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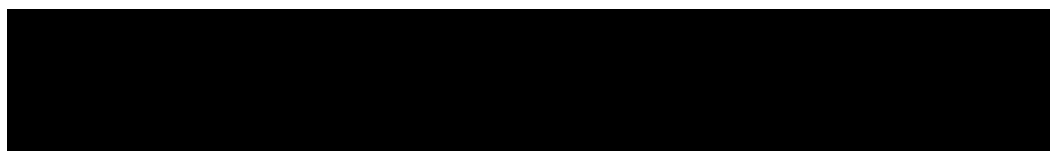
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Yemen country report



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(ADRC VISITING RESEARCHER:18 August –27 November 2014)





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1- General information:-

1-1: Physiography:

Yemen is the second largest country in the peninsula, occupying 527,970 km² (203,850 sq mi). The coastline stretches for about 2,000 km (1,200 mi). It is bordered by Saudi Arabia to the north, the Red Sea to the west, the Gulf of Aden and Arabian Sea to the south, and Oman to the east. Its capital and largest city is Sana'a. Yemen's territory includes more than 200 islands. The largest of these is Socotra, which is about 354 km (220 mi) to the south of mainland Yemen. Geographically, Yemen stretches from the desert sands of the Rub' al Khali to mountain peaks 3,660 meters above sea levels, and drops back down to the coast of the Red Sea and the Gulf of Aden. The nation is separated from the Horn of Africa by the strait of Bab-el-Mandeb.



1-2 Location and Area:

Yemen is an Islamic Arab country located in the southwest of Arabian Peninsula, in the southwest of Asia. It is bordered by Saudi Arabia to the north, the Sultanate of Oman to the east, Arabian Sea to the south and



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the Red Sea to the west. It has many islands alongside the Red Sea and Arabian Sea, the largest one of all is the island of Suqutra, around 150 km away from Yemeni nearest coast. Ancient geographers used to call Yemen "Arabia Felix". In the Old Testament it was mentioned as the south and it was said that Yemen's name was attributed to (Aiman Ben Ya'arob Ben Kahtan). In the Arabic cultural heritage and as the Yemenis themselves, its name derived from the Arabic word (Yuomn) which means the blessedness or welfare and this agrees with the name of the ancient name Arabia Felix. On the other hand, some of the Arab historians said it is called Yemen because it is located in the right direction of Al-Ka'aba. All in all, its present name is "the Republic of Yemen."

The Population:

The Republic of Yemen has nearly 24 million people (according to the latest census conducted in 2007).

Language: Arabic is the official language of the country with English being the most widely used as a second language.

Religion: Islam is the official religion of the whole country except a small minority of Jews.

Literacy: about 50% overall, including 30% of females.

Natural resources: Oil, natural gas, fish and seafood, rock salt, minor deposits of coal and copper.

Agriculture products: Coffee, cotton, fruits, vegetables, cereals, livestock and poultry; Qat (a shrub containing a natural amphetamine).

Industries: Crude oil production and petroleum refining; small-scale production of cotton textiles and leather goods; food processing; handicrafts; small aluminum products factory; cement; commercial ship repair





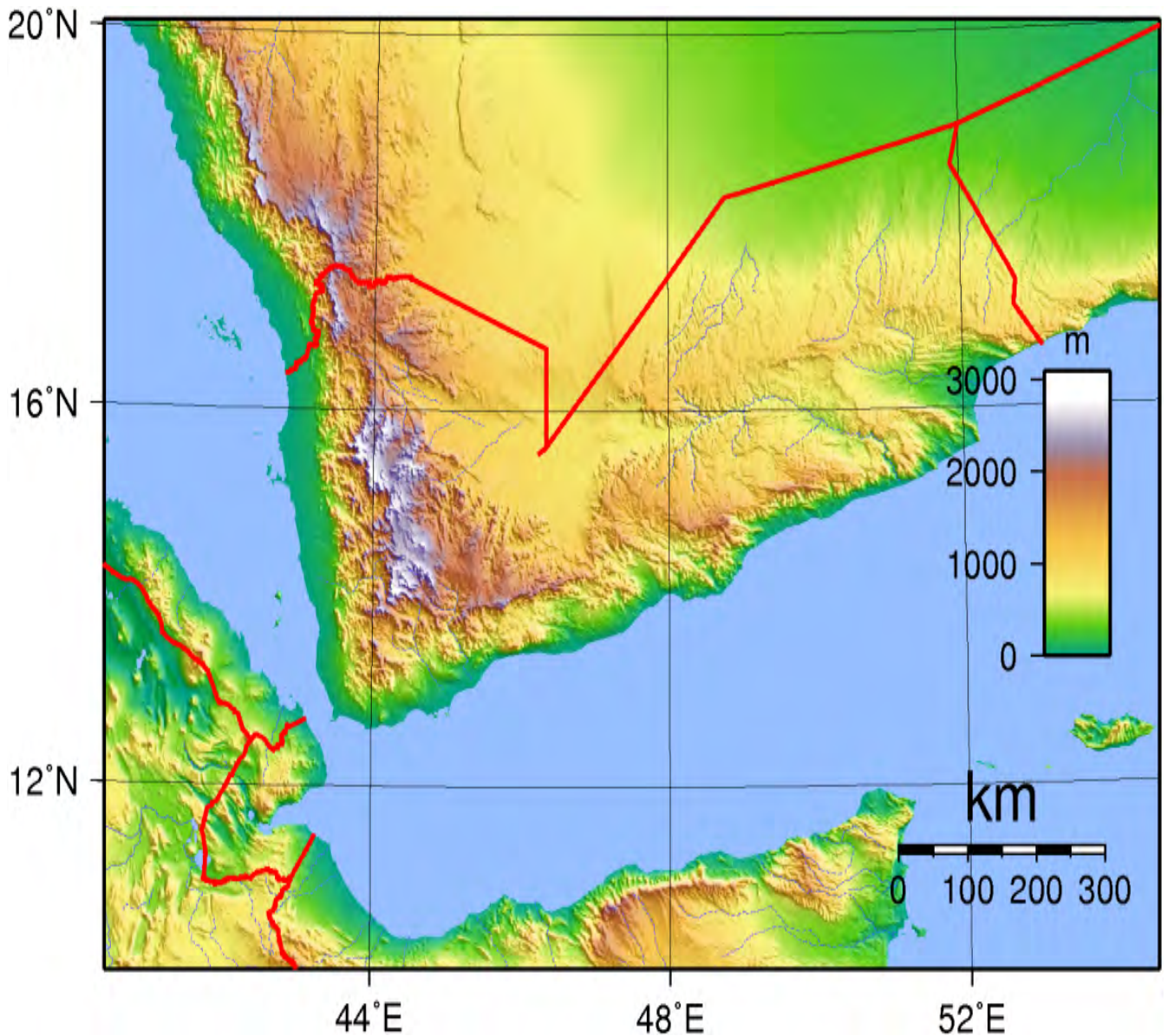
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1-3 Topography:

Yemen occupies the southern end of the Arabian plateau. The country's mountainous interior is surrounded by narrow coastal plains to the west, south, and east and by upland desert to the north along the border with Saudi Arabia. The Tihamah is a nearly 419-kilometre (260 mi) long, semi desert coastal plain that runs along the Red Sea and is part of the Arabian Peninsula coastal fog desert e coregion . The interior mountains have elevations ranging from a few hundred meters to the country's highest point, Jabal an Nabi Shuayb, which is 3,666 m (12,028 ft) above sea level. The mountains are young, jagged peaks that are known to rise from an elevation of a few hundred meters to well over 3,000. The mountains can be separated into a western and central highland. The western highlands have peaks reaching around 3,000 meters, with relatively fertile soil and sufficient and plentiful rainfall. The central highlands is more like a plateau of about 2,000-3,200 meters, with rolling hills, small knolls, and some very prominent peaks, but is still relatively more elevated. Less rainfall can be seen in this region, but the summer months give enough to sustain crops. The highland regions are interspersed with wadis, or river valleys, that are dry in the summer months. (Yemen has no permanent rivers.) Most notable is the Wadi Hadhramaut in eastern Yemen, the upper portions of which contain alluvial soil and floodwaters and the lower portion of which is barren and largely uninhabited. Both the eastern plateau region and the desert in the north are hot and dry with little vegetation.



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The Region of Eastern Plains:

It is consisted of sedimentary rocks and lies at the eastern and the northern of the mountainous region and it spans is adjacent to it. It reaches its maximum highest at 1,000 meters and waters drop to it from the mountainous region. This region includes the governorates of Al-Mahara, Al-Jawf, Shabbwa, Hadhramout and parts of the governorate of Sa'ada. The Region of Al-Rub'o Al-Khali (Empty Quarter) It is the Yemeni desert region without plants and characterized by its moving dunes sands. In the past, the Al-Rubo' Al-Khali used to be called the largest Yemeni desert or Al-Ahqaf desert.



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The Mountainous Region

It begins in the north and extends southward to the area called Bab Al-Mandab, where it makes a turn eastwards alongside the Arab Sea, ending in Al-Mahara. The mountains highest ranges from 1,000 meter to 3,600 meter above sea level. The mountainous region contains several valleys such as: Valleys, which pour its waters in the Red Sea, like Wadi Haradh, Wadi Moor, Wadi Sordod, Wadi Siham, Wadi Rasian, Wadi Zabeed and Wadi Moza'a. Valleys, which pour its waters in the Gulf of Aden and the Arab Sea, are Wadi Tuban, Wadi Bana, Wadi Ahwar and Wadi Hudramout. Valleys, which pour its waters in the desert, are Wadi Khap, Wadi Algoof and Wadi Athnah in addition to Wadi Harreap and Wadi Jerdan and others. This region includes the governorates of Sana'a, Hajja, Al-Mahweat, Sa'ada, Dhammar, Al-Bidha, Al-Dhale and Taiz.



The Yemeni Islands:

There is a large number of the Yemeni islands spread alongside the Red Sea and the Arab Sea. Yemeni islands are characterized by unique topography and spectacular environment. The Red Sea includes the largest number of the islands which constitutes an archipelago alongside the Yemeni beach. The Island of Kamaran is the largest and the most important one in the Red Sea, it is inhabited by people and rare animals. There are also the islands of Baklan, Al-Tir, and Al-Fashet in the north of Kamaran and in the south of it there are the islands of Zuqar and the archipelago of Hunish which includes the Greater Hunish and the smaller Hunish, while the island of Meyoun controls the Strait of Bab Al-Mandab and it splits it. There are also several small islands; the important of them are the islands of Abdul-Kori, Al-Akhawin, Samhah and Derrssah. In the Arabian Sea, Yemeni islands spread close to each other, the largest and the most famous one of all is the Island of Suqutra. Suqutra is a 3,625 km². It is located in the Indian Ocean, some 450 km south of the Yemeni economic city of Aden but it is a part of Hadramout province of Yemen. With estimated population of 45,000, Suqutra Island has three geographical terrains: the narrow coastal plains, a limestone plateau permeated with karst caves, and the higher mountains reaches to 5,000 feet. The climate is generally tropical desert, with rainfall being light, seasonal (winter) and more abundant at the higher ground in the interior than along the coastal lowlands. The monsoon season brings strong winds and high seas making marine transportation from June to September inaccessible. However, in July 1999 a new airport opened in Socotra. The long geological isolation of Socotra and its fierce heat and drought have combined to create a unique and spectacular endemic flora. Surveys have revealed that more than a third of the 800 or so plant species of Socotra are found nowhere else. Botanists rank the flora of Socotra among the ten most endangered island flora in the world. One of the most striking of Socotra's plants is the



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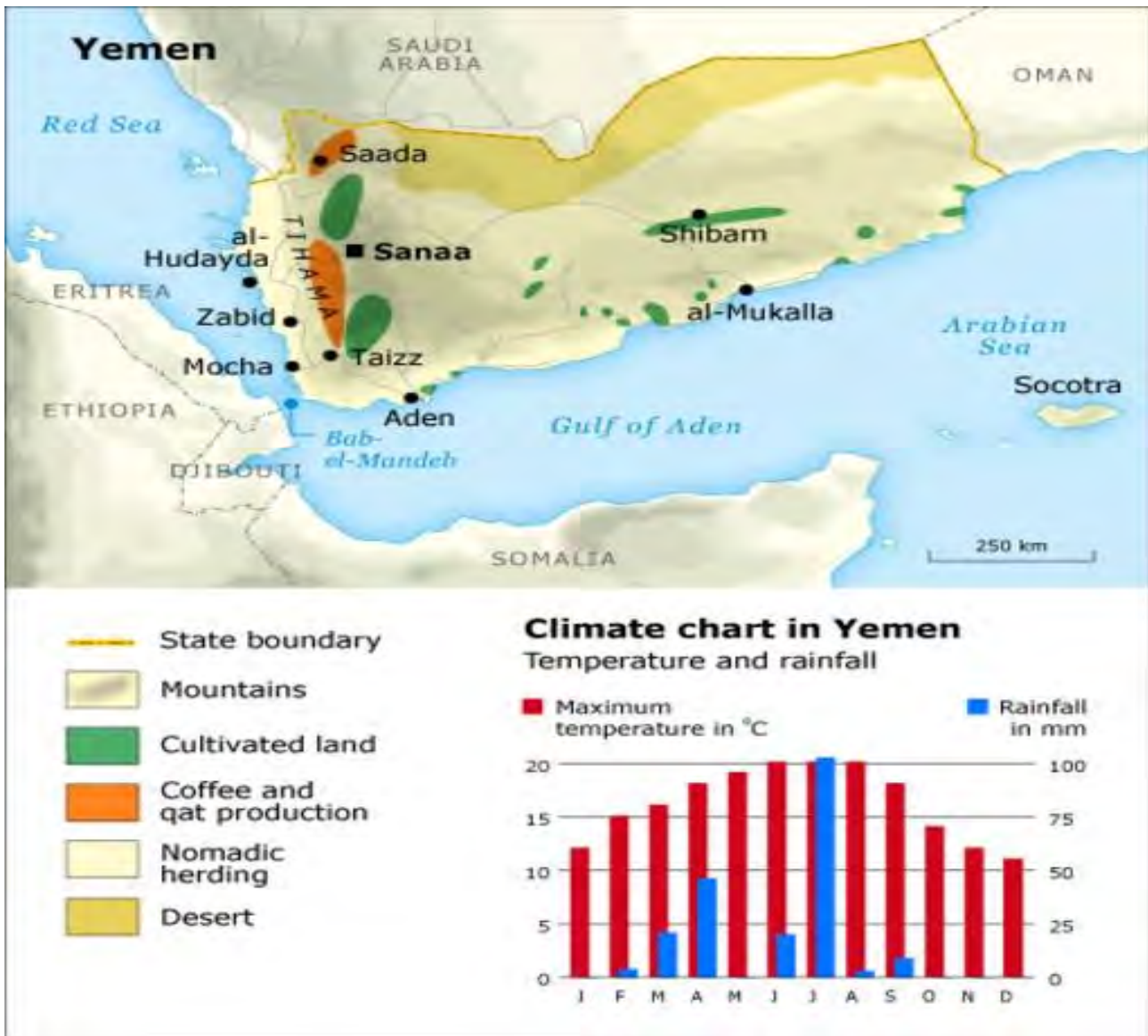
dragon's blood tree (*Dracaena cinnabari*), which is a strange-looking, umbrella-shaped tree. Its red sap was the dragon's blood of the ancients, sought after as a medicine and a dye. The island also has a fairly rich bird fauna, including a few types of endemic birds, such as the Suqutra Starling *Onychognathus frater*, the Socotra Sunbird *Chalcomitra balfouri*, Socotra Sparrow *Passer insularis* and Socotra Golden-winged Grosbeak *Rhynchostruthus socotranus*. Fourteen mammal and 175 bird species that live today on the island have been recorded as endemic species. Being virtually isolated from the rest of the world for a long period, Suqutra remains one of the most fascinating places on earth. Its unique character with greatest Biological diversity makes Socotra a potential candidate for designation as one of the new 7 wonders of nature. Suqutra Island has been recently nominated to become one of the new 7 wonders of natural monuments. The competition is adopted by the Swiss foundation new7wonders.com to choose the most wonderful natural landscapes all over the world.

1-4 Climate:

Yemen is one of the countries of the largest cellular radiation due to the sun's perpendicular upon it around the year but the diversity of its geographical features gives rise to diversification in its climate. In the coastal regions, the climate used to be hot and moist in the summer whereas in the winter it is often moderate. In the inner and mountainous region, the climate usually ranges from cool in the winter to moderate in the summer, the moderate climate also prevails in the slopes and plateaus regions where the average of temperature ranges from 10 to 30 degrees Celsius in summer whereas it goes down to fall below zero in winter. The average of moistness may reach up to 80 percent with an average of rainfalls ranges from 300 to more than 1,000 mm per a year .The climate, which prevails in the eastern region, is widely different since it is characterized by drought and the temperature there exceeds 40 degrees Celsius in summer, while it goes down to 10-15 degrees Celsius in winter. The rainfalls rate doesn't exceed the average of 50 –100 mm, particularly at the bounds of Al-Rubo' Al-Khali (the Empty Quarter). Between the above two climate regions lies the central region which spans from the north and the east of Sana'a to the bounds of Marib. The entire area of Yemen's territory has come under the influence of the torrential winds which are coming from the east; it is also influenced by the air's downfalls in the west which used to be accompanied by rains in summer season.



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1-5 History

Yemen is hailed as one of the world's oldest centers of civilization with a history dating back 4000 years. The first millennium BC was the beginning of the first notable period of the country's ancient history around which time the region began to prosper from the frankincense and myrrh trade. The second notable period is associated with the founding of the Sabaean, Awsanian, Minaean, Qatabanian, Hadhramawtian and Himyarite Kingdoms. During these two periods, the region was called 'Arabia Felix' meaning Happy Arabia by the Romans, on account of its prosperity as a spice trading centre. At the end of the 6th century and the beginning of the 7th, a large number of Sabaean left Yemen on account of the Ma'rib Dam's destruction and the region was subsequently incorporated into the empires of Persia Sassanid and Ethiopia. As the 7th century progressed, Islamic caliphs gradually exerted their influence over the region. Once the stronghold of the caliphs was broken, Yemen fell under the control of the Imam dynasties whose theocracies survived successfully until modern times. The mighty Ottoman Empire arrived in the 16th century and took control of North Yemen returning again in the 19th century to do the same. It wasn't until 1918 that North Yemen gained independence from the Ottomans and it was another 44 years in 1962 before it established itself as a republic. In 1839, British forces established occupation of the Yemen port of Aden and formed a colony which they protected with the help of local alliances known as protectorates. A complete British withdrawal was not seen until 1967 and the area that they left behind became known as South Yemen. The two regions were finally united as a single republic on May 22 1990.



2-Natural Hazard in the country

2.1 DISASTER RISK PROFILE:

The country's topography of rugged mountains, highlands, deserts, and coastal plains, coupled with arid weather conditions, render Yemen highly susceptible to desertification, landslides, earthquakes and floods, and make it a disaster prone country that has experienced at least one disaster per year over the last three



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decades as shown in the following photos. These various disasters left significant economic damages that occur due to loss of lives, damage to livelihoods, property and infrastructure.

2-2SPATIAL DISTRIBUTION OF DISASTERS IN YEMEN

Floods:

The most recent major floods occurred in 1996, 2000, and 2008. The areas that are at risk from flooding are largely the densely populated areas of western Yemen, that include governorates of Sada'a, Sana'a, Dhamar, Ibb, Taiz, Lahz, Mareb, and Abyan In central and eastern Yemen, the Hadramout Valley and the southern coastline of Yemen are also at risk from flooding. Floods in Yemen mostly result from high-intensity rainfall, and sometimes from coastal storm surges and tsunamis such as tsunami resulted from Sumatra earthquake in 2005.





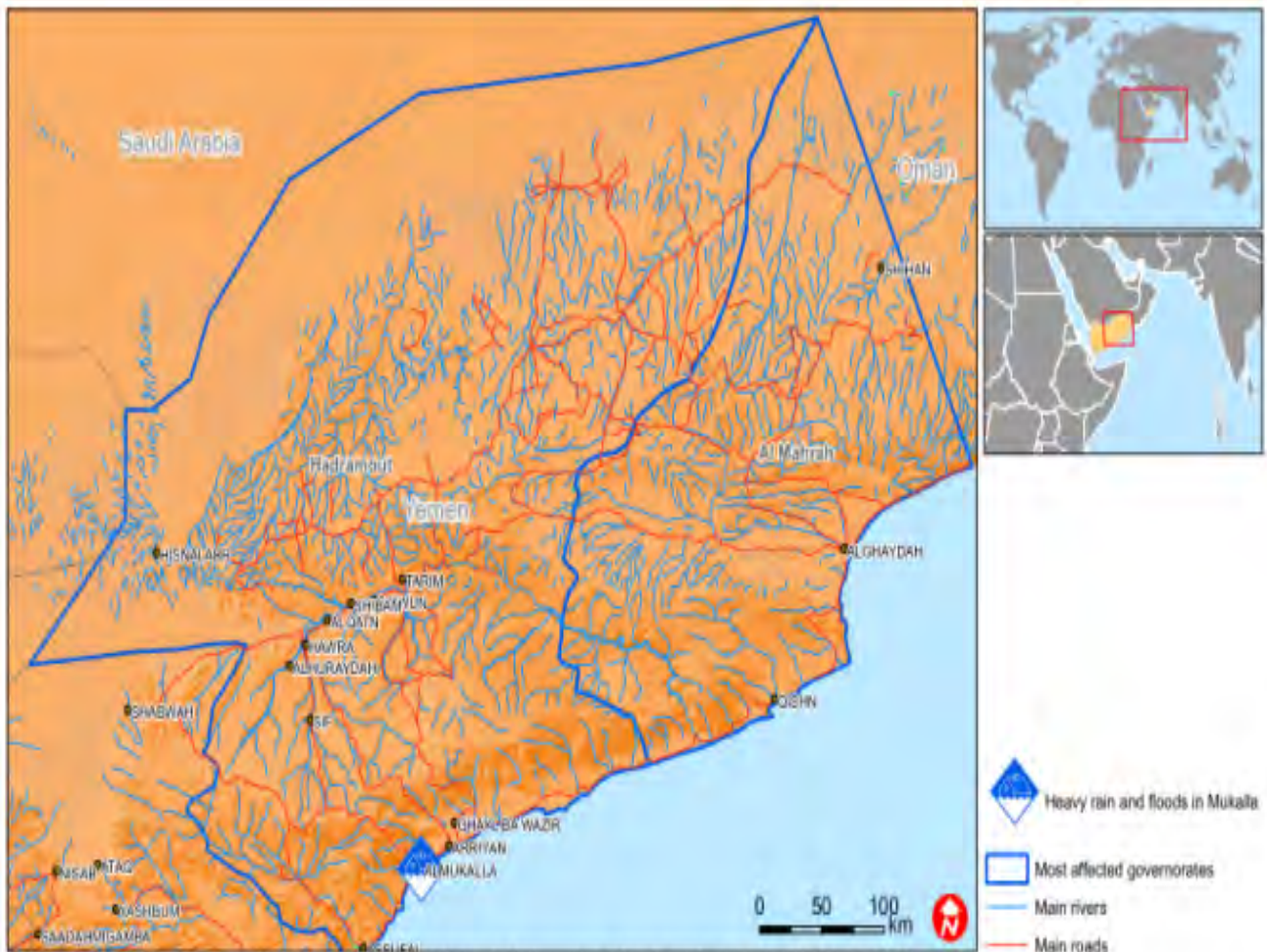
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International Federation of Red Cross and Red Crescent Societies
Fédération internationale des Sociétés de la Croix-Rouge et du Croissant-Rouge
Federación Internacional de Sociedades de la Cruz Roja y de la Media Luna Roja
الاتحاد الدولي لجمعيات الصليب الأحمر والهلال الأحمر

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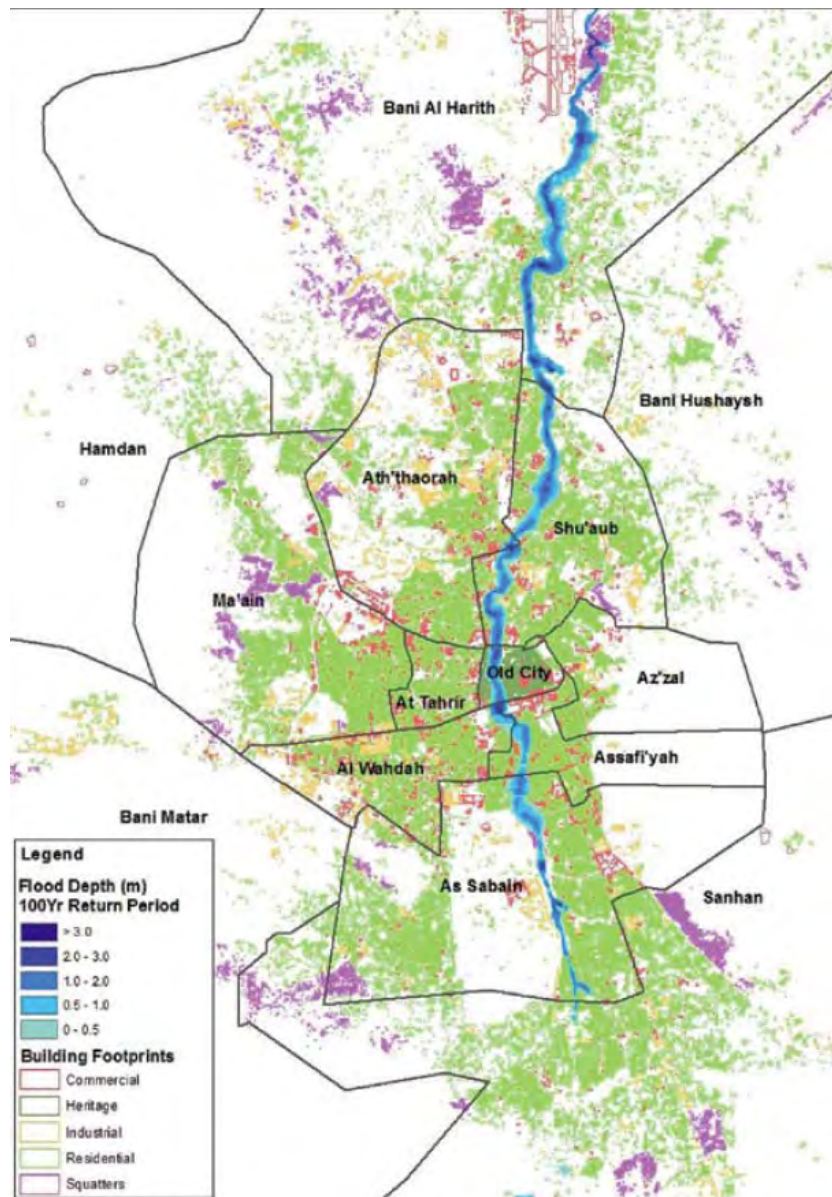
Yemen: Flash floods



The maps used do not imply the expression of any opinion on the part of the International Federation of the Red Cross and Red Crescent Societies or National Societies concerning the legal status of a territory or of its authorities.
Map data sources: ESRI, DEVMFO, International Federation, MDRYE001 road



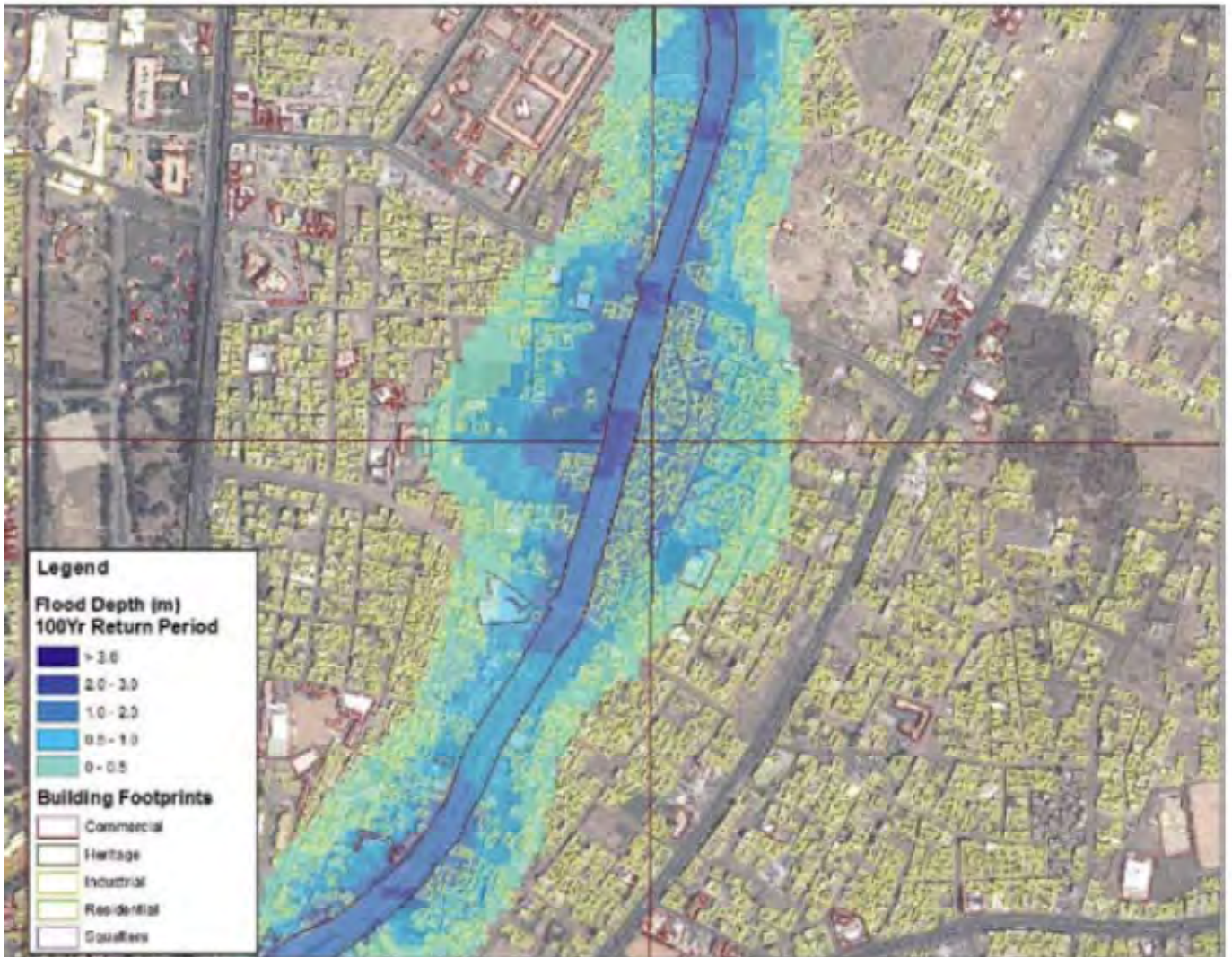
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Flood hazard map for Sana'a



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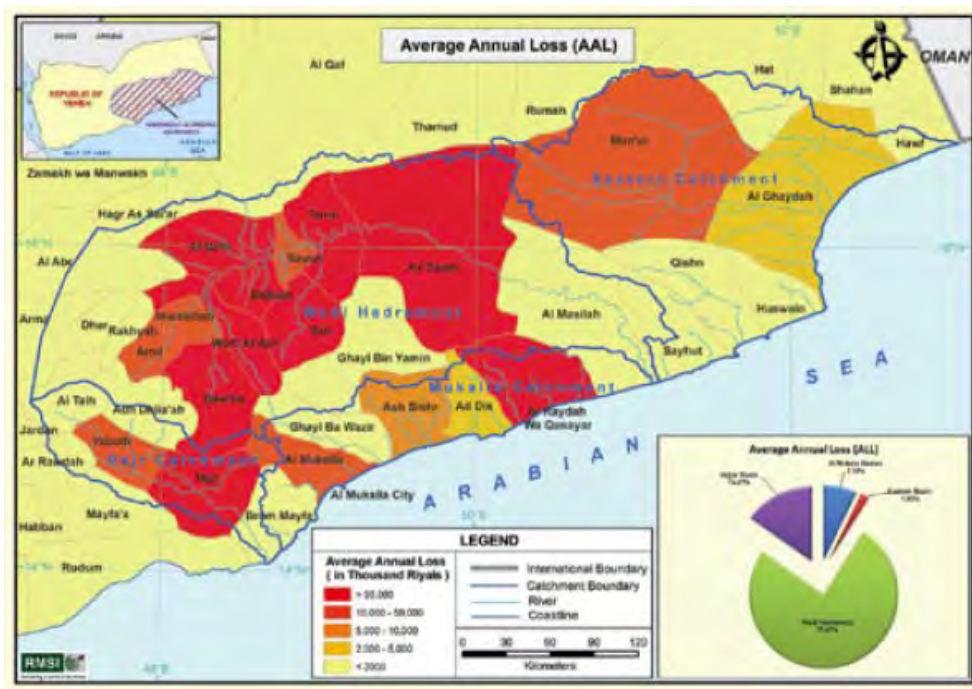
Flood hazard map depicting 100-year flood event affecting Sana'a buildings.



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2008 Flood depth and extent map for Al Mahra and Hadramout Governorates



Average annual loss in Al Mahra and Hadramout Governorates



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Earthquakes:

Yemen is located in the seismically active zone between the Arabian and African tectonic plates which are pulling apart. The western and southern portions of Yemen around the rifts of the Red Sea and Gulf of Aden represented by volcanic mountains over magma tic chambers. These portions are the most active zones and at risk from earthquakes. Although the magnitudes of events are small but it is felling by peoples living in that areas. The largest destructive earthquake was with magnitude Mw6. in Dhamar 1982 December Earthquake.

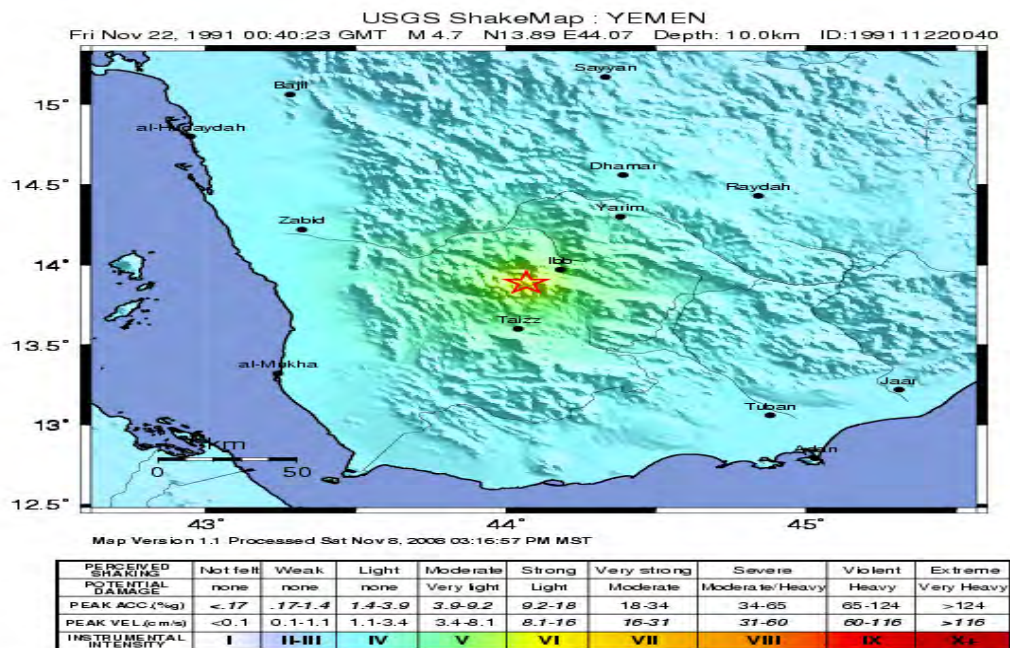
- Location: Yemen: Dhamar
- Date and Time: 12/13/1982 at Midnight, 13 minutes
- Focal Depth: 5 km
- Latitude: 14.701
- Longitude: 44.379
- Magnitude: 6
- MMI Int: 8
- Deaths (Approx. Deaths): 2,800
- Injured: 1,500
- Homeless: 700,000
- 1991 November Earthquake
- Location: Yemen
- Date and Time: November 22
- Latitude: 13.887
- Longitude: 44.068
- Magnitude: 4.7
- Deaths (Approx. Deaths): 10
- Injured: 39 Destroyed Houses: 17 houses



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Photos show Earthquake Building damage in Dhamar area, 1982





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Landslides:

Unstable geological conditions, including the development of extensive cracks due to natural aging and extreme weather conditions, exist in several mountainous regions of Yemen such as Al-Dhafeer in 2006 Al Gayah and Al-Semah. In such regions, heavy rains, storms, earthquakes, or volcanic eruptions, as well as mining and inappropriately sited infrastructure, can combine to trigger landslides. Since the terrain of Yemen is mostly mountainous, the entire country is at risk of landslides.



Photo show Landslides at Dhafeer area, 2006



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Volcanic eruptions:

As mentioned above the central and western plateau of Yemen located in the volcanic fields which consist of quaternary volcanic cones. These volcanic cones have similar age with that located along the axial of Red Sea and characterized by its active and gases case. The last new eruption was in 2007 at Al- Tair island at Red Sea. About 8 people were killed by this volcanic eruption.



Photos show Volcanic Eruption at Gabal Al-Tair Island –Red sea, 2007





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Drought:

Yemen is set to be the first country in the world to run out of water, providing a taste of the conflict and mass movement of populations that may spread across the world if population growth outstrips natural resources. Government and experts agree that the capital, Sana'a, has about ten years at current rates before its wells run dry but the city of two million continues to grow as people are forced to leave other areas because of water shortages. Drought has caused the displacement of thousands of people from mountainous villages in 2009, the first time in Yemen; the Investment Authority in Yemen has called on the private sector to compete for projects to desalinate seawater in order to face the current issue of water scarcity in Yemen as well as the future fear of drought.





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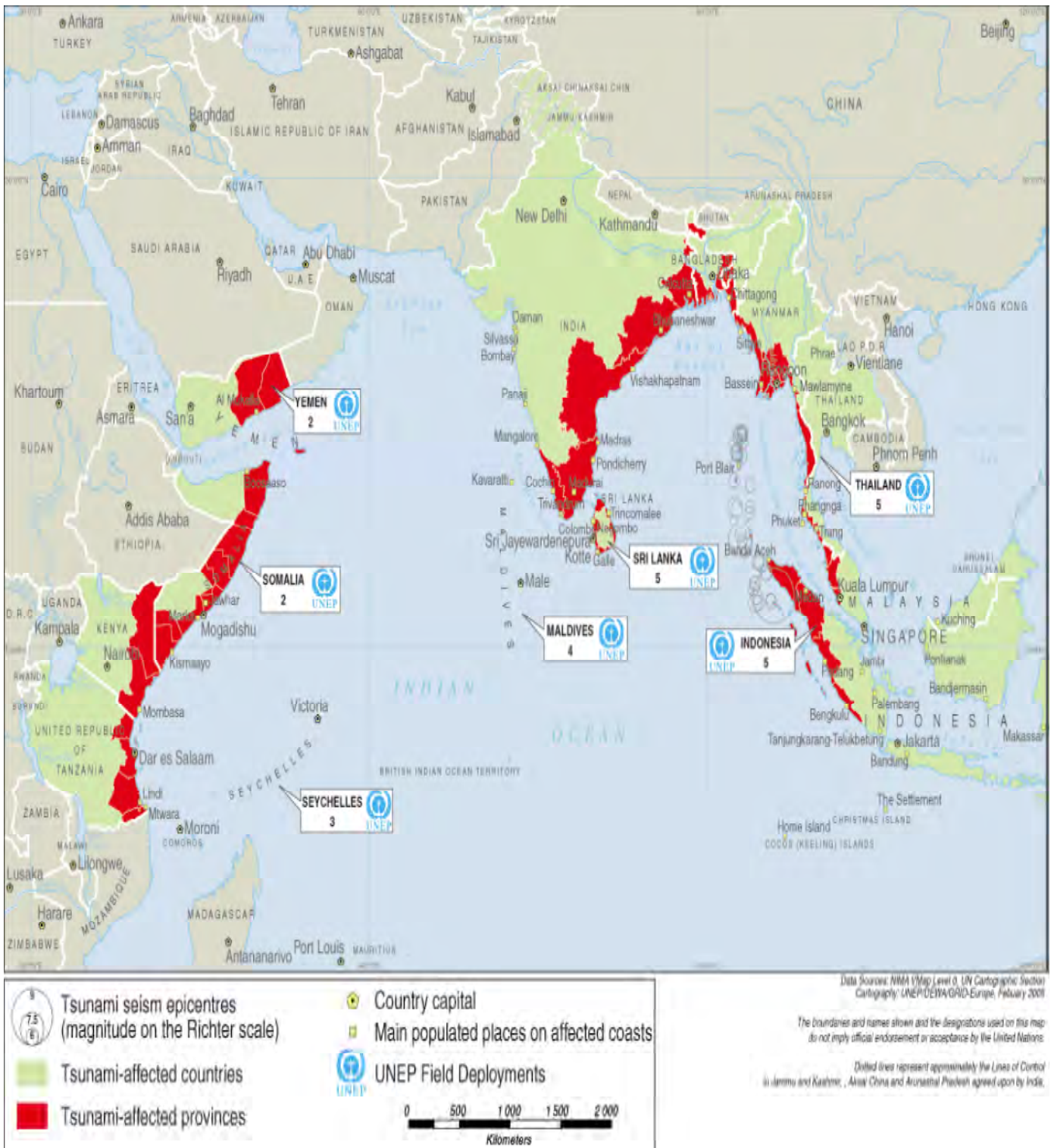
Tsunami

The 26 December tsunami wave and subsequent sea surges hit the coast of Yemen between 11.40 a.m. and 8.30 pm., causing damage to Yemen's mainland and associated islands facing the Indian Ocean. Local observations indicate that water started to rise at about 11:00 a.m. local time on 26 December 2004. The water level receded in some locations (such as Muhaifif in Al Mahra), exposing about two kilometers of the sub-tidal flats before flood relative to the countries of southeast Asia, damage in Yemen was much less mainly because of its distance from the epicenter of the earthquake, and the protection it receives from the Indian Peninsula and Horn of Africa. Nevertheless, it impacted on the livelihoods of main form of income. The two main areas identified as the most affected include Socotra Island and the coastline of Al Mahra Governorate, especially the area extending from Saihut to Wadi. Local people, especially fishermen, were significant, as many of them lost their lives.





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3- Yemen - Disaster Statistics

Data related to human and economic losses from disasters that have occurred between 1980 and 2010.

Natural Disasters from 1980 - 2010

Overview

No of events:	31
No of people killed:	958
Average killed per year:	31
No of people affected:	390,658
Average affected per year:	12,602
Economic Damage (US\$ X 1,000):	1,611,500
Economic Damage per year (US\$ X 1,000):	51,984

Natural Disaster Occurrence Reported

Average Disaster Per Year

Drought:	...
Earthquake*:	0.03
Epidemic:	0.06
Extreme temp:	...
Flood:	0.74
Insect infestation:	...
Mass mov. dry:	...
Mass mov. wet:	0.06
Volcano:	0.03
Storm:	0.06
Wildfire:	...



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Top 10 Natural Disasters Reported

Affected People

Disaster	Date	Affected	(no. of people)
Flood	1996	238,210	↓
Earthquake*	1991	40,039	↓
Flood	1991	30,000	↓
Flood	2008	25,064	↓
Flood	1993	21,500	↓
Flood	1999	19,750	↓
Flood	1996	5,000	↓
Flood	1998	3,000	↓
Flood	2006	2,000	↓
Flood	2007	2,000	↓

Killed People

Disaster	Date	Killed	(no. of people)
Flood	1996	338	↓
Flood	2008	90	↓
Flood	1998	70	↓
Mass mov. wet	2005	65	↓
Flood	2007	50	↓
Flood	2007	36	↓
Flood	2001	33	↓
Epidemic	2000	32	↓
Flood	1993	31	↓
Flood	2002	28	↓



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Economic Damages

Disaster	Date	Cost (US\$ X 1,000)
Flood	1996	1,200,000 ↓
Flood	2008	400,000 ↓
Flood	1996	10,000 ↓
Flood	1993	1,500 ↓
Epidemic	2000	0 ↓
Storm	2001	0 ↓
Flood	2001	0 ↓
Storm	2001	0 ↓
Flood	2002	0 ↓
Flood	2002	0 ↓

Statistics Per Event

Killed People

Drought:	...
Earthquake*:	10.00
Epidemic:	16.00
Extreme temp:	...
Flood:	34.96
Insect infestation:	...
Mass mov. dry:	...
Mass mov. wet:	38.00
Volcano:	6.00
Storm:	15.00
Wildfire:	...



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Affected People

Drought:	...
Earthquake*:	40,039.00
Epidemic:	234.00
Extreme temp:	...
Flood:	15,222.83
Insect infestation:	...
Mass mov. dry:	...
Mass mov. wet:	5.50
Volcano:	15.00
Storm:	...
Wildfire:	...

Economic Damages

Drought:	...
Earthquake*:	...
Epidemic:	...
Extreme temp:	...
Flood:	70,065.22
Insect infestation:	...
Mass mov. dry:	...
Mass mov. wet:	...
Volcano:	...
Storm:	...
Wildfire:	...

Statistics By Disasters Type

Percentage of reported people killed by disaster type

Earthquake*: 1 % Epidemic: 3.3 % Flood: 83.9 % Mass mov. wet: 7.9 % Storm: 3.1 %

Percentage of reported people affected by disaster type

Earthquake*: 10.2 % Flood: 89.6 %



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4- Three main factors that exacerbate Yemen's vulnerability to natural disasters

Climate change is expected to increase exposure to drought and flash floods, leading to a trend: While there is no international consensus on the impact of climate change on precipitation levels in Yemen, Global Climate Models (GCM) predict a three to four degree centigrade increase in mean temperatures by the 21st century. Climate change induced impacts may include a rise in sea levels, and increased exposure to droughts and flash floods in the country.

Depletion of water resources: The availability of water in Yemen stands at 150 cubic meters per capita, and is well below the threshold of 1000 cubic meters per capita established by the United Nations for classifying countries as water scarce countries. In fact, the availability of water in Yemen is much lower than the average figure for the Middle East and North Africa Region, which is about 1,250 cubic meter per capita. This limited availability of water is further exacerbated by three factors:

- (1) Seasonal and temporal changes in the pattern of rainfall that Yemen receives;
- (2) Both expansion of the area under cultivation as well as water intensive agricultural production;
- (3) **Higher ground water extraction and reduced ground aquifer** recharge as a result of increased urbanization which in turn has resulted in an expansion in built-up areas. The depletion of water resources is increasing aridity, which could lead to reduced economic prospects in the future, thereby making Yemen more vulnerable to natural disasters.

5. Disaster Management System (DMS)

The Yemen Country Note is based on vigorous consultations undertaken with various governmental agencies, the UN agencies, and the World Bank country office staff to understand the current organizational structure for managing disasters in Yemen and identify possible areas of support for strengthening Disaster Risk Management (DRM). Major governmental agencies consulted include the ministries of Planning and International Cooperation, Oil and Minerals, Communications and Information Technology, Transport, Public Works and Highways, Civil Defense, Water and Environment, Agriculture and Irrigation, Health, and Local Administration. The findings of the consultations were presented to a cabinet level meeting, held on 23 April 2009, chaired by the Deputy Prime Minister, Ministry of Planning and International Cooperation. During the meeting, the Government of Yemen provided guidance and identified priority areas of interventions for DRM.

5.1 Progress of implementation of Hyogo Framework for Action (HFA)

Yemen is a signatory to the Hyogo Framework for Action and in keeping with the five priority areas for action, Yemen has committed to:



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- Ensuring that the reduction of risks from disasters is a national and a local priority with a strong institutional basis for implementation
- Identification, assessment, and monitoring of risks from disasters, and enhancing its early warning system;
- Use of knowledge, innovation, and education to build a culture of safety and resilience at all levels.
- Reduction in the factors that make Yemen more vulnerable to disasters; and Strengthening disaster preparedness for effective responses at all levels.

The next section describes the state of progress that Yemen has made in the above mentioned five Hyogo Framework priority action areas, along with the gaps and possible next steps.

HFA Priority # 1: Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation

Yemen has accorded high priority to disaster risk reduction, and has established two focal agencies to take the lead in this area. These are:

- (i) The National Disaster Management Unit (NDMU), housed within the Civil Defense General Directorate (CDGD) under the Ministry of Interior (MoI); and
- (ii) The Directorate of Environmental Emergencies and Disasters (DEE) under the Ministry of Water and Environment (MWE), established in 2004 through a ministerial decree.

The Unit in the Civil Defense Directorate has the mandate to focus on disaster management and response in Yemen, while the Department of Environmental Emergencies under the Ministry of Water is responsible for reporting on progress in Yemen on the five priority areas of action outlined in the Hyogo Framework for Action, to the UN International Strategy for Disaster Risk Reduction (UNISDR) – UNISDR being the agency that is responsible for monitoring progress on the Hyogo Framework.

Although the DEE has represented Yemen at several international forums, it has limited resources.

The Unit in the Civil Defense Directorate, on the other hand, is better resourced as it has been responsible for providing emergency relief after disasters.

Yemen has established an institutional basis for implementation of actions related to disaster risk reduction. There is a legal foundation for the creation of an organizational structure for managing the risks from disasters, and Yemen has designated its Ministry of Interior to lead the structure. The 1997 Civil Defense Law defines the responsibilities of the Civil Defense General Directorate with respect to for disaster management.

Subsequently, the Executive Bylaw and the Republican Decree (N°386) became the basis for the Supreme Council of Civil Defense.

The Council is responsible for providing policy direction, approving plans for disaster preparedness and response, and defining the tasks and responsibilities of each ministry/agency, actors and stakeholders



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before and during any emergency. It is chaired by the Minister of Interior, and includes key ministries as members. However, when the floods occurred in 2008, the Supreme Council was chaired by the Prime Minister himself on two occasions.

There is progress on the identification, assessment, and monitoring of risks from disasters, and the establishment of an early warning system is in its infancy. The UN agencies and the Government of Norway have provided support to initiate disaster risk management related activities in Yemen. They supported the Disaster Preparedness, Management and Recovery project in 2003, which established under the Civil Defense General Directorate the National Disaster Management Unit. However, the Unit needs technical, and financial strengthening, in addition to an improved internal re-organization that enables it to develop the necessary vertical mechanisms for coordination with subnational entities and communities (which will also need strengthening). In order to develop an effective, comprehensive and integrated disaster risk management system, the Civil Defense General Directorate was accorded the status of an authority, with greater managerial and financial autonomy. However, it still functions as a ministerial department, and its budget is approved by the Ministry of Interior. The National Disaster Management Unit has a National Disaster Management Team that consists of focal staff from various ministries. It developed a National Disaster Management Plan in 2006. This Plan, in addition to proposed initiatives for capacity building, GIS mapping, and rescue operations, includes a checklist of activities to be undertaken in the event of a disaster, as well as a list of key contacts. This plan is awaiting approval by Yemen's cabinet.

There is a need to further strengthen the organizational structure for managing the risks from disasters, streamline agency functions, and improve functional coordination and information sharing for an early warning system. Other prominent agencies that play an important role in disaster risk management are the Public Works Program, the Geological Survey and Mineral Resources Board, the National Water Resources Agency, and the Vulnerability Assessment Mapping Unit under Ministry of Health. These agencies are active in risk assessment, early warning, and post disaster reconstruction & recovery according to their specific institutional mandate and implementation capabilities. Figure (3) provides an institutional map of agencies that are active within the different categories of activities that together constitute a comprehensive disaster risk management program, and their relationship with the National Disaster.

Yemen has to make rapid progress towards making disaster risk management a priority at the local level Sub national governments, their agencies, and local communities need to be integral to the planning and execution of disaster risk management activities, so that there is more ownership which can lead to more effective implementation. There is already progress towards decentralization in Yemen, and Yemen's decentralization policy has mandated local governments with disaster risk management and reduction. The legal foundation for developing and implementing disaster risk management programs at the local level already exists.



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Organizational Map of Government agencies for disaster risk management in Yemen

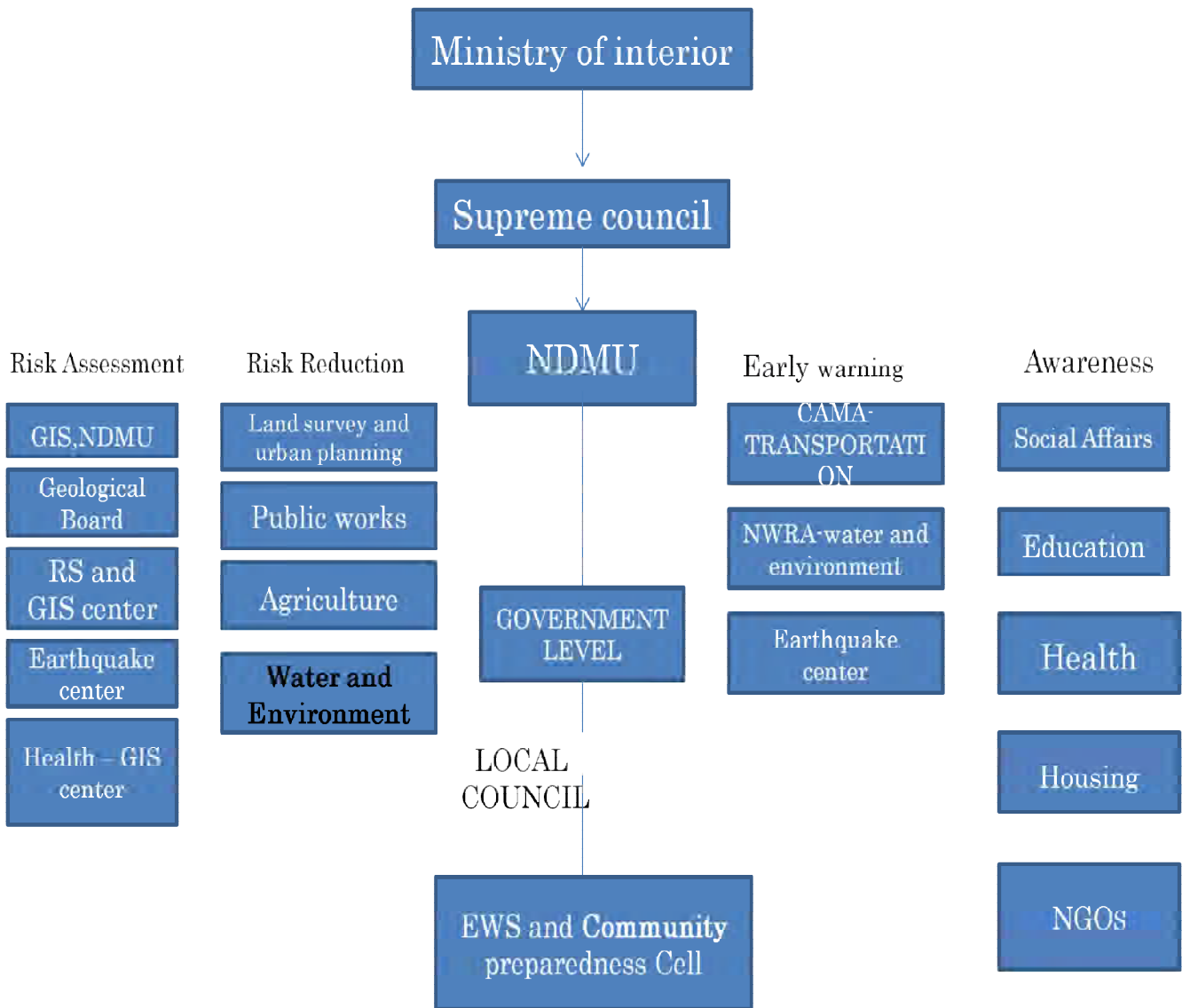


Table 1: Organizational Map of Government agencies for disaster risk management in Yemen

HFA Priority # 2: Identify, assess, and monitor disaster risks, and enhance early warning systems
Implementation of initiatives that identify disaster risks is well underway, although a formal early warning system does not so far exist.



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Several agencies are preparing digital risk maps of Yemen (Table 2). There is, however, no mechanism to either ensure compatibility between the data formats being developed by the agencies, or to avoid duplication of functions for optimizing the use of resources. There is also no institutionalized mechanism that links these agencies which are the critical suppliers of critical data, with the sub national agencies and communities that are the users of this data. Unless such of disaster risk management activities will be ineffective and yield sub-optimal results. In 2010 National Probabilistic Risk Assessment of Yemen is issued coordination and integrative mechanisms, the design and implementation as well as detailed risk assessment for the Governorate/s of Hadramout & Al-Mahara governorate, and Sana'a are underway. These studies will provide a risk atlas for various kinds of hazards, and be the basis for planning and execution of various initiatives for disaster risk management in the country. The atlas will enable informed political debate on difficult choices that Yemen may have to make for both planning and retrofitting sectoral infrastructure in various spatial locations, and help the country develop a strategy that can be supported by donors, including possibly through Additional IDA operations.

Table2: Agencies active in risk mapping

Agencies	Relation to Risk Assessment	Comments
<i>Geological Survey Board Ministry of Oil and Minerals</i>	Landslide and earthquake risk mapping	Good infrastructure, over 15 years experience. Need consistent budget and capacity building
Remote Sensing and GIS Center Min. Telecommunications	National depository of base maps for Yemen and satellite imagery	Good infrastructure, 4 years experience
GIS cell in ND MU Ministry of Interior	Preparing maps of hospitals and emergency shelters	Location within ND MU, just started working with UNDP staff
Health Sector Mapping, Ministry of Health	Health vulnerability assessment maps	Good infrastructure, developing health facility maps with WHO guidance and support

The Government of Yemen has allocated funds for the development of a formal early warning system. Although there is no formal early warning system at the national or local level, the Government has allocated US \$7.5 million to the Civil Defense General Directorate for the development of emergency control rooms in fifteen governorates. An emergency room, possibly for an early warning system and



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rescue operations, has become partially operational in Aden. A control room established in Sana'a is not yet operational due to financial and technical constraints. There are plans to establish emergency rooms in Mukalla, Taiz, and Hodeida.

An initiative to strengthen the capacity of the National Disaster Management Unit to enable it to deliver early warnings to coastal communities and enhance their preparedness is underway. This initiative, known as the assessment report from this project highlights a list of priority actions and priority intervention locations which are Al- Disaster Preparedness, Management, and Recovery Project is being supported by the UN DP. An initial Mahara, Hadramout, Aden, Shabwa, Abyan, Lahz, Taiz, Hodeidah, and Hajja. It also lists the key players that need to be involved in these areas. The project has supported community awareness programs in two pilot areas - Al Mahara and Socotra Island. The National Disaster Management Unit may partner with Oman to share early warnings about tsunamis with coastal communities.

HFA Priority # 3: Use knowledge, innovation, and education to build a culture of safety and resilience at all levels

The Government of Yemen is extremely receptive to integrating knowledge and innovation into its disaster management program The recently completed 2008 Damage and Loss Needs Assessment was well received by the Cabinet of Yemen and is being widely disseminated within the country. Similarly, the Government of Yemen is seeking to collaborate actively with Gulf Cooperation Countries in developing a regional mechanism in areas related to disaster mitigation like early warning systems and post-disaster response.

Initial educational efforts to start building a culture of resilience is underway in Yemen. A national strategy for awareness, targeting school children specifically and the public more generally, is being developed by the National Disaster Management Unit. The literature that is being developed for the awareness campaign includes advice on 'what to do during emergency'. Also included are interactive games for children.

Much progress remains to be made on building a culture of resilience at all levels. So far there exist no formal institutions or programs that can deliver training on adapting to climate change at a scale that is needed to build resilience at all levels. The National Disaster Management Unit is trying to include the concept of disaster risk management as well as the importance of environmental protection in reducing risks from disasters, in the curriculum of schools. The Ministry of Water and Environment, the Ministry of Health, and the Ministry of Social Welfare are also developing communication material that can effectively



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reach out to the larger public and inform on the appropriate response needed during a disaster or an emergency. With multiple agencies developing communication strategies and tools, efforts are needed to ensure adequate coordination and avoid duplication so that there is optimum impact on building a culture of resilience at all levels.

HFA Priority # 4: Reduce the underlying risk factors

Sectoral ministries are working towards reducing the risks posed by the three main factors that exacerbate Yemen's vulnerability to natural disasters: (i) climate change, (ii) depletion of water resources, and (iii) ineffective land use planning that are contributing to development in hazard prone areas. Table 3 maps the various national and sub-national entities that have a crucial role in limiting risks from the three underlying factors. There is a need to develop clear guidelines for mainstreaming disaster risk reduction into the sectoral planning and investment cycles of these ministries. Discussions amongst policy makers are underway to include in the institutional mandates of these agencies, an explicit focus on reducing the risks from disasters, so that appropriate initiatives can be mainstreamed and supported. These agencies have already embarked on some steps to reduce the risks from disasters, for example, the incorporation of flood plain protection in strategic land use planning, the development of appropriate building codes, and environmental impact assessment procedures.

Table3: Agencies active in risk reduction

Agency	Relation to Risk Reduction	Comments
Governorates/Director of Districts	Implementation and Enforcement	With decentralization, the role of these agencies is crucial for the development of strategic land-use planning and their enforcement.
General Authority on Land Survey and Urban Planning	Master Plans in accordance with flood plain location	Has advisory role, need actual implementation at local level
Ministry of Public Works	Building codes, permits, design and construction	Needs greater implementation at local level
Ministry of Agriculture and Irrigation	Flood protection works, Dams Dikes/	Ministry would like to focus in the areas of desertification and locust storms
Ministry of Water and Environment	Environmental Impact Assessment (EIA)	By law all infrastructure projects should follow EIA to ensure no alteration in hazard prone areas



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Implementation of specific measures that impact the underlying risk factors will not be possible without significant ownership of necessary actions at the community level

At present disaster risk reduction efforts in Yemen are far from being coherently organized vertically. Without decentralization, there will be little empowerment of sub national levels of government and their communities to develop an effective and balanced program to reduce risks. Effective disaster risk management strategies will be difficult to develop, and the implementation of policies and programs developed centrally will be difficult and inefficient.

HFA Priority # 5: Strengthen disaster preparedness for effective response at all levels

Disaster preparedness for effective response at all levels has not as yet received attention in Yemen, as the planning focus has been on disaster relief and recovery operations. Although there is no institutional mechanism to ensure adequate preparedness levels for natural disasters and an emergency response to them, as stated earlier, the National Disaster Management Unit in the Ministry of Interior has developed a National Disaster Management Plan. This plan spells out in detail, the role of key line ministries before, during, and in the post disaster emergency phase. It provides checklists for essential activities to be executed in the different phases of a disaster, as well as a list of essential contacts. This plan, however, is yet to be approved by Yemen's cabinet.

In the absence of attention to the pre-disaster planning, the only central government practice that exists is for an area to be declared a "Disaster Affected Area" before resources can be mobilized. In the event of a disaster, the President of Yemen declares the affected areas as "Disaster Affected Areas". Only after this declaration can relief funds be allocated, with relief efforts coordinated through a high level inter-ministerial committee. Such a committee was organized under the Prime Minister's Office after 2008 floods to coordinate national and international relief efforts. This committee coordinates the efforts of the army, international relief agencies, the branches of technical ministries, and utility agencies at governorate level, which are the main actors during the disaster relief phase of disaster operations. Immediate recovery and reconstruction activities, i.e. post emergency relief, are coordinated at the governorate level by branches of line ministries (chief being Ministry of Public Works) and local NGOs. Long-term recovery and reconstruction activities are mostly coordinated by specialized Recovery and Reconstruction Funds (e.g. recently established Fund for Recovery and Reconstruction in Hadramout and Al Mahara). There is a need to develop and adopt early warning protocols and preparedness plans at regional and local levels.

6- Strengthening Yemen National System for Disaster Risk Reduction

Yemen faces a range of different natural hazards the most important ones being earthquakes, flash floods,



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and land/rockslides. According to the World Disasters Report 2000, more than 50,000 people are annually affected by disasters triggered by natural hazards in Yemen. Most of those affected belong to vulnerable segments of the society, including women and children. Specifically at risk is the city of Taiz. With 540,000 inhabitants, it is one of the largest cities in Yemen, located at the base of Mt. Sabir. The city is subject to severe seasonal flash flooding that claims lives every year, injures scores of residents, and inflicts significant damage on city infrastructure. Particularly vulnerable are the poorest urban dwellers who live near the flood zone in precarious dwellings made of wood, aluminum, and other scavenged materials. The Yemen government has realized that natural hazard poses a growing risk to its sustainable development and over the last decade it has taken some initial steps to address such risk. In 1997 the Council of Ministers issued decree No 52 to form a committee to prepare an approach for Disaster Management. In 2003 the Minister of Water and Environment (MoWE) issued decree No 28 to establish an Environmental Emergency Unit to initiate and coordinate the implementation of institutional capacities to face all aspects of Environmental Emergencies and Disasters. The Presidential Decree No 218, year 2005, about the by-law of MWE also identifies the Environment Emergencies General Directorate's mandate, which allows the Environment Emergencies Unit to direct and develop the environment emergencies and risk reduction procedures. The Ministry of Interior has developed a National Plan for Disaster Management, December 2005, but this plan does not address disaster risk reduction. The Environment Emergencies Unit in the Ministry of Water and Environment is in charge of risk reduction and has worked to setup a national platform for Disaster Risk Reduction in coordination with the UNISDR. There is no national policy for disaster risk reduction and so far only scattered and uncoordinated advances in implementation of the National Plan for Disaster Management. A number of isolated initiatives have been undertaken on a project basis by different line ministries but with little sustainable improvement, partly due to a lack of clear indication of authority and responsibility for the different aspects of risk management. Some projects, like early warning systems, have been established with funding by international organizations, but they have not been maintained when funding has ended. The main reason of this halt is that there is no clear national mechanism to regulate and control these issues and a lack of national capacity.

The National Disaster Risk Reduction Project

Essentially this project will seek to operationalize the national platform that will coordinate Yemeni activities to address the five pillars in the Hyogo framework. A successful national framework would also put Yemen in a stronger position to make donors support Yemeni initiatives that are a coordinated part of a national approach to disaster risk management instead of the current situation where different donors work with different agencies to address specific and isolated aspects that relate to disasters. This will strengthen the Government of Yemen's ownership of the disaster risk management agenda. The vision is to link the



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disperse efforts that are currently being undertaken towards disaster risk management and upscale them in a coordinated fashion. There are three components of the Project: National Disaster Risk Assessment; Strengthening the National System for Disaster Risk Reduction and Recovery and Developing Viable Models to Mainstream Disaster Risk Reduction into Local Development. The overall strategy to support Yemen in developing a sound Disaster Risk Reduction and Recovery system using the funds made available by GFDRR was discussed in detail with the Director General of the Environmental Emergencies under the Ministry of Water and Environment, Government of Yemen. In particular, the top priority for Yemen was identified in the need to strengthen the national system for Disaster Risk Reduction and Recovery. To achieve this objective, a three-fold strategy was discussed and agreed to guide the identification and implementation of key activities to be supported under this proposal. The strategy consists of intervening both at national and local levels, whereas GFDRR Track II would support: (i) a country Disaster Risk Assessment which will form the basis for policy dialogue and prioritization of interventions, (ii) the central government to develop the National DRR System, including necessary legal and strategic frameworks to ensure mainstreaming and inter-ministerial and inter-sectoral coordination, and (iii) a series of innovative pilot activities at the local level (e.g. in collaboration with Sana'a on the CDS and with Taiz on urban upgrading and flood management), within specific sectors (e.g. through add-ons to ongoing or under-preparation projects), and/or cross-cutting (e.g. national awareness campaign, climate change adaptations, etc). The three parallel interventions at national, central and local level would be mutually reinforcing, whereas the pilot experience at local level would feed into the national DRR system as models for country-wide replication. Additionally, an IDA-financed Taiz Municipal Development and Flood Protection Project aimed to build flood protection structures that would channel floodwater to a catch basin south of the city, thereby protecting city residents and businesses. The project financed Yemen's first Resettlement operation, which far exceeded the typical "do-no-harm" approach to social safeguards. The integrated urban resettlement village, located at Al Birarah, included access to decent housing, tenure security, and adequate services.

Progress in achieving targets of the Project

Though the National Disaster Risk Reduction project is just taking off (a national risk assessment has been initiated, so as to help the Government of Yemen to identify and prioritize its risks), the Taiz Municipal Development and Flood Protection Project is near completion. Some of the key achievements of the Project include: The resettlement of 2,440 low-income families out of harm's way to a model resettlement village, which greatly improved their livelihoods. Representatives of a local NGO, the Akhdam community, and Local Council traveled to India to participate in a knowledge exchange with an NGO that has extensive experience in providing affordable housing for slum dwellers and implementing integrated community



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development programs. This experience bridged the gap between policymakers, NGOs, and community organizations to develop a common vision for urban upgrading in Taiz. Flood-protection infrastructure transformed major parts of Taiz city and has had an immediate and substantial impact on the lives of city residents in the affected areas (an estimated 10,000 households and 1,000 businesses were direct beneficiaries). In project areas, there have been zero flood-related losses in lives or property.

Key limitations

The key limitations are the low institutional capacity building capability of the country and lack of data availability for risk analyses. The end result of the National Disaster Risk Reduction Strategy is to build this capacity in Yemen.

Way forward

The Second Disaster and Risk Reduction Conference for the Middle East and North Africa region was held in Sana'a city in October, 2008. This is a big step for the visibility of the Disaster Risk Reduction work programs going on in Yemen. Additionally, Government employees will be participating in a Damage and Loss Assessment training program in early November (to be held in Taiz). Both these events should go a long way in building capacity of the country.



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