

A STUDY OF STRATEGIES OF DISASTER MANAGEMENT IN SULTANATE OF OMAN

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Abstract

Oman is located in the Southern Eastern part of Arabian Peninsula. It is located in an Arid and Semi-Arid region where water resources are very scarce. The country population is about 2.8 million while expatriate's population is around 1.723 million. The day time temperatures are high, generally above 30 °C and seasonally above 40 °C. Rainfall is highly variable, exceeding 350 mm in the mountains, average less than 100 mm in the foothills and to less than 50 mm in the desert. The annual evaporation varies from 1660 mm/yr in the Batinah plain to 2200 mm/yr in the interior while the per capita renewable water resources are estimated to be 550 m³/person. The concept of emergency management in Oman existed for years but actual emergency management measures are relatively recent. These measures are a result of recent natural disasters that devastated the country and awakend policymakers to the importance of integrating emergency management into community development.

Keywords: Disaster, Disaster Management, *Sultanate, Oman*

Introduction

The Sultanate of Oman is an example of a rapidly growing country with a relatively new emergency management system. The concept of emergency management in Oman existed for years but actual emergency management measures are relatively recent. These measures are a result of recent natural disasters that devastated the country and awaked policymakers to the importance of integrating emergency management into community development.

This chapter will present a case study from the Sultanate of Oman, which arguably has one of the most developed emergency management system in the region. The chapter will address the hazards faced by Oman, drawing on the recent flash floodings in the country (namely Cyclone Gonu in 2007 and Cyclone Phet in 2010) and their impact in the development of the Omani national emergency management strategies. These events have also lead to the formation of the regional Gulf Cooperation Countries (GCC) Crisis Centre. This chapter will also outline the structure of emergency management in the Sultanate and how it has developed over the years to become robust and capable of handling recurrent natural disasters. The currecnt legislation in Oman regarding emergency management will be outlined. Some of the current challenges in this vital area and how the Omani government is implementing new initives to deal with them will be outlined. Finally, this case study will present some potential lessons from the Omani Emergency Management system that could be transferred to other systems in the arabian peninsula region or across the world.

The Sultanate of Oman

The Sultanate of Oman is located in the south eastern corner of the Arabian Peninsula. Its coastal line extends 3,165 kilometers from the Strait of Hormuz in the North to the borders of the Republic of Yemen in the South. It overlooks three major bodies of water: the Arabian Gulf (Persian Gulf), the [Sea of Oman](#) and the Arabian Sea (Economy 2008). Oman borders Kingdom of Saudi Arabia and United Arab Emirates in the West, the Republic of Yemen in the South, the Strait of Hormuz in the North and the Arabian Sea in the East.

The total area of the Sultanate of Oman is approximately 309.5 thousand square kilometers. The Sultanate is composed of varying topographic areas consisting of plains, dry river beds and mountains. The most important area is the plain overlooking the [Sea of Oman](#) and the Arabian Sea with an area of about 3% of the total area. This area is the most densly populated area in the country with rapid growth and industrialization that creates a challenge for emergency management. The mountain ranges occupy almost 15% of the total land of Oman. The remaining area is mainly dry river beds and desert (about 82% of the total area).



Figure 1: Sultanate of Oman

Hazards in the Sultanate of Oman

For planning purposes, hazards are divided according to their source into two broad categories: human-made hazards and natural hazards (Sundnes and Birnbaum 2003). Human-made hazards are hazards created by humans themselves unintentionally as a by-product of civilization activities (e.g., building a chemical factory next to a residential area) or intentionally (e.g., declaring a war against a neighboring country). Natural hazards are hazards imposed by the force of nature on humans such as the hazards from the geographical location of the country. The distinction between the two categories is arbitrary and, in reality, hazards overlap and have elements from both sources.

Human-made hazards in Oman

Since 1970, when Sultan Qaboos Bin Said (the current Sultan of Oman) became ruler, rapid modernization swept the country. In 1970, only 11% of the country was considered urban. By 2005, it was 79% and is projected to be 86% by the year 2030 (Peterson 2004). A rapidly growing number of Omanis are leaving rural areas to live in the coastal areas around the [Sea of Oman](#) and the Arabian Sea (as the coastal cities are more modern and job opportunities are more available than inner cities). This movement of people from rural to urban areas increases the demand from fast growing cities such as the capital city of Muscat where 30% of people are concentrated in a land that is only 1.2% of the total country's area (Economy 2008). This rapid modernization and dramatic city development means that more people are being exposed to hazards of newly growing cities. One evident example of such a

phenomenon in Oman is the case of Sohar Industrial City. This industrial city is built in a coastal residential town (i.e., Sohar) that was turned into a major industrial hub for international corporats within few years. This rapid industrilization of Sohar is not matched by development in infrastructures such as health care system in the city. This mismatch between the industrial modernization and the infrastructure development exposes the people living in the Sohar to a group of safety and health issues(Al-Kindi, Marikar et al. 2009).

It is incomplete to discuss human hazards in Oman without mentioning that national top endemic hazard - road traffic crashes. Annually there are aproximately 10,000 crashes in Oman, causing an average of 700 direct deaths and 8,000 direct physical injuries(Al-Lamki 2010). This is a serious hazard that is another manifestation of rapid modernization and complex behavioural changes of people in Oman that follows urbanization processess (Peterson 2004). This hazard is multifaceted. It has elements of industrial and structural factors such as the safety features and physical composition of cars coupled with behavioural risks of drivers such as the widespread use of mobile phones while driving. The magnitude of the problem in Oman is beyond comprehension and has been relected in the Sultan's annual speech when he pleaded for the people of Oman to act together to reduce such "national epidemic and crisis". The have been many large road traffic crashes with mass casualties that fit the crateria to be regared as "national disaster." In one incident in 2006, 23 people died and 9 were injured in a bus crash that required a national-level emergency response. Another emerging human-produced hazard, which could be become potential evident in the future, is the security issues of Oman from the two unstable neighbouring countries, namely the Islamic Republic of Iran and Yemen.

Currently, Oman entertains good diplomatic relationships with both of them. Nevertheless, the unsettling situation in the south of Yemen could create a hot spot for extremists and radicals that have been recently reported to cross the border of South Oman illegally and vandilized farms and properties. These repeated events could spark a complex emergency in the border area between Oman and Yemen. On the other hand, the continuous global debate over Iran's nuclear development and enrichment program is another focal issue in the North of Oman. The Gluf Countries including Oman are still viewed by the Iranian ruling government as "Friends of the Americans and the West". Clearly, if the relationship between the the United States and Iran deteriorates any further, the Gulf countries including Oman might be the closest target for Iran to hit American interests in the region. These security issues are complex and details of such hazards are beyond this chapter. In short, Oman has developed rapidly in recent years and as a result many human-related hazards have surfaced due to changing in societal structure. Furthermore, other hazards facing the country are a result of the change in international and regional diplomatic dynamics. These factors have to be taken into consideration in planning and implementation of emergency management strategies in the Sultanate of Oman.

Natural hazards in Oman

The geographical location of the Sultanate of Oman in the eastern most side of the arabian peninsula exposes the country to multiple natural hazards. The two main important natural hazards are eathquakes and tropical cyclones leading to flash floods.

Earthquakes:

Tectonically, Oman sits on the South-Eastern part of the Arabian plate. The Arabian plate is one of the youngest plates that make up the surface of the earth. The plate comprises a crystalline basement of Precambrian continental crust about 40-50 km thick. The crust itself overlays a basement of sequence of younger Phanerozoic sedimentary rocks that range in thickness from zero to 10 km. This crust sits on top of the basalt and oceanic basin (Bowring, Grotzinger et al. 2007). The separation and splitting of the Arabian Plate from the African Plate along the Red Sea and the Gulf of Aden axes followed by drift of the Arabian Plate to the north and northeast, lead ultimately to a collision with the Eurasian plate that resulted in the formation of the Zagros fold belt. The Zagros fold belt is the major source of earthquakes in the eastern border of the Arabian plate and Oman. These fault systems affect only the North of Oman with the south being spared from any appreciable tectonic activity. The figure below depicted the major tectonic systems and their vicinity to the Sultanate of Oman.

The south of Oman has very low seismic activities. In contrast, the northern portion of Oman has a moderate to high seismic activities that warrant special attention and could potentially impact on wider population as shown in graph three.

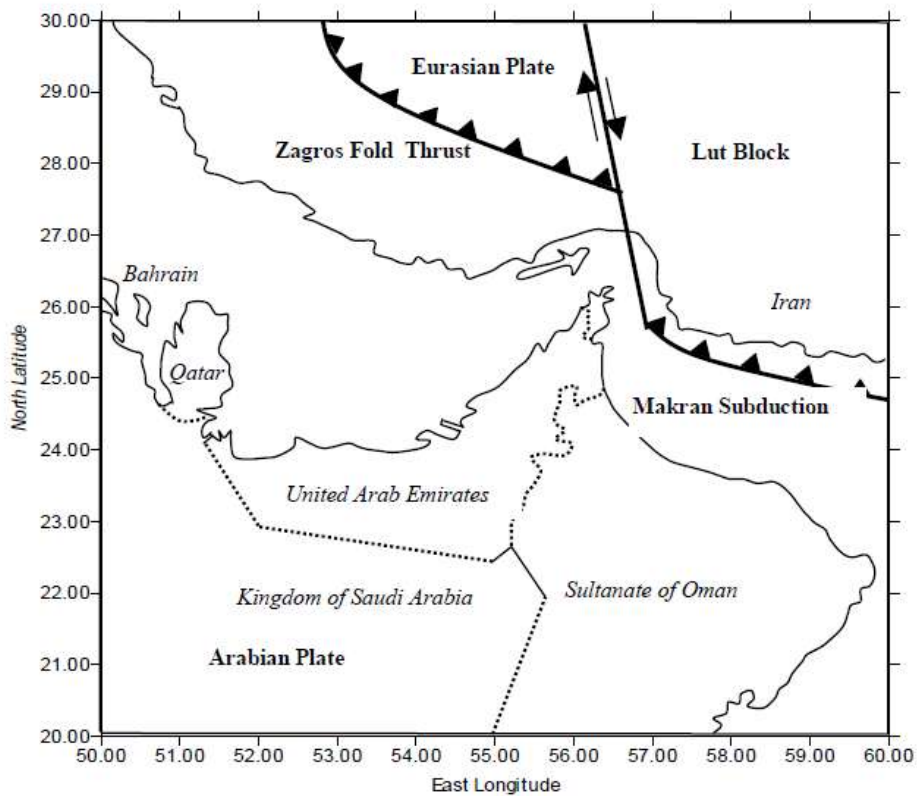


Figure 2: Tectonics of the North Oman

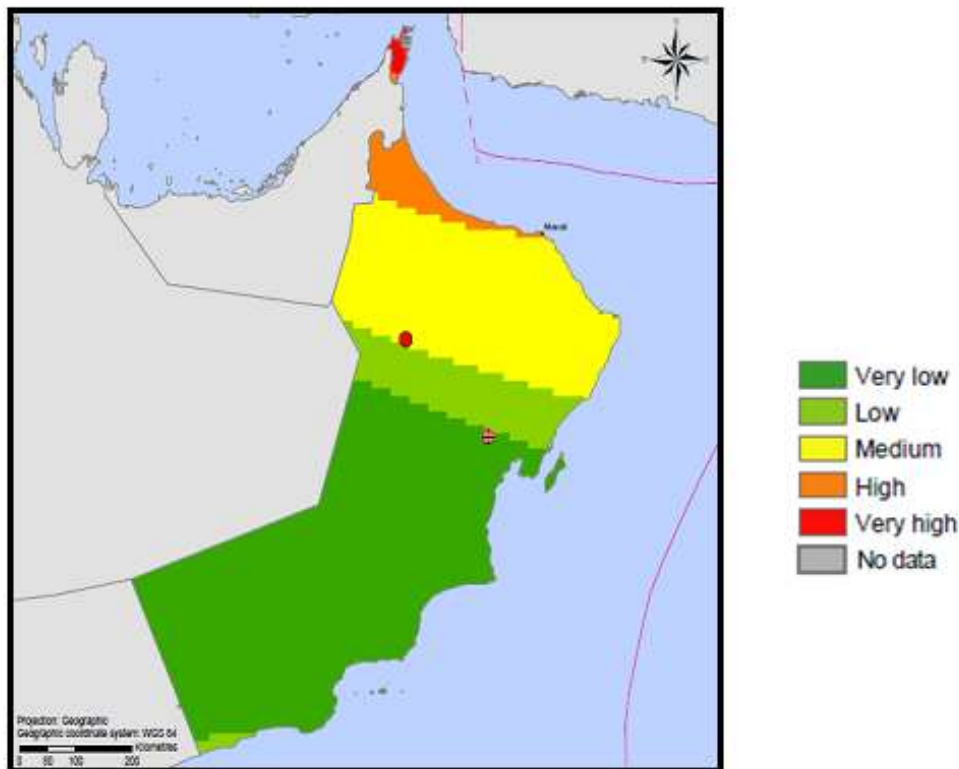


Figure 3: Seismic activity in Oman

Tropical cyclones:

Tropical cyclones in Oman are frequent events during the monsoon season from May to August every year. The cyclones themselves are considered low-risk events but they cause terrestrial rains that frequently lead to flash floods. The human distribution in Oman tends to concentrate around water banks and this increases the exposure of the population to the impact of flash floods (Ministry of Regional Municipalities and Water Resources 2009). Adding to the problem is the poorly managed drainage system in many cities in Oman so any small increase in rainfall will cause major flooding (Ministry of Regional Municipalities and Water Resources 2009). For instance, in 2007, tropical cyclone Gonu caused a 24-hour terrestrial rain which was estimated to be 27 times more than the annual rainfall of the country (Al-Shaqsi 2010).

As can be seen, the northern portion of the country is more at risk to natural hazards than the south. The sultanate of Oman is mainly exposed to seismic hazards and tropical cyclones, while the southern portion of Oman is exposed more to political instability and potential human-made conflicts.

Vulnerability in Oman

It is difficult to exactly quantify the vulnerability of populations in Oman. However, there are many factors that have been observed to exacerbate the vulnerability of people to disasters. Some of these factors include, living in industrial areas, low community awareness of risks and hazards, being an expatriate working in a construction industry, and living in rural areas.

As alluded to previously in this chapter, there are several rapidly growing industrial cities in Oman that attract many people to move to them from rural areas for the sake of job opportunities. However, the degree of preparedness of such cities to handle emergencies and crises lags behind the rapid pace of industrialization. Furthermore, the basic services in most industrial cities are not designed to cater for the rising density of workers which further increases the vulnerability of people living in such cities.

Observations from recent disasters in the country highlight the inadequacy of community awareness about the local risks and hazards. Many people do not appreciate that a flash flood caused by a cyclone is different from just a “ heavy rain.” During cyclone Phet in 2010, seven people were killed because they did not appreciate the sudden nature of flash floods and were spectators standing on river banks.

Modernization in Oman has driven a workforce of expatriates to work in the construction industry. Like all other Gulf countries, the majority of expatriates in Oman are from the sub-indian continent. The living conditions of these people are a major contributor to vulnerability. These people tend to live in un-enforced and temporary housing blocks that are usually made of light wooden material and located on construction sites. This style of temporary housing cannot withstand rainfalls, severe winds, storms, and floods. Another issue that clearly impacted this minority group during the recent cyclone, is the language barrier. All civil defense messages during cyclone Gonu in 2007 were in Arabic and English which are not the main languages among the expatriates construction workers. It is striking to know that 57% of fatalities during cyclone Gonu were expatriates construction workers who were living in temporary caravans next to river banks that were washed away by the flood. This problem has been rectified during the response to cyclone Phet when the civil defense messages were broadcasted in seven different languages.

Rural areas are a particular challenge for emergency management planners in Oman. The geographical isolation, the widespread of rural populations, and the sparse distribution of basic community services makes the provision of emergency readiness activities a tough task. There have been many major mass casualty incidents in rural areas that clearly stretched the national emergency management structure. For instance, a bus crash in 2004 in a rural road in the middle of the night, delayed notification and response to this particular incident. Special rural emergency management considerations has to be taken into account. In summary, the vulnerability for disasters in Oman is multidimensional and emergency planners should be vigilant to such factors and address them adequately.

Disasters in Oman

The record of disasters in Oman is sketchy and poor. A recent systematic review of the International Disaster Database by the Centre for Research on the Epidemiology of Disasters (CRED), School of Public Health of the Université Catholique de Louvain (UCL) in Brussels, Belgium, found that the country has a history of tropical cyclones almost once every three years (see table below). Some of the most known natural disasters include:

- A major **country wide flood** in 1977. This flood is the first recorded natural disaster in Oman’s modern history. It caused major destruction in wide areas of the north of Oman. This flood killed 105 people and directly injured over 5,000 others. It is still regarded as the “worst disaster” in the history of Oman.

- **Salalah Floods** in 2003 caused major disruption of life and services in the south of Oman. Unprecedented torrential rains during the monsoon season lasted for two weeks. This was coupled by poor drainage and flood control system in the city lead to flash floods which claimed the lives of 30 people.
- **Cyclone Gonu** in 2007, was the stimulus for modern emergency management structure in Oman. It brought the country to a standstill for a week. This disaster will be discussed in details later in the paper.
- **Cyclone Phet** in June 2010 which caused damaging flash floods and claimed the lives of 24 people and affected 10,000 others.
- There have also been a few man-made disasters in the country but their record is very unreliable. Some of these disasters are:
 - A **bus crash** in 2004 on the road between Nizwa and Salalah cities. This crash happened at mid-night and claimed the lives of 24 people and injured 8 others. The armed forces had to be called in to evacuate the dead and injured as the crash site is very remote from any proper services.
 - A **building collapse** in 2008 in the capital city of Muscat killing two people. This event was the first to activate the search and rescue national team after its inception in 2007.
 - A few **civil disobedience events** in especially in 1995, 2000, and 2005. These events were reminders that internal disasters could also include civil unrest.

EMERGENCY MANAGEMENT LIGESLATION IN THE SULTANATE OF OMAN

There are two laws that regulate emergency management in the Sultanate of Oman. The first is the Civil Defense Law that was instituted by the Royal Decree 76 in 1991. The second is the State of Emergency Law, which was outlined by the Royal Decree 75 in 2008. Here is a translated description of these two laws with a specific emphasis on the articles that directly outline emergency management operations in Oman.

Civil Defense Law (Royal Decree 76/91): Section one of this law clearly recognizes “Civil Defense” as a Directorate in the Royal Oman Police structure and is headed by a Director General appointed by the Sultan of Oman Himself. In this section, a collection of terms are presented such as the definition of Civil Defense and a State of Emergency. The law also referred specifically to the value of volunteers and defined them as “anyone who steps in by invitation or self-volunteering to help during a national crisis time” (Royal 1991). It is interesting to note that the Civil Defense Law in Oman identified the role of volunteers in emergency management from the early days of emergency management in Oman.

Section two of the Civil Defense Law outlines the measures that Civil Defense should take to achieve the goals of the civil defense operations. These measures include:

1. Proper planning to ensure the safety and security of all people in Oman during the time of emergency.
2. Establishment of evacuation plans for affected areas and rescue the impacted population.
3. Establishment of a mechanism to assess and monitor the radiological hazards in the country.
4. Establishment of national teams for search, rescue and medical care provision during emergencies with defined standards and protocols.
5. Establishment of a national plan to ensure the functionality and backup for all communication systems in the country during a national emergency.
6. Establishment of a national warning system for all-hazard emergencies and designate evacuation zones in all main populated areas.
7. Stockpiling of essential consumables and items required for national emergency response.
8. Establishment, training, and upgrading of national assistance teams ready to be deployed during emergencies.
9. Initiation of a Memorandum of Understanding with the media to increase the awareness of people in Oman to the hazards and the preparedness measures the public should engage into to effectively mitigate, prepare and response to emergencies.

This section therefore outlines the broad goals of the Civil Defense that are common in any civil defense system. However, it is interesting to note that the regional political system at that time influenced this law with a clear emphasis on radiological hazards, as this was a serious threat after the first Gulf War in 1991. Another unique issue alluded to by this section is the importance and need to establish volunteer-based assistance teams to augment the civil defense operations. This issue is very central to contemporary disaster management around the world and lessons from Haiti draws the global attention to the value of proper national level volunteer-based assistance teams (Ivers, Cullen et al.). Currently there are no assistance teams in Oman and the experience from Cyclone Gonu and Phet highlighted again the urgency to establish such teams. The royal orders in 2010, after the review of Cyclone Phet response, call for prompt action in this direction especially the urgency and need to establish the Omani Medical Medical Assistance Teams (OMATs).

Section three of the Civil Defense Law delineates command during an emergency and it gives the authority to the Chairman of the National Committee for Civil Defense to be the Commander of the national response (Royal 1991). This section also gives the authority to the National Committee for Civil Defense to override the normal national laws and regulations in order to save lives and preserve property during emergencies. It allows the Chairman of the NCCD to institute any measure to achieve the mission of the committee during a national emergency response. However, this authority and power of the NCCD chairman has to be endorsed by all members of the NCCD.

Section four of the law recognizes the privileges, financial reimbursement and support for volunteers during national emergencies. The Royal Oman Police is to be the responsible agency to establish, train

and assess national volunteer teams. The teams' financial support should follow the Civil Defense salary guidelines. For example, a medical doctor working for the ministry of health that gets deployed to a disaster management mission should be reimbursed for the work done as if he is employed by the civil defense. This regulations provides the incentives guidelines for all people to participate in emergency management missions when required.

Interestingly, article 9 specifically states that it is the responsibility of the Civil Defense to assess health care facilities preparedness to receive victims of national emergencies. This clearly gives the Royal Oman Police an over-arching power to audit the governmental health care preparedness. Article 13 of this section indicates that all governmental departments can request material and logistical support from the Civil Defense to enhance their preparedness. Finally, article 18 of this section outlines that it is paramount to teach civil defense and disaster management skills to all people in all levels of education in Oman including, schools, polytechnics, universities and colleges. The current reality in Oman is that there is no teaching of civil defense or disaster management skills to the public.

State of Emergency Law (Royal Decree 75/08): This law is perhaps a result from the lessons learned from Cyclone Gonu in 2007. The Civil Defense law alluded to above was the governing law of emergency management in Oman before the inception of this law. Following are the main sections of the Law.

Section one outlines the process of declaring a "State of Emergency." It clearly states that the Sultan of Oman is the one to declare a "State of Emergency." The Sultan's declaration should include the reasons for the declaration and the extent of the declaration. It is the responsibility of the National Security Council to advise the Sultan about the initiation, extent, and termination of the "State of Emergency." The Sultan of Oman is the ultimate commander of the national emergency response in the country. This authority is clearly stated in the foundation document of the Omani Law. Article 42 of section 1 in the White book: the Basic Law of the Sultanate of Oman, states that one responsibility of the Sultan is to "declare a State of Emergency, general mobilization, or war and making peace in accordance with the Basic Omani Law".

Section two outlines the authorities and powers of the National Security Council during an emergency. This includes imposing curfews as required, determining the functions of government agencies during emergencies, controlling communication modalities in the country for security purposes, making decisions on evacuations and the command of responders or any other government and non-government personnel to carry out specific tasks to help in the emergency response.

Section three states that the operational arm of the emergency response in Oman is the responsibility of the Royal Oman Police unless ordered otherwise by the Sultan after consultation with the National Security Council. The armed forces are not to be involved in operations of emergency responses unless directed by the commander of the armed forces (i.e., the Sultan of Oman). This section therefore reflects the heavy involvement of the Royal Oman Police and specifically the Civil Defense Directorate in emergency response in Oman.

Section four outlines the regulations during civil unrest that are considered during an internal emergency. This section also refers to the role of the National Security Court in such emergencies. This section could be seen in response to one event in 2005 in which a small group of Omanis were charged with acts of plotting and planning a national unrest(2010).

In summary, there are two main legislations in Oman outlining the emergency management. The laws delineate that the Commander for national-level emergencies is the Sultan Qaboos with assistance from the National Security Council. The operational arm of the emergency response is the Royal Oman Police and the National Committee for Civil Defense with its 20 governmental representatives. The laws also highlight the importance of training, education, public awareness and volunteerism during emergencies.

Lessons from emergency management in Oman

There are many lessons that can be learned from the Omani experience. These lessons are by no means new to the field of emergency management, but it is critical to learn from previous experiences and not to “reinvent the wheel.” The lessons from the Oman can be summarized in the following points:

The change in global hazards has slowly been appreciated in Oman and the region. The region is well known for human-made disasters but natural disasters are used to be sporadic and that led to a period of complacency. However, this is changing and natural disasters are becoming more frequent and more damaging. It is costly that policymakers in the region wait for such devastating events to decide to act and enhance emergency management measures. This situation is not exclusive to Oman, but the same issue has happened in the Kingdom of Saudi Arabia after the Jeddah Floods in 2009. It is critical for nations to be proactive about disaster management rather than learning the hard way after a disaster.

The concept of emergency management has to be integrated into the developmental process of the nation. Oman as a country is developing too fast and emergency management is lagging behind because it is still – in many ways – not appreciated as an integral part of development process. This could lead to ineffective reactive approach to hazards. Many industrial cities in the country are booming with huge factories and their potential risks and hazards have not been adequately addressed. In simple terms, emergency management measures have to be integrated into the development of infrastructures to be effective and for the development process to be safe for people. Unless emergency management is regarded as a core developmental process by policymakers then complacency will prevail. Emergency management as a reactive strategy to disaster is never effective and is a recipe for failure.

The current structure of National Committee of Civil Defense does not include any representatives from private sectors in the country nor does from non-governmental organizations. The role of private sector in emergency management has been neglected in Oman for a long time. For instance, some would argue that the response of Petroleum Development Oman to Cyclone Gonu was by far more prompt and adequate than the governmental response(2010). This is because the company regards emergency preparedness as a core value in its mission. Therefore, integrating such local private expertise and resources into the national emergency management will be valuable.

Successful emergency management systems have mixed centralized and localized approach to resources. It is essential to have a centralized command structure, but it is equally critical to have well-resourced localized depots. One of the main lessons learnt from recent floods in Oman is that centralized storage and stockpiling of resources is limited and dependent on adequate roads and transportation. It is crucial to have redundancy in resource outlets around the country rather than having one huge store that can be damaged or flooded and then render dysfunctional.

Disasters are destructive events that endanger the basic needs of humans. It is important that nations such as Oman do not get the illusion that emergency management systems are about expensive high technology measures. Rather, successful emergency management systems are based on ensuring the “basics of life” such as food, water, shelter, and electricity. During Cyclone Gonu, many hospitals in Oman sat up Intensive Care Units to provide technology-dependent high-cost medical care and unintentionally neglected the basics. However, the victims were all seeking basic needs such as food, clean water, and shelter. It is a lesson for all countries to focus on the basics, as successful disaster management relays on ensuring human basic needs are met adequately.

The emergency management legislation in Oman existed for years now but the implementation of some sections is still lagging behind. Things such as including civil defense skills in school curriculum are clearly embraced by the law but nonexistent in reality. As the law itself is important so is the enforcement of the law. There is a need to have an independent body of the government to assess and evaluate the extent to which all government agencies engage in emergency preparedness activities.

There are still questions of who should run the emergency management system. The Police are in charge in Oman and this has its own advantages such as a clear line of authority and command. However, issues such as the appropriateness of the Royal Oman Police in assessing health care preparedness, for example, is debatable (as police do not usually have the technical expertise to assess health care needs and preparedness to disasters). The bottom line is that each nation should decide on what best suits the local context.

Conclusion

This case study of emergency management in Oman highlights the urgency to integrate emergency management measures in core community development projects. Modernization and development of communities has to be accompanied by robust emergency management structure to ensure that natural and human-made hazards are assessed and managed adequately. It is time to move away from reactive operations of emergency and disaster management to more active and anticipatory activities. It is critical to appreciate that emergency management does not happen on the day of the emergency rather, it should be a well-planned process ahead of the disaster. Emergency management is never an easy task. It has been and will always be a complex process involving multiple players that have to act as one team aiming to achieve one goal during a disaster. Coordination and cooperation are central to successful emergency management. The coordination has to be inclusive of all community services and agencies, governmental and private. Emergency management in Oman is moving in a right direction with a good pace. The challenge is to keep improving continuously because if the process slows down it means development in the community has decelerated and complacency will prevail.

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