

A guideline for implementing major elements of EWS in the Arab Region: case studies in the UAE

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Abstract

The Arab region's coastal zones are of immense importance. Almost all Arab countries need to build up resilience for vulnerable communities and carry out proactive planning for integrated coastal zone management and the development of early warning systems for vulnerable coastal areas. It is clear, through the analysis of past natural disasters that the links between the four elements of EWS – risk knowledge; monitoring and warning service; dissemination and communication; response capability – are weak, leading to a reduced effectiveness of the system. The focus was on the development of technology, more than on members of the community at risk. There was also weakness in institutional cooperation, one of the main challenges in early warning. This problem has encouraged the researcher to propose a guideline for the early warning of natural disasters and increase its effectiveness by involving members of the community and improving institutional cooperation between stakeholders. The objective of this paper is to identify and assess some of the main areas vulnerable to sea level rise in the Arab world. A survey of case studies in the UAE for of Emergency and Public Safety Department is undertaken. The main objectives are to identify vulnerabilities from coastal flooding; assess adaptation measures and point out the urgent need to build up institutional and human capacities in response to the problem; identify gaps, points of strength and points of weakness in early warning and discuss options for adaptation and the need for implementing major elements of the EWS.

Keywords: early warning, natural disasters, community, preparedness, vulnerable, guideline, coastal zones.



1 Introduction

The Arab region consists of 22 countries who are all members of the League of Arab States (LAS), 10 in Africa and 12 in West Asia (El Raey [1]). It enjoys extended coastal zones on the Mediterranean Sea, the Red Sea, the Arabian Gulf and the Atlantic Ocean where large percentages of the population live in a number of highly populated cities along the coast. In addition, the growth of populations and tourism in coastal areas has been well observed (Massoud *et al.* [2]). Figure 1 gives an overall view of the size of populations at risk of impacts of climate change in the area.

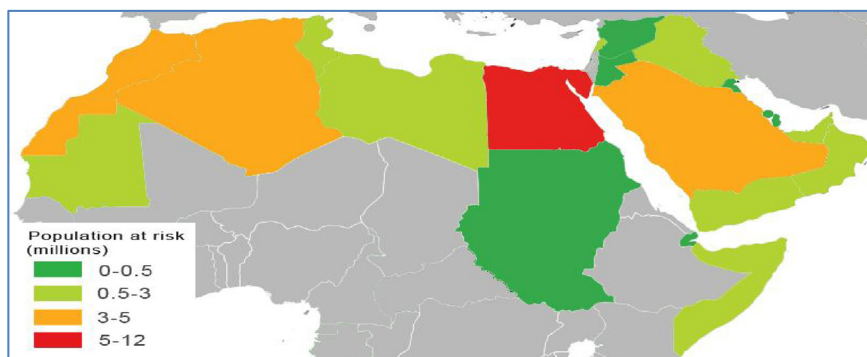


Figure 1: The Arab world indicating population at risk by change in colours (El Raey [1]).

According to recent results of World Bank studies (Dasgupta *et al.* [3]), individual Arab countries will be affected differently under various sea level rise scenarios. Qatar, the UAE, Kuwait, and Tunisia are most vulnerable in terms of their land mass: 1 to 3% of land in these countries will be affected by a 1 m SLR. Moreover, Egypt's economy is by far the most vulnerable: for SLR of 1 m, more than 6% of its GDP is at risk, which rises to more than 12% for an SLR of 3 m (El Raey [1]).

The UAE faces various socio-technical challenges: Firstly, the role of communities within EWS is not clearly defined. Also, members of the community are uninformed and unaware of federal plans and, as a result, do not know the procedures to be carried out on receipt of early warning signals. Dhanhani [4] has highlighted how the lack of an end-to-end and people-centred approach on EWS results in low levels of preparedness and a general lack of knowledge regarding emergency management plans. Secondly, the UAE has a huge expatriate population who do not speak Arabic. The presence of other languages, such as English, Persian, Hindi, and Urdu create significant communication challenges. As identified by Al Ameri [5], there are significant weaknesses in the transfer of understandable warning messages and preparedness information to those at risk and there is no networking and communication among all stakeholders.

2 Methodology

In this paper, case studies will be discussed. In the UAE, in relation to the Phet storm (2010) in the town of Sharm, a survey was conducted on a sample of 100 employees in the Emergency and Public Safety Department. They were selected civil defence employees, working in the Emergency and Public Safety Department, from different backgrounds. The researcher followed the certified approaches and frames, in selecting the sample. A questionnaire was prepared and administered by personal interviewers using a random sample of 100 persons. Although this sample is not statistically significant, it is considered sufficient to provide broad indications of major directions. A supplement to the questionnaire was supplied, explaining the problem, in order to upgrade awareness among vulnerable groups.

3 Case study in the UAE

In 2010 strong south-easterly winds brought the Phet storms. Lightning and heavy rain caused flooding in the town of Sharm. The relief operation, conducted by the Fujairah Civil Defence and Fujairah Police, was broadly effective. However, there was a lack of EWS and appropriate logistic support, reflecting the need for a better monitoring and warning service, and better dissemination and communication as part of the early warning system (personal interview Fujairah Municipality 2014).

3.1 Location

Sharm is a town located in the northern part of the Emirate of Fujairah. It is located at 25°28'7"N – 56°21'37"E, about 20 km from Dibba and 50 km from Fujairah City. Sharm overlooks the Indian Ocean coast (see figure 2), and lies on the eastern part of the Arabian Peninsula. The population is approximately 2500 and the total number of houses about 120 (Fujairah Statistic book 2007 [6]).

3.2 Description of the disaster

The UAE Ministry of Interior closed the Fujairah Corniche to avoid any risks to visitors that may have arising from the hurricane. Witnesses in Sharm reported that rainwater flooded the Corniche Park and surrounding areas (Alzjeri [7]). Looking at water concentrations in several areas, they were concerned that losses would occur similar to those left by the passage of Cyclone Gonu in the region in June 2007. The Director General of Civil Defence oversaw coordination between the municipality, the police and Red Crescent Societies. The Abu Dhabi Police rescue unit was stationed in Fujairah for three days in case of any emergency (Alzjeri [7]). The Director General said the water reached the streets of the Sharm area and damaged the municipality. He added that the competent authorities took all measures to restore normality, reassuring parents that they will not face problems with transportation and schools. The National Centre for



Figure 2: Location of Sharm (Dhanhani [4]).

Meteorology and Seismology predicted high waves on the east coast of the state inundating low lying areas the nearby streets of Sharm Beach (see figure 3). The Phet storm created serious problems as people lost their land, their crops and their boats, the very basis of their livelihoods. Around 30 houses, 2 mosques and 10 farms, and more than 10 cars were damaged. Roads to Dibba and KhorFakkan were cut off. Many cars and houses in Sharm and the major road from the Dibba and Fujairah were under more than 1 m of water, forcing hundreds of motorists to abandon their vehicles and seek safety on higher ground. Debris and mud were deposited in streets and all people were evacuated from their houses which suffered considerable damage. The flood affected more than 50 families in different parts of Sharm town. It washed away tens of hectares of land and damaged property worth more than ten million dollars. Because of the low gradient in the lower region, inundation was widespread and long-lasting in Sharm, flood waters disrupted roads and services in the town (figure 3).

3.3 Role of the Emergency and Public Safety Department in enhancing early warning system capacity to encounter natural disasters

According to the previously explained four components of an early warning system; the fourth stage is responding to a crisis in which concerned state agencies are responsible for the vital role of protecting peoples' lives and properties, and restoring normal status. Therefore, the researcher paid attention to explain and study of Emergency and Public Safety Department in Fujairah. He



Figure 3: Pictures (a) and (b) show the Phet storms which hit the coast of Fujairah in 2010 and caused considerable material damage. Picture (c) shows a car stuck in the flood caused by the storm and (d) shows some of the children who are using boats in their homes (Alrams [8]).

picked a random sample of personnel to measure their level of understanding the directorate's role and employees' awareness and comprehension of the early warning systems.

3.4 Analyzing field survey results on a sample study of the Department of Emergency and Public Safety

The study was conducted on a sample of 100 civilians in Abu Dhabi Emirate. They are selected civil employees, working in the Department of Emergency and public safety in the General Directorate of Abu Dhabi Police, from different classes and environments. Researcher followed the certified approaches and frames, in selecting the sample study. The analytical results are as follows:

Table 1: Percentage of males and females selected for the sample study.

Gender	Male	Female
Percentage	50%	50%

Individual's and families' experience of natural disasters impacts	Yes	No
Percentage	36%	64%

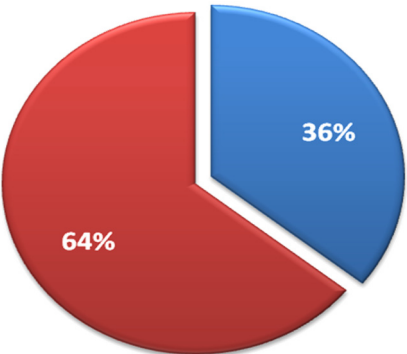


Figure 4: Individuals' and families' experience of natural disasters impacts.

The study showed that 50 persons from the study sample; they or their families have had previous experience with natural disasters, and none of them suffered from any harm or injuries. While 50 persons (64%) from the sample showed that they and their families do not have any previous experience with natural disasters. 2 persons, from the study sample, showed although they do not have any experience with natural disasters yet they are aware of some damage of it.

Receiving instructions about natural disasters	Yes	No
Percentage	50%	50%

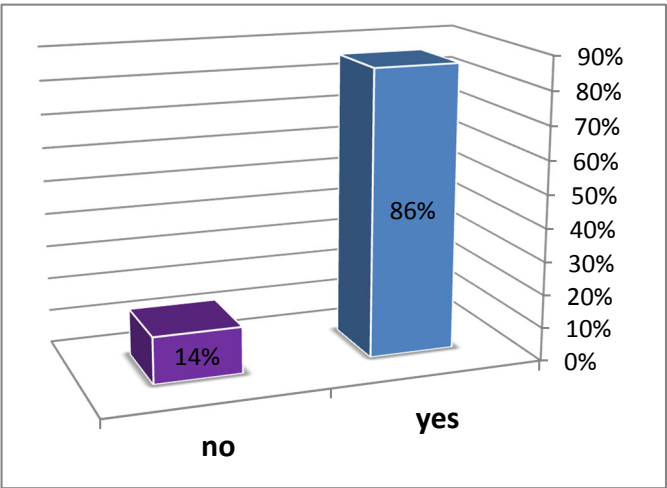


Figure 5: Receiving instructions about natural disasters.

The study showed that the percentage of those who received instructions about natural disasters is equal to those who did not. The actual number is 7 persons 50%

How do you receive an early warning for a hurricane?	Never	SMS	Mail	Phone
Percentage	57%	29%	7%	7%

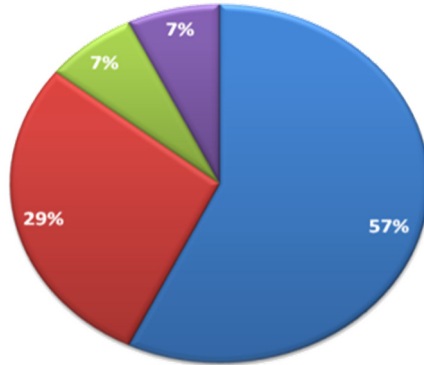


Figure 6: How an early warning for a hurricane is received.

The study showed that 80 persons (57%) do not receive any early warning for the hurricane. While 40 persons (29%) receive the early warning via text

Emergency plan knowledge average	Yes	No
Percentage	7%	93%

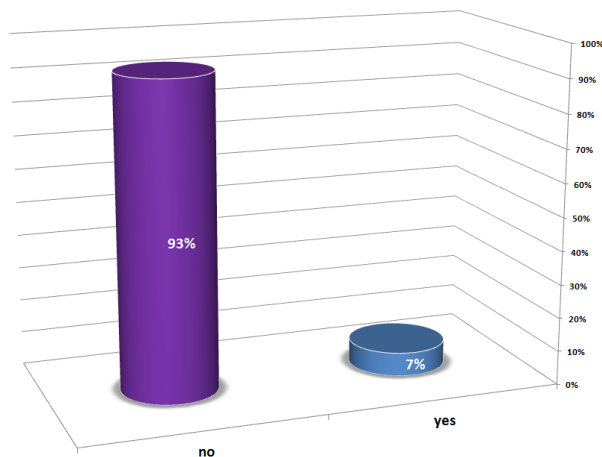


Figure 7: Emergency plan knowledge average.

messages. 1 person, from the study sample, (7%) receives the warning by mail (Emirates Barq). In addition, one person from the study, (7%) receives the early warning via phone.

The study indicated a lack of recognition and awareness among study samples regarding the emergency plan. One person (7%) answered Yes and 30 persons (93%) No, which showed the study sample's lack of awareness regarding an emergency plan.

The researcher sees that the field survey, which he conducted, has added valuable information to the research. He discovered that a class of the emirates community (males and females) does not have complete knowledge. Rather it needs the disaster-preparedness culture. According to the point of view of the researcher, it is essential to hold training courses and cultural forums to the community and increase awareness of dealing with the natural disaster.

4 Guideline for implementing EWS

- Strengthening monitoring and early warning systems, in order to better prepare the city against extreme weather events.
- Preparation and self-protection against fast-impacting phenomena, via information and education campaigns.
- Upgrading awareness and building national capacities.
- A database of systematic observation of sea level parameters such as sea level, storm surges, water and soil salinity, coastal temperatures and phytoplankton, erosion pattern and coastal socioeconomic parameters, must be established.

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