

Task Complexity of the Civil Defense Directorate in the Context of the Hajj Season

Ahmed Al-Ahmadi

Othman Yeop Abdullah Graduate School of Business, University Utara Malaysia.

Abdullah Kaid Al-Swidi

Othman Yeop Abdullah Graduate School of Business, University Utara Malaysia.

Zakaria Abas

Othman Yeop Abdullah Graduate School of Business, University Utara Malaysia.

Hj Abdullah Abdul Ghani

Othman Yeop Abdullah Graduate School of Business, University Utara Malaysia.

Abstract

Millions of Muslims go to Mecca every year to perform their Hajj (Pilgrimage). Management of Hajj activities is a very complex task for Saudi Arabian authorities and Hajj organizers due to the large number of pilgrims. The specific geographical area for the movement of pilgrims and the short period of Hajj. The organization and management of the Hajj are complex and considered as an important matter of the Saudi government. Hajj season is characterized by the requirement of a great number of works to be carried out and efforts to be expended to create a highly complex work environment that impacts task performance. The literature reveals that there are three dimensions of Hajj work environment that are significant to task performance and are primarily undertaken in accidents during Hajj; the number of pilgrims, Hajj time, and the Holy Sites. This paper aims to contribute to enriching the literature concerning the relevant topic of task complexity during the Hajj season and to provide valuable insights for future research.

1. Introduction

The Hajj is an Islamic annual event which attracts more than three million people from across the world to perform their religious duty. The Hajj has particular settings and characteristics not the least of which is its magnitude in terms of the number of pilgrims, physical settings, and length of time. Hajj is performed in the Kingdom of Saudi Arabia within a specific geographical territory (Almasha'er Almoukadasa) which includes the Holy mosque in Makkah, Arafat, Muzdalifah, and Mina. It is performed in a specific period, from the 8th to the 13th of the twelfth month Dhul-Hijja, according to the Hijra calendar.

The administration of Hajj is an extremely complex, one with which both public and private organizations are heavily committed, the preparation and delivery of which demand skilled administration and tight security controls at all times. Despite great efforts dedicated to planning and managing the whole experience, problems still exist and further research is needed.

For the Hajj period, time, space, and the number of pilgrims, as well as religious practices require a different level of accidents planning, preparedness, response and recovery. Participation of the Hajj is fixed for a certain time of the Higri calendar year. While physical space is limited, the number of pilgrims average of more than three million. These pilgrims have to adhere to the essential components and obligations of Hajj. Thus, these factors represent a difficult challenge for authority planning and allocating accident facilities and responses to accidents, keeping in mind that the type of accidents also dictates the range and the number of response resources needed (Al-Maqati & Ali, 2007). Table 1 showed the Statistics related to the number of deaths and serious injuries during the Hajj sessions for some selected years.

Table 1: Number of deaths and injuries during Hajj

Year	Number of deaths	Number of serious injuries
1975	200	312
1987	402	649
1989	5	34
1990	905	1426
1994	270	800
1995	3	199
1997	343	1542
1998	111	118
2001	35	168
2002	2	163
2003	14	177
2004	244	251
2006	17	76
2007	289	346

In this study, the researchers provide an overview of the characteristics of Makkah and description of the Hajj activities that are performed yearly by Muslims. This is followed by a

detailed discussion regarding the management and organization of these activities and a description of the Holy Sites selected for the research study.

2.0 Geography of Makkah

Makkah Al-Mukaramah (Figure 1) is located in west Saudi Arabia, or what is known as the Hejaz region. It lies in the intersection of latitude $21^{\circ} 25' N$ and longitude $39^{\circ} 49' E$. The city has a rugged landscape characterized by solid granite hills, reaching 277 meters (909 feet) above sea level. It is the valley of Abraham, surrounded by mountains from the east, west and south. To its north is the Al-Falq and Qu'aqi'an mountain ranges and to its west is the Abu Hudidah mountain range. Along its south is the Kuday mountain range while the Southeast is surrounded by the Abu Qubais and Khindimah mountain ranges.

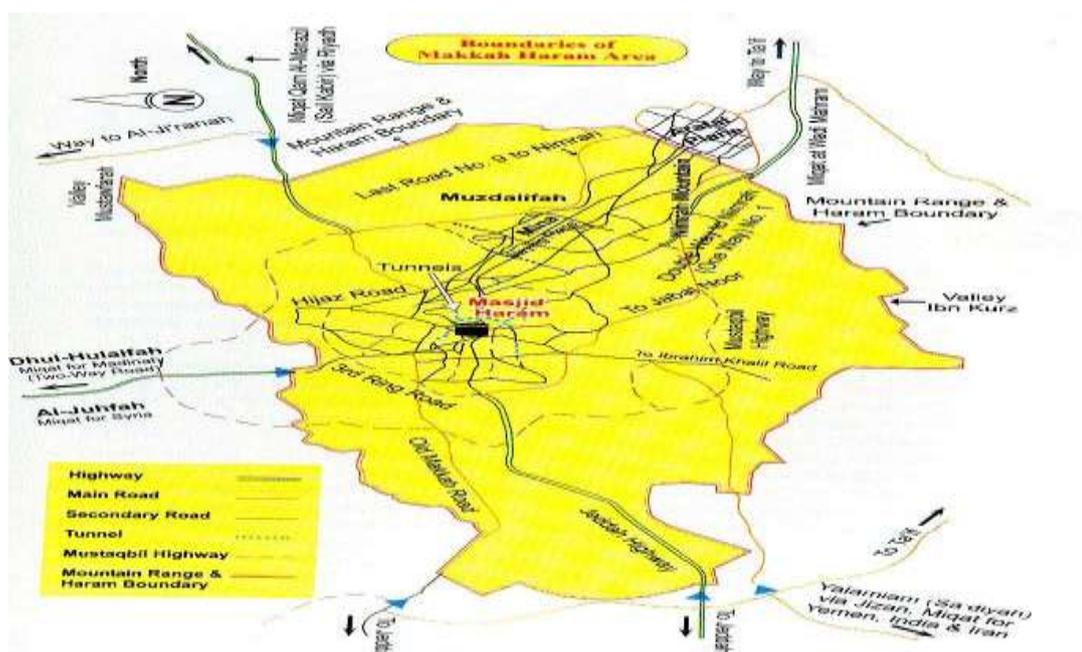


Figure 1 Makkah Al-Mukaramah

Makkah has a hot and arid climate with the temperature reaching a maximum of $49^{\circ} C$ in July and of $37.5^{\circ} C$ in January and a minimum of $36^{\circ} C$ in July and $21.5^{\circ} C$ in January, with the average temperature of $43.5^{\circ} C$ in July and $25.5^{\circ} C$ in January. The average rainfall is reported to be at 125 mm per annum. The city itself constitutes an area of about 5 km^2 in 1955 but owing to the rapid developments in the past few decades, the populated areas have expanded to around 88 km^2 , with the legitimate boundaries 550 km^2 and the sub-regional area of 14500 km^2 (Al Saud, 2009).

On the basis of the current Saudi Arabian consensus, Makkah is home to over 1,650, 000 residents and during the season of Hajj the number is multiplied exponentially to almost five times (4,500,000). Following the completion of the Hajj season, the population returns back to its normal number with a few fluctuations from time to time as visitors still visit the city to perform Umrah, sometimes referred to as small Hajj. Although Umrah is confined to certain rituals, does not have specific time and can be performed throughout the year as many times as desired (AL SOLAMI, Al-Barakati, Sayed, Al-Bahloul, & Al-Tunsi, 2009).

3.0 The Hajj

The literal meaning of Hajj is 'taking the direction of a destination'. In Islam, it means journeying to Makkah with the intention of performing Hajj rites. Every Muslim who is

capable on a physical, financial and mental sense, male or female, is required to perform Hajj at least once in a lifetime as commanded by Allah in the Quran.

As mentioned, around three million people having various cultures, languages, traditions and ethnic backgrounds come to Makkah yearly to perform Hajj. The number of pilgrims can be attributed to several factors with the most important of them is the regulation to control the number arriving every year. Accordingly, the legislation limits the number of times a Muslim can perform Hajj once in every five years.

3.1 Essential Components and Obligations of the Hajj

Hajj is the fifth pillar of Islam under and is referred under the Islamic laws (Shari'a) as a series of prescribed activities. Hajj is comprised of main ritual elements that must be completed along with obligations that have to be performed during Hajj.

The ritual components consist of:

- Wearing Ihram (the required clothing for Hajj);
- Staying at Arafat during the 9th day of Dhul-Hijjah;
- Doing Sa'iy (striding seven laps between Safa and Marwa); and
- Circumambulating Ka'ba seven times which conclude the end of Hajj in a ritual known as Tawaf Al-Ifadah.

Missing or omitting the performance of any of the above components results in the invalidation of the Hajj. In other words, the Hajj is said to have been completed after the performance of the entire components.

In addition, the Hajj obligations that every pilgrim has to perform are;

- Ihram from (Miqat) – wearing the Hajj apparel prior to passing a particular location outside of Makkah.
- Spending a night at Muzdalifah- on the 9th day of Dhul-Hijjah.
- Throwing the prescribed number of pebbles – at particular times and locations in a ritual called Jamarat.
- Spending the nights of the days of Tashriq at Mina.
- Circumambulating the Ka'ba in farewell Tawaf.
- Shaving and shortening the hair.

Overlooking or ignoring one of the above listed obligations may not invalidate the complete Hajj but it the pilgrim who does so must make a sacrificial offering.

3.2 Time and Space Components of the Hajj

The performance of Hajj has specified times and locations. Hence, time and space becomes a basic aspect of the phenomenon. It can begin as early as the first day of the Shawwal and ends on the fourteenth day of Dhul-Hijjah (months of the lunar calendar). Despite the seemingly long duration, the major events and activities of Hajj is performed within five days from the 9th to the 13th day of Dhul-Hijjah.

In addition, Hajj is also attributed to a certain space as the performed activities are confined to particular locations in the city of Makkah. These locations are bounded by invisible religious borders according to Muslim beliefs.

A Muslim begins Hajj by travelling to the Makkah Al-Mukaramah then proceeds to perform Tawaf (circumbabulation of Ka'ba), and Sa'ih (striding several laps between Safa and Marwa). These functions of Hajj are carried out by all pilgrims on their arrival to Makkah in the Holy grounds of the Holy Mosque without any specific time.

Waquuf at Arafat refers to the pilgrim's stay on the 9th day of Dhul-Hijjah in Arafat. It is at this point that Hajj begins for the pilgrims. It is considered as the first day of Hajj and is

the stage requiring specific time and space for each pilgrim with the intention of performing Hajj. After the stay in Arafat, pilgrims make their way to Mozdalifah to collect possible for the symbolic throw to the devils in the Mina valley for the completion of Hajj rites. The most critical of the functions is the movement of millions of people and thousands of vehicles in a short duration of time.

3.3 The Hajj and other Activities

Hajj can be compared to other major sports and cultural activities – they may have certain similarities and differences. The general concept of a mass gathering and the requirement for services and accommodation is similar but the number of people and the type of services offered is different. Table 2 compares the types of activities, their physical settings along with other aspects (Alsawydani, Badarinath, & Douglas, 1995).

Table 2: Comparison between Hajj and other Activities

Settings	Hajj	Sports	cultural events
<i>Physical Setting</i>			
Time	Fixed	Pre-determined	Un-determined
Location	Fixed	Pre-determined	Un-determined
Setting	Open	Urban/Semi-urban	Urban
<i>Activities</i>			
Type	Religious	Recreational	Cultural
Duration	Fixed	Controlled	Controlled
<i>Emergencies</i>			
Occurrence	Unpredicted	Unpredicted	Unpredicted
Observation	Planned	Planned	Planned
Response	Difficult	Moderate	Moderate
Verbal Communication	Difficult	Moderate	easy
<i>Facilities</i>			
Type	Varies	Varies	Varies
Duration	Temporary	Determined	Permanent

In light of the unique characteristics of Hajj settings, incidents and required responses, it is not surprising that it differs from major sporting or cultural events in light of the following elements:

1. The open space environment of the Holy Sites,
2. The huge number of pilgrims coming from various backgrounds; and
3. The level of institutionalized response services (Alsawydani et al., 1995).

A typical sporting or cultural events call for planning and allocation of emergency resources, and responses which can be employed according to known quantities. Moreover, accident planning involves the consideration of population density, characteristics and

distribution of participants, and accessibility to road networks. Unlike sporting or cultural events, people perform Hajj activities in an open limited space environment in numbers and in constant movement. As a result, planning and resource allocation along with incident response has to be dealt with, is difficult to deal with. Difficulties in response can be attributed to pilgrims, knowledge of Participants, and to the performance itself for Participants.

4.0 The Hajj Organization and Management

Owing to the huge number of pilgrims performing Hajj yearly, heavy responsibility and obligations are placed on the Saudi government and its agencies to offer the most effective and efficient services. Keeping the safety and well being of the pilgrims and residents of Makkah is also of critical consideration while simultaneously enabling the correct performance of Hajj rites. After the unification of Saudi Arabia in 1932, Makkah Al-Mukaramah and al-Madinah along with other Holy Sites have experienced a quick pace of development and modernization. The Saudi Government has planned extensive plans for upgrading the area of Makkah for the season of Hajj. The first investment was made to secure the safety and security of pilgrims. Currently, the government has made huge investments on facilitating the arrival, transportation, feeding and accommodation of pilgrims (Ramady, 2010).

The government has given the top priority to the development of infrastructure and utilities projects in the area. The major projects and their related costs are listed in Table 3. The top priority projects involve the upgrading of the two Holy Mosques and the Sacred Places, along with the connection of utilities, roads, tunnels and infrastructures, amounting to approximately, SR156 billion (around 41.8 billion U.S. dollars).

Table 3: Projects in the Two Holy Mosques Including Utilities

Project	Total Costs (SR)
The extension and upgrading of the Two Holy Mosques including land acquisition for the extension.	71,653,212,000
The development of Mina – a project finalized by the Ministry of Hajj and the Municipality of Makkah involving tunnels, roads, water towers and automatic slaughterhouses construction, along with expropriation costs.	33,714,551,000
Municipal projects of Madinah which involves the enhancement and upgrading of roads around or leading to the Prophet's mosque.	42,324,887,000
Projects concerning Highways in the Hajj areas of Makkah and Madinah	9085302000
Total (1 US \$ = 3.75 SR)	156,777,952,000

Source: Kingdom of Saudi Arabia, Ministry of Hajj (2008)

4.1 The Hajj Management

The organization and management of the Hajj are complex and considered as an important matter of the Saudi government. Almost the entire government agencies in Saudi Arabia have a hand in the Hajj activities. Hajj management and its related activities are mandated to several committees having specific authorization for the implementation of Hajj related policies (Al-Gamdi, Al-Seriani, Mirza, & Kutbi, 1995). Every committee has independent operations connected to the higher order community. The Hajj committees comprise of several sub-committees each having the responsibility of carrying out a specific activity that is related to Hajj. The hierarchical structure of Hajj administration and control is depicted in Figure 2 with the main committees as the Supreme Hajj Committee (SHC) and the Central Hajj Committee (CHC) (Nojoom, 2005).

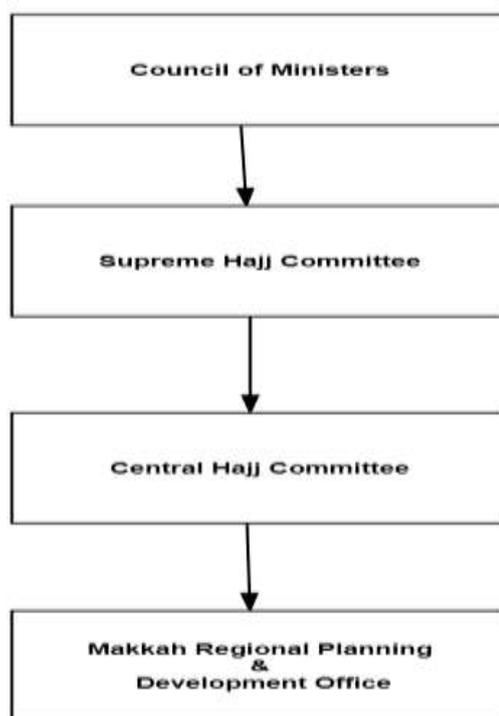


Figure 2 Hajj Management

4.1.1 The Supreme Hajj Committee

The highest Hajj committee is the Supreme Hajj Committee and is directly accountable to the Council of Ministers for the formulation implementation of policies along with financial matters. The Supreme Hajj Committee is presided over by the Minister of Interior with the Emir of Makkah as its vice president. The members of this committee include regional governors and ministers who are concerned with the provision of Hajj services and organizing the affairs of the pilgrims (Al-Gamdi et al., 1995).

The basic SHC mandate is to examine and conduct the policies listed by the Council of Ministers and to evaluate the recommendation and policies of the CHC and approve and regulate Hajj plans drawn up by the administrative organizations and operational bodies of Hajj. The Committee oversees the drafting of the annual General Hajj Master Plan, as well as the studies, proposals and recommendations brought to the sub-committee concerning the development of Hajj facilities and lays down the required arrangements for the achievement of the pilgrims' maximum comfort (Shair & Karan, 1979).

4.1.2 The Central Hajj Committee

This Committee occupies the next level of Hajj administrative authority and is presided by the Emir of Makkah, and the Deputy Emir acts as the vice president. Its members comprise of functional or operational departments and agencies of the Ministries of Hajj, Finance, Health, Commerce and Industry, Water and Electricity, Transportation, Roads, Economy and Planning, Municipal and Rural Affairs, Communications and Information Technology. The members also include the Mayor of Makkah, the General Director of Civil Defense, the Chief of Red Crescent Society, the Chief of Civil Aviation, and the General Director of Mina Project. The committee also includes other committees like the Technical Subcommittee, the Land Distribution and Allotment Subcommittee, and Hajj planning Subcommittees of Makkah, Madinah and Jeddah (Nojoom, 2005).

The main role of the CHC is to examine and approve the Hajj plans brought forward by individual governmental agencies and non-governmental bodies to form a complete master Hajj plan. The plan is submitted to SHC for perusal, approval and allocation of resources.

5.0 Holy Places

Because of the increasing population of the Muslim world, coupled with the development of transportation, the number of pilgrims is expected to increase even with the constraints of Hajj places and timing. Every year, overcrowding in the Holy Places is inevitable with the pilgrims staying in the following locations.

5.1 Mina

Mina is situated in the Southeast of Makkah. Mina, known as the tent city, is located between Makkah and Muzdalifah. It is a narrow valley about six kilometers from the Sacred Mosque of Makkah on the way to Arafat. It forms a bottle-shaped plain lying between two ranges of mountains on the north and south with a narrow entrance. It covers approximately 812 hectares within the holy boundaries, 52% of which are flat land. Mina's area capacity can be extended to accommodate 1.7-2.2 million pilgrims, with a density reaching 5,000 per hectare. The hilly part consists of steep slopes which are very difficult to develop or for pilgrims to use. Pilgrims camp in Mina for at least four days and three nights (on the 8th, 10th, 11th and 12th days of Dhul-Hijjah) (BADABAAN, 2001).

5.2 Arafat

Arafat is a plain about 20 kilometers Southeast of Makkah and it has an area of 13.9km² (1390 hectares), of which 27 hectares are built areas. The density of the pilgrims at 1,500 per hectare and could be enhanced to 2,000 to 3,000 pilgrims per hectare. Among the most crucial sites is the Mosque of Namirah with an area of 130,000 m² accommodating approximately 200,000 worshippers. The pilgrims are required to stay there by the 9th day of Dhul-Hijjah until sunset, from which they proceed to go to Muzdalifah. Staying in Arafat constitutes one of the Hajj pillars and those who fail to do so will be considered not to perform Hajj. Arafat is surrounded by several mountains from the east, to the north and south with the most famous of the ranges as Al-Rahmat Mountain where at the foot of it, the Holy Prophet, (peace and blessing of Allah be upon him) stayed during his farewell Hajj (BADABAAN, 2001).

5.3 Muzdalifah

Muzdalifah has an area of 9.25 km² (925 hectares) with a mere 670 hectares that can accommodate pilgrims while the rest are built areas. The place can accommodate approximately 3.4 million pilgrims with a density of 5000 individuals in every hectare. It is a place between Arafat and Mina where all pilgrims stop and stay for the night of the 9th day of Dhul-Hijjah after their departure (Ifadhah) from Arafat after sunset of that day in order to

pray the fourth and the last prayers (Maghrib and Isha respectively) and collect pebbles for rami at Al-Jamarat. Although the duration of stay in Muzdalifah is short (maximum one night), the activities performed in it are an integral part of the Hajj (BADABAAN, 2001).

6.0 Hajj Work Environment

Over three million Muslim men and women from more than a hundred countries gather in Makkah yearly to perform Hajj. Despite the fact that only five days are specified for Hajj performance, pilgrims normally spend a whole month engaging in prayers and rituals in both Makkah and Madinah. Pilgrims from various ethnicities, nationalities, sects and genders affirm one identity by performing one ritual and dressing in one type of garment that both stress on their equality.

On a different note, Hajj work environment requires deep analysis to provide better services to pilgrims. To this end, Saudi government agencies and departments contribute to facilitating Hajj activities and management. These agencies include General Directorate of Civil Defense (GDCD), Ministry of Interior (MI), Ministry of Hajj (MH), Ministry of Health (MoH), Ministry of Communications and Information Technology (MCIT), Ministry of Municipal and Rural Affairs (MOMRA), among others. The activities provided includes management of the following aspects: accidents, road network construction and services etc. (Kara-Zaitr). Some studies relating to these issues are discussed in the following paragraphs.

Based on the above discussion, Hajj season is characterized by the requirement of a great number of works to be carried out and efforts to be expended to create a highly complex work environment that impacts task performance. Literature reveals three dimensions of Hajj work environment that are significant to task performance and are primarily undertaken in accidents during Hajj; the number of pilgrims, Hajj time, and the Holy Sites.

6.1 Number of the Pilgrims

Hajj is influenced by two main factors which contribute substantially to the problem. First, the number of pilgrims and their origin and second is the physical, religious and specific time duration of Hajj (Abed Rabbo, Al-Shreef, Falata, Magrabi, & Khalifa, 2005). The number of pilgrims taking part in Hajj has shown a significant increase. Back in 1930, around 30,000 pilgrims came to Makkah to perform Hajj. But by 2012, the pilgrims' number has multiplied to reach 1,700,000 and to add to the issue, most pilgrims came from abroad and they join the Saudi residents in observing Hajj. The demands on emergency related services are expected to increase along with the number of pilgrims. The current statistics of pilgrims are depicted in Table 4, revealing the rate of growth for the years 1978-2012.

Table 4: Number of Pilgrims between 1978 -2012

Year	Residents	Foreigners	Total	Growth rate %
1978	1069184	830236	1899420	1.00
1979	1217169	862520	2079689	9.49
1980	1136742	812892	1949634	-6.25
1981	1063812	879368	1943180	-0.33
1982	1158000	853555	2011555	3.52
1983	1497795	1013911	2511706	24.86
1984	744807	919671	1664478	-33.73
1985	738015	851761	1589776	-4.49

1986	743757	856718	1600475	0.67
1987	658938	960386	1619324	1.18
1988	616801	762755	1379556	-14.81
1989	692435	774560	1466995	6.34
1990	817234	827236	1644470	12.10
1991	908084	720102	1628186	-0.99
1992	856138	1014141	1870279	14.87
1993	1040540	998813	2033353	8.72
1994	839169	995611	1834780	-9.8
1995	738096	1043274	1781370	-2.9
1996	784769	1080465	1865234	4.7
1997	774260	1168591	1942851	4.2
1998	699770	1132344	1832114	-5.7
1999	775268	1056730	1831998	-0.01
2000	571599	1267555	1839154	0.39
2001	549271	1363992	1913263	4.03
2002	590576	1354184	1944760	1.65
2003	610117	1431012	2041129	4.9
2004	592368	1419706	2012074	-1.4
2005	629710	1534759	2164469	7.6
2006	700603	1557447	2258050	4.3
2006*	724229	1654407	2378636	5.3
2007	746511	1707814	2454325	3.2
2008	779008	1729841	2508849	2.22
2009	699313	1613965	2313278	-7.79
2010	989798	1799601	2789399	20.6
2011	1099522	1828195	2927717	5.97
2012	1408641	1752932	3161573	7.39
Average	840613	1178640	2019086	1.97

Source: Kingdom of Saudi Arabia, Ministry of Hajj (2012)

It is impossible to determine the number of pilgrims in the future. Through the use of a conservative growth rate of less than 1% by the year 2020, the approximate figure reaches to

3.2 million (Ministry of Hajj, 2009). On the other hand, others estimate the number to reach 3 million in the coming 5 years and 5.3-7.3 million in the coming decade (Ministry of Hajj, 2009). Regulations catering to the control of the number of pilgrims in an attempt to minimize the occurrence of accidents are a political and legislative solution that should be aligned with religious norms.

As evident from the table 4, more than three million pilgrims from various cultures, languages, traditions and ethnic backgrounds come together in Makkah for Hajj. Pilgrims are classified for the purpose of forecasting in the following Fig. 3.

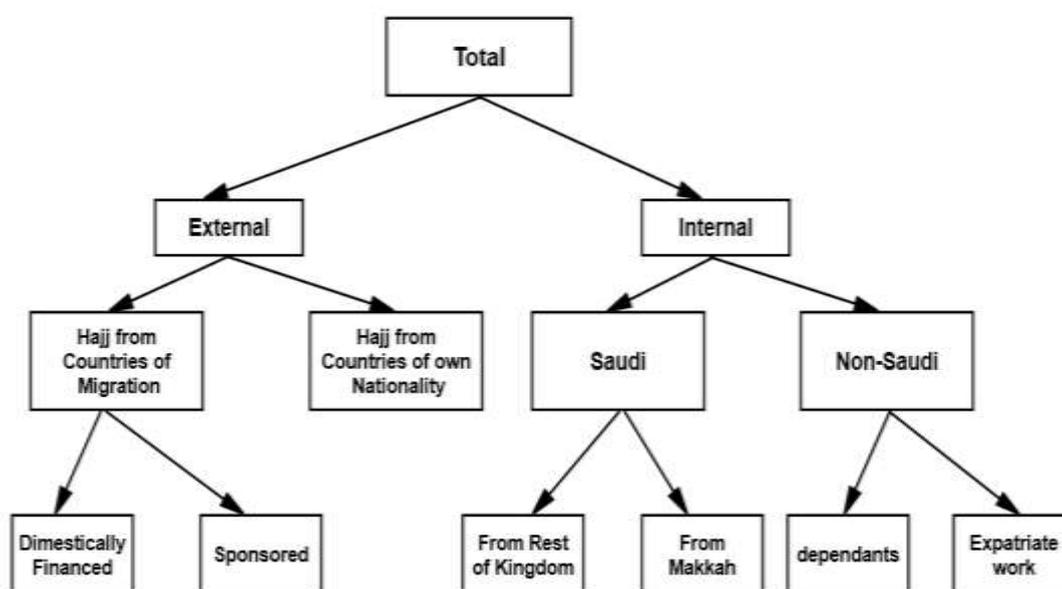


Fig 3: classifications of pilgrims for forecasting purposes

6.2 The Hajj Time

Hajj time is confined to a specific duration and locations. As such, the time and space are considered as basic aspects of Hajj phenomenon. Hajj begins as early as the first day of Shawwal (the tenth month of the lunar calendar) and ends on the fourteenth day of Dhul Hijjah (the twelfth month of the lunar calendar). This duration may appear long as it lasts for about two months and a half but the core Hajj events and activities take place in a five day duration, from the 9th day of Dhul Hijjah until the 14th. Handling the pilgrims reaching Makkah is not an insurmountable task owing to the pilgrims' non-simultaneous arrival. Upon arriving in Makkah, the pilgrims have to enter into a ritual state known as Ihram. Moving pilgrims from their arrival point to their next destination is not as challenging as they do not arrive at the same time.

Hajj comprises of a set of prescribed Islamic rituals to be carried out on particular dates at specific hours and locations in and surrounding the Makkah city. The Hajj ritual begins when the pilgrim enters into Ihram prior to going inside Makkah city. Upon entering Makkah, the pilgrim circumambulates around the Kaaba seven times in a rite called Tawaf and they have to retrace the steps of Hagar seven times between the two hills of Safa and Marwa in a ritual known as Sa'iy. On the eighth day of Dhul-Hijjah the pilgrims proceed to Mina, a site in the outskirts of Makkah where the pilgrims' camps are located for the event. On the morning of the ninth day pilgrims leave Mina and move towards Arafat. All pilgrims must be in Arafat before sunset to have a valid Hajj. They stay in Arafat from noon to sunset in what is known as the Wukuf rite. Following the sunset, they make their way back to Mina

with a stopover at Muzdalifah in a rite known as Nafrah. On the tenth day of Dhul-Hijjah, they proceed to Mina where they have to throw small stones at Jamaraat. All pilgrims are supposed to stay in until the noon of the twelfth day to stone the Jamarat on the eleventh and twelfth days. During this time they may go to Makkah and perform Sa'y. It is optional for them to stay one more day and stone the Jamarat. Performing a final Tawaf completes the rituals of Hajj. A month after, most of the pilgrims start travelling back to their countries and after three months, all the pilgrims from abroad will have left for their homeland. Figure 4 depicts the Hajj ritual step by step.

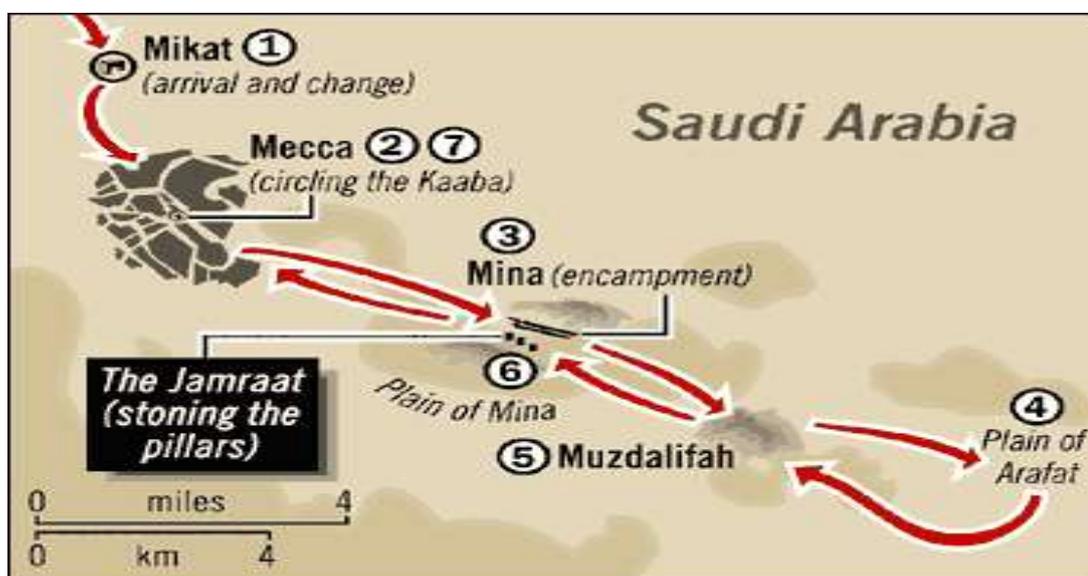


Figure 4: the Hajj Journey

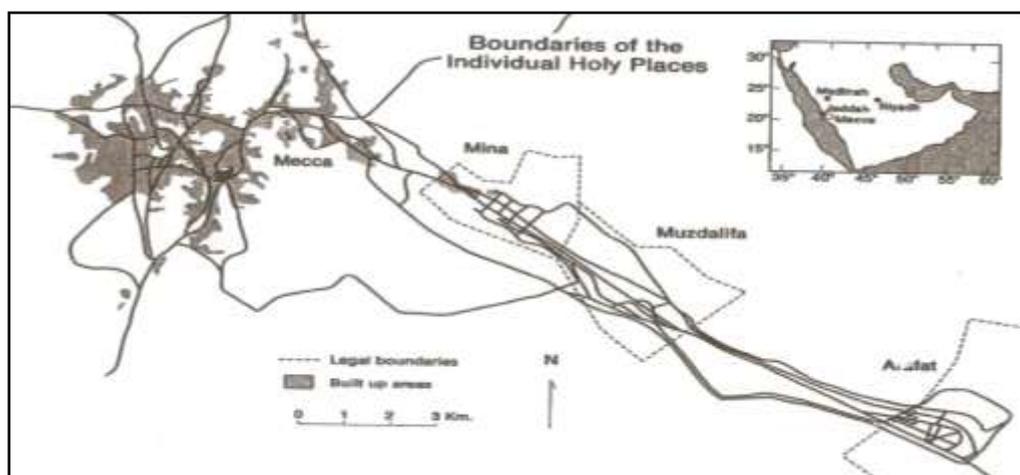
6.3 The Holy Sites

Another integral aspect of Hajj is the space as Hajj activities are performed in particular locations in Makkah. These locations are confined through religious borders on the basis of the Muslim faith. A pilgrim begins the Hajj rite by going to the Inviolable Mosque in Makkah where they perform Tawaf (circumambulating the Ka'ba). This is followed by Sa'iy ritual where they take hurried steps between the hills of Safa and Marwa. Every pilgrim has to go through these functions upon arriving to Makkah. The rituals take part in the grounds of the Holy Mosque with no specific timings.

Pilgrims are required to stop at Arafat for Waquuf in on the 9th day of Dhul Hijjah. This point marks the beginning of Hajj for all pilgrims in Makkah. It is also considered as the first day of Hajj and thus, it is the stage where the condition of a specific time and space apply to every pilgrim. Following their Waquuf at Arafat, the pilgrims proceed to Muzdalifah to collect pebbles and throw it at the symbolic devils at Mina to complete the Hajj rites. The critical aspect of the activities lies in the involvement of millions of pilgrims moving from one site to the next within a short time (Alsawydani et al., 1995).

On the basis of the Islamic law, the Holy Sites are confined by boundaries and the Hajj activities should take place within these religious boundaries. For instance, Waquf in Arafat is among the compulsory pillars¹ of Hajj. The Islamic faith predetermines the time, space and the order of Hajj activities and should be followed step by step by all the pilgrims in order to complete their Hajj rites. Figure 5 depicts the individual boundaries of sites in the Holy Places.

Figure 5 Boundaries of Individual Holy Places



7.0 Challenges in Task Performance Operations during the Hajj Season

In Hajj event management, the work is characterized as situated in an environment that is highly dynamic and complex where some significant factors arise calling for consideration. The factors that relate to organizational structure during Hajj include managerial strategies, technological infrastructure, and coordination mechanisms. The proceeding sub-sections include some of the main challenges in the task performance environment during Hajj and their justification for further study and analysis.

- The increasing number of pilgrims and their differing origin and characteristics adds to the task performance challenge faced by the GDCD officers in their attempt to minimize accidents and risks during the Hajj season. Pilgrims come from many ethnic groups and from every corner of the world bringing with them various cultures, background and languages (Al-Shihree, 2003).
- The time and space elements of the Hajj and the Muslim faith underlie the activities that have to be followed by all pilgrims in their quest to perform Hajj.
- The Hajj environment characterized by dynamism and complexity call for quick decisions that has to be immediately employed (Becerra-Fernandez & Prietula, 2006). The GDCD officers' task performance highly depends on policies and procedures in terms of communication, authority, delegation, decision criteria among other factors.
- Quick accident assessment, information integration from various sources, the capacity to formulate strategic plans of action, identification and rectification of error and the constant monitoring and feedback procedures are among the key elements that may significantly impact task performance of GDCD officers in an

¹ A pillar is an essential component of the Hajj which must be observed by all pilgrims. If a pillar of the Hajj is missed the Hajj is said to be void.

environment ripe with complexity and dynamism. According to Comfort (2007), feedback and communication from lower levels or external individuals to the chain of command occurs ineffectively.

- Emergency agencies staff comprising of public works and social services during Hajj are faced with a significant challenge in utilizing the Incident Command System (ICS) compared to GDCD departments which are more adept at the structures of command and control during Hajj (Al-Abri & Al-Mutairi, 2006).
- Participants from related agencies like the water management, electric utility, phone services, healthcare etc. may be new to the upsurge of events and are not adept at facing the task. They may be equipped with extensive knowledge and expertise in the organization they come from but they lack the experience of dealing with accident occurrences in Hajj season. Moreover, they may be new entrants to meeting and working with GDCD members (Al-Abri & Al-Mutairi, 2006). This poses as a challenge owing to the situation that calls for a high degree of interaction between the many organizational representatives in the limited time Paraskevas (2006).
- The management of Hajj environment involving various GDCD task performance is more likely to result in a high level of complexity with component, interactive and procedural rigidity. GDCD officers from multiple departments have to collaborate during the accident's occurrence. An expedient decision is called for in dangerous and stressful situations as such task performance involves risk and is susceptible to failure. To compensate for this inherent dynamic characteristic, adaptive technique should be utilized for an effective task management (Al-Abri & Al-Mutairi, 2006).

Practitioners generally depend on inefficient and ineffective approaches like the trial and error approach and the imitation approach when they are faced with operational issues (Van de Walle & Turoff, 2007). This is in the face of complex task performance processes before, during and after the event (Van Wassenhove, 2005). The tasks taken up by the task performance organizations are complex owing to the interdependence of organizations and the multitude of practitioners (Comfort, Ko, & Zagorecki, 2004). Decision-makers are faced with the challenge of flexibility and adaptability to the unfolding situation (Haeckel & Nolan, 1993).

8.0 Conclusion

Muslims from all over the world numbering millions visit Saudi Arabia to perform Hajj every year. With the exodus of pilgrims into the Holy Cities and Sites, significant changes occur in the demographic and land use in the region and in the surrounding Holy Sites. In reaction to the changes, the Saudi Government and various agencies in the country give top priority to Hajj and its related activities including expansion and development projects, provision of basic services, and infrastructure, but more important to the present study is the administrative planning and emergency services provided.

The Saudi Government has developed a complex hierarchical administrative system to provide pilgrims with services and conditions. The system comprises of different administrative levels starting from the Council of Ministers to the Makkah Regional Planning and Development Office.

The study is focused on the Holy Sites with special significance to time and space restrictions and the role of the Sites in the performance of Hajj. Also notable is the necessity of the pilgrims gathering in these Sites from 9th to 12th or 13th of Dhul-Hijjah. The hajj work environment has three dimensions that are considered critical for tasks that are generally conducted during Hajj. They are pilgrims' number, Hajj time, and the Hajj sites.

References

- Abed Rabbo, Ali, Al-Shreef, Mohammed, Falata, Omar, Magrabi, Asaad, & Khalifa, Kamal (2005). The Need for Guidance and Education of Pilgrims to the Holy Mosque in the Throwing of Carbuncles (Al-Jamarat). Makkah Al-Mukaramah: The Custodian of the Two Holy Mosques Institute of Hajj Researchs.
- Al-Abri, Ahmad, & Al-Mutairi, Khaild. (2006). Barriers and Difficulties Preventing the Movement of Fire Fighters in the Holly Sites during the Hajj Homeland Security. Makkah Al-Mukaramah: The Custodian of the Two Holy Mosques Institute of Hajj Researchs
- Al-Gamdi, A., Al-Seriani, M., Mirza, M., & Kutbi, Z. (1995). *Makkah Al Mukaramah: The Holy Capital*. Makah Al Mukaramah: Al Safa Printing.
- Al-Maqati, Safran, & Ali, Khaled. (2007). Factors Influencing the Formation of Institutions to Provide a Mental Picture of the Saudi-based Pilgrimage. Makkah Al-Mukaramah: The Custodian of the Two Holy Mosques Institute of Hajj Researchs.
- Al-Shihree, Saleh. (2003). Services and Means of Developing the Pilgrimage. Makkah Al-Mukaramah: The Custodian of the Two Holy Mosques Institute of Hajj researches.
- Al Saud, M. (2009). Morphometric Analysis of Wadi Aurnah Drainage System, Western Arabian Peninsula. *The Open Hydrology Journal*, 3, 1-10.
- AL SOLAMI, A., Al-Barakati, G., Sayed, SAS, Al-Bahloul, S., & Al-Tunsi, B. (2009). Engineering geological mapping of the holy city of Makkah Al Mukarramah, Saudi Arabia. *Engineering Geology for Tomorrow's Cities. Geological Society, London, Engineering Geology Special Publications*, 22.
- Alsawydani, S., Badarinath, K., & Douglas, D. (1995). GIS Based Emergency Management Plan for Hajj Period. *Canadian Geomatics*.
- BADABAAN, MOHAMMED. (2001). *TRAVEL BEHAVIOUR OF PILGRIMS DURING THE HAJJ*. (DOCTOR OF PHILOSOPHY), CARDIFF UNIVERSITY, Britain. Retrieved from <http://www.abahe.co.uk/cardiff-university.html>
- Comfort, L.K. (2007). Crisis management in hindsight: Cognition, communication, coordination, and control. *Public Administration Review*, 67, 189-197.
- Comfort, L.K., Ko, K., & Zagorecki, A. (2004). Coordination in Rapidly Evolving Disaster Response Systems The Role of Information. *American Behavioral Scientist*, 48(3), 295-313.
- Haeckel, S.H., & Nolan, R.L. (1993). Managing by wire. *Harvard Business Review*, 71, 122-122.
- Kara-Zaitr, C. The design and development of a Hajj Information Exchange Model (HIEM).

- Ministry of Hajj, Kingdom of Saudi Arabia. (2009). Annual report of the Hajj actions. Makkah AI-Mukaramah: Ministry of Hajj.
- Nojoom, M.S.O. (2005). The development of an information management system at the Custodian of the Two Holy Mosques Institute of Hajj Research, Saudi Arabia.
- Paraskevas, A. (2006). Crisis management or crisis response system?: A complexity science approach to organizational crises. *Management Decision*, 44(7), 892-907.
- Ramady, M.A. (2010). *The Saudi Arabian economy: policies, achievements, and challenges*: Springer.
- Shair, IM, & Karan, PP. (1979). Geography of the Islamic pilgrimage. *GeoJournal*, 3(6), 599-608.
- Van de Walle, B., & Turoff, M. (2007). Introduction. *Communications of the ACM*, 50(3), 29-31.
- Van Wassenhove, L.N. (2005). Humanitarian aid logistics: supply chain management in high gear†. *Journal of the Operational Research Society*, 57(5), 475-489.