

“Support to Building National
Capacities for Earthquake Risk Reduction
at Amman Municipality in Jordan” Project

Disaster Risk Management Profile (Amman- Jordan)



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LIST OF ABBREVIATIONS

AMA	Amman Metropolitan Area
BRC	Building Research Center
DSFS	Dead Sea Fault System
FAO	Food and Agriculture Organization
GAM	Greater Amman Municipality
GDCD	General Directorate for Civil Defense
GIS	Geographical Information system
HCCD	Higher Council of Civil Defense
HUDC	Housing and Urban Development Corporation
ICOMOS	International Council on Monuments and Sites
JNBC	Jordan National Building Council
JRC	Jordan Red Crescent Society
NDRMP	National Disaster Response Master Plan
NDV	Neighborhood Disaster Volunteers
NGO	Non Government Organization

RSS	Royal Scientific Society
SDC	Swiss Agency for Development and Cooperation
UNDP	United Nations Development Program
UNESCO	United Nations Educational, Scientific, and Cultural Organization
UNHCR	United Nations High Commissioner for Refugees
UNRWA	United Nations Relief and Works Agency for Palestinian Refugees in the Middle East
USAID	United State Agency for International Development
USAR	Urban Search and Rescue
WFP	World Food Program



AMMAN, JORDAN

DISASTER RISK MANAGEMENT PROFILE



Picture 1. Political map of Jordan



Picture 2. Amman at present day

1. INTRODUCTION

1.1 Demographic Economic Social and Cultural Characteristics

Jordan is a small country in the northern part of the Arabian Peninsula. The area of Jordan is 89,213 km²; of which 88,884 sq. km are land and 329 sq. km are water. Jordan is bordered by Syria in the north, Iraq in the north east, Saudi Arabia in the south and the West Bank and Israel in the west. It has a southern access to the Red Sea, Aqaba, which is its only sea port. Jordan is mainly a desert, with some mountain areas in the west and north-west. The majority of Jordan's population of 5.92 million live in urban areas; mainly Amman, Zarqa, and Irbid. Amman the capital is located in the central west part of the country of Jordan and has gained its importance through history. The population of Jordan is growing at a rate of 2.3%, with life expectancy of 71.5 years. The official language of Jordan is Arabic, though many people speak English fluently.^{8, 18, 40}

The nation of Jordan contains a diversity of landscapes and environments, a rich history containing many significant archeological sites, and is bounded to the west by a major fault/plate boundary. Jordan can be divided into four ecological areas: the Jordan Valley, Highlands, Steppe and Badia (Arid) region.³⁷

Jordan has a combination of Mediterranean and arid desert climates, with Mediterranean climates prevailing in the north and west of the country, while the majority of the country is desert. Generally, the country has warm, dry summers and mild, wet winters, with annual average temperatures ranging from 12 to 25 C (54 to 77 F) and summertime highs reaching the 40 C (105-115 F) in the desert regions. Rainfall averages vary from 50mm (1.97 inches) annually in the desert to as much as 800 mm (31.5 inches) in the northern hills, some of which falls as snow. Jordan maintains a dry climate throughout 90% of its area.³⁷

The country is divided into 3 regions made up of 12 governorates, Irbid, Jarash, Ajloun and Mafrqa are in the Northern region, Amman, Zarqa, Balqa and Madaba are in the Central Region, and Karak, Taffileh, Ma'an and Aqaba southern region. 18

Jordan's economy has changed from an agricultural based to a diversified economy, which includes services and industry as well as agriculture. A population increase occurred when refugees in 1948, 1967, and 1991 came to Jordan. Unfortunately this population growth created poverty and affected ecologically fragile environments.²

1.2 Governance Style

Jordan's Organic Law was instituted in April 1928 under the guidance of Emir Abdullah. It was provided for a consultative parliament, and Jordan's first elections were held in April 1929. Jordan gained full independence in May 25, 1946, following the abolition of the British Mandate. A new Constitution was formulated and adopted by the Legislative Council on November 28, 1947. It was published as law in the Official Gazette on February 1, 1947. A few years later, the Constitution was liberalized by King Talal and ratified on January 1, 1952. It is the one in current use today.²³

Jordan's constitution stipulates that the country is a hereditary monarchy with a parliamentary system. The reigning monarch is the Head of State, the Chief Executive and the Commander-in-Chief of the Armed forces. The Constitution outlines the functions and powers of the state, the rights and duties of Jordanians, the guidelines for interpretation of the Constitution and the conditions for constitutional amendments. It mandates the separation of the executive, legislative and judicial branches of government, and outlines the regulation of the government's finances, as well as the enforcement and repeal of laws. The King exercises his executive authority by appointing the prime minister, who then organizes a cabinet of ministers to be appointed by the King. The prime minister and the cabinet must then be approved by the Lower House of Parliament, the House

of Deputies. The cabinet is responsible before the elected House of Deputies which, along with the House of Notables (Senate), constitutes the legislative branch of the government. The judicial branch is an independent branch of the government.²²

Legislative powers are shared by the King and Parliament, which is comprised of the 40-member House of Notables (Majlis al-A'yan), or Senate, and the 80-member House of Deputies (Majlis al-Nuwwab). While senators are appointed by the King, deputies of the lower house are directly elected by universal suffrage. Article 34 of the Constitution entitles the King to dissolve either house of Parliament or to discharge any of its members. The normal parliamentary term is four years.^{22, 23}

The Constitution stipulates that the reigning monarch must approve laws before they can take effect, although his power of veto can be overridden by a two-thirds majority of both houses of Parliament. The King also authorizes the appointment and dismissal of judges, regional governors and the mayor of Amman, and he approves constitutional amendments, declares war and is commander-in-chief of the armed forces. As head of state, the King concludes and ratifies treaties and agreements, with the approval of the Cabinet and Parliament. The King is also entitled to grant special pardons and amnesties.²²

The administration of all internal and external Jordanian affairs is entrusted to the prime minister and the cabinet, or Council of Ministers.



Picture 3 Amman in 1918



Picture 4. Amman 2007

1.3 Amman History

Amman is an ancient home of civilization dating back to the year 8,000 BC. Different civilizations from the Heksus, Bani Ammon, Assyrians, Babylonians, Greeks, Romans, Ghassanids, Umayyad, and Abbasids left their imprints on the city in the form of caves, buildings, churches, amphitheaters and mosques. With the changes in civilizations and natural disasters such as earthquakes, some have become ruins and some still standing.¹⁸

With the increasing importance of Amman for its location and the influx of refugees and immigrants the city had several spurts of growth that affected its structure. Of the first immigrating groups was the Circassian tribe of Shabsough in 1887. At that time Jordan (it had not obtained that name yet) was still under the Ottoman rule which continued until the end of First World War when the British mandate over Trans-Jordan started. In May 1923 the British recognized Trans-Jordan to be an Emirate under the leadership of Emir Abdullah with the British mandate controlling foreign affairs, armed forces, communication, and state finance. In 1946 Trans-Jordan gained its independence from the British mandate and Emir Abdullah became King Abdullah

of the Hashemite Kingdom of Jordan. In 1948 there was another influx of refugees from Palestine (estimated at 700,000). In 1967 there was a war between Jordan and Israel with Egypt, Syria and Iraq involved, Israel took control over the West Bank, Gaza and East Jerusalem, and thousands of Palestinians became refugees in Jordan. Further conflicts and wars in different years resulted in large influx of refugees to the city.^{18, 23}

1.4 National Hazard-Scape

The Government's National Disaster Response Master Plan (NDRMP) (2004) identifies the following main hazards as potential threats to Jordan: earthquakes, flash floods, drought, locusts, and weather emergencies (snowstorms, frost), as well as human-made disasters such as fires, chemical dangers (industrial releases, hazardous materials transportation accidents, etc.), chemical, biological, and radioactive contamination, armed conflict, and mass population migration.⁴⁹

Jordan's climate varies from dry sub-humid Mediterranean in the northwest of the country to desert in the southeast. The varied climatic conditions give rise to a number of distinct ecosystems, but these are fragile and need protecting. The vulnerability of these ecosystems and of environmental resources in general is compounded by human-caused pressures due to population growth and economic development. In addition to scarce water resources, most of Jordan's economic activities take place on only 10% of its land, leading in many areas to land degradation that has direct consequences for the livelihoods of the population.³⁷

With the *Israeli-Palestinian conflict* remaining as deadly as ever, the spill-over effect from the conflict makes Jordan vulnerable to 'human-made' disasters and their consequences. The sudden influx of immigrants / refugees and returnees in past years had a series of social and economic effects related to shortages of food, housing and employment opportunities, as well as strains on the education system and urban infrastructures.

Mass Population Migration In the recent history of Jordan there have been many migrations; starting with the 1948 war that resulted in over 700,000 refugees. The 1967 war resulted in about 300,000 refugees from Palestine to Jordan. A later population growth came after the Gulf War in 1990 when over one million refugees came through Jordan and about 300,000 of them became residents in Jordan. ² This last increase in numbers of refugees put strains on the limited water resources, infrastructure and increased unemployment to 30%. ³⁷

According to the UNRWA there are 234,749 refugee camps for Palestinians in Amman, Jordan. ³⁹ In the last 5 years there has been a large influx of Iraqi refugees after the coalition's invasion of Iraq. ³⁸

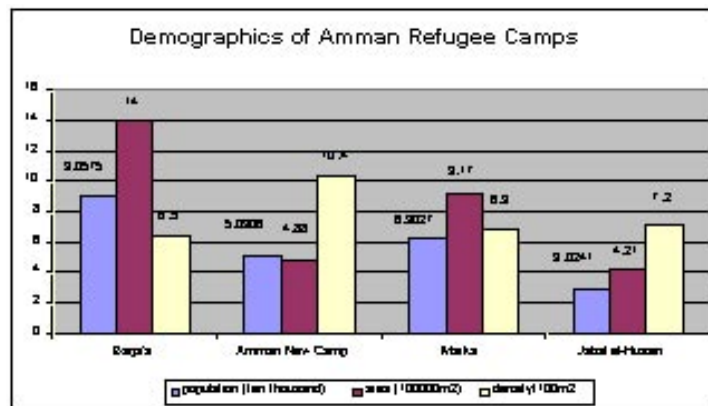


Figure 1. The population, areas, and density in the refugee camps around Amman ³⁹

Seismic Hazard: The Middle East is tectonically and seismically active. In general, the eastern Mediterranean region is dominated by the interaction of the Arabian and African Plates with Eurasia and within this tectonic framework is the Dead Sea Fault System (DSFS). This fault system defines the western edge of the Arabic

plate and forms a 1000 km long continental transform fault extending from the Red Sea northwards through Lebanon, Syria and Jordan towards the collision zone in southern Turkey. This part of the fault, which passes through Jordan, is known as the Dead Sea Rift Valley.³⁷

Dead Sea Rift Valley, which extends the whole length of the country and defines its western border, is the single most important geological feature of seismic significance within Jordan. The rift valley is a continuation of the East African Rift Valley and the Red Sea.³⁷

As indicated above, it owes its existence to a deep-seated transform fault, which marks the boundary between the Arabian and African plates. Earthquakes are reasonably common along the Rift Valley but become progressively rarer towards the interior deserts. Over 50 major earthquakes have affected the area in the past 2500 years, which have been responsible for the destruction of many historically known cultural centers. Historical earthquakes have also caused tidal waves on the Dead Sea and landslides in adjacent areas. The major seismic activity of the Dead Sea area is confined to its eastern shore. Some of the most recent earthquakes occurred on 11th July 1927, magnitude 6.2 in which 242 people died (epicenter in Amman), 31 March 1969 (Northern Red Sea) and 22 November 1995, magnitude 7.1 Gulf of Aqaba.^{16, 37}

The epicenter of the Feb 11th 2004 earthquake was 45 KM from the capital Amman. It occurred at a shallow depth of 25.8 km and was strongly felt in Amman and the northern area of Jordan. Although no deaths were recorded from this earthquake, the initial panic and confusion it triggered suggest that more attention needs to be placed on preparedness and earthquake risk reduction.³⁷

Flooding: Incidents of flash flooding have claimed the lives of a few hundred in Jordan over the years and affected the lives and livelihoods of thousands. The most recent incident occurred in the Jordan Valley 2006⁵⁷. In the past half century floods have taken 345 and affected 24,321 lives.⁵⁷

Drought: Jordan is one of the world's most water scarce countries with 75% of the country classified as desert or semi-desert. The potential for the occurrence of drought and associated adverse consequences for the economy and society are ever-present concerns in arid regions such as Jordan. Drought has been a prevalent feature of the Jordanian landscape during the latter part of the 1990s, producing serious socioeconomic and environmental consequences. In 2001 Jordan suffered eight successive years of drought, which led to international assistance by FAO, WFP, USAID, the European Union, GTZ and others. In 1999, severe drought cut rainfall in Jordan by up to 70 % with declining rainfall levels and increased demand on water resources. The effective management of water resources is crucial for meeting the demands of the productive sectors and national households. During that period drought affected over 200,000 persons including small landholders who have lost their harvest and their inputs, small-scale herders and landless rural households.³⁷

Water shortage in Jordan has been compounded by recent droughts, over-exploitation of water resources and a high population growth which is another area of concern. Jordan is considered one of the poorest countries in water resources. The water use for household and municipal purposes per capita has decreased from 3600m³ in 1946 to 160 m³ at the present time^{29, 32}. Despite plans for additional water resources and the upgrading of the water supply infrastructure, the race between supply and demand will continue.³⁷

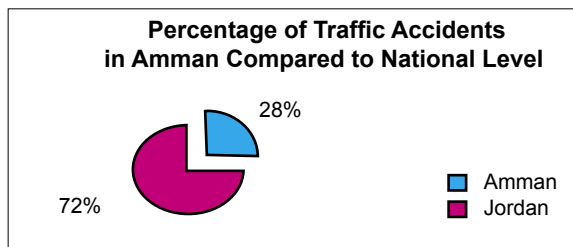


Figure 2. Traffic accidents in Jordan and Amman.

Traffic Accidents According to civil defense 2006 report road accidents are major killers in Jordan with 452 persons killed and 15044 injured in 2006, indicating an increase up to 11.4% in comparison to the same data for 2005.⁴⁵

Urban Disaster Risk: Like many countries, Jordan faces the challenge of rapid urbanization with an annual rate of urban growth of approximately 4-5%. The Amman Metropolitan Area (AMA) which includes the cities of Amman, Zarqa, Ruseifa and surrounding areas, accounts for more than 50% of Jordan's population, contains about 80% of the country's industrial sector and provides employment for about 55% of the nation's inhabitants. In 1943, Amman had only 30,000 inhabitants. Over the subsequent decades, Amman grew to a booming, overcrowded metropolitan center with a population of over two million. Population growth was largely a function of the influx of Palestinian refugees since 1948, a high birth rate and internal migration.³⁷

Historical Disasters: A summary of major disasters over the past century is provided in Table 1. The table shows the disaster types, date, affected populations (injured and displaced) and deaths.^{7,12,57}

Table 1. Major disasters in Jordan over the past 100 years.

Disaster	Date	Affected Population	Deaths
Earthquake	1927	Unknown	242
Flooding	1963	Unknown	25
Flooding	1965	500	0
Flooding	1966	5792	295
Drought	1966	180,000	0
Epidemic	1981	715	4
Flooding	1987	29	9
Flooding	1991	18,000	8
Earthquake	2004	19	0
Terror attack	2005	100	60
Floods	2006	25	6

1.5 National Disaster Management Structure and Relevant Legislation

The Government's NDRMP (2004) ⁴⁹ addresses encountering disasters and major accidents as part of the civil defense law no. 18, 1999, and is an adjustment to law no. 57, 2002 ⁵³. The plan has procedures and actions to be carried out by the civil defense. Members of the Higher Council of Civil Defense (HCCD) and its committees in the administrative divisions perform the plan's actions. The HCCD includes the Minister of Interior who is the chairman and the Director General of civil defense as vice chairman.

It also includes the additional members:

- Secretariat-General of Prime Ministry
- Secretary general of all ministries
- Secretary general of the higher council of youth
- Jordanian armed forces deputy assigned by the chairman of Jordanian Armed forces
- Public security deputy assigned by the public security general director
- Amman municipality deputy
- The chairman of the Jordanian red crescent society
- The chairman of the trade chambers union
- A chairman for one of the industrial chambers assigned by the Ministry of industry and trade. ⁴⁹

Duties of the HCCD:

- Setting public plans to take necessary procedures to encounter emergencies and disasters, and specifying duties of private and public parties.
- Setting necessary plans to provide protection against chemical, radioactive, bacterial contamination, and toxic gases in corporation with specialized concerned parties.

- Issuing required directives to organize the council's duties, and managing its operation rooms, operation rooms of the parties represented within, and the operation rooms of civil defense committees in the governorates and provinces.
- Establishing and equipping public shelters.
- Specifying duties and tasks of civil defense committees formed in governorates in accordance with the rules of this law.
- Setting the duties of Armed Forces and Public Security at emergencies and disasters to support civil defense actions.
- Forming voluntary teams of civilians with ages ranging from (18) to (50) years to support civil defense actions.
- Demonstrating alarming techniques to citizens against emergencies and disasters, and specifying required methods.
- Setting financial estimation for the budget to encounter emergencies and disasters, and submitting it to the Cabinet for confirming and including it within the public budget.
- Recommending to the Cabinet to obligate concerned local departments, organizations and authorities for assigning required financial allowances in their annual budgets to carry out duties and tasks determined by the council ⁴⁹

There are three subcommittees; media, relief, and earthquake technical committees, that have been established. The relief and earthquake committees have developed their terms of reference as follow:

The Relief Committee:

The committee is formed of: Ministry of Industry and Commerce as the director, Ministry of Health, Ministry of Social Welfare, Foreign Ministry, Ministry of Public Works and Housing, Ministry of Communication, Ministry of Transportation, Ministry of Agriculture, Civil Defense, Military, Police Force, Jordan Red Crescent Society. The committee's duties are: ⁴³

- Conduct disaster rapid damage and need assessments.
- Request relief material for the vulnerable people
- Provide logistics services (receive, store, distribute and deploy) for the relief material in adequate time
- Supervise the relief subcommittees operation in the field and monitor relief operation in the field
- Coordinate with the HCCD and the civil defense committees in the governorates during relief operations and emerging situations.
- Supervise international relief operations.
- Follow up international appeal and external support
- Reporting to HCCD on the relief operations

Earthquake Technical Committee:

The committee consists of: Ministry of Public Works and Housing, Civil Defense, The Royal Scientific Society (RSS), Natural Resources Authority, Engineer's union, Greater Amman Municipality (GAM), Ministry of Municipalities, Ministry of Water and Irrigation.

The committee's duties are: ⁵⁹

- Training civil engineers, Ministry representative, and emergency teams in earthquake resistant building design.
- Implementing the Jordan building code for earthquake-resistant buildings
- Monitoring the implementation of the Jordan building code in coordination with GAM and the Engineers Association.
- Identifying buildings at risk
- Creating and updating a database of engineering offices and institutions that have the necessary skills to conduct building evaluation and rehabilitation for earthquake resistance

- Establishing an engineering emergency team in each governorate to assess and classify the buildings affected by the earthquake in terms of their safety and resistance based on the approved rating system.

The HCCD signed agreements with Algeria, Lebanon, Egypt, Syria, Sudan, Saudi Arabia, Yemen, Switzerland and Austria, regarding civil defense, search and rescue, training, and support in response operations. The HCCD also conducts evacuation simulation exercises in public hospitals and institutions.

1.6 National Land Use Management System and Relevant Legislation:

Since 1993 there was the earthquake code within the loads and forces code. Jordanian National Building Council developed 32 codes to control and monitor the building constructions in Jordan.²⁵ Concrete structures are widely used in Jordan. Steel structures are used to a much lesser degree, mostly in warehouses and factories. Detailed design provisions for both concrete and steel structures are provided in the new seismic code.³

The Ministry of Public Works and Housing published the earthquake resistance building code in December 2005⁵⁴. Motivated by the importance of seismic hazard mitigation and by the necessity to update the seismic regulations, the Jordan National Building Council (JNBC) commissioned the Building Research Center (BRC) of the RSS to draft a comprehensive set of seismic provisions and regulations for the first Jordanian Code for Earthquake-Resistant Buildings, referred to hereinafter as the Code. Employing the state-of-the-art knowledge in earthquake resistant design of structures, the new seismic regulations aim at providing minimum design requirements for structures in relevance to their functions with due consideration of providing safety and prosperity for people through reducing quake inflicted hazards. Moreover, these regulations aim at maintaining the functionality of both essential and hazardous facilities during and after an earthquake. The new Code is intended to provide designers with the required provisions for the “performance-based” seismic analysis and design of new structures. The philosophy for earthquake design for structures, other than essential facilities,

can be summarized as follows:

- To prevent frequent non-structural damage in frequent minor ground shaking.
- To prevent structural damage and minimize non-structural damage in occasional moderate ground shaking.
- To avoid collapse or serious damage in rare major ground shaking.⁵⁵

A task force was established in 2007 based on memorandum of understanding signed by Engineering Association, Contractors Association, Civil Defense and GAM. The task force consists of representatives from the above mentioned organizations.⁵⁶

The purpose of the task force is to monitor the building construction process. The group is authorized to stop the constructions if they found any violations. The structure of the task force is divided into three teams. Each team has a representative of each participating organization. The task force agreed to divide Amman into three major sections; each section consists of nine districts. They developed an organized system for their monitoring process that includes a database of new buildings, reporting system on their findings, and a database of buildings, contractors, supervising engineers, and locations.⁵⁵

1.7 Significance of the City to the Nation

Today's city of Amman covers an area of 1680 km², and is populated by 2.25 million people (38% of total Jordan population); as estimated by the Department of Statistics (DOS).⁸



Picture 5. Amman roads

The Greater Amman Municipality has a staff of 18340 employees keeping the city functioning, clean and presentable.¹⁴ The municipality values the cultural side of the capital and supports cultural and artistic activities by sponsoring many festivals and events throughout the year.¹⁸ Jordan acts as a host country for many United

Nations programs for the region and for international NGOs to implement programs at national and regional levels. Amman is the center of most services including, education, health, engineering in different fields,

publication agencies, religious places, touristic facilities, and local NGOs as well as international representations and organizations.⁴ These services have a major role in the disaster preparedness and response programs. The Greater Amman Municipality is working on development of a geographical distribution of locations for the public services. The following two figures are an example of the Geographical Information system (GIS) achievements.¹⁸



Figure 3. The distribution of schools in Amman¹⁵



Figure 4. The distribution of mosques in Amman¹⁵

The following table provides a statistical summary of these facilities and services in Amman 9, 18
Table 2. Number of facilities in Amman

Type	Services	Number
Education	Schools	1762
	Universities	8
Local NGOs	Specialized	142
	Multi purpose	221
	Women	60
Health	Medical staff	1581
	Health centers	45
	MCH	39
	T.B Centres	1
	Dental Clinics	31
	Pharmacies	945
	Doctors	
	Male	21196
	Female	3421
	Hospitals (private 39, governmental 12)	51
	Number of beds	6265
	Engineers	49802
	Mosques	3950
	Hotels	201
	Hotel suite	123

All these facilities and resources could be utilized and mobilized during emergencies especially in relief (shelter and distribution).

Amman is located in the Central Region of Jordan; it is not only the transit hub between the North and South of the country – it is also the largest city, and Jordan’s main business hub. Infrastructure and transportation networks are key determining factors to facilitate the sustainable development of our Capital City.”⁴

2. INTER – CITY LINKAGES

2.1 Internal Division of the City

The Greater Amman Municipality is divided into 27 administrative districts and each district has a full staff of employees. The GAM city council has 68 members distributed into 14 committees:

- 1) Zoning and building district committee
- 2) Local committee of sub-districts
- 3) Employees affairs committee
- 4) Supplies and work committee
- 5) Land laying hand committee
- 6) Green area committee
- 7) Finance planning committee
- 8) Finance committee
- 9) Health committee
- 10) Legal committee
- 11) Street naming and numbering committee
- 12) Social and cultural committee
- 13) Development committee
- 14) Traffic safety and awareness committee 60



Figure 5. Boundary region of GAM 27 districts 15

2.2 Governance/Management Style

The Greater Amman Municipality is a financially independent private corporation. The functions are administered by the GAM Council, which includes the Mayor of Amman (Council President). The Council is the Municipality's highest governing body. Amman Mayor is considered the top of the administrative pyramid in the Municipality's organizational structure. The Council Ministers vote to select the Mayor and Deputy Mayor from within the 68 members of the GAM Council. The Mayor is assisted in his duties by the Deputy Mayor. The Council of Ministers consists of 34 Amman residents elected to the Council and 34 appointed to the

Council to represent official, commercial, and economic bodies as well as other services departments within the city of Amman ^{44, 52}. The council term is four years. The Council is assisted by several Council-delegated committees, where each committee deals with a specific task. ¹⁸

2.3 Formal Arrangements

The Greater Amman Municipality has several service departments including research and development department, GIS, quality control, information development, legal, culture, communication center, public relation, external relations, Zaha center for children, internal monitoring unit, workshops and fleet, sports and international relations, environmental health, finance, planning, engineering, security and protection, and management ⁶⁰.

The goals of GAM are:

- 1) Working to meet the needs of, and in partnership with, service-recipients who are the driving force behind designing and improving services.
- 2) Dedicated leadership
- 3) The City's ancient roots, architectural heritage and multiculturalism
- 4) Safe and healthy environment.
- 5) Fairness, transparency, accountability and confidence-building
- 6) Creation of correspondence between results and national objectives.
- 7) Communication and coordination, internally and externally.
- 8) Being proactive by taking preventive measures
- 9) Enhancing and rewarding initiative-taking, innovation and team work.
- 10) Continued planning, development and improvement
- 11) Educational institutions and knowledge sharing.

- 12) Loyalty.
- 13) Instilling and enforcing the concept of public service among employees.
- 14) Empowering employees and delegating authority
- 15) Adhering to legislation ^{4, 18}

The following major activities for GAM to meet its goals are summarized into laying out a 20-year strategic plan, developing financial resources, administrative development, by achieving knowledge-based management, as well as optimum use of resources. In addition reducing costs of services through citizens' increased collaboration, improving the City's environmental and health situation, also improving traffic movement throughout the City, and achieving 'E-Municipality'. The municipality will focus on social and economic development, fighting desertification and increasing green areas, and pay attention to cultural affairs and heritage to promote tourism, and promote interest in sports for youth. ¹⁹

Greater Amman Municipality is a member of the Higher Council of Civil Defense, and has its own two emergency centers, which provide direct response for day to day needs and they have a disaster response plan in case of large scale disasters ⁵⁰. These centers report to the enforcement operational unit of Amman Greater Municipality ⁶⁰.

Civil Defense:

Disaster response is the main task of the General Directorate for Civil Defense (GDGD), which is carried out by defense directorates, divisions, and centers at 115 locations at national level. The GDGD report to the Ministry of Interior in case of major response to disasters. The disaster management department in the Civil Defense is responsible for the following at national level:

- 1) Gathering and storing strategic information related to the disaster management.
- 2) Coordinating with international bodies and NGOs concerned with disaster related matters.
- 3) Coordinating with universities and scientific institutes concerned with disaster management. As a

result, coordination with Grandfield University took place in Britain for holding qualification courses for civil defense officers and members of the Higher Council of Civil Defense (HCCD) in the field of disaster management.

- 4) Making and publishing books and leaflets related to disaster management.
- 5) Updating their disaster response plan
- 6) Conducting awareness campaigns and training in the form of workshops, lectures, and field visits
- 7) Providing technical and professional counseling through the media during disasters
- 8) Supervising the establishment of the civil defense academy which will focus on disaster management, fire fighting engineers, specialized emergency medical services in addition to organizing specialized training programs in civil defense science (fire fighting, first aid, search and rescue)⁴⁹

Civil defense has signed agreements with neighboring countries to support each other in case of disasters, exchange information, and facilitate search and rescue team operations in case of major disasters.

As part of the public awareness campaign the civil defense developed in coordination with Hashemite Charity a poster on how to deal with earthquakes. It continuously carries out public awareness campaigns through producing brochures, poster and conducting trainings upon request for government institutions and local NGOs.

In general the civil defense is working on developing a framework to guide and monitor disaster risk reduction in Jordan; the framework will concentrate on political commitment institutional aspects, risk assessment, impact assessment, forecasting and early warning systems, and knowledge management which includes information management and communication, education and training, public awareness research as well as risk management applications that include environmental and natural resource management, social and economic development practices and technical measures, and they will focus on preparedness and emergency management.^{2, 41}

Jordan Red Crescent Society (JRC) recently conducted a Vulnerability and Capacity Assessment to collect

information (risk mapping) on potential hazards and weaknesses and identifying capacities.⁵⁷

The Building Research Center of RSS of Jordan implements a three-year project on mitigation of seismic hazard in Jordan. It aims at assessing the seismic hazard in the country which is considered the first and essential step in the mitigation process. The Royal Scientific Society develops maps which indicates the seismic risk for specific locations, and which allow construction engineers to design structures able to resist the likely shocks caused by a major earthquake. The Royal Scientific Society also cooperates with contractors to improve local construction practices, in order to increase the resistance of buildings during the earthquake and provides technical assistance for the development of disaster curriculum for other institutions.⁵⁷

Due to the large amount of significant historical and archeological sites within Jordan the conservation of cultural heritage sites has been addressed by UNESCO, ICOMOS, and other international organizations. They have initiated conventions, charters, and suggestions to preserve these areas. These include the Convention for the Protection of Cultural Property in the Event of Armed Conflict: The Hague Convention in 1954 and the International Charter for the Conservation and Restoration of Monuments and Sites: The Venice Charter 1964⁵.

2.4 Relevant Legislations/Regulations

The responsibilities of the Municipality of the City are dictated in the Municipalities Law No. 14 of 2007 and its amendments⁵². Listed are a few of many related to the issues addressed in this document:

- “City and Street Planning: Roads - constructing new roads, canceling or changing the routes of others; determining and constructing their sidewalks, width, route; paving, maintaining, cleaning, and lighting them; numbering the buildings along them; preventing encroachment upon them; conduct landscaping and planting alongside; and monitoring what may fall on them from open lands, and ordering owners of said lands to erect walls.”

- “Building Licenses: Monitoring the construction and destruction of buildings; and ordering changes their design; installation of elevators in them; granting of licenses for such works; determining the form and shape of a building and its area relative to the land on which it is to be built; and ensuring the existence of sanitary conditions in them.”
- “Water: providing residents with water; determining the specifications for its supply, such as water meters, pipes; regulate its distribution; determine its prices and the cost of subscription to the service; preventing pollution of springs, water channels, tanks and wells.”
- “Public Parks: establishing, monitoring and regulating public squares, public parks, gardens, baths, places for swimming in pools and lakes.”
- “Fire Stations and Fire Prevention: taking precautions to prevent fires; monitoring and regulating the sale and storage of fuels and flammables, and determine their prices; maintaining fire stations.
- “Precautions against Flooding: taking precautions to prevent damage caused by floods and overflowing streams.”
- “Helping Victims of Disasters: providing aid to victims of fires, floods, earthquakes, and other disasters; and collecting donations for them and distributing these among them.”
- “Sanitation: collect, transport and get rid of street trash and garbage from homes and public places.”
- “Public Health: take all measures and necessary precautions to maintain public health and prevent the spread of diseases.”
- “Risk Prevention: take all necessary precautions to protect individuals and properties; prevent damages and harms caused by any acts mentioned in this article.”
- “Destruction of Dilapidated Buildings: destruction of dilapidated buildings that pose a risk of collapsing or constitute a public health hazard, once a notice is given to the owner.”

- “Right-of-Way: sale and make use of right-of-way lands and what is acquired for public projects.”
- “Budget: approve the annual budget, final account statement and personnel salaries prior to referral to responsible authorities.”
- “Disbursement of Municipality Funds: managing Municipality properties and funds, and constructing, leasing, selling and purchasing needed buildings on such property, in accordance with the provisions of this Law. Also, receiving grants, donations and endowments.”⁵²

3. LAND USE MANAGEMENT

“The absence of a *Master Plan* and the random change in land use has not only had consequences on the cityscape and impacted established neighborhoods; it has also resulted in traffic congestion, unsafe roads, and stress on the urban infrastructure. New major multipurpose projects have to be carefully and comprehensively assessed, especially in congested areas. In short, the Master Plan must clearly outline development zones and establish urban design guidelines that create a cityscape that is attractive and of a human scale.”⁴

A Master Plan will typically divide a city into various land use districts – classifying residential, commercial, and industrial, parks, institutional, and agricultural lands, for instance. These land uses are generally regulated, describing in detail permissible land uses and dimensional standards (building heights, setbacks, etc.)⁴. The Geographical Information System Department categorized the land use in Amman into: commercial, residential, public parks, public buildings, schools, mosques, parking lots, and green areas¹⁵. The proposed Amman Master Plan intends to follow this model to:

- Create a more efficient city – especially with regards to traffic flow and urban infrastructure - by clustering appropriate land uses together
- Ensure that there is land use compatibility – co-locating complementary land uses and separating conflicting uses

- Protect and enhance existing neighborhoods and communities
- Support the greening of the City by protecting potential green belts and park lands
- Designate and preserve cultural and historical sites
- Ensure that our natural resources are protected, including the preservation of the most productive agricultural lands. “⁴

At the present time Amman’s transportation system is ‘chasing development’ and is unable to keep pace with urban growth. The total length of Amman’s roads is 3798.48 km ¹⁵. The proposed Master Plan intends to reverse this trend by integrating transportation planning with land-use planning. The municipality’s preferred state is for the transportation system to help guide the development of the City – it will be one of the ‘instruments’ to implement the Master Plan. ⁴

3.1 Relevant Legislation/Regulation

The municipality’s law that has been approved in 2007 takes into consideration many issues, but does not address the issue of disasters and emergency situations. It has been mentioned that municipalities’ responsibility has to be in relief operations by distributing relief assistance and collection of donations as well as work on precautions to prevent floods. There is no standard operation procedures identified in this law ⁵².

Other area that the municipality is undertaking under its mandate is supervising constructions and buildings in Amman. A law was presented lately to enforce using building codes in the new buildings. ⁵⁶

3.2 Responsible Agents and their Relationships

Land use regulations and development are a function of both the national government and the city municipality. There are basic regulations prepared by the national government that should be applied in the entire country, On a national level the Housing and Urban Development Corporation (HUDC) ²¹ deals with housing issues.

HUDC's tasks are to "study, formulate, and implement" laws and codes relative to the Housing and Urban sector as well as improving urban areas. The HUDC addresses issues such as the poor and their housing needs by getting private developers involved.

Natural Resources Authority carries out regular awareness campaigns on earthquakes through periodic bulletins, posters and opening the Jordan Seismological Observatory for public visits for students in particular.^{10, 11, 12}

Jordan Seismological Observatory began routine operations in September 1983. Seismic data is being telemetered via radio on assigned frequencies, telephone and microwave lines to the recording center at the natural Resources Authority building in Amman. The automated system and data processing was designed to achieve the following goals:

- Detect and locate earthquakes immediately
- Save digital records of the seismograms for further analysis
- Operate at a remote location where telemetry to central observatory might be feasible

The Seismological observatory has established a network of 26 telemetry stations and 26 strong motion stations distributed across the country. In Amman there are 6 stations distributed throughout the city at different buildings on different elevations.^{20, 11}

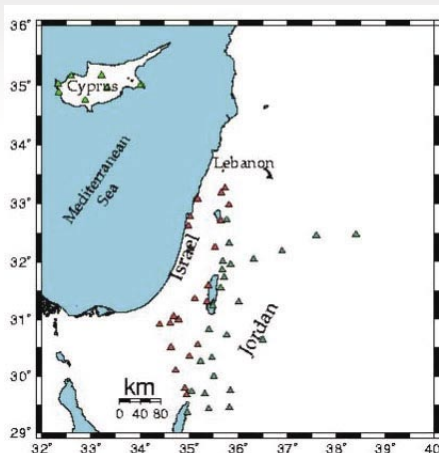


Figure 6. Seismic observation stations ¹

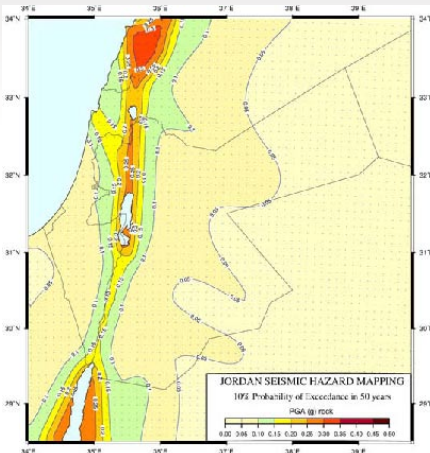


Figure 7. Jordan Seismic Hazard Mapping ³⁴

Engineering Association ensures the implementation of the *coda*, through approving the building design, follow up building laws and regulations, participate in the follow up filed committee with GAM and contactors association and conduct earthquake awareness campaigns. ^{17, 56}

The association carries out the following training workshops related to earthquake and disaster management in their centers. The association is targeting more than 50,000 engineers from different specialties in Amman:

- Analysis and structural design by computer
- Application of software on analysis and design of high rise buildings-ETABS9
- Analysis & structural design by computer (STAAD Pro.2004)
- Analysis and structural design by computer (SAP 2000)

- Risk management
- Engineering insurance
- Design of Surface & deep Foundation
- Design of earthquake resisting Construction
- Design, execution Errors & Collapse of concrete constructions
- Quality control in engineering projects
- Forensic Investigations of structural Failure
- Structural defects "rehabilitation and Remedies"
- Seismic Design Basics for Architects ⁴⁸

The association is developing Seismic principles booklet for engineers, architects, building owners and authorities in cooperation with SDC.

The association highlighted the importance of response plan and they are ready to open an operation room in case of disaster and support national risk reduction activities. The association can mobilize their experienced engineers to develop case studies and update the training manuals as well as provide technical consultations.

3.3 Effectiveness of Current Arrangements

The current arrangement effectiveness is not clear since there has not been any impact evaluation or assessment. This is due to the fact that the initiative to implement such studies is a recent initiative. The high interest of different agencies in Jordan to building up risk reduction programs is significant. Different organizations have invested in organizing or carrying out training for their staff in building up skills in disaster management ⁴⁹. The Ministry of Health, Ministry of Environment, Civil Defense, GAM and other institutions are working on building up their strategies for emergency preparedness and humanitarian action ^{28, 50, 51, 49}.

4. VULNERABILITY ISSUES

4.1 Seismic Zoning

Based on the seismic zoning map shown in Figure 8, a site is assigned to one of four zones: 1, 2A, 2B and 3 with increasing hazard towards the Dead Sea Transform Fault which constitutes the major source of seismic hazard in Jordan³. Each of the zones is characterized with a seismic zone factor, Z that describes the level of expected seismicity and that is directly associated with the effective peak ground acceleration.

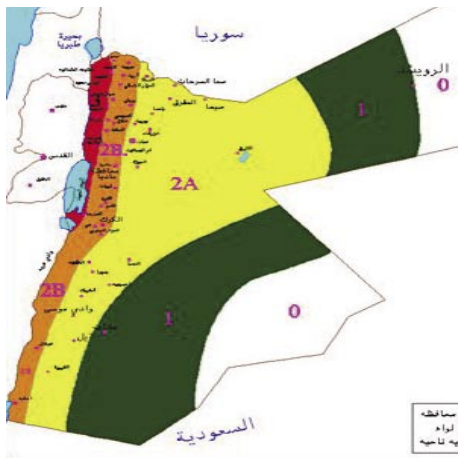


Figure 8. Jordan seismic hazard map³

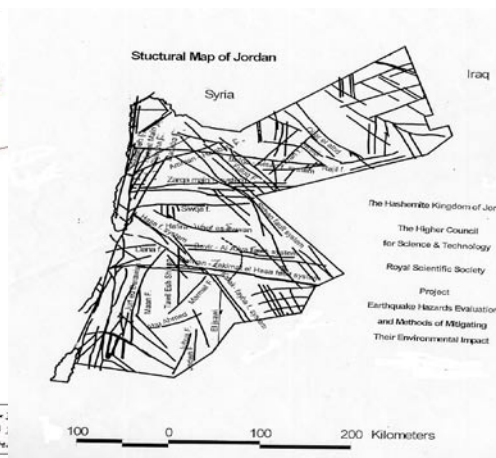


Figure 9. Jordan faulting system²⁶

Jordan is situated along a major fault line which dramatically increases the vulnerability of the country to

earthquakes and related natural disasters. “The Dead Sea fault zone is a major left-lateral strike-slip fault. South of the Dead Sea basin, the Wadi Araba fault extends over 160km to the Gulf of Aqaba. The Dead Sea fault zone is known to have produced several relatively large historical earthquakes.”²⁷

Faulting systems near Jordan and Amman

- Includes the Dead Sea and part of the Jordan Valley. Secondly, because it is in this sheet where a radial pattern of faults branching off eastern shoulder of the Dead Sea in various directions. These faults are:
- Zarqa - Mai'n and Siwaqa Strike - slip faults systems, which are the most important strike - slip faults in Jordan having an E-W direction from the central part of the Eastern Shore of the Dead Sea.²⁶
- Karak - Fayha and Hasa fault Systems with a NW-SE trend from the central part and the southeastern corner of the eastern shore of the Dead Sea.
- Amman - Hallabat structure having NE-SW trend branching from the northeast corner of the Dead Sea.

However, the historical events are unequally distributed along the fault and only four events have been reported in the Araba Valley over the last few thousands of years. Magnitudes estimated from the historical record are probably slightly smaller than that of Mw~7.3 earthquake that struck the Gulf of Aqaba in 1995.”²⁷

4.2 At-Risk Groups

The population living in the refugee camps and the old city, which includes higher population density and more vulnerable structures, are the at risk groups in Amman. These areas have not been subjected to the earthquake resistant building code. These areas include Ras el -Ain, al- Yarmouk, Basman, Al-Naser, and Al-Abdali. These groups have been identified based on speculations taking into account the population density. This speculation

is agreed upon by the 50 plus city representatives interviewed during the preparation of this document.¹⁵ Currently the UNDP is working on a risk assessment project of Amman which will provide comprehensive disaster risk assessment technology that will enable the assessment of earthquake risk in the city and to evaluate the geographical distribution of potential human and material losses in greater Amman³⁷.

4.3 At-Risk Locations

Local and international research groups have recognized Jordan's vulnerability to earthquakes, and Amman is located in zone 2A according to the seismic zoning map^{1, 3, 5, 10, 11, 12, 13, 20, 24, 27, 33, 35, 36, 41, 45, 48, 50, 51, 64, 66, 54, 74, 57,}⁵⁸. Several studies and workshops recognize that Amman is at risk in the case of a major earthquake in the region. Figure 10 shows the faults within Amman city, for example, the Hallabat structure in Amman with a NE-SW trend

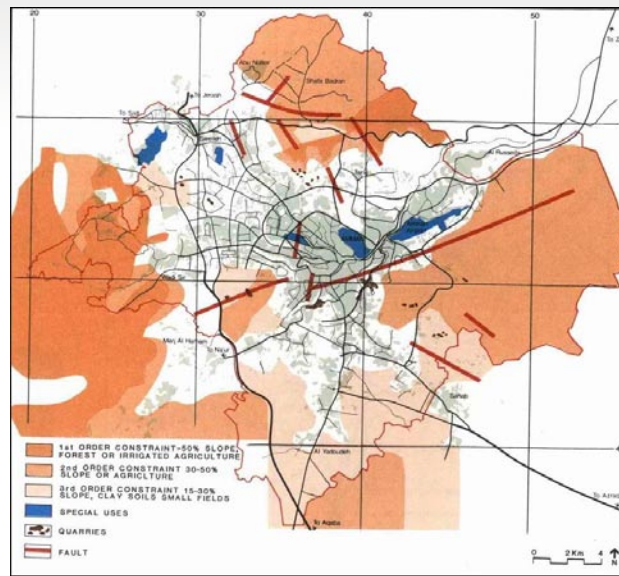


Figure 10. Fault map of Amman ³²

branching from the northeast corner of the Dead Sea. The haphazard expansion of Amman has created a situation whereby zoning restrictions have been surpassed in relation to actual construction. Residential districts have migrated into commercial and industrial areas and vice-versa. Low-rise neighborhoods now host high-density buildings. It is creating a ‘hodgepodge’ of development that is not attractive. Some developments are clearly ‘out-of-scale’ with the neighborhoods in which they have been located. ⁴

The areas of Amman with the highest density are those with narrow streets which would compound the catastrophe. In the case of an earthquake, there is no green area or parks in these locations to be used as shelter

places ⁴⁷. In addition it will be very difficult for emergency teams to reach these populations. The earthquake resistance building code has been published in 2005 but has not been activated until 2007 by the establishment of the technical committee. The mission of this committee is to follow up the implementation of the code in the field, but the effectiveness of this committee has not proven tangible yet ⁵⁶. The UNDP project “support to building national capacities for earthquake risk reduction at Amman Municipality in Jordan” will be a useful resource to identify the at-risk locations in Amman. ³⁷

4.4 City Policy on Vulnerability Alleviation

There is an emergency procedure adopted by Amman Municipality and other ministries to deal with emergency situations ^{50, 51, 49}. But there is no policy for disaster preparedness, response, and rehabilitation that governs the emergency operations. Having said that, it is worthwhile mentioning that there is a committee to follow up on the implementation of the building codes and is monitoring the construction of new buildings especially those of more than 1000m². In addition the Municipality, the Engineering association, and the RSS are encouraging engineers training on assessment criteria of earthquake damaged concrete buildings ⁶⁶. There is an approach by the GAM to create and establish green areas and parks but these areas have not been designed to cope with emergencies ⁴⁷.

5. DISASTER RISK MANAGEMENT ARRANGEMENT

5.1 Functional arrangements

Operational management

In case of emergencies and disasters the Interior Minister is authorized by the Prime Minister under Civil Defense Law No. 18, 1999 (amended in 2003)⁵³ in accordance with article No. 8 to give orders and take the following procedures during the time required by these situations:

- Laying hands on all means of transportation, restricting their moves and moves of drivers, laying hands on their spare parts, and restricting sale.
- Laying hands on required immovable properties and buildings for establishing public shelters, hospitals, and necessary centers for the purpose of ambulance services, nursing and other civil defense affairs.
- Taking hold of various types of flammable materials, restricting use and the way of storing
- Organizing, specifying, distributing foods and all required materials in order to encounter emergencies and disasters for the stability of people's living
- Organizing the use of electricity and water resources in coordination with concerned parties.
- Maintaining the work of radio and wired communications
- Preventing general staff, doctors, pharmacists, male and female nurses, the staff at any institution or utility of public services, the staff of food trading manufacturing field, and transportation laborers from leaving their jobs without permission signed by the minister or his representative. Besides, the minister has the right to impose prevention upon any other parties, if their works were necessary for the stability of living.

- Charging any person- of those whom has the required ability- with contributing in civil defense comprehensive services. If this person works in free business field, he has to put the equipment he has under the disposal of civil defense.
- Charging any public employee with running civil defense services all the required time.
- Charging any of the public/private organizations with delegating one of their senior officials for working as liaison officer between the organization and civil defense committees in order to coordinate with them as soon as possible.
- Issuing any directions, orders, and other decisions necessary for comprehensive civil defense requirements.
- Establishing coordination and cooperation through signing agreements with neighboring countries, Arab states, European countries and international organizations.^{49, 53}

Greater Amman Municipality has established an emergency center to provide access (opening streets in emergency), provides water drainage, builds supporting walls, maintains the valleys and streams in the Amman area, and manages the response operations from the central operation room. In addition they are responsible to build up a database of the water drainage lines and pipes. The emergency team has developed a contingency plan for natural and man made disasters⁵⁰. The main duties in this contingency plan is to prepare and equip the operation room linked to the High Council of Civil Defense, support the 27 sub operation rooms in the different areas of Amman, mobilize all GAM departments to respond, support in the relief operations through their operation teams, support debris removal, sustain the cleanliness and maintenance of affected areas, prepare burial places for the victims, and provide sterilization material to prevent epidemics, insects and rodents. Greater Amman Municipality has provided these materials and they are in place and ready for use. A map of alternative roads and routes has been developed for 89 bridges, tunnels, grand intersections, water tunnels, and major traffic roundabouts that may be affected in the case of disaster^{15, 42}.

There are two major emergency centers, one in Tla'-Ali and the other in Ras el-Ain, as well as a list of officials to be contacted in case of disasters ⁵⁰.

The HCCD has four regional warehouses under construction distributed in the Kingdom (al-Azraq, al-Muaqqar, Ma'an, and el-Mafraq). The location for these warehouses was selected for their distance from earthquake high risk locations. The Jordan Government has two established public emergency storage facilities in the middle and south regions of Jordan. Also, there are many storage facilities maintained by the Red Crescent Society and Jordan Hashemite Charity Organizations as well as private storages, all of which to be used under HCCD instructions during emergencies.

5.2 Risk Assessment

Amman, the capital of Jordan, is located in an earthquake zone. Several studies about risk assessment in Jordan have been carried out by local and international organizations. All these studies focused on fault locations, seismic behavior, geophysical studies of the Dead Sea rift, water and mineral resources, calibration of seismic wave propagation, cultural heritage and nature of disasters, and cataloging of earthquake areas. All these studies have not specified the vulnerable groups or locations at risk in the cities and the expected impact of earthquake, as well as the local resources to be utilized in case of emergency ^{1, 5, 10, 11, 12, 13, 17, 20, 25, 30, 33, 35}

The civil defense, GAM, UNDP, and the Foreign Ministry have established a team to implement the project of *“Support to Building National Capacities for Earthquake Risk Reduction at Amman Municipality in Jordan”* of which a major part is risk assessment ³⁷.

5.3 Risk Communication

Amman community at large does not show a high level of awareness. In the 2004 earthquake, most injured people were located at schools due to the stampede caused by fear. This shows a lack of awareness in evacuation and emergency plan for evacuating the schools¹². Such incidents also indicate the lack of proper early warning system for evacuation of public areas and residential buildings.

The seismic observatory has a hotline connection with civil defense and those in turn are directly connected to the GAM. In spite of that the communication to the public is still through radio, TV, mobile telecommunication and newspapers which are at risk to fail during emergency.

5.4 Risk reduction activities:

Based on this approach and mandate, Jordan signed the Hyogo Declaration in 2005 during the World Conference on Disaster Reduction and with reference to the Government's National Master Plan for Emergency and Disaster Management (2004).⁴⁹ Each member has to work on developing and implementing risk reduction activities according to his specialty and services.³¹

6. DISASTER RISK MANAGEMENT VISION

Greater Amman Municipality's vision is: "A livable city is an organized city with a soul"⁴.

To achieve this vision GAM has started to implement the grand master plan in "a year long process which will combine 'master planning' with institutional reform so that both the Master Plan and the capacity are prepared to implement the master plan in parallel. This will accelerate realization of the vision."

"The master plan will be a legally binding document committing the Municipality to an inclusive, open, and transparent planning system that balances between public and private needs. It will:

- Institute and promote measures to capitalize on, protect and promote Amman's natural physical environment, topography, landscape, and climate.
- Respect and restore Amman's culture and heritage; its monuments and structures, its people's way of life, their hospitality, tolerance of outsiders and openness that makes Amman a welcoming city.
- Be used to ensure that while Amman grows and develops in size, amenities and facilities, it retains its soul while striking a balance between its simplicity and modesty –East and West- old and new.”⁴

The Master Plan will be created and implemented in coordination with all other related government institutions. An inter-agency working group will be created. This will include Ministries and other related public sector bodies. Only through collective efforts will the plan successfully impact the city.⁴

For GAM to reach its vision in relation to disaster risk management they have to build up programs in disaster risk reduction based on clear framework and policies, and establish clear systems that identify roles and responsibilities for response operations in case of disasters and coordinate mitigation programs. A disaster management program and structure is needed to realize this vision. The program will help in mapping the vulnerability and hazards, documentation of lessons learned, evaluation of disaster management projects, and establishment of disaster management tools; such as neighborhood teams, field assessment teams, and logistics tools. A contingency plan will help organize their structure procedures, tools, policies, and resources towards implementing their vision.³⁰

7. ISSUES

Amman has experienced tremendous growth over the past several years. The city's population increase coupled with limited infrastructure and planning has led to haphazard expansion. As a result, certain issues now need to be addressed³: urbanization, desertification and shortage of water as well as influxes of Iraqi people or refugees

⁴, ³⁸, ³⁹

Institutional emergency plan has been written, but there are no coordination mechanisms between the different parties and partners to have an organized preparedness for response programs. In addition there is no networking system to facilitate such coordination. ^{48, 50, 51, 49}

There is no serious regulation that incorporates hazards into land use and planning processes such as evacuation areas and preparation of green areas to be used for emergencies, the municipality would cooperate in the implementation of support to building national capacities for earthquake risk reduction. The Greater Amman Municipality would incorporate this project into the master plan.

There is no vulnerability study that shows the number of people that would be affected in the case of earthquakes or other disaster, this information would help the GAM and the government to develop policies based on actual findings.

Disaster management in Amman focuses on response procedures and not on preparedness and mitigation, therefore the GAM plans do not include disaster preparedness program. Having said that; it is important to mention that, GAM is working with the National Building Council on raising awareness among contractors about implementing the building laws and codes.

Currently there's no clear policy or legislation addressing disaster risk reduction at national and city levels. Recently his Majesty King Abdullah II has ordered the government to make a comprehensive surveillance to find out the living conditions in the Jordanian Society in order to implement programs to fight poverty. ² The following organizations started to implement risk reduction activities:

In terms of health disasters, the GAM has prepared guidelines for health sectors in the municipality. These guidelines include laws and regulation to deal with epidemics, but lack the standard operation procedures or contingency plans to implement in case of disaster or mobilize the health teams.

There should be a policy to govern the implementation of risk reduction programs at national and local level.

The following practices could be enhanced during the implementation of the Support to Building National Capacities for Earthquake Risk Reduction project

- 1) Upgrading the National Disaster Response Master Plan by Greater Amman Municipality
- 2) Establishing Neighborhood Disaster Volunteers by civil defense department
- 3) Establishing Assessment Teams consisting of representatives from different ministries
- 4) Supporting Greater Amman Municipality Geographic Information System Department
- 5) Upgrading Greater Amman Municipality Emergency Centers
- 6) Integrating Risk Reduction Programs within the Child Friendly City at Greater Amman Municipality

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Greater Amman Municipality	www.ammancity.gov.jo
Jordan Department of Statistics	www.dos.gov.jo
Jordan National Building Council	www.jnbc.gov.jo/eindex.htm
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UNHCR Jordan	www.unhcr.org/country/jor.html
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Royal Jordanian Geographic Center	www.rjgc.gov.jo/what_we_do.html

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29	Eng. Samir Subhi	GAM	Mayor Advisor
30	Eng. Wael Al-Saqa	Jordan Engineers Association	President JEA
31	Eng. Zaidun	GAM	Environment Department
32	Fawaz Al-Najdawi	GAM	Emergency Center
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35	Hasan Al-Kiswani	GAM	GIS Director
36	Ibrahim Abdullah Al-Sarayrah		
37	Imad Majed El-Din	Civil Defense	Operation and Statistics Director
38	Iyad Amer	Civil Defense	Media Department
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43	Lt-Colonel Husam Al-Hababbeh	Ministry of Interior	HCCD Secretary
44	Lt-Colonel Mahmoud Al-Share'	Civil Defense	Civil Defense Media Director
45	Lt-Colonel Marwan Bader Al-Smiyat	Civil Defense	Disaster Department Director

46	Major Mahmoud Abu Al-Shaikh	Prevention Department (Civil Defense)	Building Management and Maintenance
47	Major Mahmoud Al-Hajaj	Civil Prevention and Protection Administration (Civil Defense)	
48	Mohamed Abdel Karim Harb	Civil Defense	Media Department
49	Mr. Mohamed Al-Assaf	Department of Statistics	
50	Rand Al-Nsour	GAM	Architect
51	Rashad Salem Shahin	GAM	Construction Designs Advisor
52	Ruba Al-Qutub	GAM	Agricultural Engineer
53	Soud Al-Quran	UNDP	National Coordinator
54	Siam Al-Hadid	GAM	Sites and Documentation Department Director
55	Taghrid Fakhuri	GAM	Execution Projects & Programs Director

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SOUND PRACTICES

SOUND PRACTICE RECOMMENDATION ONE

(Upgrading the National Disaster Response Master Plan)

The National Disaster Response Master Plan (NDRMP) plan has been updated in 2004 at which point potential risks and hazards have been identified. It also has a very clear structure at higher level. The duties and responsibilities of each organization/ institution/Ministry are well identified. During updating of Amman Risk Management Profile process, it has been realized that the master plan needs to be modified taking into consideration the following:

Objectives:

- 1) Disaster response, preparedness, and rehabilitation policies to govern the disaster management programs at national level.
- 2) Disaster management framework that includes; policy and planning, legislation, resources, normative framework, organization structure, risk identification, knowledge management, risk management application, environmental and natural resource management, social and economic development practices, and technical measures, as well as preparedness and emergency management.³⁵
- 3) The approach for building up the NDRMP follows:
 - a. Institutional disaster planning, this is the first level of planning which defines the general references for humanitarian actions based on institutional mandates.

- b. Disaster response plan, this is the second level specifically oriented for institutions interventions depending on organizational structure and capabilities for response locally, regionally, and nationally.
- c. The third level is the contingency plan which links to specific events to establish operational procedures for direct humanitarian actions.^{6, 28}

Specific Actions:

1. “Disaster response planning involves identifying disaster risks, vulnerabilities, impact, organizational resources and capacities, determining roles and responsibilities, and developing policies and procedures and planning activities to reach a level of preparedness for timely and effective response to a disaster”⁴⁸
2. “A contingency plan which highlights the individuals specific events or known risks at local, national, regional or even global e.g. earthquakes, floods, etc., and include a concept of operations with anticipated resources requirements, available resources and shortfalls or gaps”⁴⁸
3. The organizational structure for the HCCD should be driven by disaster management programs such as:
 - a. relief health committee
 - b. relief committee
 - c. safer access
 - d. communication and media
 - e. telecommunication
 - f. risk reduction
 - g. logistics

- 4- Standard operation procedures should be developed to operationalize the contingency plan and the disaster response plan through prioritizing the activities, development of expected results of each activity, description of basic process to follow, to keep a logical sequence and try to group actions into stages or phases, as well as identifying people in charge and authority level, regarding the resources establish the indispensable physical resources for the success of the process.⁴⁸

Beneficiaries:

The direct beneficiaries are the general population in Amman, institutions and organizations, and disaster managers at local and national levels.

Implementing agents:

- Ministry of interior
- The General Directorate of Civil Defense
- Greater Amman Municipality

PRACTICE RECOMMENDATION TWO

(Establishing Neighborhood Disaster Volunteers)

With reference to the National Disaster Response Master plan each organization has to mobilize their staff and volunteers in case of emergency. It is part of a law for the organizations to mobilize local communities¹². The civil defense started to establish emergency teams in public entities these emergency teams are in charge of operation in public places such as schools, institutions and hotels, but not in neighborhoods or districts.

Therefore it is essential to start the establishment of neighborhood disaster volunteers in the four most populated areas on Amman. Neighborhood Disaster Volunteers (NDV) approach is designed to mobilize the potentials of local residents while systematically addressing their weaknesses.

Objectives:

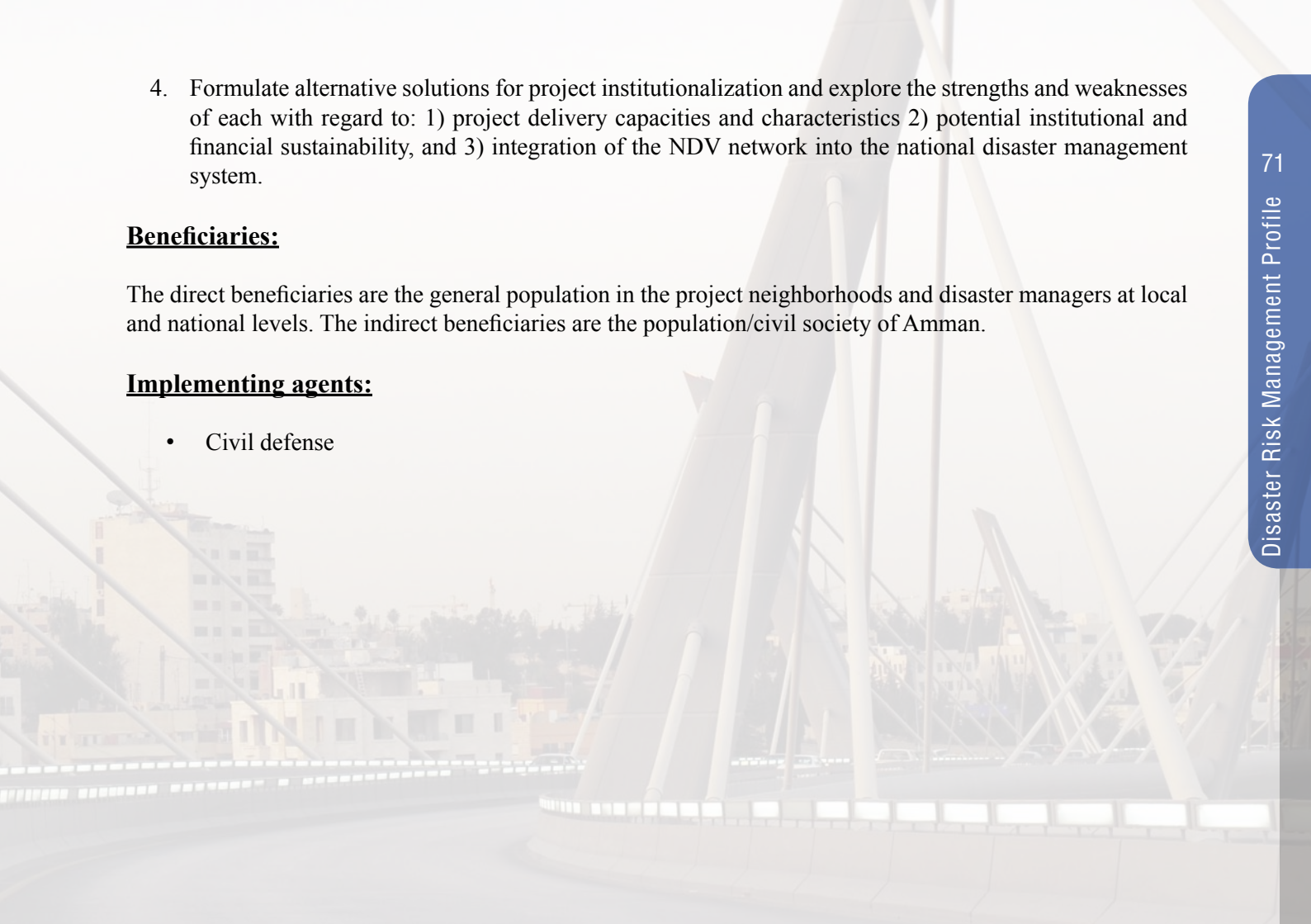
The overall goal of this project is to achieve an extendable network of neighborhood-based organizations with appropriate institutional support. This would generate an effective disaster response capability by the local population that can be sustained over the long-term. In order to meet this goal, the project would have the following objectives:

1. To establish a number of community-based neighborhood disaster volunteer groups to be able to support governmental and international agencies in response and preparedness programs.
2. To equip the team with emergency equipments.
3. To institutionalize the NDV set-up with the potential to implement, further develop and replicate the model into other areas.

Activities:

The following main components which are also associated with the development of Urban Search and Rescue (USAR) capacities are part of this program:

1. Recruit, train and equip volunteers from a number of neighborhoods in four districts in Amman.
2. Experimentally develop, test, refine and demonstrate the effectiveness of the NDV model.
3. Document the results of the pilot experience and present them in an accessible form which demonstrates the effectiveness and the broader relevance of the NDV model.

- 
4. Formulate alternative solutions for project institutionalization and explore the strengths and weaknesses of each with regard to: 1) project delivery capacities and characteristics 2) potential institutional and financial sustainability, and 3) integration of the NDV network into the national disaster management system.

Beneficiaries:

The direct beneficiaries are the general population in the project neighborhoods and disaster managers at local and national levels. The indirect beneficiaries are the population/civil society of Amman.

Implementing agents:

- Civil defense

SOUND PRACTICE RECOMMENDATION THREE

(Establishing Assessment Teams)

The higher council of Science and Technology in cooperation with the RSS developed a field manual of the project “Assessment Criteria of Earthquake-Damaged Concrete Buildings”⁴⁶. The purpose of the manual development is to equip the engineers with scientific methodologies in assessment criteria. There are two methods of evaluating affected buildings; rapid assessment and in depth assessment. Therefore it is important to equip the engineers especially civil and architect engineers, with assessment skills that can help in response operations especially in sheltering the affected people.

The process started with training initiative from the RSS to train engineers on the assessment methodologies using the above mentioned manual as a guide, the training will be organized in July 2007.

Objectives:

1. To establish assessment team in order to support other teams in assessing concrete buildings affected by earthquakes and to lead sheltering operations incase of disaster.
2. To create an assessment system to be used by engineers and response personnel in case of emergencies.
3. To assist decision makers and response teams during emergencies in taking decisions related to

usage and safety of the buildings. In addition to coordinate with other teams in the field during response operations.

Specific Actions:

1. Establishment of task force representing different organizations to plan for the development of terms of reference for the building assessment team and to identify the technical and material requirements for the team.
2. Select the team members among the civil engineers and architects
3. Carry out advanced training programs for the selected team and equip them with the necessary tools that they need in case of emergency.
4. Create a standard operation procedure for the team and test it regularly.
5. Develop a mobilization system for the team and test it regularly through organizing simulation exercises.
6. Support the team with official recognition from the HCCD.

Beneficiaries:

The direct beneficiaries are engineers, owners of the affected buildings, and affected people. As well as the local organizations will benefit through coordination and identification of needs and available resources.

Implementing agents:

- Royal Scientific Society
- Engineering Association
- Contractor association
- Greater Amman Municipality

SOUND PRACTICE RECOMMENDATION FOUR

(Supporting Greater Amman Municipality Geographic Information System Department)

Greater Amman Municipality has been executing several technical projects, which translate its general attitude for development of the administrative and technical work on its different sectors scale to provide the greater possible amount of accurate information and correct date for the applicants and to provide accordingly a wide database of information, so as to be able to keep pace with the economic and architectural growth and acceleration for the coming years. Believing in significance of providing all types of high quality and accuracy to the citizens, GAM puts in mind priority of benefit from the most modern scientific techniques and development sand technology, to work through and to continue performing the project of building up the integrated Geographic Information System (GIS).

Objectives:

1. Producing topographic & thematic maps related to local capacities in Amman at different scales to plan utilization system of resources before and during and after disasters.
2. Using Remote Sensing techniques in thematic map production in addition to different remote sensing applications such as hydrology, geology, environmental pollution, desertification, and in the land use/land cover analysis.
3. Training and preparing qualified personnel for local institutions and neighboring countries.
4. Maximize the efficiency of decision making and planning

Specific activities:

1. Identification of local resources and capacities by location and purpose.
2. Identification of usage for thematic maps.
3. Develop a disaster response plan based with the integration of thematic maps.
4. Provide GIS department with the results of the risk assessment related to hazards to include in the thematic maps.
5. Train HCCD and representatives from emergency response organizations on the GIS system.
6. Develop standard operation procedures for the GIS department in order to assist in decision making process in the case of emergency

Beneficiaries:

The direct beneficiaries are the general population in Amman and disaster managers at local and national levels.

Implementing agents:

- Greater Amman Municipality
- Royal Geographical Center
- Engineering Association

SOUND PRACTICE RECOMMENDATION FIVE

(Upgrading Greater Amman Municipality Emergency Centers)

Greater Amman Municipality established two emergency centers in Amman in order to mobilize its resources during hazards. Their mandate is direct response to large or small scale disasters by mobilizing up to 1300 employee from different departments. The operation room for these two centers is working 24h/7day. In regular times the staff is working in 2 shifts and in case of emergency they work in 3 shifts. The emergency centers are equipped with emergency telecommunication systems and have a hotline with the civil defense operation room, governor's office, as well as the general security to coordinate their emergency response at all levels.

A disaster response plan was developed in these centers, and it is update every 6 months, but it is not based on specific scenarios part of it is to raise awareness during disasters. It shows the roles and responsibilities of different departments and officials in GAM.

The present situation is that all elements needed for disaster response (equipments, human resources, telecommunication, emergency plan, and finances) are available, but there is no disaster response plan based on clear scenarios and no emergency standard operation procedures for the operation rooms, no clear disaster management structure and authorities to mobilize their resources in case of emergency, as well as no field assessment team to coordinate their response operations.

Therefore there is a need to upgrade these emergency centers with specialized training and introduce disaster management systems such as computerized programs linked with GIS department, organize joint training with other organizations, and support them with technical expertise to establish specialized emergency teams such as: water sanitation, relief distribution, search and rescue teams... etc....

Objectives:

1. Develop the contingency planning process and update their standard operation procedures.
2. Train the emergency centers teams in disaster preparedness and response programs.
3. Establish a specialized response teams (field assessment and coordination team, water sanitation team, search and rescue team, relief teams and logistic team)
4. Develop an organization structure for the emergency centers with clear lines of authorities and responsibilities.

Specific Activities:

Review the present emergency plan

Development of specific scenarios especially earthquakes

Organize simulation exercise to test and update their contingency plan

Carry out specialized training in field assessment and coordination, water sanitation, search and rescue, relief teams, and logistic

Conduct training of trainers workshops to build up staff skills

Review of existing structure to be updated

Beneficiaries:

The direct beneficiaries are the 1300 staff members, general population in Amman.

Implementing agents:

- Greater Amman Municipality
- Civil Defense
- Engineering Association

SOUND PRACTICE RECOMMENDATION SIX

(Integration of Risk Reduction Programs within the Child Friendly City)

Greater Amman Municipality council approved on 08//1/2005, based on the recommendation of Amman Mayor, the establishment of the ‘executive agency for a Child Friendly City’ to work as a coordinating unit encompassing highly executive powers to ensure sustainability and improve the quality of programs offered to children, especially children in less privileged areas. Furthermore, to ensure children’s participation in decisions related to them.

In July 2005 GAM launched its policy document around the following themes: primary health care, psychological care and guidance (counseling), child labor and economic empowerment, child safety and their protection against abuse, children with disability, informal education and information technology center, culture, creativity and art, environment, recreation and sport, urban design and the child-built environment, participation of children and planning through the participation of the local community, gender and the girl child.

The executive agency has carried out different activities and projects in many of the less privileged areas. These included; family violence and drug abuse reduction, scouts camp and discussion sessions on street promotion, theatrical plays, nutrition at school, drawing competition, and visits to the Children’s museum. The total number of participants in these activities is 21,828 children between the age of 6 and 18 years. Participating children came from the most populated areas of Amman and least privileged; Khirbet Al-Suq, Al-Yarmouk, Ras El-Ain, Basman, Sahab, Al-Muwaqar, and Al-Jiezah. In addition, in collaboration with the department of Green Areas the executive agency they developed “Guidelines for the Design of Outdoor Play Settings for Children” focusing on child safety. The executive committee has conducted a road safety program as well, which is a major hazard as mentioned in the city profile, 28% of traffic accidents occur in Amman. Other projects include

the Right to Play in coordination with the UNICEF, and rehabilitation of public libraries.

A children's city council has been established. It has 77 members age 12 to 15 years representing children from different parts of Amman. The council elects a committee to participate in decision making, discussions, planning and implementing of the executive committee's projects.

Greater Amman Municipality has shown a great interest in child safety and well being through its policies and programs. In spite of that there is no clear policy to include risk reduction activities within their programs or activities; there has been no clear vision of how to include disaster management in children's priorities. Based on interviews and focus group discussion meeting with the children city council, focal points, individuals with special needs consultant and children's right consultant, Green Area engineers, and UNDP personnel, on July 17, 2007; it has been agreed that there is a need to integrate risk reduction program into their projects.

Objectives:

1. To integrate disaster risk reduction program into the Child Friendly City project, through organizing joint activities with NGOs and government organizations at community level.
2. Empower the existing structure of the Child Friendly City through developing standard procedures in risk reduction to carry out awareness campaigns at local and Amman city level.

As a result of in depth discussion with the children's city council, they suggested the following activities to be integrated within the disaster management program:

1. Develop training of trainers' disaster management guidelines to train selected members of the child council.
2. Build up a multi purpose room to be a model for safety measures to be taken at home.

3. Develop contingency plan guidelines that are accessible for children and their families.
4. Design risk location maps to raise awareness among neighborhood residents about high risk locations.
5. Devise risk reduction presentations to be conducted by the children themselves
6. Design practical models representing risk reduction procedures
7. Distribute documentary material on risk reduction
8. Participate in the national drills
9. Development of alerting methods and signs for the Deaf
10. Build a mobile tent to be placed in public parks for children and their family's exposure
11. Write theatrical plays and songs about risk reduction for children to perform.
12. Organize drawing workshops for children to express their ideas about risk reduction.

Beneficiaries:

The direct beneficiaries are the children living in these target areas and their families, GAM and other organizations working with the children's city council.

Implementing agents:

- Greater Amman Municipality Child Friendly City
- Children city council
- Greater Amman Municipality Green Area department
- Civil Defense
- Ministry of Education
- UNRWA

DRMMP AMMAN



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