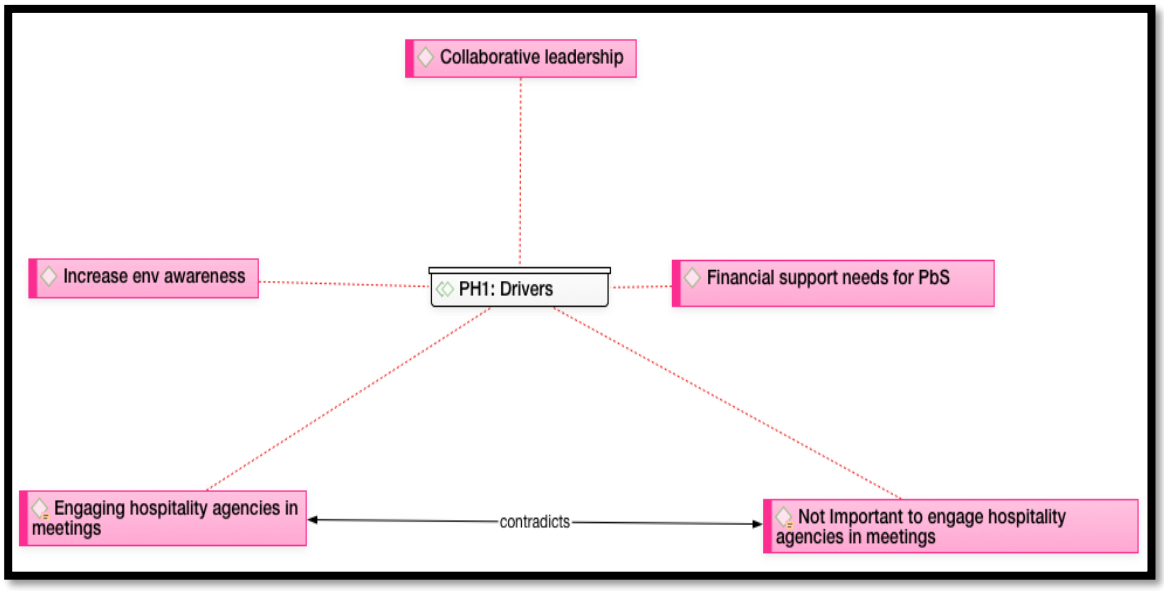

Figure 23. The structure of the development of driver themes

Note: Env = environment, PH1 = first phase, PbS = public sector.

5.2.6.1 Engaging hospitality agencies in meetings

This theme presents the opinion of participants from public and private sectors on the importance of engaging hospitality agencies in meetings to stimulate collaboration among them in the planning stage.

Interview findings showed that most participants believe that engaging hospitality agency stakeholders in planning is vital. As discussed, hospitality agencies do not have the right to attend meetings and participate in decisions because they are represented by MnH. However, hospitality agencies believe that their attendance in meetings with PbS is important. One participant indicated:

> It's supposed that we attend meetings, but we cannot do anything. (PrS-8)

Another participant from a private stakeholder believes that:

> If the ministries turned to commissions, our voice will be stronger and will be heard. (PrS-9)

The idea behind turning the ministries to commissions is that the organisational structure of commissions differs to that of ministries. For instance, the Commission has a board of directors that develops plans and programs, while the ministry has assignments and goals for which the minister is responsible for (Khalid 2020). Thus, ministries usually are more centralised than commissions.

The response of participants from hospitality agencies about the importance of their participation in planning also corresponded to many of the participants from public stakeholders, who claimed that their participation in meetings would enhance collaboration:

> They are now not attending with us, but their attendance is important when we discuss the wastes and other subjects that are related to their tasks. (PbS-16)

> Yes, their (referring to hospitality agency stakeholders) participation is crucial as they are the executive sector who work in the field. (PbS-11)

Another participant believes that the attendance of hospitality agencies and NGO stakeholders is important to reach one decision that meets the different concerns and interests of all stakeholders:

> My opinion is that their attendance is vital, and it will be more beneficial if that the HA conducted a meeting for environmental subjects and gather all stakeholders including charity organisations, then we can come up with recommendations based on all stakeholders concerns and interests. (PbS-15)

In contrast, few stakeholders believe that their attendance is not important, and their current level of power and participation should not be equalised to that of the PbS:

> To every status there is prestige, and to every prestige there's a status (Arabic idioms). This term is used in the context of differentiation between classes of society, it means that in this context that hospitality agency stakeholders should not attend and share the same power that public stakeholders possess. (PbS-13)

Another participant believes that their attendance at the meetings may make the situation more complex because the environmental issues until now between public stakeholders remain unsolved:

> No, we discuss many problems. Oh man, we are now few people and we have not solved the environmental problems. So, imagine how worse it would be if we bring them in our meetings especially that they don't have any environmental orientation. (PbS-17)

Most participants believe that the involvement of hospitality agencies is vital to advance collaboration and reach a single decision that outlines all Hajj stakeholders' interests and concerns. However, as described previously, their participation with public stakeholders is completely absent.

5.2.6.2 Environmental awareness

This theme describes the importance of increasing environmental awareness and knowledge for all stakeholders, including community and pilgrims, to advance collaboration between them. Most stakeholders emphasised the importance of increasing environmental awareness and knowledge. One participant claimed that there are four pillars that must be developed to stimulate collaboration to protect the environment. One of them is to increase environmental awareness of all Hajj stakeholders:

> The third pillar is to educate and raise awareness of all stakeholders (referring to the public, the private and pilgrims as well). We need to educate them and raise their awareness. (PbS-2)

This response corresponded to other participants, who emphasised the importance of awareness as an essential component for all stakeholders:

> Awareness is the first thing we need to do. They (referring to the public and private sectors) must realise the benefit of protecting the environment. You can say that we need to focus heavily on educating stakeholders about the benefit of protecting the environment to make them believe for the benefit of the environment. (PrS-5)

> Look, I've mentioned that before, awareness, awareness, awareness, all of them need education to be aware of the issue. (PbS-1)

Another participant claimed that increasing the level of environmental awareness is a precondition for stakeholders to start designing environmental plans:

> Before we talk about plans, policies and the environment, the first thing we need to fix the issue of awareness. You must raise awareness of the people who make the plans and the people who implement them. Without it, forget it. (PbS-3)

This statement coincides with another participant, who indicated that without increasing stakeholder awareness, the results of government initiatives to save the environment will not lead to any success:

> We need to focus on raising awareness among all stakeholders, or the government will continue to pay money and the result is negative. (PbS-12)

Thus, some participants proposed to create environmental campaigns to raise the environmental awareness of stakeholders:

> We need to increase the knowledge of all people by creating an environmental campaign to educate them. (PbS-6)

> We must do a national campaign to raise environmental awareness for all society. So, before talking about environmental police, we must recognise that we need environmental rehabilitation. (PbS-12)

Environmental police is a new governmental sector that will be developed to monitor the environment during the Hajj and impose sanctions on Hajj stakeholders who harm the environment through their actions, be it from the public, private and NGOs sectors.

5.2.6.3 Collaborative leadership

This theme explains the importance of leadership to convene the work and stimulate collaboration between Hajj stakeholders. An effective collaborative leader or convener should have the characteristics and ability to play various roles such as the collaborator, advocate and facilitator to stimulate collaboration among stakeholders (McDermott & Hall 2016).

Interview findings showed that many participants emphasised the importance of having a powerful leader who has the authority to drive collaboration between Hajj stakeholders. For example, one participant claimed:

> Look, the effective collaboration between one sector to another sector will not exist unless there is a powerful leader. Every stakeholder from the public sector says in our

> meetings I have the power on certain tasks, but this is not my job it is your job (referring to another public stakeholder); thus, in this matter, if there is a powerful leader this issue would be resolved. (PbS-15)

In addition, a participant from PbS who also owns a hospitality agency indicated that the existence of powerful convener would lead to the resolution of conflict between stakeholders in solving the environmental problems:

> I always say if there is a leader with authority many issues would be resolved. For example, one of the public sectors right now have the full power on the waste, we talked to them that we encountered problems in 1,2,3 they said no we cannot do anything right now. (PrS-11)

Another participant believed that existence of a leadership will improve the collaboration between stakeholders. The government aims to establish a new governmental sector (HM) whose role is to convene and organise the work between key stakeholders:

> If they take the responsibility (referring to HM) I think many things will change, but so far, their role has not been activated. (PbS-17)

5.2.6.4 Financial support needs for the public sector

This theme elucidates that governmental financial support is needed to induce collaboration between public stakeholders. As described previously, the lack of financial support was one of the major issues that hinders collaboration towards adopting and implementing environmental projects and plans. Therefore, many participants asserted the importance of providing a financial support to PbS to resolve the conflicts between them because many public stakeholders refuse to collaborate with environmental sectors owing to the limited budget they possess:

> When we told them (referring to stakeholders from PbS), let's do the project, they say give me a budget, why should I pay from my budget. (PbS-14)

> Sometimes in meetings they argue who should be responsible for the environmental projects. Everyone said I will not pay the cost. I am using my budget on other projects. (PbS-7)

> Everyone has different responsibilities and certain budgets to accomplish their tasks, so if there was a financial support (Hand gesture that reflects the situation if there was a financial support), but now I think HM is working on this issue. (PrS-11)

Accordingly, it is believed that the financial support is an essential component to induce collaboration between public stakeholders to adopt and implement environmental projects and plans:

> Unless there is financial support, there will be no collaboration. Many environmental projects have been postponed because of financial matters. (PbS-14)

5.3 Direction-Setting Stage

In this stage, stakeholders manage problems in depth and create a framework that directs their collaboration by reaching a shared vision, plan and strategy by consensus, sharing information, exploring alternatives, establishing agendas and organising subgroups if required (Jamal & Getz 1995; Gray 1989).

As described above, it is obvious that Hajj stakeholders encounter many difficulties to complete the first stage of Gray's (1989) collaboration model. As a result, it has been argued that the success of the second stage depends on the success of the first stage (Gray 1989), although Parker (1999) found that the success of the second stage of the Gray's model was not necessarily linked to the success of the first stage. However, this study found that the failure of accomplishing the first stage between Hajj stakeholders affected the success of both the second and third stage of planning.

Interview data revealed five main themes: a siloed work environment between Hajj public stakeholders, environment not being a priority, a lack of shared understanding, a lack of transparency between public stakeholders and deficiencies in environmental roles and responsibilities. The driver that induces collaboration between Hajj stakeholders in this stage encompasses one theme: the need for effective leadership.

Each theme is discussed in Sections 5.3.1–5.3.6.

5.3.1 Siloed work environment between Hajj public stakeholders

This theme (see Figure 24) describes the siloed nature of the work based on the priorities and the absolute independence of power among public stakeholders in decision-making

and designing plans. Silos are institutional units in which there is a lack of interaction, collaboration and coordination with external parties (Fenwick et al. 2009).

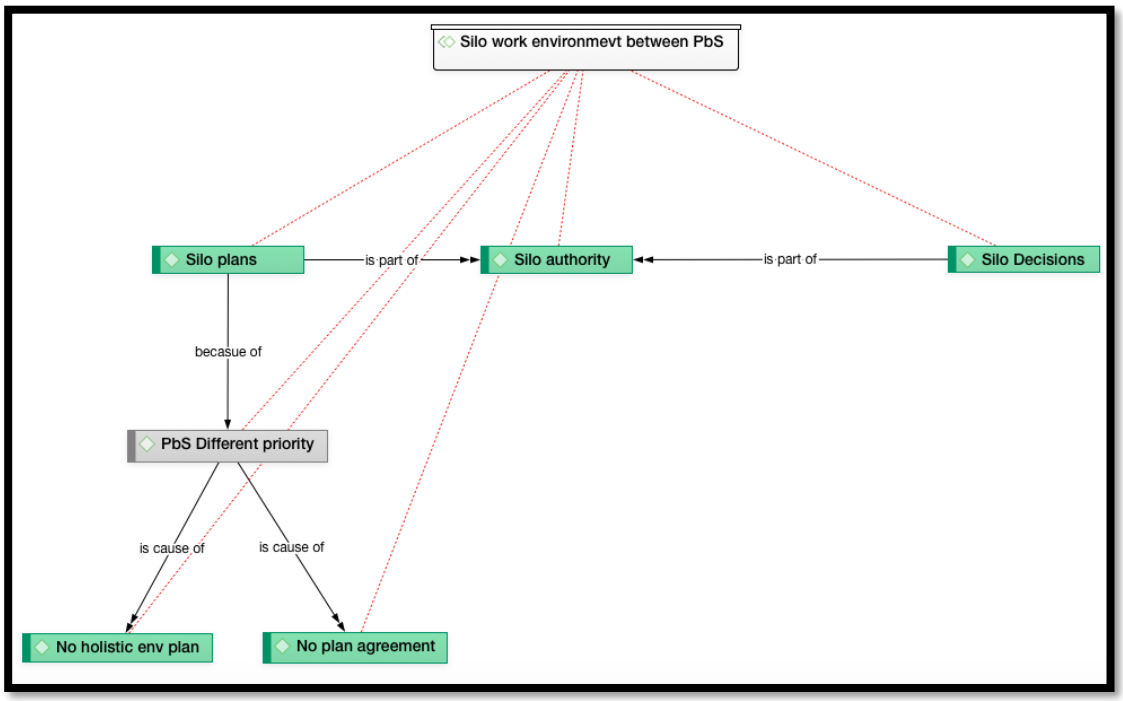

Figure 24. The structure of the development of theme (siloed work environment between Hajj public stakeholders)

Note: Env = environment, PbS = public sector.

This study found that the nature of work between public stakeholders in the planning stage relies heavily on centralisation and operational silos. Most participants indicated that each sector has the power and autonomy to design its plans and make decisions:

> Each sector put its plans by its own self. (PbS-17)

> Each sector designs its own plans. (PrS-11)

Gray (1989) advocates that stakeholders maintain the power to make decisions when there is consensus in decision-making between stakeholders and adherence of the common rules within the collaborative relationship (Wood & Gray 1991; Jamal & Getz 1995). Yet, this is not the case in the Hajj. This study found that although stakeholders share their plans with each other, it appears that similar to the situation mentioned between PbS and private sector, the centralisation of authority dominates the nature of the relationship between Hajj stakeholders from the PbS:

> There is an issue that decisions are made based on individual centralism. (PbS-11)

> Each sector makes decisions based on centralisation. (PbS-10)

One participant believed that many initiatives to solve environmental problems have not materialised because of centralisation:

> No, many efforts were hindered due to the decisions that were made based on centralisation. (PbS-4)

This was evident because although the PbS shares their plans with each other, it appears that they only share them to inform the other PbS of their plans

> There is a general plan (like a framework), but each sector puts its detailed plans based on their authority and send it to us and to other public sectors to inform us. (PbS-14)

Moreover, each sector has an authority to either accept or reject other public stakeholders' recommendations or comments about their plans:

> Each public sector has the power in its domain, when you go a meeting, they may accept your opinion about their plans or not. (Prs-11)

> They share (referring to the PbS) their plans with us to take our recommendations about them, but do they follow our recommendations? (PbS-17)

Consequently, because of the siloed nature of work and different priorities, many conflicts between Hajj stakeholders from the environmental sector and the PbS occur which prevents reaching joint agreement on environmental plans:

> We make our plans and we discuss them (referring to the PbS), but for them the possibility of collaborating with our plans is depended on their priorities. Sometimes when for example we talk with a public sector about a plan, they say no, but we can put this plan in our plan after 3- 4 years. (PbS-14)

The same participant who works in the environmental sector indicated that:

> When we told them to change or amend something in their works, they also say no we cannot because we have another plan. (PbS-14)

Another participant noted that the lack of agreement on environmental plans is the reason environmental plans are made on the basis of individual efforts:

> ME (PbS) is responsible for designing the environmental plans, but individual efforts in developing environmental plans is occurring due to the lack of coordination and agreement between sectors (referring to the PbS). (PbS-16)

As a result, there is no collaborative holistic plan for protecting the environmental sustainability of the Hajj:

> Unfortunately, there is no holistic environmental plan. To put you in the picture, there is individual efforts to set plans for protecting the environment of the Hajj. (PbS-8)

> There are no comprehensive plans for the environment. You can say until now the plans that are designed to protect the environment of the Hajj are made based on the individual efforts. (PbS-14)

> No, there is no holistic environmental plans, but there are some environmental regulations that each environmental sector puts in place. (PrS-11)

5.3.2 Environment is not a priority

This theme (see Figure 25) describes the impact of government prioritisation of environmental issues of the Hajj when setting the planning agenda. The setting of agendas is defined in this study as 'a list of problems to which government officials, and those associated with government, are paying serious attention' (Kingdon 1995, p. 3).

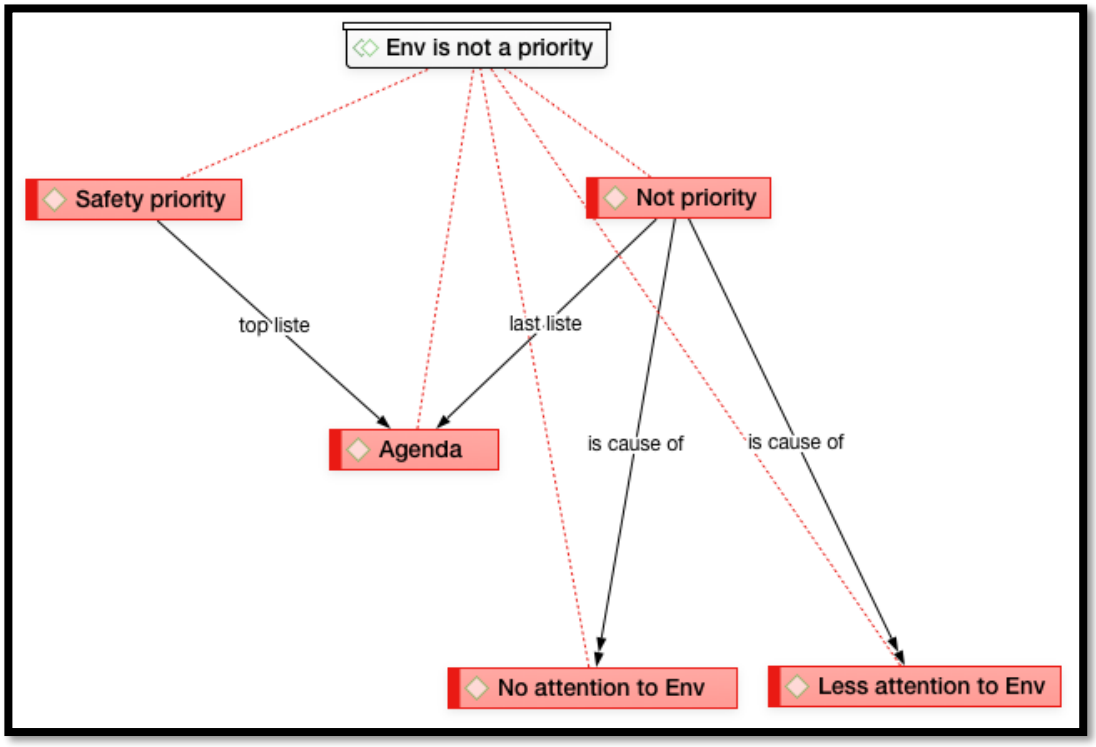

Figure 25. The structure of the development of theme (environment is not a priority)

Note: Env = environment.

This study found that the environmental sustainability is not one of the highest priorities for the government. This is one of the causes that impedes collaboration between Hajj stakeholders to jointly discuss and develop environmental plans:

> To be honest with you, this is not a priority for the government and you can say, it is in the last priorities. (PbS-6)

> It is not a priority. We have many other priorities that we consider. We have the safety of pilgrims, housing, transportation and other priorities. (PbS-15)

> Thus, it can be understood why many stakeholders are not concerned about environmental sustainability issues that occur during the Hajj given that public sectors concerns are driven by the government priorities. The key priority for the government is the safety of pilgrims and collaboration between Hajj stakeholders to improve the pilgrim's safety issue is very powerful:

> In our plan as a transportation sector, number one is to increase the transportation safety for pilgrims. (PbS-6)

> We have a lot of buildings for pilgrims housing, but the most important thing for us is the safety only. (PbS-5)

> They don't look at the environmental issues. The most important thing for them is to ensure the safety of pilgrims. (Prs-3)

Even in stakeholders' meetings, it was found that the concern of Hajj stakeholders for pilgrims' safety is very high. Pilgrims' safety is listed in the top of Hajj stakeholder's agenda:

> In the meeting sheet proposal, the priority is given to discuss the issue of safety and crowding of pilgrims. (PbS-9)

Environmental issues, however, are low on the agenda and planning to protect the environment of the Hajj is declining.

> The environmental issues are not discussed in our meetings except if we (referring to stakeholders from environmental sector) raised them. (PbS-17)

> Look, in our meetings the percentage of environmental issues are considered let's say 10%. There are other problems that have higher percentage such as pilgrim's safety, housing, transportation. So, we put our attention to solve these issues first. (PbS-15)

5.3.3 Lack of shared understanding

This theme (see Figure 26) describes the lack of shared understanding when Hajj stakeholders develop their plans and projects. There are various terms to describe the meaning of shared understanding in the literature, such as 'common ground', 'common mission', 'common objective' and 'shared vision' (Ansell & Gash 2008). This study applies the term of 'lack of shared understanding between Hajj stakeholders' from two aspects (sub-themes): lack of shared environmental vision and lack of shared common objectives. Each sub-theme is discussed in Sections 5.3.3.1–5.3.3.2.

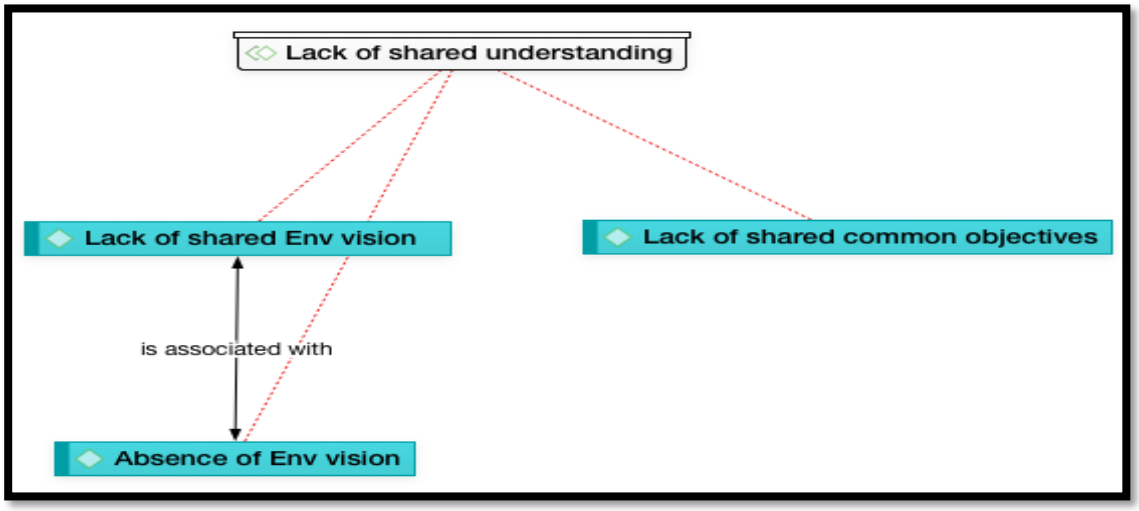

Figure 26. The structure of the development of theme (lack of shared understanding)

Note: Env = environment.

5.3.3.1 Lack of shared environmental vision

This theme discusses the absence of shared vision between Hajj stakeholders when they design and set their plans for protecting the environmental sustainability of the Hajj. There is no clear standard definition of vision in the planning literature (Shipley & Newkirk 1999; Shipley 2000), so this study adapted the term vision from Allison and Kaye (2015) and defines the environmental vision as how the organisation plans to change the environmental issues.

This study found that there is an obvious absence of environmental vision in most of public and private sectors except in the environmental sector. One participant from the private sector (catering services) declared that their organisation has banned the use of plastics when providing foods for pilgrims. However, their vision for banning the plastics was not created out of a drive to protect the environment. Rather, their vision was to reduce the number of plastics, so they decrease the waste to ease the movements of pilgrims during Hajj:

> We in this organisation made a decision to not using the plastics and use big boxes when providing the food and beverages. We made this decision because we want to reduce the number of wastes from plastics because it hinders pilgrims' movement sometimes … no, to be honest, we don't have environmental vision and we don't concentrate on the environmental aspects in our plans. (PrS-1)

Another participant from hospitality agency indicated that they have not considered environmental sustainability in their vision:

> Our vision is to serve pilgrims as much as we can because they are the (guest of God) … no, we don't look at this matter (referring to the environment). (PrS-4)

Unsurprisingly, this study also finds that environmental vision is not only absent in the private sector, but also in many PbSs. For example, one participant from a hospitality agency argued that most plans and decisions that have been made from the PbS have been made without an environmental vision:

> If they (referring to some PbS decision-makers) have any environmental vision and consider the environmental vision in their plans, they supposed to consider the heat and emission produced from the desert air conditioning, but they forced us to put them in tents without looking at their consequences on the environment. (PrS-5)

This statement was quite true; many participants from the PbS indicated that they do not consider environmental sustainability vision in their plans:

> Now we don't have (referring to the environmental vision), but in the future we may have Insallah (if God willing). (PbS-5)

This statement corresponded to that of another participant from the PbS who works in the transportation sector. When asked about the environmental vision of reducing the emissions from buses and cares, he declared:

> No, this is too early now (which means that vision of reducing the emissions is not exist and it needs time to be considered). (PbS-6)

5.3.3.2 Lack of shared common objectives

This theme explains the conflicts between Hajj stakeholders in reaching a common comprehension of the goals of designing environmental projects. As mentioned previously, many environmental projects have been undertaken to reduce environmental issues during the Hajj, such as Green Hajj and the prepared meal projects. However, despite the approval of these projects to be implemented by stakeholders, this study found a conflict between Hajj stakeholders in understanding the goal of designing the environmental projects. This was evident because stakeholders from environmental

sector considered the prepared meal project objective as the increase in environmental sustainability of the Hajj by reducing the number of food wastes. Conversely, stakeholders from hospitality agencies considered the objective of the project as to increase the safety of pilgrims' health:

> The prepared meal plan is very environmentally idea. The idea behind it is to provide the food to pilgrims in sealed containers. By that we provide a high quality of food and protect the environment by reducing the number of food waste. (PbS-8)

> Unfortunately, in the Hajj you will find tonnes of food wastes, but now after launching the prepared meal project we will see a gradual improvement in controlling the food waste as this year 15% of hospitality agencies are required to provide to their pilgrims the prepared meals which in the end will result in reducing the environmental pollution that is caused by the food waste. (PbS-2)

However, participants from hospitality agencies denied that the objective behind the prepared meal project was to increase or protect the environmental sustainability of the Hajj:

> No no, the project was not made for protecting the environment. They made it because they want to prevent pilgrims from food poisoning. (Prs-5).

> Who told you that this project was made to protect the environment? We and MnH looked at the project from safety aspect and not from the environmental aspect. (PrS-8)

5.3.4 Lack of transparency between public stakeholders

This theme explains the lack of transparency between public stakeholders in sharing information and environmental data (see Figure 27).

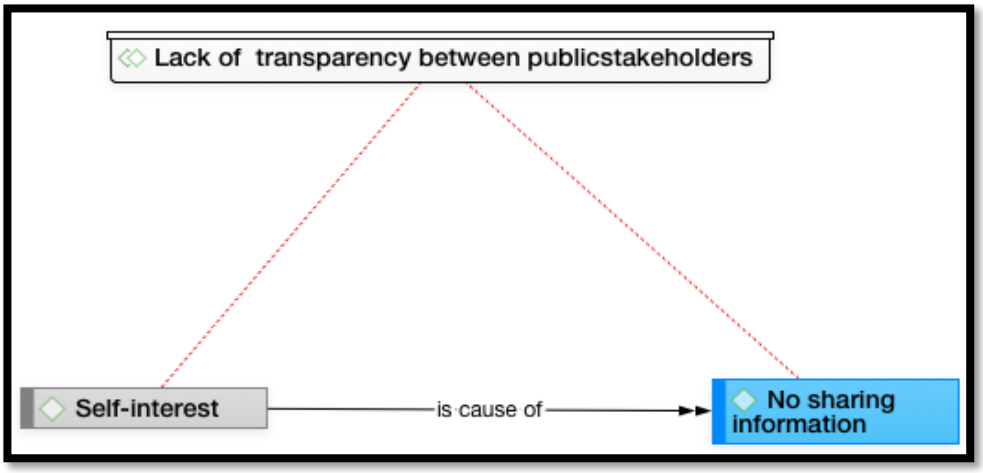

Figure 27. The structure of the development of theme (lack of transparency between public stakeholders)

In this stage, transparency between stakeholders in exchanging information is an essential component. This is because collaborative decision-making entails a shared decision-making process, which requires the exchange of information between key stakeholders (Margerum 2002). This can help stakeholders reach agreement about the issues and proposed problems (Bentrup 2001). Yet, this study identified the lack of transparency in information exchange between Hajj stakeholders from the PbS as another major issue that hinders the effectiveness of collaboration between public stakeholders in the direction-setting phase.

The interviews show that a lack of transparency in the exchange of information exists between PbS stakeholders:

> Some representatives of some sectors do not disclose all the information they have. (PbS-16)

> No, not everyone is transparent when giving the information. Some of them try to hide some information they have. (PbS-9)

In fact, this study found that this issue also exists between stakeholders who work in the environmental sector. To illustrate, there are different governmental sectors that plan and work to protect the environment of the Hajj. For instance, there is a sector responsible for the reduction of food waste during the Hajj. Other sectors are responsible for other aspects of the environment, such as measuring environmental emissions during the Hajj and attempting to set plans to reduce the emissions produced during the Hajj. However,

although the government set different sectors to protect the environmental sustainability of the Hajj and they are supposed to share the same objectives and goals, this study found that there is a major problem with the exchange of environmental data and information between them.

One participant from environmental sector claimed that there is no transparency in sharing information between stakeholders from other environmental sectors:

> No, they don't share their information with us (referring to the other environmental sectors). (PbS-17)

Another participant from the environment sector indicated that a lack of transparency in sharing environmental information and data is also present among stakeholders from the same sector. For clarity, one environmental sector has two different branches (Jeddah and Mecca). Although the two branches fall under one sector, they do not share all environmental data with each other:

> There is no transparency on sharing the environmental data. The sector in Jeddah does not share all environmental data with us even if we asked them to get the data. (PbS-11)

However, some participants from environmental sectors noted that some decision-makers do not share all the information because of self-interest:

> It is impossible that some sectors provide all the information they have, because of own interest and some decision-makers want to preserve their job positions. (PbS-17)

Another participant clarified that the absence of transparency is a result of the tendency of some decision-makers to gain full credit for the success of any environmental project:

> Look, some of decision-makers don't disclose all they got because they want to show to the leader (from HA) that he has done the whole work. (PbS-9)

This statement corresponded to that of another participant from environmental sector who indicated that:

> Everyone wants to show that they have done the work in front of the leader (AMA). So, that's why they don't share all the information in order not to not lose their central power. (PbS-11)

5.3.5 Deficiencies in environmental roles and responsibilities

This theme describes the lack of clarity in environmental responsibilities and roles between Hajj stakeholders from both sectors (public and private) which led to conflict about responsibilities for the implementation of environmental plans (see Figure 28).

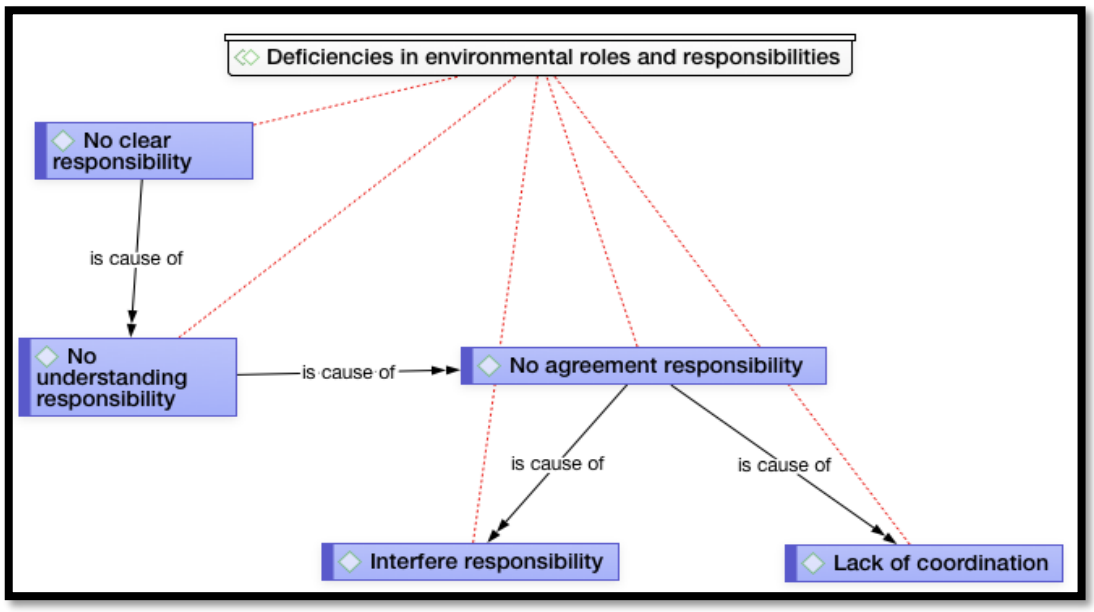

Figure 28. The structure of the development of theme (deficiencies in environmental roles and responsibilities)

A theme arising from the interviews was that there is a lack of clarity of responsibilities and roles. This is despite government assignment of roles and responsibilities for each sector (public and private): ‘responsibilities were assigned between us long time ago’. (PbS-17)

> There are no clear responsibilities assigned for the environment. (PbS-16)

This lack of clarity creates confusion between Hajj stakeholders in understanding their roles and duties. For instance, one of the issues that faces AMNH and hospitality agencies every year is around who is responsible for disposing of the waste in garbage bins. AMNH believes that hospitality agencies should be responsible for disposing of the waste inside the garbage bins, compressors or underground containers:

> It is not the responsibility of the public sector to collect and dispose the wastes that hospitality agencies produced. (PbS-6)

> We have sat with the hospitality agencies representatives and they like always say this is your responsibility not our responsibility. They do not know that cleanliness has six levels of process and the most important level is the first one, which is controlling the waste producers of waste and obligating the producers to dispose their wastes in the right place. But until now they insist that this our responsibility not their responsibility. (PbS-12)

However, hospitality agencies believe that their responsibility is keeping their tents clean but that cleaning outside of the tents is a public service responsibility:

> Our responsibility is cleaning the internal tents and their responsibility (referring to the cleanliness department) is outside the tents. It is not my responsibility to think how they would remove the wastes or think how they would solve this problem this is their responsibility. (Prs-8).

> They want (referring to AMNH) us to dispose the waste during the Hajj and this is not our responsibility, this is their responsibility. (PrS-10).

In fact, the issue of lack of understanding responsibilities between Hajj stakeholders is not only limited to the public and private sector, but also exists between stakeholders from public sector:

> In determining the responsibilities phase, the problem usually revolves around specifying the responsibilities, duties and roles. So, you may find that one sector does the role of another sector. (PbS-16)

> They meet, and they argue about the responsibilities. So, you will find in the meeting that (referring to PbS stakeholders) some of them say to other public stakeholders you don't have any relation to the environment, but the other would response and say no we are responsible for the environment. (Prs-11)

This conflict has led to many disagreements between Hajj stakeholders in meetings about reaching consensus in determining responsibilities and roles. One participant from AMNH demonstrated that although they have met with hospitality agencies several times to solve this issue, it has not been resolved.

> Nothing, like always, incompatible convictions. (PbS-12)

This lack of agreement has led to interference across sectors:

> One of the problems is the interference between sectors (referring to the PbS). Like, one of the public sectors attempts to interferes with another public sector in responsibilities that are not in its competency. (Pbs-10)

> In the Hajj you will find a complex network of interference. You will find many public sectors interfere with each other … it happens because there is a conflict in responsibilities, so it is normal to see this kind of interference. (PbS-3)

As a result, the nature of coordination in the implementation phase during the Hajj between stakeholders is weak and fragile.

> There is a lack of coordination between them (referring to the PbS) in implementing the plans. (PbS-16)

This was evident from the participant response from environmental sector. Many tasks were undertaken by other PbS without even coordinating with them, despite the fact that their projects are related to environment aspects:

> They say (referring to the public sector stakeholder) that the waste landfills are their responsibility, but they should take our approval first because we are the environmental department. (PbS-17)

> The waste landfilled is supervised by one of the public sectors and they do not get back to us in the operation. (PbS-10)

> The slaughterhouses operate in the Hajj without coordination with us. (PbS-11)

5.3.6 Drivers that affect collaboration between key stakeholder in the direction-setting phase

In this section, the driver that promotes collaboration between Hajj stakeholders in the direction-setting phase is identified in Figure 29. This driver is the need for effective leadership, which was a theme that emerged from the interview data.

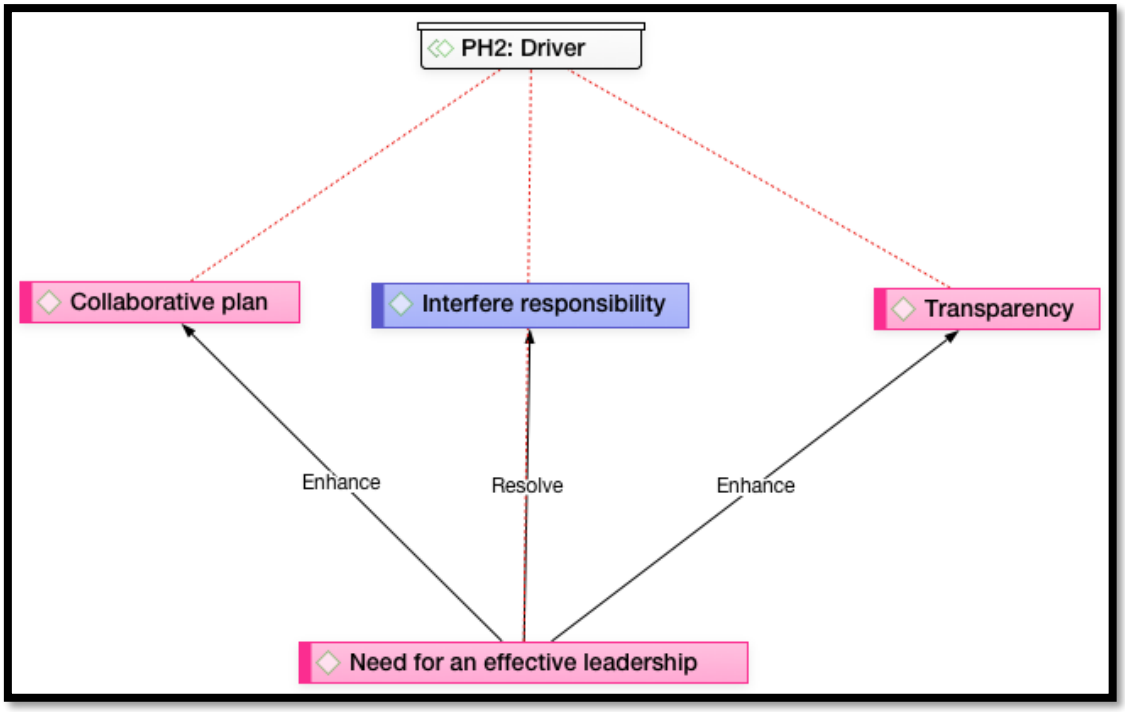

Figure 29. The structure of the development of theme (need for an effective leadership)

5.3.6.1 Need for an effective leadership

As described previously, this study found that the nature of work among stakeholders is siloed and centralised. This type of organisational arrangement has led to interventions and conflict between the environmental sector and other public sectors in terms of planning. This conflict has, in turn, has prevented stakeholder agreement in defining one holistic plan that shares all stakeholders' interests and priorities. It has also resulted in the neglect of environmental issues. To resolve this, many interviewees asserted the importance of gathering all stakeholders together to collaborate in designing a holistic plan for the Hajj:

> To reach collaboration, it is supposed to set one clear collaborative plan. Honestly, the individualistic way of work is not appropriate. Mecca must convert to be an environmental city that induce collaboration between all sectors. Each sector should support based on its role and responsibilities. Like for example, if I am working in the traffic sector, I should consider the environmental matters in my plan of organising the movement of pilgrims. Also, if I am working in the cleaning department, I should set plans to recycle all the wastes. All this thing is supposed to be exist in one plan. (PbS-15)

> The process of Hajj system needs a holistic approach from all aspects whether organisational, planning or services. We need a holistic approach because everything is related to each other. (PbS-3)

Another participant from an environmental sector asserted the need for collaborative plans because all their plans to protect the environmental sustainability of the Hajj have not been successful:

> Every year we set a plan for reducing the waste of Hajj, but it is impossible to do this task alone we are Oud-Min-Hezma (Arabic idioms which means just one part of the system), and as you know reducing the waste need collaboration from everyone. Of course, we attempt to set plans to reduce the waste, but it needs collaborative effort to define a national strategic plan to solve this issue. (PbS-2)

As a result, many participants noted that the existence of powerful leadership is needed to bring stakeholders together to collaborate in designing one comprehensive plan:

> I wish the role of HA is activated because honestly there is no master plan, until now there is no master plan. (PbS-12)

> Everything will change if the HA takes the responsibility; you will see a better collaboration. Now collaboration is very weak, but the HA is working now to solve this issue. (PrS-11)

In addition, it was remarked that the presence of cross-sectoral leadership would increase the supervision level of Hajj stakeholders plans and actions, leading to increased transparency among stakeholders in the exchange of information and data:

> Soon, everything will be more organised and transparent when HA takes the responsibility of supervising all sectors including the public sector. (PbS-17)

Further, many participants believe that the conflict in responsibilities and roles between Hajj stakeholders will be solved when the HA leads the environmental sustainability planning process:

> In the future the HA will assign our responsibilities. The current situation will be changed. (PbS-12)

> Assigning responsibilities will be determined in the near future. (PbS-15)

5.4 Implementation Stage

After stakeholders reach consensus in plans and visions, they move to the third stage—implementation. In this stage, stakeholders implement the plans made in the direction-setting stage and ensure that the agreement reached is institutionalised and followed through practice. Moreover, stakeholders may accept devices such as redistribution of power among stakeholders, external mandates and regulations (Parker 1999). According to Gray (1989), the action steps of this stage are that stakeholders obtain ongoing support from their constituents, and request and build external support for those who may assist in implementing collaboration, identify an appropriate structure to institutionalise the process, and monitor the progress to ensure compliance to collaboration agreements and decisions.

Since the nature of collaboration between Hajj stakeholders in the first two phases were not successfully achieved it was expected that there would be obstacles to the progress of the third phase. Interviews revealed that this was the case and two themes were identified: a lack of environmental regulation and absence of e-government. The drivers that induce collaboration between Hajj stakeholders in this stage encompass two main themes (environmental regulations setting and need for e-government). Each theme is discussed in detailed in Sections 5.4.1–5.4.3.

5.4.1 Lack of environmental regulation

This theme describes the lack of holistic environmental regulation for the Hajj (see Figure 30). The term, ‘regulation’ is defined as the policies and rules imposed to protect environmental sustainability during the Hajj.

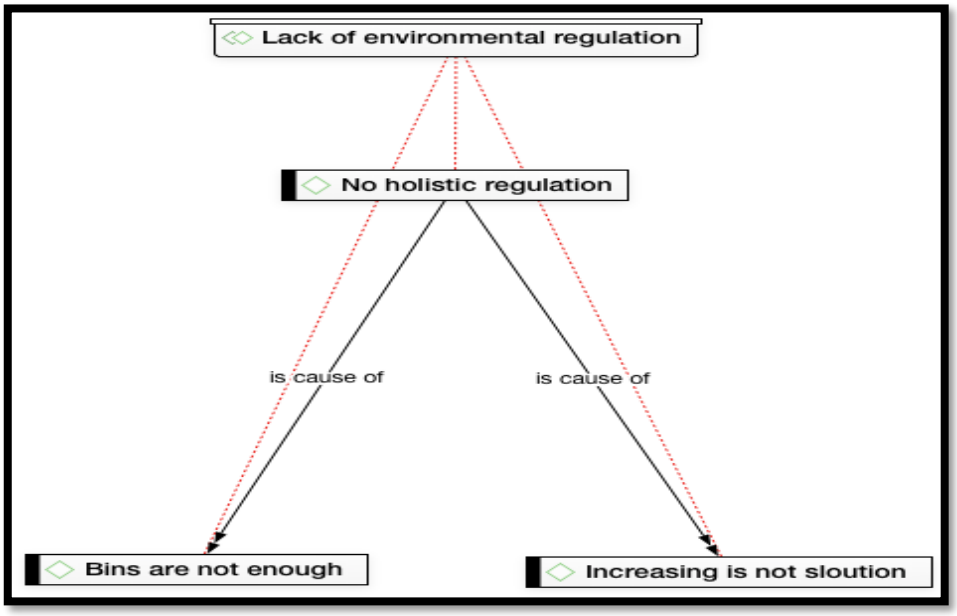

Figure 30. The structure of the development of theme (lack of environmental regulation)

This study identified an absence of environmental regulation during the Hajj, which hindered collaboration and support between public and private sector to preserve the environmental sustainability of the Hajj. Many participants from the public sector claimed that there is a lack of environmental regulation in the Hajj season:

> No, until now there is no holistic regulations and rules for the environment. (PbS-15)

> There is no regulation that determines the environmental policies and rules. (PbS-1)

The only environmental regulation that is in place is that hospitality agencies stakeholders should throw the garbage in the bins and keep their tents clean during Hajj:

> No, there is no regulation. The only rule is that we keep the tent clean from inside and throw the garbage in the bins. (PrS-6)

> MnH instruction is that we throw the garbage in the bins or garbage compressor and to keep our tents clean. (PrS-4)

This absence of holistic environmental regulation has affected the quality of environmental sustainability of the Hajj; many hospitality agencies provide food and beverages over and above what pilgrims need during the Hajj, resulting in food waste during the Hajj:

> Many hospitality agencies bring tonnes of food to their pilgrims such as rice, meats, snacks … so you will find some of them (referring to hospitality agencies) produce too much waste. (PbS-1)

Moreover, the existence of donation services makes the situation even worse. To illustrate, donation services is an NGO sector whose responsibility is to take products, such as food and beverages, from people and donate them to pilgrims during the Hajj. They enter the Hajj areas with large trucks that hold the donated products and distribute them to pilgrims. However, because their goal is to distribute all the charitable foods and beverages that they hold to pilgrims, they distribute them in a random manner, which results in the production of tonnes of waste:

> All pilgrims' catering services and housing is covered in their contracts with hospitality agencies, but if you go to Hajj areas, you would see a huge amount of waste production due to the actions of donation services. They produce too much waste. Probably they provide foods and beverages 1,000 times more than what pilgrims need. Once, I was informed by one of the managers that he went with some staff members to the Hajj areas at night with a truck and collected as much as he could from the charitable foods and drinks that untouched (meaning sealed and not used) and were thrown on the ground. Imagine, he spent 3 months to distribute all the foods and drinks to poor people. (PbS-2)

Thus, owing to the high volume of waste produced in the Hajj and lack of regulation, it is not surprising to find that the bins the government places in the Hajj areas are not enough to contain the food waste produced:

> The pilgrims are producing a huge amount of waste and the number of bins is not enough. (PrS-4)

> The bins are not enough for pilgrims' waste. (PrS-3)

Despite government plans to increase the waste infrastructure, such as placing waste compactors and underground wastes container in the Hajj areas, it seems the expansion of garbage bins plan has not effectively solved the problem of waste:

> We have placed around 40–50 thousand (size 240 L) and 1,100 waste compactors and 30 waste underground containers. All that can hold up to 40,000 tonnes for the five days of the Hajj. However, imagine that only in one day in Mina the quantity of food

> waste exceeds 30,000 tonnes. It means even if I increased the capacity by 100%, it would not be sufficient. (PbS-2)

As mentioned previously, the waste issue is considered one of the major problems to occur during the Hajj. The conflict between Hajj stakeholders to solve this issue began many years ago and it is still remaining especially between one of the environmental sectors (AMNH) and the hospitality agencies:

> No, they don't support our plans and when we talk to them, they say, discuss them with our representative (MnH). (PbS-14)

> We have talked to them (referring to the hospitality agencies) and informed their representative (MnH) many times about the issue, but nothing has happened. (PbS-2)

Consequently, it is believed that because of the absence of regulation, the level of support and collaboration between private and public sector to solve the environmental problems will be minimal:

> Look, if there is no regulation, they (referring to hospitality agencies) can collaborate and apply the project today but tomorrow they can withdraw. Did you get my point? (PbS-8)

> As long as there is no regulation, you have a choice either to apply or not apply the environmental projects. Like, the Green Hajj project it is still considered an initiative and there is no regulation to enforce hospitality agencies to apply the Green Hajj project. (PbS-1)

5.4.2 Absence of e-government

This theme describes the impact of the absence of e-government on coordination between Hajj stakeholders. E-government refers to 'the use of information and communication technologies, and particularly the internet, as a tool to achieve better government' (OECD 2003, p. 22). This study identified the absence of an electronic system to bond all Hajj stakeholders together:

> There is no electronic system that linked all sectors. (PbS-1)

> Currently, there is no electronic system. (PbS-15)

All stakeholders' work relies on old-fashioned (paper-based) methods. The way that stakeholders share information, data, reports and so on is either via email or by hand:

> There is no electronic system, we either send the papers via email or by hand. (PbS-11)

As a result, some participants argued that the absence of the electronic system has resulted in inconsistencies in coordination between stakeholders in monitoring the environmental procedures. This is particularly evident, as shown before in the overlapping of duties and roles between Hajj stakeholders:

> In the Hajj, everyone gives fines. So, one sector could come to the tent and give a fine, then another sector gives you the same fine … there is no coordination because there is no stage that gather them to inform them about other actions. (PrS-11)

Another participant agreed:

> The BA (public sector) gives you a fine, then HS (public sector) also give you the same fine, so you may find yourself take the same fine two, three, four times from different public sectors. That occurs because there is no electronic system. (PbS-1).

5.4.3 Drivers that affect collaboration between key stakeholders in the implementation phase

In this section, the drivers that facilitate collaboration between Hajj stakeholders in the implementation phase are shown in Figure 31. According to the responses of participants, two themes emerged: environmental regulations setting and the need for e-government.

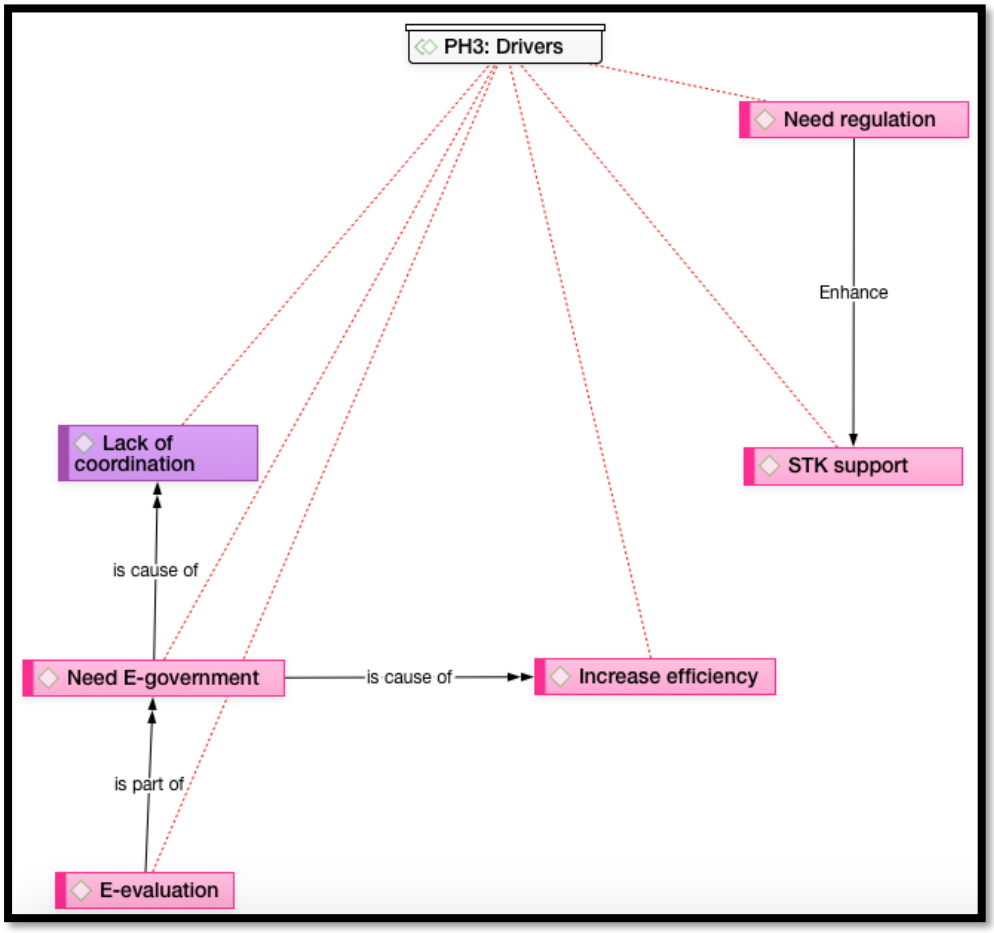

Figure 31. The structure of the development of driver themes

Note: E = electronic, PH3 = third phase, STK = stakeholder.

5.4.3.1 Environmental regulations setting

This theme describes the need for setting environmental regulations so that Hajj planners can gain support and collaboration from all Hajj stakeholders from different sectors. One of the vital drivers that facilitates collaboration between Hajj stakeholders is by setting a regulation that obligates Hajj stakeholders to adopt and collaborate to execute the environmental projects during the Hajj:

> Many environmental projects are initiatives. Many public sectors have proposed and implement various environmental initiatives and they got supported by other stakeholders. However, even they were supported by other stakeholders they still considered initiatives. Hence, as long as they remain initiatives the level of support would be minimum, but if it they were regulated by the government you would find everyone implement them. For instance, the Green Hajj project was adopted by

> different stakeholders but not all of them adopt them because it was not regulated. So, if we need to convert the traditional tents to green tents, we need regulation. (PbS-1)

> The first thing we need is regulations. For example, when you finished from your thesis and determined one, two, three, four, five things that need to be done for the environment, without regulation, you will find that some can say no we cannot apply it, or you will find some of them say we can pick one or two only. (PbS-5)

> There are three aspects that need to be improved, all stakeholders support, regulations because in Mina pilgrims spend around five days and thus, it needs regulations and rules … we are making 80% of effort to protect the environment and achieving only 20%. We want to do the opposite, we want to make 20% of effort and achieve 80%, but this equation cannot be attained without setting regulations that obligate each stakeholder to be responsible for cleaning and reducing their wastes. (PbS-2)

The response of public stakeholders is consistent with stakeholders from the private sector, who indicated that regulation is crucial in improving the environmental sustainability of the Hajj. One participant indicated that the donation of food and beverages need to be limited and regulated by the government to reduce waste:

> The government must find a way to resolve the waste of donation institutions. The government needs to regulate and limit the number of food and beverages that donation institutions donate during the Hajj. They produce a huge amount of waste. (PrS-4)

Another participant from catering services demonstrated that regulation is the core factor that would reduce the waste produced by hospitality agencies:

> The profit is the most important thing for them (referring to hospitality agencies), but to reduce their food waste, regulations and rules should be set. Then you will see the result. (PrS-1)

In fact, one participant asserted that regulation is key factor that the government needs to set to increase stakeholder support:

> Do you think all Hajj stakeholders have heard about Green Hajj project? Of course, no, even though that every year we talk about it, but if there was a regulation and rules you would see everyone is aware about the project. Look at the tax, since the government impose the tax regulation to people, they have followed the rules and paid the tax.

> Before imposing the regulation, no one knew anything about the tax, but since they set regulation for tax, everyone now is aware about the tax. (PbS-8)

It seems that the response of the participant is quite valid given that after the government set a regulation that obligates stakeholders from private sector to take the initiative to increase the quality service of Hajj, some hospitality agencies adopted and supported the implementation of Green Hajj project:

> We were interested to attend the conference of Green Hajj project and we adopted and implemented the project. We adopted the project as an initiative. Especially in this time, we (referring to private sector) are obligated to take an initiative to increase the quality of serving the Haramin (Hajj and Umrah). (PrS-8)

5.4.3.2 Need for e-government

This theme describes the importance of transferring the government from the traditional system to e-government to improve collaboration and coordination between Hajj stakeholders. Participants asserted the importance of transferring the traditional system of communications described earlier, to e-government systems to improve the quality of transparency, collaboration and coordination between Hajj stakeholders.

One participant remarked:

> That what we miss. There must be an electronic system that link all sectors. Because decision-makers are changeable and without electronic systems, they can change the rules and plans. So, the existence of electronic systems will obligate everyone to work based on the system. (PbS-1)

The same participant argued that the existence of electronic system would improve the coordination between stakeholders in the monitoring stage:

> If there is one electronic system, the issue that many sectors give the same fines would be solved. (PbS-1)

Another participant asserted the importance of an electronic system in monitoring the actions of all Hajj stakeholders and inducing the coordination between them:

> You must put them in one electronic system. So, if anything happened to anyone, all of them will be aware and they can then give one decision. (PbS-3)

Other participants determined other benefits of the existence of electronic system that links all Hajj stakeholders, such as increased efficiency between stakeholders:

> We should have an electronic collaborative system like (Abshar which is an electronic platform that gather all Ministry of interior sectors). If you look at (Abshar) you will see that all interior affairs sectors are gathered in one system. So, if you want to renew your passport, you don't need to waste your time asking where you should go to renew it. Everything in one system and everything is clear. (PrS-11)

In addition, it can motivate hospitality agencies to adopt and implement the Green Hajj project by giving them credits in the evaluation and providing information to pilgrims about which hospitality agency employs eco-friendly services in their tents:

> In our recommendation in 39, we recommended to set Green Hajj project in an electronic system. The idea is that people who look at the system will be aware which hospitality agency is adopting the environmental project and which is not. Also, we recommended to give credits to any hospitality agency that participates in implementing the Green Hajj project in the evaluation. (PbS-8)

5.5 Vision 2030: The Future of Change

This theme, which was generated from the data when using the abductive approach in the analysis stage, illustrates the impact of Vision 2030 on the future collaboration between stakeholders in planning for the environmental sustainability of the Hajj (see Figure 32).

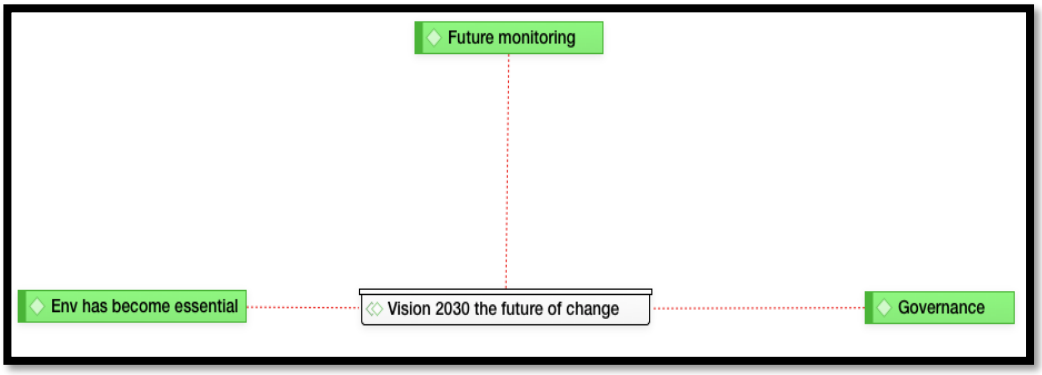

Figure 32. The structure of the development of the theme (Vision 2030 the future of change)

Note: ENV = environment.

As explained previously, Vision 2030 is the country's long-term development plan to reform the economy and society. Through Vision 2030, Saudi Arabia has set an agenda for achieving more balanced growth in environmental development (Alshuwaikhat & Mohammed 2017). This was evident, as one of the participants from HA illustrated:

> We have set 15 strategies, one of them is for the environmental sustainability. (PbS-16)

Since the sectors priorities are driven by government priorities, many participants indicated that because of Vision 2030, environmental sustainability has become a priority for Hajj stakeholders:

> Now, the interest of protecting the environment has become important for the sectors because of the vision. There are many sectors such as universities and AMNH has conducted conferences for environmental issues. (PbS-14)

> Environmental issues were not important in the discussion in the past, but now they will be discussed vigorously. Environmental issues are mentioned in Vision 2030 document. So, you have to keep this in mind, since the government mentioned environmental issues in the vision, it means that it has become a fundamental issue and not a complement. (PbS-13)

Another participant from the transportation sector asserted that in past, the environmental issue was not considered in their plans and strategies. However, everything will change because the government has the vision to shift the priority of environmental issues from low to high:

> Yes, it will become one of the priorities. In the past, we were concerned about the safety of buses but now the government is aiming to concentrate on the environmental issue, and from 2020, they won't accept any buses that is below Euro 3 which has less carbon dioxide than Euro 2 or 1. (PrS-2)

In fact, after the government set Vision 2030, many institutional structural changes have occurred. For example, the government has established new governmental sectors with specific clear missions, roles and responsibilities for protecting the environment:

> The government is undergoing radical transformation. It has established the national centre for the wastes and the national centre for monitoring the environmental affairs.

> Thus, the result will be promising because they (referring to the national centres) will set the regulation and the system for the environmental matters. So, everything will be governed. (PbS-12)

> Look, the government now has established new national centres that will take the role of environmental matters in more professional and effective way. In the past, HM was responsible for the environmental affairs but now the government has given the responsibility for the environment to those centres. The roles were clearly distributed so each centre has specific role for the environmental matters. For example, now we have one centre for forecasting and another centre for waste. These centres were established not only for the national scale but also for the Hajj and Haramin … we are setting rules and regulations so in few years many things will more organised where each sector has specific responsibilities, so now what we are trying to do is to gather all sectors look at their responsibilities. If we found that there are overlapping in responsibilities between two sectors, we will give the responsibilities to one of them. (PbS-13)

The institutions will also act as convener between Hajj stakeholders to ensure environmental compliance:

> Now, there is a royal decree to create an environmental unit inside HA that will connect us all. They will be the channel of communication between us on any environmental issues that may occur. Their presence will ensure environmental compliance. (PbS-14)

Moreover, the government has established a new institution whose role is to monitor the environmental aspects for all Hajj stakeholders:

> The environmental police that the government is going to establish will take the role and power to monitor the environmental actions during Hajj and they will increase the environmental performance of all Hajj stakeholders. (PbS-12)

> We need to increase the efficiency of monitoring, but soon the environmental police will come and monitor all Hajj sectors including the governmental sector. (PbS-17)

More importantly, Vision 2030 has started to induce a collaborative network between Hajj stakeholders:

> Definitely, now the work and mentality has become more participatory to achieve one goal. It is not like before every manager acts individually and does whatever he wants

> … it has started from the beginning of the launch of the national programs. Now, the work is in this way. Let's sit with each other and discuss how we can support the private sectors. Many things have been improved. (PbS-16)

5.6 Chapter Summary

This chapter presented an analysis of the data obtained from the interviews of the participants. The aim of this chapter was to understand the nature of collaboration between Hajj stakeholders in the planning process and the drivers that enhance their level of collaboration. The analysis was structured using Gray's (1989) collaboration model. The findings of this chapter indicated that the level of collaboration between Hajj stakeholders is still fragile and requires significant improvement. In addition, this chapter identified the drivers that may induce a collaborative network between Hajj stakeholders in each stage of the planning process. Furthermore, the perception of the nature of collaboration between key stakeholders when planning for sustaining the environment of the Hajj in the future was discussed, which was generated from the data when using the abductive approach in the analysis stage. Chapter 6 provides a comprehensive discussion on the findings of this study.

Chapter 6: Discussion

6.1 Introduction

The objective of this chapter is to draw on the findings to respond to the core research question of how the environmental sustainability of the Hajj can be improved. The response draws on all data gathered over the course of the project, including literature review of environmental policy, an assessment of GHG emissions generated by the Hajj and in-depth interviews with Hajj stakeholders. A key focus of the research was on planning processes and how stakeholder collaboration in planning can be improved to achieve sustainability goals.

The chapter is divided into four sections. Section 6.2 summarises the results of the estimation of GHGs produced from the Hajj activities from MSW, transportation and electricity generation and how these emissions might be reduced. Section 6.3 presents the initiatives that the government have taken to reduce the adverse impact of the Hajj activities on the environment and possible reasons that these have been less than effective.

Section 6.4 will identify barriers to the achievement of environmental sustainability of the Hajj by drawing on interview findings and the wider literature. Finally, Section 6.5 explores the role of Vision 2030 on the environmental sustainability and the implications for improving environmental sustainability.

6.2 The Impact of GHGs Produced from the Hajj on Environmental Sustainability

As discussed in Chapter 2, the Hajj activities contribute significantly to the production of GHG emissions, and hence, are harmful to the environmental sustainability of the destination. This is evident despite the assessment of this research being limited to the application of scope 1 and 2 methods. Scope 3 methods have not been undertaken. The emissions produced from liquid waste and from energy used in hotels and motels for pilgrim's accommodation are also excluded because of lack of availability of data. If these activities were included, the estimation of total emission would be increased. However, despite these limitations, the significant GHG emissions revealed by this study is sufficient to show the substantial environmental impact of the Hajj (see Table 19). The

results estimate that, at minimum, Hajj activities in 2018 produced approximately 1,866,450,976.40 kg of GHGs.

Table 19. Approximate estimation of CO_2-e emissions raised from the Hajj 2018.

Activity	kgCO2-e emissions	%
Aviation	1,561,190,021.20	87
MSW	169,204,000.00	9
Electricity generation (water desalination and accommodation)	78,918,834.00	4
Land transportation (car and bus)	57,138,121.20	3
Total	1,866,450,976.40	100

The GHG emission estimation arising from the Hajj 2018 indicated that aviation contributes the largest percentage (87%). This result is consistent with Kumar (2015), who found that air travel is the largest producer of GHGs in Shri Mata Vaishno Devi Shrine religious event in Katra, Jammu and Kashmir. In fact, globally, it is well documented that aviation produces the largest amounts of GHGs in international events (Higham et al. 2019). Hence, with the anticipation that air travel will increase as the numbers of pilgrims increase, emissions will continue to rise. This is unless there is action to reduce the aviation production of GHGs. For instance, one of the initiatives is setting taxation for CO_2 reduction. This step has been already taken by many governments, such as those of Sweden, the United Kingdom and Germany to obligate airlines to use more efficient aircraft (Becken & Pant 2019). The government could also financially support international initiatives for airlines, especially Middle Eastern-owned airlines, to become more carbon efficient by improving technology to use low-carbon fuels such as biofuels and hydrogen.

Although this research only approximately estimated the CO_2 emissions of MSW, this study confirms that the emissions of MSW contributes notably to producing GHGs with around 9% of the total emission. Thus, the government needs to improve its waste management practices. This is because disposing of all MSW in landfill without proper treatment generates GHGs, mainly methane and carbon dioxide (Hardy 2003), both of which have high GWP (Chalvatzaki & Lazaridis 2010). Accordingly, effective strategies such as recycling methods or converting the waste to energy will mitigate the GHGs from landfill. For instance, Nizami et al. (2017) indicated that if the government of Saudi

Arabia developed a waste-based biorefinery or waste-to-energy facilities, they would treat around 87% of total MSW. The remaining waste can be recycled. The same study revealed that both strategies will reduce GWP to 1.15 million Mt.CO_2eq and will help the government increase the sustainability of its economy. In fact, the country has a great opportunity to reduce GHGs from MSW in the context of the Hajj because it has been found that Hajj pilgrims have expressed strong intentions and support for sorting and recycling wastes if recycling bins were available at the Hajj sites (Alsebaei 2014).

Generating electricity for seawater desalination and accommodation also contributes approximately 4% of GHGs. Regarding seawater desalination, this study revealed that approximately 78,480,000 kg CO_2-e were produced by using non-renewable energy for the operation of seawater desalination. The result is supported by other studies that show the significant impact of desalinating seawater on the environment using non-renewable energy in the tourism context (Xu et al. 2003; Sadhwani & De Ilurdoz 2019).

Similarly, it has been revealed that using non-renewable resources of generating electricity for accommodation in tourism contributes significantly to producing GHGs (Abeydeera & Karunasena 2019). The estimate of Hajj tent accommodation only shows that the generation of electricity produced is around 438,834 kg CO_2-e. The necessary data are not available, but if it were possible to estimate the generation of electricity by hotels and motels in Mecca (more than 100), this figure would be much greater (Al-Eqtisadiah 2011). However, despite this exclusion, the quantity of GHGs that this study identified indicates that the generation of electricity for accommodation and seawater desalination the Hajj releases significant levels of GHGs. In fact, it was indicated that compared with all cities in Saudi Arabia, Mecca has the highest level of electricity consumption because of the pilgrimage (Mekkahnews 2015) and is expected to increase in future if no measures are put into place to reduce consumption. Thus, to mitigate the GHGs from electricity generation, the use of solar energy is the most feasible approach (Daly et al. 2010), particularly in a country like Saudi Arabia where its geographical location falls in a sun belt (Almasoud & Gandayh 2015). In fact, Faqeha et al. (2019) indicated that if solar energy was used in all tents in the Hajj, approximately 1,280 mega-volt ampere of low emission energy would be produced.

Land transportation was estimated to contribute 3% of the Hajj's GHGs. The study estimated the GHGs produced from each pilgrim per km rather than using such data as fuel consumption, vehicle type, and fuel emissions factors (Grizane & Jurgelane-Kaldava 2019), owing to the lack of availability of this data. Despite applying only basic methods to estimate the GHGs from land transportation, the result of this study illustrated that 57,138,121.20 kg of CO_2e were emitted. This result provides a clear indication that land transportation has a harmful environmental impact on the destination.

The quantity of GHGs released by land transportation can be reduced if both short- and long-term mitigation policies and strategies are introduced, such as increasing vehicles that use electric and/or hybrid engines (UNWTO 2019b), enhancing bus engine performance and using lightweight martials to decrease the energy intensity per km per pilgrim (IPCC 2014a). For instance, for the 2008 summer Olympic Games in Beijing, the government replaced traditional buses with more than 100 buses fuelled by natural gas. This one action achieved a reduction of 20,000 tonnes of GHGs (Wu et al. 2011). Further, the World Expo 2010 held in Shanghai reduced GHGs from 1.66 kg/trip to 1.55 kg/trip through improving the transport infrastructure, the use of clean energy vehicles and the impost of policies to restrict the rate of cars growth (Zeng & Li 2014).

Overall, the result of this study is consistent with Abdulredha et al. (2017), Rafiee et al. (2018) and Suryavanshi et al. (2020). These authors investigated the impact of religious events on sustainability and found that religious events produced significant amounts of GHGs, thereby decreasing the environmental sustainability of the destination.

In summary, this research has included an approximate estimate of the GHGs produced by the Hajj. Despite its limitations, this estimate shows that Hajj operations have an extremely negative impact on the environmental sustainability of the destination. Many of these impacts could be mitigated through the adoption of clean technologies, recycling initiatives and the use of renewable energy, which have been shown to be effective in other events elsewhere in the world (Holmes et al. 2015). While some measures have been implemented to date, there has been recognition by government of the extent of the problem and various plans, policies and strategies have been developed. Section 6.3 provides an overview of government efforts to reduce the environmental impacts of the Hajj.

6.3 Government Measures to Mitigate the Environmental Impact of the Hajj

The government of Saudi Arabia has set many strategies and policies to reduce the significant impact of the Hajj activities on the environment, such as the Green Hajj project, the prepared meal project, the shuttle buses project, and the *Environmental Charter* (see Table 13). Yet, as argued previously, many environmental strategies have failed because of ineffective planning and implementation processes. As identified by the relevant literature, a lack of stakeholder collaboration is a key factor, as discussed in Sections 1.1.2 and 2.7. For example, Singh and Bisht (2014) argued that one of the main reasons for the ongoing negative environmental impacts of the Kumbh Mela religious event is the lack of collaboration and coordination between stakeholders. Accordingly, this study applied Gray's (1989) model of CP to investigate the nature of collaboration between Hajj stakeholders to explain why environmental protection policies have failed as well as to identify how planning problems might be addressed. Section 6.4 includes a discussion of the causes that hindered the success of achieving environmental sustainability in the Hajj and what these findings suggested about what can be done to improve the environmental sustainability of the Hajj.

6.4 Why Environmental Sustainability in the Hajj has not been Improved in the Past

As discussed in Chapter 5, the issue of environmental sustainability has only been recently recognised as a policy priority in Saudi Arabia owing to the country's economic reliance on oil production. The reduction of GHGs means that the demand for petroleum might be reduced and affect economic growth. Therefore, there has been little government interest in environmental sustainability compared with other sustainability dimensions (Al Surf & Mostafa 2017). This lack of governmental interest is reflected across Saudi institutions, such as education and public–private sectors, which make little effort towards contributing to environmental sustainability (Hashmi et al. 2015; Alkhayyal et al. 2019).

Similarly, there has been little interest in the environmental sustainability of the Hajj. The data show that during the planning process, Hajj stakeholders showed little interest in environmental sustainability; thus, it was a very low planning priority. This has created much conflict between Hajj stakeholders. This was illustrated as stakeholders from

environmental sector were more concerned about discussing the environmental issues, while other stakeholders from different sectors were less interested in the environmental sustainability.

> Look, in our meetings the percentage of environmental issues are considered let's say 10%. There are other problems that have higher percentage such as pilgrim's safety, housing, transportation. So, we put our attention to solve these issues first. (PbS-15)

The low priority given to environmental goals over social or economic objectives has evidently hindered the success of achieving sustainability in many developed and developing countries (Howes et al. 2017), including this study. However, this situation has changed after launching Vision 2030.

After launching the vision, the government has shifted its focus on sustaining not only the economy, but also the environment (Alsharif et al. 2021). For example, the government has set different national strategies and plans to improve environmental sustainability, such as improving the sewage infrastructure and ocean sustainability (Gastat 2018b). This new vision of the country has resulted in requiring that all sectors in the country follow the government sustainability goals, which include environmental sustainability (UN 2018). This also was evident in the Hajj, as shown in Section 2.7. Yet, as indicated previously, these strategies have not achieved their aim to improve the environmental sustainability of the destination. One factor that hindered achieving environmental sustainability was the lack of Hajj stakeholder collaboration (see Section 2.8). Indeed, this type of conflict is expected to occur because the government only recently started to consider the environment and the development of collaboration is a complex process that needs time and requires various elements to ensure its success (Jamal & Getz 1995; Gray 1989). Therefore, since stakeholder collaboration is an essential component for achieving sustainability in tourism destinations (Graci 2013), a key focus of this study was to understand the nature of Hajj planning through Gray's (1989) CP framework. Through this analysis, many barriers to achieve environmental sustainability in the destination were found.

Section 6.5 discusses the barriers to environmental protection. These barriers fall into the three categories: centralisation, leadership and resources.

6.5 Barriers to Achieve Environmental Sustainability in the Hajj

6.5.1 Centralisation

To achieve sustainability goals in destinations or organisations, key stakeholders should collaborate in the planning process to achieve a shared vision, goals and strategies (Bramwell & Lane 2003; Fobbe 2020). This is particularly important in tourism because of its fragmented nature and the existence of a wider range of stakeholders from across sectors. (Jamal & Getz 1995). Thus, to achieve sustainability, consensus through collaborative work that transcends silos is essential to prevent conflict and differences between various tourism stakeholders from various sectors (Cockburn-Wootten et al. 2018). However, this study found that the nature of work among stakeholders in the Hajj takes place within silos, where each government sector designs its plans without real collaboration:

> We make our plans and we discuss them (referring to the PbS), but for them the possibility of collaborating with our plans is depended on their priorities. Sometimes when for example we talk with a public sector about a plan, they say no, but we can put this plan in our plan after 3–4 years. (PbS-14)

The results show that some Hajj decision-makers reject collaboration with stakeholders from environmental sectors owing to the perceived conflict in interests and priorities. This indicates that those decision-makers do not understand the value of collaboration and its capacity in making Hajj stakeholders work together to achieve number of basic goals, while preserving each sector's goals, priorities and independence (Dredge 2006). This arises through a 'silo mentality' that exists between Hajj stakeholders and has contributed to creating a competitive rather than collaborative environment in their relations (de Waal et al. 2019). This hinders the creation of solutions necessary to protect the environmental sustainability of the Hajj. This was evident as until recently, there was no holistic collaborative plan that shares Hajj stakeholders' objectives, priorities and visions. Thus, even if the government has taken many environmental initiatives and strategies to mitigate the environmental problems in the Hajj, the siloed nature of the administration of the Hajj would hinder the success of the initiatives. This is an issue shared globally as illustrated by Liu and Mwanza (2014), who found that administrative silos have hampered the success of achieving sustainability in one of the tourism areas on Zambia.

Another issue that increased conflict between Hajj stakeholders is the exclusion of the private sector and NGOs from the planning process. Indeed, this is common in many developing countries owing to the high level of centralisation and governmental institutions tendency to closely maintain decision-making authority (Tosun 2000; De Araujo & Bramwell 2002). The problem of centralisation is that it confers ultimate power to some stakeholders and limits the power and influence of other stakeholders in the planning process (Tosun 2000).

This was evident in the case of the Hajj, where the director representing hospitality agencies declared:

> We gather all the hospitality agencies and then we give (PbS) our recommendations but in the end, they will make the final decision. (PrS-8)

Despite the importance of hospitality organisations as being responsible for serving pilgrims during the Hajj season, their voices and decisions are marginalised. Therefore, the continued exclusion of legitimate Hajj stakeholders from the planning and decision-making processes prevents all Hajj stakeholders from executing environmental plans and projects. This has been demonstrated empirically through numerous studies that have found that the exclusion of legitimate tourism stakeholders from the planning process has affected the development of collaboration between them to achieve sustainability in their destinations (Araujo & Bramwell 1999; Ladkin & Bertramini 2002; Kenway et al. 2017).

The absence of clear environmental regulations also makes the situation worse:

> As long as there is no regulation, you have a choice either to apply or not apply the environmental projects. Like, the Green Hajj project it is still considered an initiative and there is no regulation to enforce hospitality agencies to apply the Green Hajj project. (PbS-1)

In fact, the argument of the participant is valid given that while the guidelines and codes of conduct are important for collaboration to achieve sustainable development in tourism destinations, they do not have the same power as formal regulations. As found elsewhere, voluntary compliance is less effective in making tourism stakeholders collaboratively work towards the implementation of sustainable development plans or projects (Bramwell & Lane 2003). This was evident in Kenawy (2015), who found that the

absence of a regulatory system was one of the factors that impedes stakeholder collaboration on sustainable development in Egyptian eco-tourism areas.

Although setting environmental regulation is a vital component for achieving sustainability (Churugsa et al. 2007), the current centralised system excludes legitimate stakeholders from participation in setting regulations with the public stakeholders. This system hinders the collaboration of Hajj stakeholders from other sectors to effectively implement environmental regulations. This is because the PbS may design some regulations that only support their interests without considering other stakeholders' interests from other sectors (Dong 2005), which is evident in the Hajj:

> No, they don't consider our interests. They (referring to the PbS) made a decision to implement the prepared meal program and it is expected that next year 45% of hospitality agencies will provide pilgrims with prepared meals, but the issue is that you cannot force pilgrims to eat such food. (PrS-8)

A further issue of the current planning structure is its failure to encourage Hajj stakeholders to share the same vision and objective. This was evident as there was a clear difference in understanding between Hajj stakeholders about the objectives of many environmental projects. For example, environmental sector participants had the understanding that the objective of the prepared meal project was to improve the environmental sustainability of the Hajj by reducing the amount of food waste. In contrast, participants from hospitality organisations believed that the objective of the project was to improve the safety of pilgrims' health. Given these different beliefs, there was a lack of a shared vision in relation to how and why the project should be implemented. This finding aligns with previous studies that have highlighted how the centralised nature of the planning process in developing countries tends to create variation in objectives between public and private institutions (Tosun 2000; Yuksel et al. 2005). This was also evident in this study as private sector stakeholders are not allowed to participate in the planning process. This contributes to conflict between Hajj stakeholders in setting a common vision and objectives.

Moreover, this study found that there is lack of transparency between Hajj stakeholders as the control of the important information and data lies with some stakeholders at a government managerial level who have the authority and the discretion to share with other stakeholders or not. For instance, when stakeholders from the environmental sector in

Mecca asked for certain data and information about the environment from the branch in Jeddah, the request was rejected. Although they work in the same sector and have the same vision, there is an absence of transparency between them. Some participants indicated that stakeholders from managerial levels are not fully transparent in exchanging information owing to self of interest. The participants clarified that some managers tended to hide some information to gain the full credit of the achievement or ensure that not disclosing all information may keep them in their positions.

> Everyone wants to show that they have done the work in front of the leader [AMA]. So, that's why they don't share all the information to not lose their central power. (PbS-11).

It has been argued that centralised planning systems is one of the key reasons for the lack of transparency between stakeholders (Altinay et al. 2007). Thus, it is expected that there are instances in which power is abused through the utilisation of data and information for their self-interest, which is enabled by organisational silos and lack of participation (Siakwah et al. 2020).

Accordingly, the goal of achieving sustainability in the Hajj will be difficult with the absence of transparency that exists between Hajj stakeholders. This has been proven by the previous studies in other tourism destinations. The studies clearly showed that lack of transparency played a critical role in hindering the collaborative network between tourism stakeholders to achieve sustainable development (Altinay et al. 2007; McCabe 2016).

6.5.2 Leadership

As indicated in Chapter 5, the existence of leaders is essential to initiate and motivate the collaboration process. This is particularly important in the tourism context owing to the diversity of stakeholders with varied opinions and interests. (Araujo 2000; Van Nguyen et al. 2020). However, not every leader can facilitate collaboration between stakeholders to attain sustainability. The leader should possess attributes such authority, knowledge and expertise on sustainable tourism development (Jamal & Getz 1995). Yet, the findings indicated that some leaders who have the authority to make decisions do not have the leadership attributes to develop collaboration and guide the successful implementation of the environmental projects and plans.

The findings show that some Hajj stakeholders who have the authority do not have the sufficient knowledge and awareness of the importance of environmental sustainability pillar for human wellbeing and the health of all Hajj stakeholders. This has resulted in the underestimation of the consequences for the health of the destination, the community and pilgrims owing to environmental degradation. Thus, there is little common agreement between stakeholders about the nature of the problem, which created some collaborative boundaries between Hajj stakeholders from the environmental sector and other sectors to solve the environmental issues that occur during the Hajj season. This was evident as one of the participants indicated:

> There is no obligation from some stakeholders (referring to some public sector stakeholders) on environmental issues because they do not care about the environmental dimension, because many of them lack environmental awareness. (PbS-16)

Indeed, this issue is expected to occur. This is because the development of successful collaboration between stakeholders to improve the sustainability of tourism destinations requires that each stakeholder understand the effects of environmental degradation. This was emphasised by Waligo et al. (2013, p. 21), who claimed that 'It is clear that stakeholders become involved in sustainable tourism initiatives only when they have an awareness and understanding of its significance'. However, this study showed that many stakeholders who attend the meeting do not possess sufficient experts and knowledge about environmental sustainability issues. This issue has led some of them to undervalue the importance of preserving the sustainability of the Hajj environment, which contributed to their lack of collaboration with stakeholders from the environmental sector to find solutions to improve the environmental sustainability of the Hajj. This result is consistent with Kenawy (2015) who found that one of the barriers that hindered collaboration between Egyptian tourism stakeholders to achieving sustainability in eco-tourism destinations was because of the lack of sustainability awareness. In fact, this is not surprising given that the environment is not included in the education system (Alkhayyal et al. 2019), and there is lack of workshops given to Hajj stakeholders about environmental sustainability issues. Therefore, it has been argued that involving legitimate stakeholders in collaboration meetings should be determined on the basis of knowledge and expertise about the field because realising the importance of the problem

motivates the collaborative work more effectively between tourism stakeholders to attain sustainability in the destination (Jamal & Stronza 2009).

Given the lack of environmental awareness between Hajj stakeholders at a managerial level, it is not surprising that there is little commitment or urgency in relation to addressing environmental issues. Often agreement between stakeholders in defining a common problem leads to commitment and vice versa, agreement generates commitment (Huxham 1996). Yet, since there is lack of environmental awareness, the environmental problems were not considered a serious issue by some leaders. This has led to weak levels of commitment to addressing environmental issues:

> Sometimes, we hear positive responses, and everyone is singing for loving Mecca (Arabic idioms which means everyone shows care and interest) but in reality, there is no commitment as they are busy to accomplish their priorities. (PbS-12)

Given that building shared commitment between stakeholders is one of the preconditions for collaboration (Ramayah et al. 2011; Park & Kohler 2019) and that a lack of commitment can negatively affect the success of the sustainability in the tourism context (Ghanem & Saad 2015), the result of this study shows that the level of commitment between Hajj stakeholders is shallow owing to a lack of necessary knowledge and awareness.

In fact, this study found that this particular issue has led to many failures between Hajj stakeholders in executing many environmental projects and plans, which ultimately has affected the success of improving the environmental sustainability of the destination.

6.5.3 Resources

A further finding was that one of the critical issues that hindered effective environmental planning is the inadequate resources available to stakeholders. For example, one of the identified constraints was the lack of financial resources allocated to the implementation of plans. Although many participants argued that the lack of clarity of defining the responsibilities and duties was one of the reasons that hindered the CP process between Hajj stakeholders, this was not the main issue. This study found that the limited budget to implement environmental plans and projects constrained collaboration efforts between Hajj stakeholders to implement environmental projects.

> Yes, we meet (referring to stakeholders from PbS) to discuss the environmental projects but in the end, we conclude in who is going to take the responsibility to adopt this project. For example, the fertiliser bins project was discussed between us but in the end, we concluded who is going to pay the expenses of the bins because the project may cost 100 million Saudi Riyal and everyone has certain budget and have different projects and tasks. (PbS-14)

This behaviour is not a new case in the tourism context. For instance, Araujo and Bramwell (1999) reported that some governmental sustainable projects in Brazil have suffered from scarcity of funding. As a result, some tourism stakeholders are reluctant to collaborate in the project process. Likewise, other studies found that a lack of financial resources has restricted tourism stakeholders from collaborating in the sustainable planning process (Ladkin & Bertramini 2002; Adu-Ampong 2017). Thus, it is not surprising to find that Hajj stakeholders avoid adopting the environmental projects.

A further constraint to CP processes in the implementation of the environmental plans and projects in the Hajj is the absence of e-government. E-government is the use of information and communication technology (ICT) that is operated by public institutions to provide digital services to various tourism stakeholders from different sectors (Kalbaska et al. 2017). E-government is not just a website, but an electronic system that aims to support and improve governance (Basu 2004). It has been designed to increase transparency, efficiency, effectiveness and collaboration between tourism stakeholders (Kalbaska et al. 2017).

In the Hajj, many stakeholders claimed that there is an absence of e-government and all administration is paper-based. This is an important gap in the planning process given that the adoption of ICT for tourism is not new (Dimitrios 1998) and Saudi Arabia is considered one of the highest-ranking countries in the development of e-government (UN 2020). Yet, the use of ICT does not extend to the planning and administration of the Hajj. Therefore, some participants explained that because of this issue, the level of coordination between them in implementing environmental tasks and plans is fragile:

> In the Hajj, everyone gives fines. So, one sector could come to the tent and give a fine, then another sector gives you the same fine … there is no coordination because there is no stage that gather them to inform them about other actions. (PrS-11)

This conflict is not surprising given the overlapping environmental responsibilities, the diverse interests that exist between Hajj stakeholders and the general lack of coordination (Ladkin & Bertramini 2002). This is a major contributing factor limiting the success of sustainability projects in tourism destinations (Timur & Getz 2009) as well as in the Hajj.

Since improving sustainability requires collaboration between tourism stakeholders and the success of collaboration will be achieved when coordinated actions effectively occur between tourism stakeholders (Jamal & Stronza 2009), this study found that the absence of e-government is a major contributing factor to the failure of environmental sustainability plans.

Section 6.6 will discuss the important contribution of Vision 2030 to improving environmental sustainability and collaboration between Hajj stakeholders. In addition, this section will illustrate the implications for improving the environmental sustainability of the Hajj.

6.6 Vision 2030: The Main Pillar Towards Achieving Environmental Sustainability in the Hajj

As explained previously, Vision 2030 is a national plan to improve the economy, social issues and environmental sustainability in the country. This also includes improving the environmental sustainability of the Hajj—it is one of the Vision 2030 priorities (Mashat 2020). Before Vision 2030, the environmental sustainability of the Hajj was not on the government's list of priorities. This has resulted in environmental issues being neglected in the plans of Hajj stakeholders from the public and private sectors. As discussed, this is because the priorities and concerns of Hajj stakeholders will be primarily driven by national government priorities. In fact, Tosun (2001) found that the priority of higher government bodies is one of the factors hindering the development of sustainable tourism in developing countries. This is because some principles of sustainable development may conflict with government priorities or interests. This was also evident in the case of the Hajj, where many environmental projects were not implemented because they contradict the interests and priorities of some higher authorities in the PbS.

However, since the government launched the vision, many participants emphasised that the government has begun to focus on solving environmental sustainability issues and

many organisational and structural changes have taken place as a result. For example, the government established a new institution called HA. This institution will be the highest authority in Mecca and will lead all Hajj sectors. HA will redistribute the tasks and clarify the duties of each sector to ensure coordination. Moreover, it will be responsible for setting environmental policies and regulations, which is necessary to protect the destination's environmental sustainability (Tosun 2001). In addition, it will act as a convener and lead the planning process between Hajj stakeholders from various sectors. Its presence will lead to addressing problems between stakeholders in the Hajj, initiating the collaboration process of, and ensuring the continuation of the collaboration process if the representative has the adequate attributes (Gray 1989).

Another important measure that has been taken by the government is the establishment of environmental police. This sector will monitor the environmental actions of all Hajj stakeholders in the field and ensure that they follow environmental policies and regulations.

Vision 2030 is evidence of increasing government interest in improving the environmental sustainability of Hajj and placing it on the national agenda. If successful, the main stakeholders in the Hajj from all sectors will consider environmental sustainability in their agendas and consider this issue a priority. Indeed, this is common in developing worlds owing to the centralised system in which local bodies apply the national government priorities and agendas (Tosun 1999). This was evident in the case of the Hajj, where the issue of the safety and security of pilgrims was given priority by Hajj stakeholders from both the public and private sectors over environmental issues because the government has set this issue as a priority. This prompted those involved in the Hajj to make this issue a priority and work together to achieve this goal. This means that Hajj stakeholders would finally reach to common visions of environmental sustainability, which is one of the most important factors required for successful collaborative efforts to improve the sustainability. Having a common vision and goals between Hajj stakeholders will make the collaborative work more effective owing to the acknowledgement of shared problems that they need to solve (Werner et al. 2011). More importantly, it will drive them to work collectively to achieve the sustainability in the destination (Graci 2013).

Accordingly, the setting of the national Vision 2030 is the first step towards developing collaboration between Hajj stakeholders to improve the environmental sustainability of the Hajj:

> Environmental issues are mentioned in Vision 2030 document. So, you have to keep this in mind, since the government mentioned environmental issues in the vision, it means that it has become a fundamental issue and not a complement. (PbS-13)

In fact, collaboration has already been initiated between Hajj stakeholders, as indicated by one participant:

> Definitely, now the work and mentality has become more participatory to achieve one goal. It is not like before every manager acts individually and does whatever he wants… it has started from the beginning of the launch of the national programs. Now, the work is in this way. Let's sit with each other and discuss how we can support the private sectors. Many things have been improved. (PbS-16)

However, despite the current positive changes, it is evident that the nature of collaboration is still fragile. There are numerous barriers to collaboration between Hajj stakeholders in the planning process with the result being continued environmental damage. Therefore, it is argued that the government will not achieve its Vision 2030 aim to improve the environmental sustainability of the Hajj without effective collaboration between Hajj stakeholders. This was evident as enhancing the collaborative network proved to lead stakeholders to set innovative initiatives, which resulted in improving the sustainability in the destination (Graci 2013). Hence, the findings of this study have several implications that must be considered.

6.7 Implications for Environmental Sustainability of the Hajj

The research findings reveal clear barriers to collaboration between Hajj stakeholders that undermine any efforts to protect the environmental sustainability of the destination. Hence, there are several key considerations for the improvement of environmental sustainability of the Hajj.

One of the critical barriers is the low level of environmental awareness, which is a common problem in developing countries (Lee et al. 2015). Given that there are inadequate environmental education and training systems in place, this issue will continue

to dampen efforts to improve the sustainability of the destination. Thus, there is a need to develop and deliver adequate training relevant to environmental sustainability issues as a key to improve the quality of collaboration and effective planning (Ardoin et al. 2020; Graci et al. 2021). In addition, this training needs to be built into the education and training system to prepare a new generation with the relevant expertise (Hashmi et al. 2015).

> Before we talk about plans, policies and the environment, the first thing we need fix the issue of awareness. You must raise awareness of the people who make the plans and the people who implement them, without it, forget it. (PbS-3)

Moreover, as discussed, the centralised system is a major barrier to stakeholder inclusion and many environmental plans in the Hajj have been designed without engaging legitimate Hajj stakeholders in the planning process. Failure to identify the right stakeholders would affect the success of the development of collaboration and the outcome of the project (Jamal & Stronza 2009), which is evident in the Hajj. Of course, it would be unreasonable to ask every Hajj stakeholder's opinion, but in general, leaders or representatives from various sectors should be allowed to participate in the planning process to design environmental plans that consider the needs and interests of all Hajj stakeholders, not solely the interests of stakeholders from the PbS. Therefore, decentralising the planning process by engaging Hajj stakeholders from various sectors may minimise uncertainty and conflict, and increase the level of collaboration, which ultimately may reflect positively in the quality of plans and sustainability of the destination. This has been achieved in comparable destinations such as in Gili Trawangan, Indonesia, where improved collaboration between tourism stakeholders has led to increased sustainability of the destination (Graci 2013):

> My opinion is that their attendance is vital, and it will be more beneficial if that the HA conducted a meeting for environmental subjects and gather all stakeholders including charity organisations, then we can come up with recommendations based on all stakeholders concerns and interests. (PbS-15)

Improvements in the regulation of environmental plans is also an important priority:

> The first thing we need is regulations. For example, when you finished from your thesis and determined one, two, three, four, five things that need to be done for the

> environment, without regulation, you will find that some can say no we cannot apply it, or you will find some of them say we can pick one or two only. (PbS-5)

As discussed, many plans and projects such as Green Hajj and others were developed to improve the environmental sustainability of the Hajj but were not implemented because of a lack of regulation to ensure compliance. Simultaneously, even though hospitality agencies were not satisfied with the prepared meal projected, it was implemented because it had been regulated. Yet, the current centralised approach that excludes Hajj stakeholders from setting environmental regulations will not solve existing conflict between public and private stakeholders. This is because regulations are devised centrally without considering the interests of other stakeholders (Tosun 2000). This was evident in the implementation of the prepared meal project where, although the scheme was regulated, and many stakeholders from hospitality agencies were forced to implement it, they were not satisfied with the project owing to the conflict of interests. Such a process will ultimately hinder government efforts towards full coordination and support from Hajj stakeholders as evident in many tourism destinations in developing countries (Tosun 2000). Thus, there is a need to decentralise decision-making by allowing key Hajj stakeholders from different sectors to participate in formulating regulations. Such a measure is likely to lead to greater commitment, compliance and collaborative synergies to achieve the environmental sustainability in the destination (Roxas et al. 2020).

Another critical priority is the need for strong leadership. The findings show that the nature of work among stakeholders in the Hajj takes place within silos, where each government sector designs their plans without real collaboration to improve the environmental sustainability of the destination. Of course, every sector in the Hajj should have a certain level of autonomy, but consensus through collective strategies that transcend silos is essential for decision-making to constructively manage the differences between them (Cockburn-Wootten et al. 2018). The silo mentality that exists between Hajj stakeholders has contributed to the creation of a competitive rather than a collaborative environment in their relations, which has ultimately hindered the creation of solutions necessary to protect the environmental sustainability of the Hajj. This was evident as until recently, there was no holistic collaborative plan that shares Hajj stakeholders' objectives, priorities and visions. Thus, the presence of effective leader is vital in this stage to break down the siloed structure that exists between them (Edmondson et al. 2019), bring different interests together (Selin & Chavez 1995) and induce

collaboration to resolve the environmental issues. This was evident in the case of Victoria, Australia, where strong leadership played critical role in encouraging stakeholders including the community to preserve the environmental sustainability of the tourism destinations (Getz & Timur 2012).

> I always say if there is a leader with authority many issues would be resolved. For example, one of the public sectors right now have the full power on the waste, we talked to them that we encountered problems in one, two, three, they said no we cannot do anything right now. (PrS-11)

Further, since the government now aims to redefine and redistribute environmental responsibilities among the Hajj stakeholders, it is expected in the beginning that some Hajj stakeholders may not be satisfied or may be confused about the new changes. An effective leader can address this issue by understanding their concerns and taking proactive measures to reduce them (Lin et al. 2018). Moreover, an effective leader plays a critical factor in this stage to clarify the new roles and responsibilities between Hajj stakeholders (Jamal & Getz 1995; Jamal & Stronza 2009; Jamal Valente et al. 2014). This eventually will lead to success the collaborative initiatives between Hajj stakeholders in enhancing the environmental sustainability of the destination (Graci 2013; Adu-Ampong 2017). Yet, having effective leaders by itself without offering adequate resources is not sufficient to induce collaboration for improving the sustainability of the destination.

The findings of this study showed that the lack of financial support has made some Hajj stakeholders from the public sector evade collaboration with stakeholders from the environmental sector to plan or implement environmental projects. This is unsurprising given that each public institution has different priorities and plans, and each sector in the Hajj spends their budgets implementing their own plans and projects. Hence, the limited financial resources would logically make certain groups reluctant to collaborate with stakeholders from the environmental sector in designing or implementing the environmental plans and projects. This situation has also occurred in other tourism destinations, where lack of financial resources hindered the collaboration process between the stakeholders for improving the sustainability of the destination (Jamal & Stronza 2009; Adu-Ampong 2017). Therefore, the provision of adequate financial support is vital in stimulating collaboration between Hajj stakeholders to improve the sustainability of the destination:

> Unless there is financial support, there will be no collaboration. Many environmental projects have been postponed because of financial matters. (PbS-14)

Another change that is vital is the adoption of e-government. The result of this study shows that there are many barriers that hindered the development of collaborative network between Hajj stakeholders for improving the environmental sustainability in Mecca such as lack of transparency, lack of shared vision and lack of commitment. All these elements are necessary for inducing collaboration and achieving sustainability in the tourism destination (Wondirad et al. 2020). Implementing e-government will enhance the collaborative process by bringing all legitimate Hajj stakeholders from various sectors into one digital platform. This may lead to raise the level of transparency, accountability, evaluation, measurement and communication between them (Kalbaska et al. 2017). Ultimately, this will reflect positively in improving the sustainability in the destination.

6.8 Chapter Summary

This chapter presented the discussion of the findings obtained from the primary and secondary data. The chapter was divided into three sections.

Section 6.2 discussed the findings of the first objective, which is estimating the GHGs from the Hajj activities in 2018. Section 6.3 discussed the initiatives that have been taken by the government of Saudi Arabia to mitigate the impact of the Hajj activities on the environment. Section 6.4 discussed the reasons the environment is not sustainable and what needs to be done to address this issue. This section was divided into three parts. The first part discussed the national priorities of the government and their effects on hindering the development of collaboration between Hajj stakeholders and the improvement of environmental sustainability of the destination and the country. The second part identified the barriers between Hajj stakeholders that impeded the success of improving the environmental sustainability of the destination. The third part illustrated the importance of Vision 2030 and the implications for improving the environmental sustainability.

Chapter 7: Conclusion

This chapter outlines the conclusion in relation to the aims and objectives set out in Section 1.2. This chapter is divided into five sections. Section 7.1 evaluates the achievement of the objectives set in Section 1.2. Section 7.2 explains the usefulness of adopting Gray's (1989) model in guiding this study to understand the nature of collaboration between Hajj stakeholders and the drivers that may induce their collaboration. Section 7.3 clarifies the study implications and discusses the theoretical and practical contribution that this study makes towards filling the gap in the knowledge. Section 7.4 articulates the limitations of the study, and Section 7.5 proposes the scope of future research based on the findings of this study.

7.1 Evaluating the Achievement of the Objectives

This section summarises the research against the four key objectives discussed in Section 1.2. The first objective of this study was to provide a comprehensive overview of the components that contribute to affecting the environmental sustainability of the Hajj and include an estimation of the CO_2-e emitted from different sources arising from the Hajj 2018. The goal of the estimation was to contextualise the Hajj environmental issues owing to an absence of recent studies that have calculated the GHGs produced during the Hajj seasons. The results of this study have shown that the Hajj 2018 activities contributed significantly to harming the environmental sustainability of the destination, despite this study using only scope 1 and 2 approaches. According to the findings, the Hajj activities in 2018 contributed to producing approximately 1,866,450,976.40 kg of GHGs. This study then moved to the second objective, which was to develop an understanding of the plans, policies and strategies that the government of Saudi Arabia has taken to mitigate the environmental impact of the Hajj activities.

After analysing the government's plans and policies, this study discovered that it took actions such as the Green Hajj project and prepared meals to reduce the impact of the Hajj activities on the environmental sustainability of the destination. However, the lack of collaboration between Hajj stakeholders in the planning process impeded the success of the initiatives. Subsequently, this study explored a suitable collaboration framework for understanding the nature of collaboration between Hajj stakeholders in the planning

stage of the Hajj and the drivers needed to enhance their level of collaboration. After analysing the potential frameworks, this study adopted Gray's (1989) collaboration model as a framework for investigating the drivers and barriers to the implementation of sustainability policies.

7.2 Applying Gray's Collaboration Model in a Developing Country

The design of this study was based on Gray's (1989) collaboration model, which has been previously applied in a number of different tourism contexts in both developed and developing countries (Parker 1999; Kernel 2005; Kenawy 2015; Ferede 2019). Gray's (1989) framework was used to guide this study to understand the planning processes of Hajj stakeholders, why collaboration between Hajj stakeholders had not been occurring, and how to enhance it. In applying Gray's (1989) model, the findings showed its usefulness in revealing some key problems in the planning process. As Gray (1989, p. 55) argued, the model can be applied to understanding any form of collaboration and that, 'while there is not a clearly prescribed pattern that characterises every collaboration, there appear to be some common issues that crop up repeatedly'. In fact, this study agrees with Gray's claim. To illustrate, the model has been used in both developed (Parker 1999; Kernel 2005) and developing countries (Kenawy 2015; Ferede 2019) to examine the collaborative network between tourism stakeholders. The model was appropriate for understanding the nature of collaboration between tourism stakeholders, despite the variance in the structural system of governance between the developed and developing countries. Similarly, the application of Gray's (1989) model has guided this study to understand the nature of collaboration between stakeholders in a country, Saudi Arabia, which may have a different structural system than other developing countries. For example, Kenawy (2015) applied his study in Egypt. Although the structural system of governance between Egypt and Saudi Arabia is different (EIU 2020, UNP 2021), the model was appropriate to understand the nature of collaboration between tourism stakeholders in both countries. Therefore, this study argues that Gray's (1989) collaboration model is useful to examine the level of collaboration between key tourism stakeholders in developing countries generally, and in those that share similar political and structural systems to those of Saudi Arabia.

7.3 Study Implications

This study demonstrates that collaboration between Hajj stakeholders is an essential component in the planning process for resolving the environmental damage that occurs every year. To reach an effective collaborative relationship between Hajj stakeholders, it is crucial to address the issues that this study discussed, such as centralisation, lack of adequate resources available to Hajj stakeholders and the absence of an effective leader.

Regarding the collaborative relationship between Hajj stakeholders and environmental sustainability, this study provides a number of theoretical and practical contributions.

7.3.1 Theoretical contributions

By investigating the role of collaboration among Hajj stakeholders, this study contributes to CP theory in several ways. Although the theory has been applied widely in many different tourism contexts, this is one of the first studies to apply the theory in the context of a major religious event in a developing country. By understanding the nature of collaboration and the drivers that enhance it, this study contributes to the literature by confirming the interconnection between stakeholder collaboration and environmental sustainability in destinations that conduct major religious events. The study reveals the factors that drive stakeholder collaboration, which if implemented would contribute to the environmental sustainability of the destination. Likewise, the barriers to collaboration are associated with hindrances to achieving environmental sustainability in the destination.

Moreover, the results of this study contribute to theory by showing how collaboration can occur in developing countries that share similar structural systems to that of Saudi Arabia. The results demonstrate that a ‘top-down’ approach can contribute positively to building successful collaboration between tourism stakeholders. For example, when the Saudi government included environmental sustainability in its Vision 2030 document, the Hajj stakeholders began to collaborate to reduce the environmental impact of the Hajj. This study argues that, without this government intervention, collaboration between Hajj stakeholders to set plans for preserving the environmental sustainability would not have occurred. This contrasts with the argument that claims tourism destinations that execute a top-down approach, in which the governmental sector sets the strategy and determines

what is best for the destination, are most likely to hinder the achievement of participatory and CP processes (Keogh 1990; Ritchie 1994; Cooper 1995; Van Nguyen et al. 2020).

Further, the identification of the barriers to, and drivers of, collaboration is another contribution to the theory. Although many studies have identified the barriers to and drivers of collaboration between tourism stakeholders (Ladkin & Bertramini 2002; Adu-Ampong 2017), the use of abductive and inductive methods has contributed to providing a better view of the main problems. The use of both approaches has added new drivers that may induce collaboration between stakeholders in the planning process. For example, the use of an abductive approach discloses that the absence of applying e-government hinders the CP process between stakeholders and vice versa. The application of e-government induces a CP process between stakeholders. Also, the use of an inductive approach reveals that applying a top-down approach will not always hamper the development of collaboration between stakeholders. The study results show that government intervention is the main driver inducing the development of collaboration between stakeholders in developing countries that have a similar structural system to that of Saudi Arabia.

Finally, this study contributes to the theory by confirming that Gray's (1989) model can be used to explain the CP process between stakeholders in developing countries that conduct major events.

7.3.2 Practical contributions

As mentioned earlier, and based on the researcher's knowledge, this is the first study to have investigated the CP process in the Hajj context. Therefore, the results of this study can inform government policymakers of the importance of changing the traditional relationship between Hajj stakeholders in the planning process and that collaboration between Hajj stakeholders in the planning process is crucial for solving the environmental issues that occur every year in the Hajj.

In addition, the results provided the required attributes for leaders to build successful collaboration between Hajj stakeholders. The results emphasised the importance of appointing a leader with a mixture of "ascribed" and "achieved" status for enhancing the collaborative network between Hajj stakeholders to preserve the environmental sustainability of the destination. This was illustrated when the Crown Prince included the

environmental sustainability in Vision 2030, many organisational and structural changes have taken place as a result (see Section 5.5 and 6.6).

Moreover, the results may aid in providing an opportunity for effective networking between stakeholders and work on ensuring upstream downstream suppliers. This may ultimately contribute to enhancing the effective management of scope 3.

Further, the results of this study can inform all Hajj stakeholders from across sectors. This is particularly important at this time because the government of Saudi Arabia is now prioritising environmental sustainability, as mentioned in the national document of Vision 2030. Thus, encouraging collaboration between stakeholders from all sectors is one of the key strategies necessary to achieve this aim (Graci 2013). The results may guide Hajj stakeholders from all sectors to understand the barriers and drivers affecting the development of collaboration. In this way, they may review and re-establish their collaborative network for the Hajj planning process.

Finally, since improving the sustainable development of all religious events requires key stakeholders' involvement and collaboration (Lin 2021), the findings may have some valuable insights for other developing countries that have similar events to the Hajj. For example, it has been found that one of the main reasons for the ongoing negative environmental impacts of the Kumbh Mela and the Arba'een religious events is the lack of coordination and collaboration between stakeholders (Singh & Bisht 2014; Abdulredha et al. 2020). Accordingly, the findings may contribute to enhancing the sustainability of religious tourism destinations by sensitising religious event stakeholders in developing countries to the main barriers and drivers that affect the success of collaboration.

7.4 Study Limitations

In addition to the limitations mentioned in Section 4.4.4, the researcher faced three other limitations during the data collection process that might affect the outcome of this study. First, because of the conservative culture in Saudi Arabia, some participants, especially those from the PbS, were very cautious in their responses owing to concerns about potential repercussions from the organisation or the PbS management.

Second, since all the interviews were conducted in Arabic, the translation of the interviews was undertaken by the researcher. An inherent problem in the translation process is that some meanings may not have been fully captured.

Third, an unavoidable problem was the lack of publicly available data on waste and other emissions, which meant that only a broad estimate could be made in relation to GHGs. Similarly, details of future environmental plans and initiatives were not readily available.

7.5 Future Research

This section presents suggestions for future studies based on the results of this study. Two main themes are indicated in this section: environmental sustainability in the Hajj and the Hajj planning process.

7.5.1 Environmental sustainability in the Hajj

One of the aims of this study was to contextualise the environmental sustainability of the Hajj by investigating the activities that contributed to damaging the environmental sustainability of the Hajj and estimating the GHGs of these activities. As discussed, the study demonstrated that the Hajj activities produced significant emissions. However, this was an estimate and there is a need for further study in the following areas.

First, the estimation of GHGs from Hajj activities needs to be measured using a more accurate approach (scope 3). The reason that this study used scope 1 and 2 approaches was a lack of data availability. Therefore, it is important that the Saudi government provides accurate data about the activities of the Hajj, so researchers can provide an accurate estimation of GHGs from the Hajj activities. This can assist the government in its efforts to understand the environmental issues that are caused by the Hajj activities and implement more exacting measures. Eventually, this may help the government to set adequate mitigation and adaptation strategies, which may contribute in reducing the impact of the Hajj on the global warming.

Second, integration of the sustainability pillars (economic, social and environmental) has been an effective way to alleviate sustainability challenges in tourism destinations (De Lacy et al. 2014; Espiner et al. 2017). Hence, more research is needed to investigate how sustainability principles can be incorporated into the Hajj. Such a study may guide Hajj

stakeholders to develop plans that integrate the sustainability pillars (economic, social and environmental).

Finally, the government of Saudi Arabia has established various strategies and policies such as the Green Hajj project, the prepared meal project and the Environmental Charter to mitigate the impact of the Hajj activities on environmental sustainability. Yet, the results show that these measures have not been implemented effectively to improve the environmental sustainability of the Hajj. Although this study identified lack of collaboration as one of the main factors hampering the success of the environmental projects and plans, there is a need for further studies to explore other factors that may hinder the success of the plans and policies. For example, future studies could explore the impact of conducting workshops and campaigns based on the principles of Islam on encouraging Hajj stakeholders towards protecting the environmental sustainability of the destination.

According to the Qur'an and the Hadith Muslims are obligated to ensure the preservation of nature for future generations and other species (Jusoff and Samah, 2011). In the Quran and the Hadith there are several verses stating how people should interact with the environment. In the Quran there are approximately 200 verses expound the relationship between people and the environment (Ozdemir 2020). Thus, the investigation of the Islamic obligations impact on stakeholders' attitudes and behaviours towards protecting the environmental sustainability may contribute in enhancing the strategies taken by the government of Saudi Arabia to increase interest in and awareness of the sustainability issues. This may contribute in increasing stakeholders' commitments towards protecting the environmental sustainability of the destination.

7.5.2 The Hajj planning process

The focus of this study was on CP, the nature of Hajj stakeholder collaboration and identifying the drivers that enhance collaboration at the planning stage. This study found that collaboration between the stakeholders in Hajj is still at an early stage and can be best described as a loose relationship. Hence, to improve the collaborative network between Hajj stakeholders, future research could usefully concentrate on the following areas.

First, future research could focus on further clarifying the elements that this study identified in the development of collaboration between Hajj stakeholders. For example, it would be useful to focus on specific issues such as how Hajj stakeholders can establish a plan to increase financial support in an effective way that does not affect other processes to build successful collaboration between them.

Second, this research and the few studies conducted on Mecca have focused solely on the Hajj and neglected the Umrah, which is another religious ritual that has been found to contribute to harming the environmental sustainability of Mecca (Nizam et al. 2015). Hence, future studies could focus on the Umrah, which has attracted less scholarly interest. Such an investigation would contribute to the discussions about environmental sustainability and stakeholder collaboration in Saudi Arabia and other developing countries that also conduct major religious events.

Finally, given that this study was conducted in a developing country where there are limited studies available on stakeholder collaboration compared with those in developed countries (Adu-Ampong 2017), future research in other developing countries that conduct major religious events can draw on this study to reach a clearer understanding of the weakness that hinders the development of collaboration and of the drivers that may enhance collaboration between stakeholders in the planning stage of an event.

7.6 Conclusion

The intention of this research was to contribute to the emerging efforts of the Saudi Arabian government to contribute to global efforts to address climate change. It has done this through a focus on the Hajj, one of the world's largest religious events. The results of this study show that initiatives to reduce the adverse impact of the Hajj activities on the environment will not achieve their goals without stakeholder collaboration in the planning process. The study has revealed key barriers to effective planning and stakeholder collaboration that provide important insights on how the planning process might be improved. These include improvements in education, governance and resources. The results of this study are vital to Hajj stakeholders because this is one of the first studies to illustrate the barriers and drivers that affect their collaborative network in the planning process. Thus, it can inform government policymakers on the importance of changing the traditional relationship between Hajj stakeholders in the planning process

and that collaboration between Hajj stakeholders in the planning process is crucial for solving the environmental issues that occur every year in the Hajj.

Indeed, this study is timely because it was revealed in a recent study conducted by the Massachusetts Institute of Technology that pilgrimages to the Hajj are under threat owing to global warming. The study found that the amount of heat and humidity during the Hajj will exceed the critical threshold by 20% in the period from 2045 to 2053, and by 42% between 2079 and 2086 (Kang et al. 2019), hence, the urgent need for Hajj stakeholder collaboration to reduce the GHGs of the activities to prevent this catastrophe.

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Appendix 1

Tourism concern and WWF 1992 principles for sustainable tourism

Principals	**Details**
Using resources sustainably	The conservation and sustainable use of resources – natural, social and cultural – is crucial and makes long-term business sense.
Reducing over- consumption and waste	Reduction of over-consumption and waste avoids the costs of restoring long-term environmental damage and contributes to the quality of tourism.
Maintaining diversity	Maintaining and promoting natural, social and cultural diversity is essential for long-term sustainable tourism and creates a resilient base for the industry.
Integrating tourism into planning	Tourism development which is integrated into a national and local strategic planning framework and which undertakes environmental impact assessments, increases the long-term viability of tourism.
Supporting local economies	Tourism that supports a wide range of local economic activities and which takes environmental costs and values into account, both protects those economies and avoids environmental damage.
Involving local communities	The full involvement of local communities in the tourism sector not only benefits them and the environment in general but also improves the quality of the tourism experience.
Consulting stakeholders and the public	Consultation between the tourism industry and local communities, organizations and institutions are essential if they are to work alongside each other and resolve potential conflicts of interest.
Training staff	Staff training which integrates sustainable tourism into work practices, along with

	recruitment of local personnel at all levels, improves the quality of the tourism product.
Marketing tourism responsibly	Marketing that provides tourists with full and responsible information increases respect for the natural, social and cultural environments of destination areas and enhances customer satisfaction.
Undertaking research	On-going research and monitoring by the industry using effective data collection and analysis is essential to help solve problems and to bring benefits to destinations, the industry and consumers.

Source: Weaver (2001).

Appendix 2

Sustainable tourism principals (UNWTO 2005).

1- Taking a holistic view

Planning and development of tourism should not take place in isolation. Tourism should be considered as part of the sustainable development of communities, alongside other activities. Its impact on other sectors, in terms of competing resource use and mutual support, should be considered. Over-dependency of an economy and society on tourism should be avoided. A holistic approach is also about taking account of all impacts and relationships within the tourism sector itself and considering how all public policies may affect or be affected by tourism.

2- Pursuing multi-stakeholder engagement

Sustainable tourism is about local control, but also about working together. All those implicated by tourism should have an opportunity to influence its development and management. This may involve formal partnerships or looser arrangements, as well as strengthening and utilizing local democratic structures.

3- Planning for the long term

Short term approaches should be avoided, and the long-term view encouraged, with resources committed accordingly. Where possible, actions should be self-sustaining. Projects that are structured around short-term inputs and finance must take account of how initiatives, once started, can be maintained into the future.

4- Addressing global and local impacts

Impacts on the local environment and communities are often apparent. It can therefore be easier to gain support for policies that address these local impacts rather than for policies that address global issues. However, the sustainable development of tourism should pay equal attention to global impacts, especially with respect to pollution from tourism (such as greenhouse gas emissions) and the use of non- renewable resources. Such global impacts also have a direct effect on tourism itself (e.g. climate change).

5- Promoting sustainable consumption

Sustainability is not just about the supply side. Equal consideration should be given to influencing the pattern and impact of consumption. This means influencing the volume and nature of tourism demand, the choices made by tourists (such as products selected and mode of travel), and their activities and behaviour.

6- Equating sustainability and quality

It should be increasingly accepted that a quality tourism destination or product is one that addresses the full range of sustainability issues rather than simply concentrating on visitor satisfaction. Indeed, tourists should themselves be encouraged to think in these terms—a place that cares for the environment and its workforce is more likely also to care for them.

7- Reflecting all impacts in costs—polluter pays principle

Under the polluter pays principle it is the perpetrator of environmental impacts who bears the responsibility for costs incurred which, where possible, should be reflected in financial costs. This principle has strong implications both for policies and for the use of economic instruments to influence consumption and pollution. In tourism it has implications, for example, for charges for activities such as transport, admission to sites and waste disposal.

8- Minimizing risk taking—precautionary principle

Careful risk assessment is an important component of sustainable tourism development. Where there is limited evidence about the possible impact of a development or action, a cautious approach should be adopted. The precautionary principle means putting in place measures to avoid damage before it occurs rather than trying to repair it afterwards.

9- Taking a life cycle perspective

Life-cycle assessment means taking full account of impacts over the entire life of a product or service, including initial resources used, siting and design, development and construction, all inputs to its operation, and disposal and after-use implications.

10- Considering functional alternatives

Consideration should be given to whether the same function can be performed, and the same result achieved by doing things in a way that has more positive and less negative impacts on resources. For example, in a strategy to improve visitor satisfaction by adding further recreational opportunities, preference should be given to those options that bring the least environmental and social impacts and the highest economic returns.

11- Respecting limits

The readiness and ability to limit the amount of tourism development or the volume of tourist flows in a destination or site are central to the concept of sustainable tourism. Limiting factors may be ecological resilience, resource capacity, community concerns, visitor satisfaction, etc. These factors should be considered in setting limits that are respected by all concerned.

12- Adapting to changing conditions

Adaptive response and management are an important aspect of sustainable development. Tourism is sensitive to external conditions in terms of its performance and the level of its impact. Global threats, such as climate change and terrorism need to be considered in planning for future tourism and in introducing risk management policies.

13- Undertaking continuous monitoring using indicators

Sound management of tourism requires readily available evidence of changes in impact over time, so that adjustments to policies and actions can be made. Indicators that relate to sustainability aims and objectives should be established to monitor the condition, performance and impact of tourism. Cost effective monitoring programs should be put in place.

Appendix 3

Unstructured interview questions

(First round)

Nature of work

1. Can you please describe your business role during the Hajj event?

Barriers and opportunities to environmental sustainability

1. Can you tell me about the environmental problems that are caused by Hajj-related activities?
2. What are the main causes of these problems?
3. What practices or strategies must be put in place to reduce environmental problems?

Planning

1. Can you please tell me about the planning approach that has been established to protect the environment?
2. Who sets the environmental plans for the Hajj?
3. What factors do you consider when proposing a sustainability plan?
4. What are the obstacles in applying the plan?
5. What are the policies and regulations that have been devised to protect the environment during the Hajj event?

Stakeholders' attitudes to environmental sustainability

1. What is your opinion about the commitment of stakeholders in reducing environmental problems? Why?
2. What practices can be implemented to guide Hajj stakeholders in the protection of the environment during the Hajj?

Appendix 4

Interview questions

(Second round)

Nature of work

1. Can you tell me please what your role in the Hajj is?

First stage of the collaboration process

1. Are environmental issues considered important to Hajj stakeholders when planning for it? Why? How can we improve this situation?
2. Who participates in the planning process? Who should participate? Why?
3. What is your opinion about the commitment of stakeholders in achieving the environmental plan? Why? Is there any way in which it can be improved?
4. Who convenes the meetings? How is the convener selected? What do you think about the role of the convener in encouraging Hajj stakeholders to collaborate with each other? Why?
5. What do you think about the availability of the resources that planners have? Why? Does it affect the success of the planning process between Hajj stakeholders? What can be done to change this situation?

Second stage of the collaboration process

1. How are the environmental rules and regulations established? Who designs them? What do you think about the design process? Why? What do you think that we need to do to improve the process?
2. What agenda has been set to protect the environment? How was it designed? Who designed it?
3. In the planning process what do you think about the full disclosure/transparency aspects between stakeholders when exchanging information? Why? How can we change this situation?
4. How do you distribute the work between you? Who has the right to do so? Why?

Third stage of the collaboration process

1. How do Hajj stakeholders who do not participate in the planning process get informed about the outcomes of the planning process? Can they contribute to changing the outcome? Why?

2. What is your opinion about the level of support given by Hajj stakeholders? Why? How can we improve the support that they offer?

3. How are plans monitored and evaluated? What can be done to improve the process?

4. What do you think about the implementation of the plan? Why? How can we improve it?

General question

1. In general, what is your opinion about the level of Hajj stakeholders' collaboration? Why? How can we improve it?

Appendix 5

Information to participants involved in the research

(English Version)

You are invited to participate

You are invited to participate in a research project entitled Investigating the environmental sustainability of a mega-event: a case study of Hajj.

This project is being conducted by a student researcher Abdullah Abonomi as part of a PhD study at Victoria University under the supervision of Prof Terry De Lacy and Dr Joanne Pyke from college of business.

Project explanation

This research is concerned with investigating why environmental degradation occurs in the Hajj event despite the existence of sustainability regulations and how this might be overcome. Thus, this research will attempt to understand what is happening in Hajj in relation to sustainable event management practice, why there are conflicts between stakeholders in implementing policies to protect the environment, and how planning systems can be refined to better protect the environment during pilgrimage. The results of the study will inform policy makers on how to enhance the environmental sustainability of the event. Furthermore, the study results will inform Hajj-related institutions in relation to weaknesses with existing event planning and how sustainable planning can be implemented.

What will I be asked to do?

First, you need to read the consent form before conducting the interview. If you agree to participate in the interview, you will be requested to sign on the consent form below. In the interview, you will be asked questions that are related to environmental sustainability issues in Hajj. The interwire will take maximum 35 minutes of your time. You have the right to not to answer any question that you do not like. There are no costs associated with participating in this research project, nor will you be paid.

What will I gain from participating?

We cannot guarantee or promise that you will receive any benefits from this research; however, you may appreciate contributing to knowledge. Possible benefits may include identifying the factors that impact the environmental sustainability during Hajj event in Saudi Arabia. In addition, helping the government of Saudi Arabia to identify the weakness aspect of their planning strategies and improve it. Further, contributing in illustrating why some stakeholders do not follow the environmental policies that has been undertaken by the government.

How will the information I give be used?

All information will be used for A PhD thesis conducted by Abdullah Abonomi. However, it is anticipated that the results of this research project will be published and/or presented in a variety of academic journals/magazines and conferences. The relevant publications to this research will be made available to the participant upon his request. It is to be noted that the research will conclude approximately in the year 2021.The PhD thesis will be available in the Victoria library research repository. If you wish to receive a summary of the findings, you may contact the researcher. The contact details are provided at the end of this document.

What are the potential risks of participating in this project?

The only risk involved is a loss of time, but your participation will make a valuable contribution to this research.

How will this project be conducted?

The proposed research will be conducted through a semi structured interview. Umm Al-Qura University will contact the participants to assist the researcher to conduct the interviews. This study aims to reach 12-60 participants, or until the researcher reach saturation. The reason behind conducting this interview is to add credibility to the research and to accurately understand what is happening, what is not happening and how to improve the environmental sustainability planning strategies during Hajj event.

Who is conducting the study?

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Any queries about your participation in this project may be directed to the Chief Investigator listed above.

If you have any queries or complaints about the way you have been treated, you may contact the Ethics Secretary, Victoria University Human Research Ethics Committee, Office for Research, Victoria University, PO Box 14428, Melbourne, VIC, 8001, email researchethics@vu.edu.au or phone (03) 9919 4781 or 4461.

(Arabic Version)

معلومات للمشاركين في البحث

دعوة للمشاركة

أنت مدعو للمشاركة في مشروع بحثي بعنوان التخطيط للاستدامة البيئية للحج

يجري تنفيذ هذا المشروع من قبل الباحث الطالب عبد الله أبونمي كجزء من دراسة الدكتوراه في جامعة فيكتوريا تحت إشراف البروفيسور تيري دي لاسي والدكتورة جوان بايك من كلية الأعمال

شرح المشروع

.يهتم هذا البحث بالتحقيق في قضايا الاستدامة البيئية في واحدة من أكبر الأحداث الدينية الكبرى في العالم وهو الحج
قد تكون تساهم نتائج هذا البحث حكومة المملكة العربية السعودية في تطوير وتعديل بعض اطر التخطيط لضمان الاستدامة البيئية في الحج. وعلاوة على ذلك، ستكون هذه الدراسة مفيدة لصانعي السياسات الذين يضعون خططًا لحدث الحج في كيفية .تعزيز الاستدامة البيئية من خلال التخطيط في حدث الحج وتوضيح بعض جوانب ضعف التخطيط للسلطات المنظمة للحج

ماذا سوف اسأل؟

أولاً، تحتاج إلى قراءة نموذج الموافقة قبل إجراء المقابلة. إذا وافقت على المشاركة في المقابلة، سيُطلب منك التوقيع على .استمارة الموافقة أدناه
في المقابلة، سوف يتم طرح الأسئلة المتعلقة بقضايا الاستدامة البيئية في الحج. سوف تستغرق 35 دقيقة كحد أقصى من وقتك. لديك الحق في عدم الإجابة عن أي سؤال لا يعجبك. لا توجد تكاليف مرتبطة بالمشاركة في هذا المشروع البحثي، .ولن يقوم الباحث بدفع اي مبالغ مالية لمشاركتك

ما سوف تكسب من المشاركة؟

لا يمكننا أن نضمن أو نتعهد بأنك ستحصل على أي فوائد من هذا البحث؛ ومع ذلك قد تشمل الفوائد المحتملة تحديد العوامل مشاركتك قد الجهات المخططة لحدث الحج التي تؤثر على الاستدامة البيئية خلال حدث الحج في المملكة العربية السعودية على تحديد بعض وتحديد جوانب الضعف في استراتيجيات التخطيط البيئية الخاصة بها وتحسينها.

كيف سيتم استخدام المعلومات التي أقدمها؟

سيتم استخدام جميع المعلومات لأطروحة الدكتوراه التي يجريها الباحث عبد الله أبونمي
ومع ذلك، من المتوقع أن يتم نشر نتائج هذا المشروع البحثي و / أو تقديمها في مجموعة متنوعة من المجلات الأكاديمية والمؤتمرات. سيتم توفير المنشورات ذات الصلة لهذا البحث إلى المشارك بناء على طلبه.
تجدر الإشارة إلى أن البحث سينتهي تقريبًا في عام 2021 وستكون أطروحة الدكتوراه متوفرة في ارشيف أبحاث مكتبة فيكتوريا لذلك إذا كنت ترغب في الحصول على ملخص للنتائج، فيمكنك الاتصال بالباحث.
يتم توفير تفاصيل الاتصال في نهاية هذا المستند.

ما هي المخاطر المحتملة للمشاركة في هذا المشروع؟

الخطر الوحيد الذي ينطوي عليه مشاركتك هو وقتك ولكن مشاركتك ستقدم مساهمة قيمة في هذا البحث.

كيف سيتم تنفيذ هذا المشروع؟

سيتم إجراء البحث المقترح من خلال مقابلة شبه منظمة. تهدف هذه الدراسة إلى الوصول إلى 12-60 مشاركًا، أو حتى يصل الباحث إلى التشبع. السبب وراء هذه المقابلة هو إضافة مصداقية للبحث، وفهم دقيق لما يحدث وما لا يحدث، وكيفية تحسين استراتيجيات تخطيط الاستدامة البيئية خلال حدث الحج.

Appendix 6

Consent form to participants involved in the research

Information to participants:

The aim of this study is to investigate why environmental degradation occurs in the Hajj event despite the existence of sustainability regulations and how this degradation might be prevented. You are invited to participate in an interview about the environmental sustainability in Hajj event. The project is interested in comprehending why the environment in Hajj is not sustainable despite that the government has put plans and policies in place to protect the environment of Hajj, so a series of open-ended questions will be asked about your viewpoints of the planning measures that has been put in place to achieve environmental sustainability of Hajj event, who are the stakeholders involve in planning process and

their level of involvement, the performance of stakeholders in implementing the environmental sustainability polices, and the barriers to policies implementation.

We do not envisage that there are any risks involved in participating in this interview. Your contribution is entirely voluntary and there are no implications for you if you choose to decline this invitation. If you decide to proceed with your involvement, you are under no obligations to answer questions that you are uncomfortable with and you are free to withdraw your involvement at any time.

All information gathered through the interview will be transcribed and analysed to identify key issues, trends and other findings. Your interview transcripts will be sent to you to verify its authenticity. All information will be securely maintained by the researcher Abdullah Abonomi and the views of no individual will be identified in any reports or publications that will come from the project. The results of this research project will be published and/or presented in a variety of academic journals/magazines and conferences. The relevant publications to this research will be made available to the you upon your request.

All identifying information gathered will be removed from transcriptions or other documentation and privacy is guaranteed except if you permitted to identify your information in this project.

Certification by the participant

I, "[ ]" of "[ ]"

certify that I am at least 18 years old and that I am voluntarily giving my consent to participate in the study:

"[ ]" being conducted at Victoria University by: "[ ]".

I certify that the objectives of the study, together with any risks and safeguards associated with the procedures listed hereunder to be carried out in the research, have been fully explained to me by:

"[ ]"

and that I freely consent to participation involving the below mentioned procedures:

The interview will be series of open-ended questions will be asked about your viewpoints of the planning measures that has been put in place to achieve environmental sustainability of the Hajj, who are the stakeholders involve in planning process and their level of involvement, the performance of stakeholders in implementing the environmental sustainability polices, and the barriers to policies implementation.

All information gathered through the interview will be transcribed and analysed to identify key issues, trends and findings.

Your interview transcription will be sent to you to verify its authenticity.

The results of this research project will be published and/or presented in a variety of academic journals/magazines and conferences.

The relevant publications to this research will be made available to you upon your request.

I certify that I have had the opportunity to have any questions answered and that I understand that I can withdraw from this study at any time and that this withdrawal will not jeopardies me in any way. I have been informed that the information I provide will be kept confidential.

Signed:

Date:

If you have any queries or complaints about the way you have been treated, you may contact the Ethics Secretary, Victoria University Human Research Ethics Committee, Office for Research, Victoria University, PO Box 14428, Melbourne, VIC, 8001, email Researchethics@vu.edu.au or phone (03) 9919 4781 or 4461.

(Arabic Version)

معلومات للمشاركين

أنت مدعو للمشاركة في مقابلة حول الاستدامة البيئية في حدث الحج

الهدف من هذه الدراسة هو التحقيق في سبب حدوث التدهور البيئي في حدث الحج بالرغم من وجود لوائح وتنظيمات من اجل المحافظة على البيئة.

يهتم المشروع بتحديد العوامل المسببة لعدم استدامة البيئة في الحج رغم أن الحكومة وضعت خطط وسياسات لحماية بيئة الحج، لذا سيتم طرح سلسلة من الأسئلة المفتوحة حول وجهة نظرك في إجراءات التخطيط التي تم وضعها لتحقيق الاستدامة البيئية لحدث الحج، مستوى مشاركة وأداء الجهات الحكومية والغير حكومية في عملية التخطيط وتنفيذ سياسات الاستدامة البيئية، وماهي الحواجز التي تعترض تنفيذ هذه السياسات والتنظيمات.

لا يوجد هناك أي مخاطر ينطوي عليها المشاركة في هذه المقابلة.

تعتبر مساهمتك تطوعية تمامًا ولا توجد أي آثار عليك إذا اخترت رفض المشاركة في المقابلة.

لا تتحمل أي التزامات للإجابة على أسئلة لا تشعر بالارتياح معها كما أن لديك إذا قررت المشاركة في المقابلة، فأعلم أنك مطلق الحرية في سحب مشاركتك في أي وقت تريد.

سيتم نسخ وتحليل جميع المعلومات التي يتم جمعها من خلال المقابلة لتحديد العوامل المؤثرة للاستدامة البيئية في حدث الحج.

سيتم الحفاظ على هذه المعلومات بشكل آمن من قبل الباحث عبد الله أبونمي وسوف يتم اعلام اي مشارك عندما يقوم الباحث بنشر البحث في اي مجله او مؤتمر.

سيتم إرسال نصوص المقابلة لك للتحقق من صحتها.

ستتم إزالة جميع المعلومات الشخصية التي تم جمعها من النسخ الفوتوغرافية أو الوثائق الأخرى، كما أن الخصوصية مضمونة إلا إذا سمحت بإظهار معلوماتك في هذا المشروع

اقرار من قبل المشارك

أنا "[ ]"

" من [ ]"

أقر بأن عمري لا يقل عن 18 عامًا * وأنني أوافق طواعية على المشاركة في الدراسة الذي يتم إجراؤه في جامعة فيكتوريا عن طريق "[ ]"

أقر بأن أهداف الدراسة، بالإضافة إلى أي مخاطر أو ضمانات مرتبطة بالإجراءات المذكورة أدناه في البحث، قد تم شرحها بالكامل لي عن طريق الباحث

"[ ]"

- :وأنني أوافق بحرية على المشاركة في الإجراءات المذكورة أدناه

ستكون المقابلة سلسلة من الأسئلة المفتوحة -

- سيُسأل عن وجهات نظري عن الأمور التخطيطية التي تم وضعها لتحقيق الاستدامة البيئية لحدث الحج وعن مستوى مشاركة وأداء الجهات الحكومية والغير حكومية في عملية التخطيط و تنفيذ سياسات الاستدامة البيئية ، والحواجز التي تحول دون تنفيذ هذه السياسات.

- سيتم نسخ وتحليل جميع المعلومات التي يتم جمعها من خلال المقابلة لتحديد العوامل المؤثرة للاستدامة البيئية في حدث الحج

- سيتم إرسال نسخ المقابلة للتحقق من صحتها بالإيميل واذا لم ارد على الموافقة خلال ١٤ يوم من تاريخ ارسال الإيميل فللباحث الحق في اعتبار الموافقة.

- سيتم نشر نتائج هذا المشروع البحثي و / أو تقديمها في مجموعة متنوعة من المجلات / المجلات الأكاديمية والمؤتمرات.

- سيتم توفير نسخه لي من البحث بناء على طلبي.

أشهد أنني قد أتيحت لي الفرصة للإجابة على أي أسئلة، وأنني أفهم أنني أستطيع الانسحاب من هذه الدراسة في أي وقت وأن هذا الانسحاب لن يعرضني لأي مخاطر بأي شكل من الأشكال.

لقد تم اخباري بأن المعلومات التي أقدمها ستبقى سرية

:التوقيع

:التاريخ

إذا كانت لديك أية استفسارات أو شكاوى حول الطريقة التي عوملت بها، يمكنك الاتصال بأخلاقيات المهنة، لجنة أخلاقيات البحث العلمي بجامعة فيكتوريا، مكتب الأبحاث، جامعة فيكتوريا، ص.ب. 14428، ملبورن ،8001

البريد الالكتروني: Researchethics@vu.edu.au

او الهاتف 99194781 (03) 4461:

Appendix 7

HDR Student Conference Award