Appendix 2-1

District Disaster Diagnosis Sheet

District No: 1

General Description

- Located at the skirt of Alborz Mountains which creates geographical features of the land with rivers and valleys
- One of the lowest population density among 22 districts
- Many of diplomatic and international affairs concentrate

Key Map

Basic Information			
Population:	229,143	Area:	3,398 ha
Aged Population (>65)	15,305	Population Density:	67.4person/ha
Young Population (<5)	16,715		

Land Information			
Built-up Area Ratio	20.0%	Major Fault: NTF runs along the north boundary of the district	
PGA:		Slope Stability: The north fringe of the district is relatively unstable in case of NTF model, due to the middle range of slope gradient	
Ray	300-400gal 3%	200-300gal 81%	100-200gal 16%
NTF	400-500gal 9%	300-400gal 91%	Liquefaction: No liquefaction risk

Distribution of Building						
Number of Building (Residential)	33,584	Building Density		9.7(nos/ha)		
Type of Building						
Steel Structure	17,610	RC Structure	7,202	Steel&Brick/Stone	10,950	Others 3,872
Weak building		37 %				

Distribution of Infrastructure and Lifeline			
Road Length:	521 km	Railway Length:	- km
Road Bridge:	4	Railway Bridge:	0
Gas:	421km	Electricity:	767km
Water:	373km	Telecommunication:	579km

Distribution of Hazardous Facility			
Petrol Station	7	Other	0

Earthquake Damage

	Ray Fault	NTF	Mosha Fault
Building Damage	11,665	23,633	6,869
Bridge	0	0	0
Human Casualty	2,719	14,032	1,174
Water (point)	8	169	1
Gas (point)	2	37	0
Electricity (m)	0	1,530	0
Telecommunication (m)	0	1,200	0

Disaster Management Resources

Government Office: Management center	9	NCNDR:			1
Police (Traffic Police):	9(1)	Red Crescent Society:			1
Hospital:	10	Fire Brigade:			3

Evacuation

Regional Evacuation Place	0.0 (m^2/persons)	Primary Evacuation Area			18
Education Facility	261	Water Points			10
Primary School 91	Intermediate, High School and High Education				169
Vulnerability Analysis	5	4	3	2	1
Building Damage	8.2%	51.1%	40.1%	0.6%	0.0%
Evacuation	0.0%	26.7%	18.7%	54.6%	0.0%
Secondary Disaster	0.0%	1.2%	21.6%	77.2%	0.0%
Integrated Vulnerability	0.0%	15.4%	60.7%	23.9%	0.0%

Countermeasures

- The most predominant earthquake hazard is NTF, which cause PGA 300-400 gal in most area of the district. Most of the building is made from steel or mixture of steel structure. 46 percent of building is recognized as weak building. The lifeline would have huge damaged.
- Evaluation results show that the building damage is relatively high within the municipality. More than 50 percent of the area is categorized into risk level 4. There is no safety evacuation site in the district.
- The district has to strengthening the existing buildings and provides safety evacuation site.

District No: 2

General Description

- Located at the middle and northern part of Tehran city
- Unbalanced distribution of population density between northern and southern parts produces the divergence within the district
- High proportion of park/open spaces per person

Key Map

Basic Information			
Population:	464,773	Area:	4,956 ha
Aged Population (>65)	22,930	Population Density:	93.8 person/ha
Young Population (<5)	32,090		

Land Information				
Built-up Area Ratio			17.13%	Major Fault: NTF runs along the north boundary of the district Slope Stability: The north fringe of the district is relatively unstable in case of NTF model, due to the middle range of slope gradient Liquefaction: No liquefaction risk
PGA:				
Ray	300~400gal 11%	200~300gal 86%	100~200gal 3 %	
NTF	300~400gal 39%	200~300gal 61%		

Distribution of Building			
Number of Building (Residential)	49.532	Building Density	10.0(nos/ha)

Type of Building					
Steel Structure	32,960	RC Structure	17,101	Steel&Brick/Stone	11,253	Others	3,327
Weak building	23 %				

Distribution of Infrastructure and Lifeline			
Road Length:	661 km	Railway Length:	- km
Road Bridge:	26	Railway Bridge:	0
Gas:	389km	Electricity:	1,444km
Water:	636km	Telecommunication:	726km

Distribution of Hazardous Facility			
Petrol Station	6	Other	0

Earthquake Damage			
	Ray Fault	NTF	Mosha Fault
Building Damage	26,980	29,862	7,248
Bridge	1	1	0
Human Casualty	8,812	11,914	627
Water (point)	46	76	0
Gas (point)	5	9	0
Electricity (m)	0	40	0
Telecommunication (m)	0	20	0

Disaster Management Resources			
Government Office: Management center	11	NCNDR:	1
Police (Traffic Police):	8(5)	Red Crescent Society:	0
Hospital:	10	Fire Brigade:	5

Evacuation			
Regional Evacuation Place	1.04(m^2/persons)	Primary Evacuation Place	17
Education Facility	289	Water Points	9
Primary School 94	Intermediate, High School and High Education		209

Vulnerability Analysis	5	4	3	2	1
Building Damage	5.7%	27.8%	37.6%	28.9%	0.0%
Evacuation	0.0%	1.8%	5.3%	92.9%	0.0%
Secondary Disaster	0.0%	0.0%	9.0%	88.2%	2.8%
Integrated Vulnerability	0.0%	1.4%	32.6%	63.4%	2.6%

Countermeasures

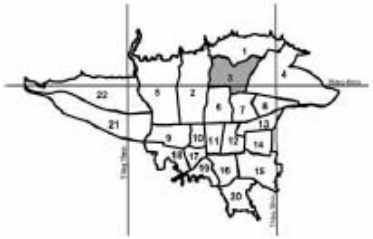
- Ray Fault and NFT model would cause great impact on the district. Seismic intensity would be 300-100 gal in the district. More than 50 percent of the building is categorized as weak building, in the case of NTF, approximately half of the building would be collapse.
- The most part of the district is relatively low disaster damage risk comparing to the Teheran Municipality as a whole.
- The building strengthening would be the most important countermeasures in the district.

District No: 3

General Description

- North-south and east-west freeway run through the district
- Activity area clusters along physical boundary by road corridors
- Many road bridge with seismic resistant

Key Map



Basic Information			
Population:	237,301	Area:	2,940ha
Aged Population (>65)	19,799	Population Density:	80.7person/ha
Young Population (<5)	14,967		

Land Information				
Built-up Area Ratio	23.1%			Major Fault: No major fault runs through the district, but the district is close to NTF Slope Stability: Small portion of the district has a middle range of slope gradient, but the district has a reliable slope stability Liquefaction: No liquefaction risk
PGA:				
Ray	300~400gal 49%	200~300gal 51%		
NTF	500~600gal 1%	400~500gal 39%	400~200gal 60%	

Distribution of Building			
Number of Building (Residential)	31.390	Building Density	10.7(nos/ha)

Type of Building					
Steel Structure	20,548	RC Structure	5,576	Steel&Brick/Stone 8,712	Others 1,965
Weak Building	29%				

Distribution of Infrastructure and Lifeline			
Road Length:	450km	Railway Length:	7km
Road Bridge:	21	Railway Bridge:	0
Gas:	388km	Electricity:	688km
Water:	366km	Telecommunication:	593km

Distribution of Hazardous Facility			
Petrol Station	9	Other	0

Earthquake Damage			
	Ray Fault	NTF	Mosha Fault
Building Damage	13,974	19,231	5,656
Bridge	0	0	0
Human Casualty	5,187	10,290	944
Water (point)	43	176	2
Gas (point)	10	39	0
Electricity (m)	60	980	0
Telecommunication (m)	50	920	0

Disaster Management Resources			
Government Office: Management center	1	NCNDR:	1
Police (Traffic Police):	7(2)	Red Crescent Society:	0
Hospital:	20	Fire Brigade:	5

Evacuation			
Regional Evacuation Place	1.33(m^2/persons)	Primary Evacuation Place	13
Education Facility	242	Water Points	5
Primary School 74	Intermediate, High School and High Education		167

Vulnerability Analysis	5	4	3	2	1
Building Damage	0.9%	29.9%	50.1%	19.1%	0.0%
Evacuation	0.0%	0.8%	17.5%	26.2%	55.5%
Secondary Disaster	0.0%	0.0%	1.1%	86.9%	12.0%
Integrated Vulnerability	0.0%	0.8%	31.3%	50.6%	17.3%

Countermeasures

- NTF has great impact on the district. Seismic intensity of PGA is ranged from 400-200 gal, yet the only one percent would record 500-600 gal. The weak building has shared more than 50 percent.
- Risk of building collapse is 4 and 5 in middle of the district 3. Most of the district is fall in evacuation level one.
- The problem of the district is the weakness of the existing buildings. Strengthening of the existing building is the most important countermeasures in the district.

District No: 4

General Description

- Located at the eastern fringe of the city with vast area
- Higher proportion of the young population
- Relatively higher percentage of parks/open spaces

Key Map

Basic Information			
Population:	642,207	Area:	6,696ha
Aged Population (>65)	21,407	Population Density:	96.7person/ha
Young Population (<5)	58,812		

Land Information				
Built-up Area Ratio			17.9%	Major Fault: NTF runs along the north edge of the district Slope Stability: Relatively steep slope exists in the middle of the district, but the district has a reliable slope stability Liquefaction: No liquefaction risk
PGA:				
Ray	300~400gal 2%	200~300gal 94%	100~200gal 4 %	
NTF	300~400gal 39%	200~300gal 61%		

Distribution of Building			
Number of Building (Residential)	87,126	Building Density	12.0(nos/ha)

Type of Building					
Steel Structure	40,498	RC Structure	6,515	Steel&Brick/Stone 30,936	Others 4,693
Weak Building			43%		

Distribution of Infrastructure and Lifeline			
Road Length:	824km	Railway Length:	1km
Road Bridge:	10	Railway Bridge:	0
Gas:	739km	Electricity:	1,361km
Water:	801km	Telecommunication:	829km

Distribution of Hazardous Facility			
Petrol Station	5	Other	0

Earthquake Damage			
	Ray Fault	NTF	Mosha Fault
Building Damage	23,060	31,697	11,328
Bridge	0	0	0
Human Casualty	6,777	15,277	2,444
Water (point)	28	83	3
Gas (point)	5	15	0
Electricity (m)	0	40	0
Telecommunication (m)	0	30	0

Disaster Management Resources			
Government Office: Management center	11	NCNDR:	1
Police (Traffic Police):	5(0)	Red Crescent Society:	0
Hospital:	9	Fire Brigade:	6

Evacuation			
Regional Evacuation Place	3.79(m^2/persons)	Primary Evacuation Place	29
Education Facility	272	Water Points	13
Primary School 96	Intermediate, High School and High Education		200

Vulnerability Analysis	5	4	3	2	1
Building Damage	1.6%	10.4%	51.5%	35.5%	1.1%
Evacuation	1.3%	5.5%	8.6%	84.7%	0.0%
Secondary Disaster	0.0%	3.7%	3.2%	85.7%	7.4%
Integrated Vulnerability	0.0%	1.1%	22.0%	69.6%	7.3%

Countermeasures

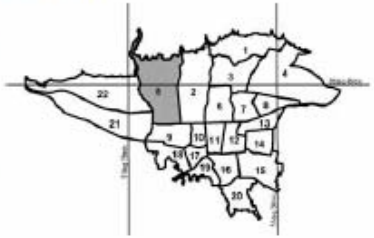
- Ray Fault would cause great impact on the district. The range of seismic intensity would be 100-400 gal. The most predominant intensity would be 200-300 gal, and it is relatively low within the municipality. 50 percent of the buildings are classified as weak building.
- Risk of the earthquake damage is comparatively low within the municipality. Integrated vulnerability of the earthquake risk is 2, which is shared 69.5 percent.
- The countermeasure to the earthquake risk is the strengthening of the building.

District No: 5

General Description

- Located at the skirt of Alborz Mountains to the middle of the city
- Low value of built-up ratio
- Relatively higher proportion of the young population and weak buildings

Key Map



Basic Information			
Population:	424,960	Area:	5,448ha
Aged Population (>65)	13,433	Population Density:	78.0person/ha
Young Population (<5)	36,249		

Land Information			
Built-up Area Ratio	12.6%	Major Fault: NTF runs along the north edge of the district Slope Stability: The north fringe of the district is relatively unstable in case of NTF model, due to the middle range of slope gradient Liquefaction: No liquefaction risk	
PGA:			
Ray	300~400gal 3%	200~300gal 97%	
NTF	300~400gal 82%	200~300gal 18%	

Distribution of Building			
Number of Building (Residential)	36,870	Building Density	6.2(nos/ha)

Type of Building					
Steel Structure	29,250	RC Structure	11,763	Steel&Brick/Stone 9,875	Others 2,464
Weak building	23%				

Distribution of Infrastructure and Lifeline			
Road Length:	552km	Railway Length:	- km
Road Bridge:	11	Railway Bridge:	6
Gas:	312km	Electricity:	1,117 km
Water:	516km	Telecommunication:	701km

Distribution of Hazardous Facility			
Petrol Station	2	Other	0

Earthquake Damage			
	Ray Fault	NTF	Mosha Fault
Building Damage	18,996	25,111	4,553
Bridge	0	0	0
Human Casualty	5,768	12,217	313
Water (point)	27	87	0
Gas (point)	3	10	0
Electricity (m)	0	60	0
Telecommunication (m)	0	30	0

Disaster Management Resources			
Government Office: Management center	8	NCNDR:	0
Police (Traffic Police):	8(1)	Red Crescent Society:	0
Hospital:	5	Fire Brigade:	3

Evacuation			
Regional Evacuation Place	0.0(m^2/persons)	Primary Evacuation Place	39
Education Facility	202	Water Points	8
Primary School 88	Intermediate, High School and High Education		153

Vulnerability Analysis	5	4	3	2	1
Building Damage	1.1%	13.8%	59.8%	25.2%	0.0%
Evacuation	0.6%	8.9%	7.0%	83.5%	0.0%
Secondary Disaster	0.0%	0.2%	9.1%	84.3%	6.4%
Integrated Vulnerability	0.0%	4.8%	20.3%	68.7%	6.3%

Countermeasures

- NTF would cause more damage than Ray Fault model. The seismic intensity is 300-400 gal for the NTF, which shares more than 80 percent of the area.
- The weak building is more than 50 percent.
- The district's integrated vulnerability is 2, which shares more than 68 percent of the district.
- The countermeasure to the earthquake damage is to strengthening the existing building.

District No: 6

General Description

- Situates in the middle of Tehran City
- Administrative, educational and cultural core with the presence of a number of ministries, higher education facilities, etc.

Key Map

Basic Information			
Population:	242,049	Area:	2,140ha
Aged Population (>65)	18,141	Population Density:	113.1 person/ha
Young Population (<5)	13,445		

Land Information				
Built-up Area Ratio	28.37%			Major Fault: No major Fault runs through the district Slope Stability: Relatively steep slope exists in the north of the district, but the district has a reliable slope stability Liquefaction: No liquefaction risk
PGA:				
Ray	300~400gal 64%	200~300gal 36%		
NTF	200~300gal 100%			

Distribution of Building			
Number of Building (Residential)	30,619	Building Density	14.3 (nos/ha)

Type of Building					
Steel Structure	14,278	RC Structure	2,577	Steel&Brick/Stone 10,233	Others 1,365
Weak building	41%				

Distribution of Infrastructure and Lifeline			
Road Length:	361km	Railway Length:	- km
Road Bridge:	6	Railway Bridge:	0
Gas:	302km	Electricity:	1,001km
Water:	299km	Telecommunication:	677km

Distribution of Hazardous Facility			
Petrol Station	9	Other	0

Earthquake Damage			
	Ray Fault	NTF	Mosha Fault
Building Damage	13,842	10,884	3,894
Bridge	3	3	0
Human Casualty	6,517	3,144	570
Water (point)	57	18	1
Gas (point)	11	4	0
Electricity (m)	370	0	0
Telecommunication (m)	430	0	0

Disaster Management Resources			
Government Office: Management center	7	NCNDR:	18
Police (Traffic Police):	8(0)	Red Crescent Society:	0
Hospital:	37	Fire Brigade:	4
Evacuation			
Regional Evacuation Place	0.89(m^2/persons)	Primary Evacuation Place	11
Education Facility	204	Water Points	6
Primary School 59	Intermediate, High School and High Education		145

Vulnerability Analysis	5	4	3	2	1
Building Damage	0.0%	14.3%	58.3%	27.4%	0.0%
Evacuation	0.0%	0.0%	2.0%	98.0%	0.0%
Secondary Disaster	0.0%	0.0%	4.8%	95.2%	0.0%
Integrated Vulnerability	0.0%	0.0%	15.9%	84.1%	0.0%

Countermeasures

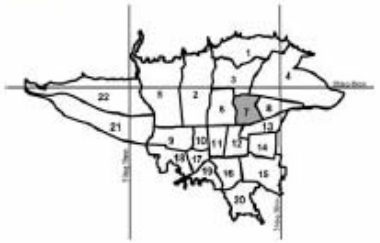
- Ray Fault model would cause the largest earthquake damage in the district. Seismic intensity is in the range of 200-400 gal.
- The integrated vulnerability of the earthquake risk level is 2, which accounts for 84.1 percent of the total district. The risk of earthquake will be relatively small, comparing to the Tehran as a whole.
- The building strengthening is the most important countermeasures.

District No: 7

General Description

- Situates in the central area of the city
- Most of the area is urbanized with higher percentage of built-up ratio
- A number of governmental offices locate in the districts and give its characteristics as an administrative centre

Key Map



Basic Information			
Population:	300,212	Area:	1,534ha
Aged Population (>65)	21,626	Population Density:	195.7person/ha
Young Population (<5)	22,895		

Land Information				
Built-up Area Ratio	33.89 %			Major Fault: No major fault runs through the district Slope Stability: The district has a reliable slope stability Liquefaction: No liquefaction risk
PGA:				
Ray	300~400gal 95%	200~300gal 7%		
NTF	200~300gal 100%			

Distribution of Building			
Number of Building (Residential)	44,022	Building Density	28.6(nos/ha)

Type of Building							
Steel Structure	18,710	RC Structure	1,907	Steel&Brick/Stone	20,914	Others	3,361
Weak building	54%						

Distribution of Infrastructure and Lifeline			
Road Length:	338km	Railway Length:	- km
Road Bridge:	5	Railway Bridge:	0
Gas:	441km	Electricity:	626km
Water:	437km	Telecommunication:	556km

Distribution of Hazardous Facility			
Petrol Station	8	Other	8

Earthquake Damage			
	Ray Fault	NTF	Mosha Fault
Building Damage	23,061	15,585	5,712
Bridge	0	0	0
Human Casualty	12,817	4,337	831
Water (point)	123	25	1
Gas (point)	24	5	0
Electricity (m)	370	0	0
Telecommunication (m)	260	0	0

Disaster Management Resources			
Government Office: Management center	6	NCNDR:	2
Police (Traffic Police):	3(2)	Red Crescent Society:	1
Hospital:	26	Fire Brigade:	2

Evacuation			
Regional Evacuation Place	0.00(m^2/persons)	Primary Evacuation Place	3
Education Facility	202	Water Points	4
Primary School 86	Intermediate, High School and High Education		112

Vulnerability Analysis	5	4	3	2	1
Building Damage	0.0%	7.0%	78.2%	14.8%	0.0%
Evacuation	2.9%	13.8%	83.3%	0.0%	0.0%
Secondary Disaster	0.0%	0.0%	8.0%	92.0%	0.0%
Integrated Vulnerability	0.0%	4.7%	80.5%	14.8%	0.0%

Countermeasures

- Ray fault model would have the great impact on the district. The seismic intensity is in the range of PGA 200-300 gal. More than 40 percent of the buildings are classified as the weak building.
- The integrated vulnerability analysis shows that more than 80 percent of area is fall into the earthquake risk 3. Most of the area is moderate risk on seismic damage risk. The southern part of the district is relatively high-risk area.
- The countermeasure of the earthquake damage is strengthening the building as well as providing evacuation area.

District No: 8

General Description

- Relatively higher population density and built-up area ratio
- Situates between two major east-west access roads
- Intricate road network creates small parcels of densely residential area

Key Map

Basic Information			
Population:	332,005	Area:	1,325ha
Aged Population (>65)	19,497	Population Density:	250.6person/ha
Young Population (<5)	28,777		

Land Information			
Built-up Area Ratio	36.88%	Major Fault: No major fault runs through the district Slope Stability: The district has a reliable slope stability Liquefaction: No liquefaction risk	
PGA:			
Ray	300~400gal 92%	200~300gal 8%	
NTF	200~300gal 100%		

Distribution of Building			
Number of Building (Residential)	47,003	Building Density	35.5(nos/ha)

Type of Building					
Steel Structure	18,985	RC Structure	1,352	Steel&Brick/Stone 28,309	Others 2,693
Weak building	60%				

Distribution of Infrastructure and Lifeline			
Road Length:	346km	Railway Length:	- km
Road Bridge:	0	Railway Bridge:	0
Gas:	458km	Electricity:	664km
Water:	494km	Telecommunication:	454km

Distribution of Hazardous Facility			
Petrol Station	3	Other	7

Earthquake Damage			
	Ray Fault	NTF	Mosha Fault
Building Damage	26,115	17,092	5,631
Bridge	0	0	0
Human Casualty	14,610	4,750	786
Water (point)	148	27	1
Gas (point)	26	5	0
Electricity (m)	600	0	0
Telecommunication (m)	400	0	0

Disaster Management Resources			
Government Office: Management center	4	NCNDR:	0
Police (Traffic Police):	3(1)	Red Crescent Society:	0
Hospital:	7	Fire Brigade:	2

Evacuation			
Regional Evacuation Place	0.00(m^2/persons)	Primary Evacuation Place	10
Education Facility	156	Water Points	1
Primary School 72	Intermediate, High School and High Education		97

Vulnerability Analysis	5	4	3	2	1
Building Damage	0.0%	13.1%	62.5%	24.4%	0.0%
Evacuation	1.9%	14.9%	40.4%	42.7%	0.0%
Secondary Disaster	0.0%	0.4%	28.6%	71.0%	0.0%
Integrated Vulnerability	0.0%	9.1%	43.8%	47.1%	0.0%

Countermeasures

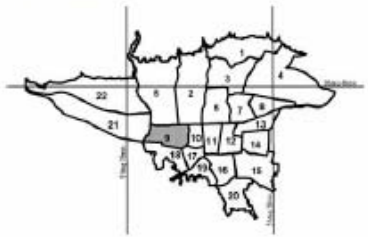
- Ray Fault Model would cause great impact on the district. The seismic intensity is 200-400 gal in the most of the district.
- The weak building ratio is relatively low at 37 percent.
- Integrated vulnerability is moderate to low risk within the Tehran Municipality, yet the western part of the district is relatively high on building collapse and evacuation.
- The western part of the district should consider the development program for the area. The building strengthening is the most important countermeasures.

District No: 9

General Description

- The entrance gate of south west part of Tehran to its center
- Very low built-up ratio due to the existence of Mehrabad Airport and its relating installations, facilities and organizations occupy a considerable part of the area

Key Map



Basic Information			
Population:	173,482	Area:	1,953ha
Aged Population (>65)	7,321	Population Density:	88.8person/ha
Young Population (<5)	16,202		

Land Information				
Built-up Area Ratio	13.53 %	Major fault: No major fault runs through the district Slope Stability: The district has a reliable slope stability Liquefaction: No liquefaction risk		
PGA:				
Ray	400~500gal 24%	300~400gal 76%		
NTF	200~300gal 100%			

Distribution of Building			
Number of Building (Residential)	24,360	Building Density	12.5 (nos/ha)

Type of Building							
Steel Structure	4,747	RC Structure	557	Steel&Brick/Stone	14,500	Others	876
Weak building	74%						

Distribution of Infrastructure and Lifeline			
Road Length:	186km	Railway Length:	- km
Road Bridge:	1	Railway Bridge:	0
Gas:	197km	Electricity:	175km
Water:	200km	Telecommunication:	170 km

Distribution of Hazardous Facility			
Petrol Station	6	Other	0

Earthquake Damage			
	Ray Fault	NTF	Mosha Fault
Building Damage	11,936	5,559	1,759
Bridge	0	0	0
Human Casualty	9,755	1,880	158
Water (point)	89	4	0
Gas (point)	16	1	0
Electricity (m)	260	0	0
Telecommunication (m)	220	0	0

Disaster Management Resources			
Government Office: Management center	2	NCNDR:	2
Police (Traffic Police):	2(0)	Red Crescent Society:	0
Hospital:	6	Fire Brigade:	0

Evacuation			
Regional Evacuation Place	0.00(m^2/persons)	Primary Evacuation Place	7
Education Facility	74	Water Points	1
Primary School 27	Intermediate, High School and High Education		50

Vulnerability Analysis	5	4	3	2	1
Building Damage	0.3%	85.3%	12.2%	2.2%	0.0%
Evacuation	1.0%	4.9%	9.5%	84.6%	0.0%
Secondary Disaster	68.6%	8.1%	22.8%	0.5%	0.0%
Integrated Vulnerability	0.0%	4.6%	90.6%	4.7%	0.0%

Countermeasures

- The district would have great impact on Ray Fault model. Seismic intensity of PGA ranges from 300-500 gal. The district has low building density due to the location of international airport.
- There are several primary evacuation areas in the district, yet there is no safety evacuation area.
- The building density is relatively low but the building itself is weak. More than 85 percent of area falls into risk level 4.

District No: 10

General Description

- One of the most vulnerable district with high population density and built-up area ratio
- Condensed residential area with lack of open spaces

Key Map

Basic Information

Population:	282,308	Area:	807ha
Aged Population (>65)	18,919	Population Density:	349.8person/ha
Young Population (<5)	25,512		

Land Information

Built-up Area Ratio				43.21%
PGA:				
Ray	500~600gal15%	500~500gal 51%	100~200gal 44%	
NTF	200~300gal100%			

Major Fault: No major fault runs through the district
Slope Stability: The district has a reliable slope stability
Liquefaction: No liquefaction risk

Distribution of Building

Number of Building (Residential)	47,675	Building Density	59.2 (nos/ha)

Type of Building

Steel Structure	8,117	RC Structure	218	Steel&Brick/Stone	28,682	Others	3312
Weak building	79 %						

Distribution of Infrastructure and Lifeline

Road Length:	271km	Railway Length:	- km
Road Bridge:	4	Railway Bridge:	0
Gas:	388km	Electricity:	701km
Water:	392km	Telecommunication:	341km

Distribution of Hazardous Facility

Petrol Station	3	Other	0

Earthquake Damage

	Ray Fault	NTF	Mosha Fault
Building Damage	27,450	12,382	4,014
Bridge	0	0	0
Human Casualty	21,983	3,701	373
Water (point)	273	11	0
Gas (point)	48	2	0
Electricity (m)	1,560	0	0
Telecommunication (m)	740	0	0

Disaster Management Resources

Government Office: Management center	5	NCNDR:	0
Police (Traffic Police):	1(1)	Red Crescent Society:	0
Hospital:	12	Fire Brigade:	3

Evacuation

Regional Evacuation Place	0.00(m^2/persons)	Primary Evacuation Place	14
Education Facility	145	Water Points	0

Primary School 70	Intermediate, High School and High Education 75				
Vulnerability Analysis	5	4	3	2	1
Building Damage	14.7%	56.1%	29.3%	0.0%	0.0%
Evacuation	1.7%	34.7%	63.6%	0.0%	0.0%
Secondary Disaster	0.0%	66.5%	33.5%	0.0%	0.0%
Integrated Vulnerability	11.4%	55.8%	32.8%	0.0%	0.0%

Countermeasures

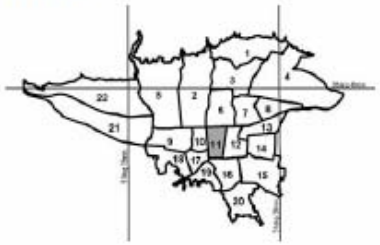
- Ray Fault would be the most predominant earthquake intensity in this district. It cause of seismic intensity of 600 to 100 gal. The weak building is relatively small 20 percent, yet the building damage is more than 60 percent of the total residential building.
- The integrated vulnerability results show that the more than 67 percent of the district has categorized risk level of 4 and 5. Especially the southern part of the district is high risk of the earthquake damage.
- The southern part of the district should be re-developed to establish safe urban structure, by providing evacuation space and improvement of buildings.

District No: 11

General Description

- High population density and built-up area ratio with lack of open spaces
- One of the most vulnerable area with much amount of weak buildings and intricate lifeline network

Key Map



Basic Information			
Population:	234,251	Area:	1,208ha
Aged Population (>65)	15,758	Population Density:	194.0person/ha
Young Population (<5)	18,138		

Land Information				
Built-up Area Ratio	35.94%			Major Fault: No major fault runs through the district Slope Stability: The district has a reliable slope stability Liquefaction: No liquefaction risk
PGA:				
Ray	500~600gal 35%	400~500gal 50%	300~400gal 15%	
NTF	200~300gal100%			

Distribution of Building			
Number of Building (Residential)	42,742	Building Density	35.4 (nos/ha)

Type of Building							
Steel Structure	9,975	RC Structure	492	Steel&Brick/Stone	15,338	Others	6,459
Weak building	68%						

Distribution of Infrastructure and Lifeline			
Road Length:	293km	Railway Length:	- km
Road Bridge:	1	Railway Bridge:	0
Gas:	243km	Electricity:	582km
Water:	321km	Telecommunication:	590km

Distribution of Hazardous Facility			
Petrol Station	7	Other	0

Earthquake Damage			
	Ray Fault	NTF	Mosha Fault
Building Damage	25,920	12,818	6,316
Bridge	1	1	0
Human Casualty	31,635	5,128	1,520
Water (point)	295	11	1
Gas (point)	41	2	0
Electricity (m)	1,770	0	0
Telecommunication (m)	1,700	0	0

Disaster Management Resources			
Government Office: Management center	1	NCNDR:	1
Police (Traffic Police):	8(2)	Red Crescent Society:	1
Hospital:	27	Fire Brigade:	5

Evacuation			
Regional Evacuation Place	1.42(m^2/persons)	Primary Evacuation Place	8
Education Facility	195	Water Points	0
Primary School 76	Intermediate, High School and High Education		116

Vulnerability Analysis	5	4	3	2	1
Building Damage	49.3%	38.5%	12.2%	0.0%	0.0%
Evacuation	0.0%	10.5%	19.8%	69.7%	0.0%
Secondary Disaster	7.0%	88.0%	5.1%	0.0%	0.0%
Integrated Vulnerability	8.3%	43.8%	44.1%	3.8%	0.0%

Countermeasures

- The Ray Fault model would cause the most serious damage in this district. Seismic intensity is the range of 600-300 gal in this district. More than 35 percent of the area is seismic intensity of 500-600 gal.
- The building density is relatively high in 26.7 building pre hector.
- The results shows the more than 87 percent of the areas is building collapse risk level of 4 and 5, while evacuation risk is low of risk level of 2, which shares 70 percent of the area. Integrated risk level is risk 5 and 4, which is more than half of the district.
- The southern part of district should consider area development scheme. The most of the district has vulnerable conditions against earthquake.

District No: 12

General Description

- High population density and built-up area ratio represents its vulnerability especially in the case earthquake model of Ray fault and expected human casualty is the highest in the city
- Relatively higher percentage of weak buildings distributes in the area

Key Map

Basic Information			
Population:	189,625	Area:	1,357ha
Aged Population (>65)	12,752	Population Density:	139.8person/ha
Young Population (<5)	17,869		

Land Information				
Built-up Area Ratio	41.57%			Major Fault: No major fault runs through the district Slope Stability: The district has a reliable slope stability Liquefaction: Southern part of the district has low liquefaction potential
PGA:				
Ray	500~600gal 8%	400~500gal 72%	300~400gal 20%	
NTF	200~300gal 100%			

Distribution of Building			
Number of Building (Residential)	49,023	Building Density	36.1(nos/ha)

Type of Building					
Steel Structure	8,493	RC Structure	436	Steel&Brick/Stone 9,648	Others 10,114
Weak building	69%				

Distribution of Infrastructure and Lifeline			
Road Length:	344km	Railway Length:	- km
Road Bridge:	3	Railway Bridge:	0
Gas:	211km	Electricity:	763km
Water:	279km	Telecommunication:	550km

Distribution of Hazardous Facility			
Petrol Station	10	Other	1

Earthquake Damage	Ray Fault	NTF	Mosha Fault
Building Damage	22,118	14,115	9,056
Bridge	3	2	0
Human Casualty	37,058	7,722	3,095
Water (point)	242	10	1
Gas (point)	34	1	0
Electricity (m)	2,080	0	0
Telecommunication (m)	1,460	0	0

Disaster Management Resources			
Government Office: Management center	6	NCNDR:	5
Police (Traffic Police):	6(0)	Red Crescent Society:	2
Hospital:	17	Fire Brigade:	3

Evacuation			
Regional Evacuation Place	0.00(m^2/persons)	Primary Evacuation Place	12
Education Facility	192	Water Points	0
Primary School 81	Intermediate, High School and High Education		111

Vulnerability Analysis	5	4	3	2	1
Building Damage	44.8%	46.6%	8.6%	0.0%	0.0%
Evacuation	6.9%	12.8%	42.7%	37.6%	0.0%
Secondary Disaster	74.6%	25.4%	0.0%	0.0%	0.0%
Integrated Vulnerability	13.6%	55.9%	30.6%	0.0%	0.0%

Countermeasures

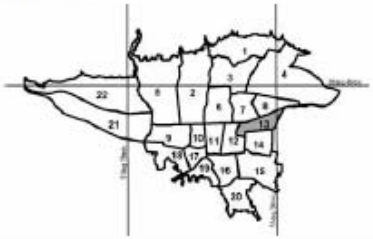
- Ray Fault model has great impact on the earthquake damage on the district. Seismic intensity is the rage of 500 to 300 gal. More than 70 percent of the district is fall into the range of 400-500 gal.
- The ratio of weak building is 30 percent in the total residential buildings.
- The integrated vulnerability shows that more than 69 percent of the area is categorized into risk level of 4 and 5. The southern part of the district is very vulnerable. As for the building vulnerability, the most of the district is risk level 4 and 5. The evacuation condition in the area is moderate, while secondary damage risk level is 5 in more than 74 percent of the district.
- Area development scheme should apply to improve vulnerability. Relocation of the industrial facility also another countermeasure.

District No: 13

General Description

- Parliament and many capital functions situate in this district
- Intricate road and lifeline networks and many hazardous facilities would cause disaster in the event of earthquake of Ray fault model

Key Map



Basic Information			
Population:	238,735	Area:	1,332ha
Aged Population (>65)	14,415	Population Density:	179.2person/ha
Young Population (<5)	19,328		

Land Information				
Built-up Area Ratio	32.48%			Major Fault: No major fault runs through the district Slope Stability: The district has a reliable slope stability Liquefaction: No liquefaction risk
PGA:				
Ray	300~400gal 99%	200~300gal 1%		
NTF	300~400gal 100%			

Distribution of Building			
Number of Building (Residential)	38,260	Building Density	27.6(nos/ha)

Type of Building					
Steel Structure	11,781	RC Structure	580	Steel&Brick/Stone 20,459	Others 2,708
Weak building	65%				

Distribution of Infrastructure and Lifeline			
Road Length:	268km	Railway Length:	- km
Road Bridge:	0	Railway Bridge:	0
Gas:	406km	Electricity:	453km
Water:	344km	Telecommunication:	335km

Distribution of Hazardous Facility			
Petrol Station	9	Other	8

Earthquake Damage			
	Ray Fault	NTF	Mosha Fault
Building Damage	17,958	10,423	4,295
Bridge	0	0	0
Human Casualty	10,312	2,614	599
Water (point)	88	10	1
Gas (point)	19	2	0
Electricity (m)	170	0	0
Telecommunication (m)	160	0	0

Disaster Management Resources			
Government Office: Management center	5	NCNDR:	0
Police (Traffic Police):	3(0)	Red Crescent Society:	0
Hospital:	9	Fire Brigade:	4
Evacuation			
Regional EvacuationPLace	0.00(m^2/persons)	Primary Evacuation Place	8
Education Facility	190	Water Points	0
Primary School 69	Intermediate, High School and High Education		124

Vulnerability Analysis	5	4	3	2	1
Building Damage	0.0%	7.0%	87.1%	5.9%	0.0%
Evacuation	1.7%	10.1%	26.4%	61.7%	0.0%
Secondary Disaster	0.0%	0.3%	11.0%	88.7%	0.0%
Integrated Vulnerability	0.3%	2.0%	36.7%	61.0%	0.0%

Countermeasures

- The Ray and NTF would cause approximately same impact on the district. Seismic intensity would be 300-400 gal in the district. Weak building ratio is low at 33 percent of the total buildings.
- 61 percent of the area is the integrated seismic risk is 2.
- The countermeasure to the earthquake risk is strengthening of the existing building that is the most important matter.

District No: 14

General Description

- Relatively higher population density and built-up area ratio indicate its vulnerability
- Cluster of weak buildings in dense residential area with lack of open spaces represent high human casualty number in the event of Ray fault model earthquake

Key Map

Basic Information			
Population:	367,472	Area:	1,453ha
Aged Population (>65)	29,739	Population Density:	252.9person/ha
Young Population (<5)	36,023		

Land Information				
Built-up Area Ratio	34.44%	Major Fault: No major fault runs through the district Slope Stability: The district has a reliable slope stability Liquefaction: No liquefaction risk		
PGA:				
Ray	400~500gal 33%	300~400gal 69%		
NTF	300~400gal 100%	200~300gal %		

Distribution of Building			
Number of Building (Residential)	58,535	Building Density	40.2(nos/ha)

Type of Building							
Steel Structure	19,946	RC Structure	839	Steel&Brick/Stone	29,726	Others	4,837
Weak building	62%						

Distribution of Infrastructure and Lifeline			
Road Length:	382km	Railway Length:	- km
Road Bridge:	0	Railway Bridge:	0
Gas:	632km	Electricity:	654km
Water:	532km	Telecommunication:	513km

Distribution of Hazardous Facility			
Petrol Station	4	Other	0

Earthquake Damage	Ray Fault	NTF	Mosha Fault
Building Damage	31,484	14,653	7,197
Bridge	0	0	0
Human Casualty	22,968	4,191	1,265
Water (point)	268	11	1
Gas (point)	58	2	0
Electricity (m)	1,040	0	0
Telecommunication (m)	660	0	0

Disaster Management Resources			
Government Office: Management center	6	NCNDR:	0
Police (Traffic Police):	6(1)	Red Crescent Society:	0
Hospital:	5	Fire Brigade:	2

Evacuation			
Regional Evacuation Place	0.00(m^2/persons)	Primary Evacuation Place	22
Education Facility	149	Water Points	0
Primary School 75	Intermediate, High School and High Education		85

Vulnerability Analysis	5	4	3	2	1
Building Damage	9.8%	27.8%	56.8%	5.6%	0.0%
Evacuation	11.1%	7.7%	81.1%	0.0%	0.0%
Secondary Disaster	0.0%	13.2%	86.8%	0.0%	0.0%
Integrated Vulnerability	0.7%	23.7%	70.9%	4.7%	0.0%

Countermeasures

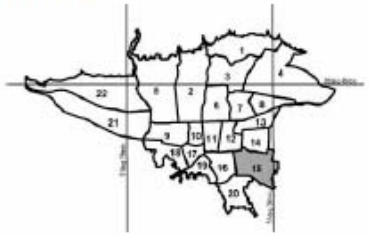
- The Ray Fault have cause relatively strong impact on the district PGA is range from 400-500 gal, while NTF would cause earthquake intensity of 300-400 gal. Most of buildings are constructed by steel and mixture of steel structure.
- Ray Fault model cause relatively high damage on the southern part of the district, especially near district borders with 15.
- As for evacuation space, there is no safety evacuation place, yet there are 22 primary evacuation place is identified.
- The district should take care of improvement of the existing buildings as well as provision of the safety evacuation space.

District No: 15

General Description

- Locates at south-east fringe of Tehran city
- Experienced rapid population growth in the last decades
- The most severe damage of human casualty is predicted in the event of Ray fault model earthquake

Key Map



Basic Information			
Population:	595,856	Area:	2,793ha
Aged Population (>65)	18,857	Population Density:	213.3person/ha
Young Population (<5)	69,498		

Land Information				
Built-up Area Ratio	23.50%			Major Fault: No major fault runs through the district, but North Ray Fault is in vicinity to its southern boundary Slope Stability: The district has a reliable slope stability Liquefaction: The district has low liquefaction potential
PGA:				
Ray	500~600gal 20%	400~500gal 40%	300~400gal 40%	
NTF	300~400gal 79%	200~300gal 21%		

Distribution of Building			
Number of Building (Residential)	81,943	Building Density	28.8(nos/ha)

Type of Building					
Steel Structure	27,203	RC Structure	1,945	Steel&Brick/Stone 38,546	Others 7,561
Weak building	61%				

Distribution of Infrastructure and Lifeline			
Road Length:	508km	Railway Length:	- km
Road Bridge:	2	Railway Bridge:	0
Gas:	511km	Electricity:	1,242km
Water:	721km	Telecommunication:	741km

Distribution of Hazardous Facility			
Petrol Station	5	Other	17

Earthquake Damage			
	Ray Fault	NTF	Mosha Fault
Building Damage	48,707	19,141	9,057
Bridge	0	0	0
Human Casualty	50,937	7,177	1,841
Water (point)	489	14	1
Gas (point)	55	2	0
Electricity (m)	1,950	0	0
Telecommunication (m)	1,520	0	0

Disaster Management Resources			
Government Office: Management center	7	NCNDR:	0
Police (Traffic Police):	5(0)	Red Crescent Society:	0
Hospital:	2	Fire Brigade:	3

Evacuation			
Regional Evacuation Place	2.10(m^2/persons)	Primary Evacuation Place	31
Education Facility	170	Water Points	1
Primary School 77	Intermediate, High School and High Education		124

Vulnerability Analysis	5	4	3	2	1
Building Damage	32.1%	34.1%	28.2%	5.5%	0.0%
Evacuation	0.0%	0.9%	11.6%	22.2%	65.3%
Secondary Disaster	1.9%	49.9%	48.1%	0.0%	0.0%
Integrated Vulnerability	0.7%	15.8%	41.1%	41.0%	1.5%

Countermeasures

- Ray Fault would cause great seismic impact on the district. Seismic intensity is the range of 600-300 gal. The building intensity is relatively dense of 26.4 buildings per ha.
- Ray Fault would cause huge damage on the district. More than 48,000 residential building will be collapse. More than 50,000 persons are human casualty. The northern part of the district would have heavy damage on the earthquake.
- Evaluation of earthquake vulnerability shows the building damage would be the most serious damage in the area. More than 66 percent of the total area ranks risk level 4 and 5. The evacuation space ranks 2 and 1 in the most of the area.
- The district should strengthen the weak existing buildings. The northern part of the district should consider area-development scheme.

District No: 16

General Description

- Locates in the south central part of Tehran city
- Population density and built-up area ratio are around the average level of the city
- Much damage of lifeline facilities is estimated in the event of Ray fault model earthquake

Key Map

Basic Information			
Population:	289,999	Area:	1,665ha
Aged Population (>65)	15,333	Population Density:	174.2person/ha
Young Population (<5)	30,347		

Land Information			
Built-up Area Ratio	26.05 %		
PGA:			
Ray	500~600gal 1%	400~500gal 97%	300~400gal 2%
NTF	200~300gal 95%	100~200gal 5%	

Major Fault: North Ray Fault runs in close vicinity to the southern boundary of the district
Slope Stability: The district has a reliable slope stability
Liquefaction: North area has relatively low liquefaction potential. Remained area has very low liquefaction potential

Distribution of Building			
Number of Building (Residential)	49,211	Building Density	29.7 (nos/ha)

Type of Building					
Steel Structure	8,852	RC Structure	424	Steel&Brick/Stone	23,399	Others	4,763
Weak building	75%				

Distribution of Infrastructure and Lifeline			
Road Length:	300km	Railway Length:	85km
Road Bridge:	4	Railway Bridge:	0
Gas:	260km	Electricity:	681km
Water:	349km	Telecommunication:	397km

Distribution of Hazardous Facility			
Petrol Station	6	Other	0

Earthquake Damage			
	Ray Fault	NTF	Mosha Fault
Building Damage	27,673	10,812	5,248
Bridge	1	0	0
Human Casualty	29,732	4,213	1,140
Water (point)	335	7	0
Gas (point)	46	1	0
Electricity (m)	1,950	0	0
Telecommunication (m)	1,190	0	0

Disaster Management Resources			
Government Office: Management center	7	NCNDR:	0
Police (Traffic Police):	6(0)	Red Crescent Society:	2
Hospital:	8	Fire Brigade:	1

Evacuation			
Regional Evacuation Place	1.28(m^2/persons)	Primary Evacuation Place	16
Education Facility	137	Water Points	0
Primary School 58	Intermediate, High School and High Education		77

Vulnerability Analysis	5	4	3	2	1
Building Damage	38.0%	61.5%	0.4%	0.0%	0.0%
Evacuation	0.0%	3.9%	8.3%	21.4%	66.3%
Secondary Disaster	27.7%	72.3%	0.0%	0.0%	0.0%
Integrated Vulnerability	2.3%	17.3%	79.9%	0.4%	0.0%

Countermeasures

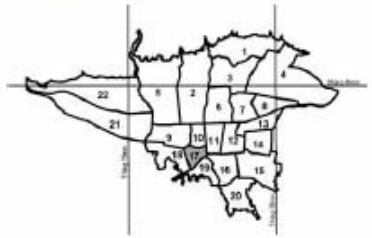
- Ray Fault would cause serious damage on the area. The PGA is the range of 600-300 gal and the most of the area is 400-500 gal.
- The earthquake damage of the Ray Fault is more than 27,000 residential buildings damage.
- The building damage is the most serious problem in this district. The middle of district would be more vulnerable than the rest of the district. The integrated vulnerability shows that the more than 19 percent of the area is categorized as the risk level of 4 and 5. Most of the area is ranked risk level of 3.
- The strengthening of the existing building is the most important countermeasures. The northern edge or border of the district 11 should consider the area development.

District No: 17

General Description

- One of the most dense area of population, buildings and road network
- Estimated damage in the event of Ray fault model earthquake is quite severe

Key Map



Basic Information

Population:	287,367	Area:	789ha
Aged Population (>65)	12,421	Population Density:	364.0person/ha
Young Population (<5)	31,784		

Land Information

Built-up Area Ratio	39.99%	Major Fault: No major fault runs through the district, but North Ray Fault situates to its south Slope Stability: The district has a reliable slope stability Liquefaction: No liquefaction risk	
PGA:			
Ray	500~600gal 48%	400~500gal 52%	
NTF	200~300gal 100%		

Distribution of Building

Number of Building (Residential)	46,156	Building Density	58.0(nos/ha)

Type of Building

Steel Structure	7,490	RC Structure	148	Steel&Brick/Stone	23,401	Others	2,173
Weak building	77%						

Distribution of Infrastructure and Lifeline

Road Length:	240km	Railway Length:	11km
Road Bridge:	7	Railway Bridge:	0
Gas:	191km	Electricity:	327km
Water:	332km	Telecommunication:	260km

Distribution of Hazardous Facility

Petrol Station	1	Other	6

Earthquake Damage

	Ray Fault	NTF	Mosha Fault
Building Damage	28,025	10,086	4,288
Bridge	1	0	0
Human Casualty	28,547	3,433	935
Water (point)	332	9	1
Gas (point)	35	1	0
Electricity (m)	940	0	0
Telecommunication (m)	780	0	0

Disaster Management Resources

Government Office: Management center	4	NCNDR:	0
Police (Traffic Police):	2(0)	Red Crescent Society:	0
Hospital:	8	Fire Brigade:	2

Evacuation

Regional Evacuation Place	0.00(m^2/persons)	Primary Evacuation Place	6
Education Facility	109	Water Points	1
Primary School 48	Intermediate, High School and High Education		62

Vulnerability Analysis	5	4	3	2	1
Building Damage	65.9%	33.2%	0.9%	0.0%	0.0%
Evacuation	2.8%	40.2%	57.0%	0.0%	0.0%
Secondary Disaster	9.7%	90.3%	0.0%	0.0%	0.0%
Integrated Vulnerability	33.0%	67.0%	0.0%	0.0%	0.0%

Countermeasures

- Ray Fault model would cause the most earthquake impact on the district. The seismic intensity is the range of 600-400 gal. The building density is very high in 40 buildings per hector. Most of the buildings are made from steel and brick and are very vulnerable.
- The disaster management resources also are not enough for the district. There is no identified safe evacuation place.
- The integrated vulnerability shows that the earthquake risk is ranks risk level 5 and 4 whole district. The district is the most vulnerable district within the Tehran Municipality.
- The area re-development should consider seriously in this district. It is important to provide a space for evacuation. The building strengthening is the most important countermeasures.

District No: 18

General Description

- Locates at south fringe of Tehran city
- Low population density, built-up area ratio and building density
- Relatively high ratio of parks/open spaces per person due to the green belt

Key Map

Basic Information			
Population:	272,534	Area:	1,745ha
Aged Population (>65)	7,884	Population Density:	156.2person/ha
Young Population (<5)	34,412		

Land Information			
Built-up Area Ratio	25.57%	Major Fault: North Ray Fault runs through the southern part of the district Slope Stability: The district has a reliable slope stability Liquefaction: No liquefaction risk	
PGA:			
Ray	500~600gal 30%	400~500gal 70%	
NTF	200~300gal 79%	100~200gal 21%	

Distribution of Building			
Number of Building (Residential)	41,536	Building Density	23.3 (nos/ha)

Type of Building							
Steel Structure	11,496	RC Structure	269	Steel&Brick/Stone	22,247	Others	1,664
Weak building	67%						

Distribution of Infrastructure and Lifeline			
Road Length:	322km	Railway Length:	31km
Road Bridge:	5	Railway Bridge:	0
Gas:	199km	Electricity:	618km
Water:	344km	Telecommunication:	317km

Distribution of Hazardous Facility			
Petrol Station	2	Other	32

Earthquake Damage			
	Ray Fault	NTF	Mosha Fault
Building Damage	27,446	8,942	3,618
Bridge	0	0	0
Human Casualty	24,564	2,622	631
Water (point)	341	9	1
Gas (point)	36	1	0
Electricity (m)	1,750	0	0
Telecommunication (m)	950	0	0

Disaster Management Resources			
Government Office: Management center	6	NCNDR:	0
Police (Traffic Police):	2(0)	Red Crescent Society:	0
Hospital:	6	Fire Brigade:	3
Evacuation			
Regional Evacuation Place	0.92(m^2/persons)	Primary Evacuation Place	25
Education Facility	121	Water Points	3
Primary School 61	Intermediate, High School and High Education		69

Vulnerability Analysis	5	4	3	2	1
Building Damage	39.5%	58.8%	1.7%	0.0%	0.0%
Evacuation	0.0%	0.2%	10.8%	23.1%	65.9%
Secondary Disaster	96.3%	3.7%	0.0%	0.0%	0.0%
Integrated Vulnerability	0.2%	17.5%	82.3%	0.0%	0.0%

Countermeasures

- Ray Fault model would cause the most serious earthquake damage on this district. Seismic intensity level is in the range of 600-400 gal. More than 70 percent of the area is fall in 400-500 gal.
- Most of the buildings are weak and made from steel and brick.
- There is a safe evacuation place and more than 25 primary evacuation places.
- The integrated vulnerability is moderate to high risk. The vulnerability on building collapse is more than 98 percent. The secondary damage vulnerability risk is categorized risk level 5 in more than 94 percent of the area. The evacuation risk is very low.
- The most important countermeasures in this district is the building strengthening.

District No: 19

General Description

- Locates at south fringe of Tehran city with relatively small area
- Lacks in disaster resources due to its recent rapid development process

Key Map

Basic Information			
Population:	202,994	Area:	1,144ha
Aged Population (>65)	6,470	Population Density:	177.4person/ha
Young Population (<5)	26,477		

Land Information			
Built-up Area Ratio	21.33%	Major Fault: No major fault runs through the district, but North Ray Fault is in close vicinity to its southern boundary Slope Stability: The district has a reliable slope stability Liquefaction: The district has very low liquefaction potential	
PGA:			
Ray	500~600gal 29%	400~500gal 71%	
NTF	200~300gal 72%	100~200gal 28%	

Distribution of Building			
Number of Building (Residential)	31,289	Building Density	27.2(nos/ha)

Type of Building					
Steel Structure	9,273	RC Structure	292	Steel&Brick/Stone 16,086	Others 1,079
Weak building	64 %				

Distribution of Infrastructure and Lifeline			
Road Length:	180km	Railway Length:	- km
Road Bridge:	1	RailwayBridge:	0
Gas:	172km	Electricity:	614km
Water:	239km	Telecommunication:	268 km

Distribution of Hazardous Facility			
Petrol Station	0	Other	9

Earthquake Damage

	Ray Fault	NTF	Mosha Fault
Building Damage	18,437	4,817	1,669
Bridge	1	0	0
Human Casualty	16,472	1,466	131
Water (point)	236	3	0
Gas (point)	31	0	0
Electricity (m)	1,760	0	0
Telecommunication (m)	800	0	0

Disaster Management Resources

Government Office: Management center	4	NCNDR:	0
Police (Traffic Police):	2(0)	Red Crescent Society:	0
Hospital:	6	Fire Brigade:	2

Evacuation

Regional Evacuation Place	0.00(m^2/persons)	Primary Evacuation Place	14
Education Facility	63	Water Points	2
Primary School 25	Intermediate, High School and High Education		44

Vulnerability Analysis	5	4	3	2	1
Building Damage	23.8%	74.8%	1.4%	0.0%	0.0%
Evacuation	0.0%	0.0%	3.8%	15.1%	81.1%
Secondary Disaster	4.4%	95.6%	0.0%	0.0%	0.0%
Integrated Vulnerability	0.0%	9.3%	89.7%	1.0%	0.0%

Countermeasures

- Ray Fault model would cause serious damage in the district. The seismic intensity is the range of 600-400 gal. More than 70 percent of the area is categorized in 400-500 gal.
- The ratio of weak building is more than 65 percent.
- The results of vulnerability analysis shows that the most of the area is categorized risk level of 3. The building damage is the most serious damage in this area. More than 98 percent of the area is categorized risk level 4 and 5.
- The most important countermeasure in this district is strengthening of the existing buildings.

District No: 20

General Description

- Located at the south fringe of Tehran city
- Existence of open urban outlooks and green belt in south of Tehran create a desirable residential quality in this district

Key Map

Basic Information			
Population:	293,100	Area:	1,782ha
Aged Population (>65)	13,583	Population Density:	164.5 person/ha
Young Population (<5)	39,537		

Land Information			
Built-up Area Ratio	27.84%	Major Fault: Ray Fault runs through the district Slope Stability: The district has reliable slope stability Liquefaction: Very low liquefaction potential exists in the district, while very high liquefaction potential area situates in close vicinity to its eastern boundary	
PGA:			
Ray	500~600gal 43%	400~500gal 57%	
NTF	200~300gal 59%	100~200gal 41%	

Distribution of Building			
Number of Building (Residential)	47,564	Building Density	23.5 (nos/ha)

Type of Building					
Steel Structure	16,480	RC Structure	2,082	Steel&Brick/Stone	21,139	Others	3,577
Weak building	57%				

Distribution of Infrastructure and Lifeline			
Road Length:	364km	Railway Length:	25,121km
Road Bridge:	1	Railway Bridge:	0
Gas:	194km	Electricity:	691km
Water:	363km	Telecommunication:	436km

Distribution of Hazardous Facility			
Petrol Station	6	Other	8

Earthquake Damage			
	Ray Fault	NTF	Mosha Fault
Building Damage	29,306	8,379	4,121
Bridge	0	0	0
Human Casualty	30,188	2,797	584
Water (point)	362	4	0
Gas (point)	34	0	0
Electricity (m)	1,930	0	0
Telecommunication (m)	1,310	0	0

Disaster Management Resources			
Government Office: Management center	8	NCNDR:	0
Police (Traffic Police):	6(0)	Red Crescent Society:	2
Hospital:	13	Fire Brigade:	2

Evacuation			
Regional Evacuation Place	0.00(m^2/persons)	Primary Evacuation Place	36
Education Facility	179	Water Points	0
Primary School 76	Intermediate, High School and High Education		103

Vulnerability Analysis	5	4	3	2	1
Building Damage	42.6%	54.4%	3.0%	0.0%	0.0%
Evacuation	0.0%	9.8%	11.8%	78.4%	0.0%
Secondary Disaster	79.7%	20.3%	0.0%	0.0%	0.0%
Integrated Vulnerability	7.6%	41.8%	50.5%	0.0%	0.0%

Countermeasures

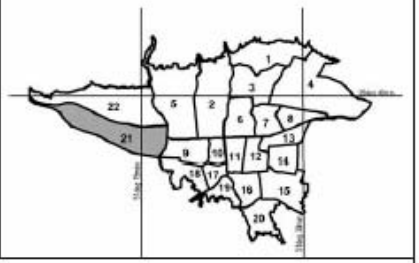
- Ray Fault would cause serious damage on the district. Seismic intensity is the range of 600-400 gal. More than 57 percent of the area is the PGA 400-500 gal.
- The weak building ratio is more than 57 percent.
- Evaluation of integrated vulnerability in the district shows that the more than 49 percent of the district is risk level 5 and 4. The building vulnerability fall into risk level 4 and 5 in most of the district.
- The building strengthening is the most important in this district. The middle of the district should consider the area development.

District No: 21

General Description

- Locates at west side of Tehran city
- Recently developed area and still in progress without sufficient infrastructure
- The high proportion of younger population and weak buildings characterise it as developing area

Key Map



Basic Information			
Population:	131,202	Area:	5,793ha
Aged Population (>65)	4,189	Population Density:	22.6person/ha
Young Population (<5)	21,038		

Land Information				
Built-up Area Ratio	11.93%			Major Fault: No major Fault runs through the district Slope Stability: The district has a reliable slope stability Liquefaction: No liquefaction risk
PGA:				
Ray	300~400gal 66%	200~300gal 33%	100~200gal 1%	
NTF	200~300gal 100%	100~200gal %		

Distribution of Building			
Number of Building (Residential)	20,646	Building Density	4.0(nos/ha)

Type of Building							
Steel Structure	8,798	RC Structure	1,831	Steel&Brick/Stone	10,366	Others	1,372
Weak building	52%						

Distribution of Infrastructure and Lifeline			
Road Length:	215km	Railway Length:	7km
Road Bridge:	5	Railway Bridge:	0
Gas:	0km	Electricity:	0 km
Water:	145km	Telecommunication:	218 km

Distribution of Hazardous Facility			
Petrol Station	2	Other	0

Earthquake Damage			
	Ray Fault	NTF	Mosha Fault
Building Damage	7,009	4,944	1,148
Bridge	0	0	0
Human Casualty	4,776	1,761	104
Water (point)	34	6	0
Gas (point)	0	0	0
Electricity (m)	0	0	0
Telecommunication (m)	120	0	0

Disaster Management Resources			
Government Office: Management center	3	NCNDR:	0
Police (Traffic Police):	3(0)	Red Crescent Society:	1
Hospital:	3	Fire Brigade:	3
Evacuation			
Regional Evacuation Place	0.00(m^2/persons)	Primary Evacuation Place	12
Education Facility	65	Water Points	0
Primary School 30	Intermediate, High School and High Education		44

Vulnerability Analysis	5	4	3	2	1
Building Damage	0.0%	30.4%	37.7%	31.8%	0.0%
Evacuation	0.0%	3.2%	3.0%	93.9%	0.0%
Secondary Disaster	3.8%	32.9%	30.7%	32.5%	0.2%
Integrated Vulnerability	0.0%	0.0%	37.5%	62.4%	0.2%

Countermeasures

- The Ray Fault model would cause the most damage on earthquake in the district. The seismic intensity level is in the range of 300-400 gal.
- The building density is relatively low of 4.3 building per hector. The weak building ratio is approximately 50 percent.
- The results of evaluation show that the integrated vulnerability risk is 2 in the 65 percent of the district and most of the area is low risk level.
- The strengthening of the existing building is the most important in this district.

District No: 22

General Description

- Located at the skirt of Alborz Mountains and north west fringe of Tehran city with vast area
- Development in the district is still in progress and built-up area ratio is quite low
- Most of the buildings in the district are categorised as seismic weak buildings

Key Map

Basic Information

Population:	57,230	Area:	6,614ha
Aged Population (>65)	1,155	Population Density:	8.7person/ha
Young Population (<5)	5,552		

Land Information

Built-up Area Ratio			1.11%
PGA:			
Ray	200~300gal 93%	100~200gal 7%	
NTF	300~400gal 57%	200~300gal 43%	

Major Fault: NTF runs along the north boundary of the district
Slope Stability: The north fringe of the district is relatively unstable in case of NTF model, due to the middle range of slope gradient
Liquefaction: No liquefaction risk

Distribution of Building

Number of Building (Residential)	4,495	Building Density	0.7(nos/ha)

Type of Building

Steel Structure	4,312	RC Structure	1,500	Steel&Brick/Stone	740	Others	186
Weak building	14%						

Distribution of Infrastructure and Lifeline

Road Length:	123km	Railway Length:	- km
Road Bridge:	3	Railway Bridge:	32
Gas:	0km	Electricity:	4km
Water:	65km	Telecommunication:	110km

Distribution of Hazardous Facility

Petrol Station	5	Other	0

Earthquake Damage

	Ray Fault	NTF	Mosha Fault
Building Damage	2,051	2,785	456
Bridge	0	0	0
Human Casualty	651	1,540	41
Water (point)	2	8	0
Gas (point)	0	0	0
Electricity (m)	0	0	0
Telecommunication (m)	0	0	0

Disaster Management Resources

Government Office: Management center	3	NCNDR:	0
Police (Traffic Police):	2(0)	Red Crescent Society:	1
Hospital:	2	Fire Brigade:	2

Evacuation

Regional Evacuation Place	113.75(m^2/persons)	Primary Evacuation Place	3
Education Facility	22	Water Points	0
Primary School 12	Intermediate, High School and High Education		15

Vulnerability Analysis	5	4	3	2	1
Building Damage	0.3%	21.5%	32.3%	45.9%	0.0%
Evacuation	0.0%	0.0%	0.4%	11.4%	88.2%
Secondary Disaster	0.0%	24.6%	26.1%	49.4%	0.0%
Integrated Vulnerability	0.0%	0.0%	0.5%	66.3%	33.3%

Countermeasures

- The NTF would cause the most serious damage in the district. Seismic intensity level is in the range of 300-400 gal.
- The building density is low at 1.1 building per hector.
- The result of the evaluation shows that the area is relatively low risk level of seismic damage. Since the area has not developed fully by construction of buildings.
- The building strengthening is the most important countermeasures.

Preliminary Financial and Economic Analysis for Pilot Urban Redevelopment Project

2.1 General

In Teheran City there are several areas with higher disaster vulnerability. For such vulnerable areas, several countermeasures for disaster prevention are proposed.

"Urban redevelopment" is considered one of the effective countermeasures for disaster mitigation. Urban redevelopment stands for, roughly speaking, demolishing the existing congested urbanized area, and reconstructing new buildings with such some spaces as roads and parks. Urban redevelopment mainly aims at the following:

- Improvement of urban environment,
- Upgrade of regional amenity,
- Improvement of regional traffic condition, and
- Strengthening of preventive condition against disaster.

This preliminary study aims at "financial analysis" and "economic analysis" regarding "pilot plan of urban redevelopment" for the assumed site selected as a test/pilot case among the several worst disaster vulnerable areas. The feasibility of urban redevelopment project is examined based on the assumed pilot plan of urban redevelopment.

2.2 Pilot Plan of Urban Redevelopment

2.2.1 Objective Site of Pilot Plan

The profile of the assumed objective area as a pilot plan site is as follows:

1) Location of Site:

- District 17,
- Near Abouzar Square, and
- Seven blocks surrounded by the streets of Aqaiani, Asadi, Paydar, and Gholami.

2) Land Area

The existing profile of land area is shown in Table A. 2. 1.

Table A. 2. 1 Existing Profile of Land Area

Item	Area Size (m2)	Share Percentage (%)
Seven Blocks	23,336	73%
Roads	8,784	27%
Total	32,120	100%

Source: JICA Study Team

3) Building Floor Area

The existing profile of building floor area is shown in Table A. 2. 2.

Table A. 2. 2 Existing Profile of Building Floor Area

Item	Area Size
Total Building Floor Area	37,707 (m2)
Building Coverage Area	16,701 (m2)
Building Coverage Ratio	72%
Average Number of Floor	2.3
Average Floor Area Ratio	162%

Source: JICA Study Team

4) Plot

The existing profile of plot is shown in Table A. 2. 3.

Table A. 2. 3 Existing Profile of Plot

Item	Amount
Number of Plots	355
Average Size of Plot	66 (m^2)

Source: JICA Study Team

5) Household/Population

The existing profile of household/population is shown in Table A. 2. 4.

Table A. 2. 4 Existing Profile of Household/Population

Item	Amount
Number of Households (unit)	551
Population (person)	2,462
Average No. of Persons per Household	4.5
Average Floor Size per Household	68 (m^2)
Average Floor Size per Person	15 (m^2)

Source: JICA Study Team

The background of selection of this area as a pilot plan site is as follows:

- This area is considered one of the sites evaluated as worst vulnerable with higher building collapsibility and heavier difficulty in evacuation, and
- The recommendable countermeasure for this area is “urban redevelopment.”

2.2.2 Future Land Use Plan in Pilot Plan

The future land use plan is assumed as shown in Table A. 2. 5.

Table A. 2. 5 Future Land Use Plan

Item	Area Size (m^2)	Share Percentage (%)
Total	32,100	100%
Road	7,000	22%
Excluding Road	25,120	78%
Public Space	5,500	17%
Remaining Private Property	19,620	61%
(Building Coverage Ratio)	(50%)	
Building Coverage	9,810	31%
Open Space	9,810	31%

Source: JICA Study Team

2.3 Financial Analysis of Urban Redevelopment Pilot Plan

2.3.1 General

1) System

Here, redevelopment follows the "right conversion system," which is applied in the framework of "equivalent transfer." Under this system, the area sizes of "floor area of right" and "reserved floor area" are estimated.

"Floor area of right" stands for the floor area for the original property possessors, which is provided as a result of right conversion from the existing floor area. "Reserved floor area" means the other floor area than the "floor area of right." Basically, the sales revenues of the "reserved floor area" will be appropriated for the implementation cost of urban redevelopment.

2) Floor Area of Right

The area size of "floor area of right" is calculated as follows:

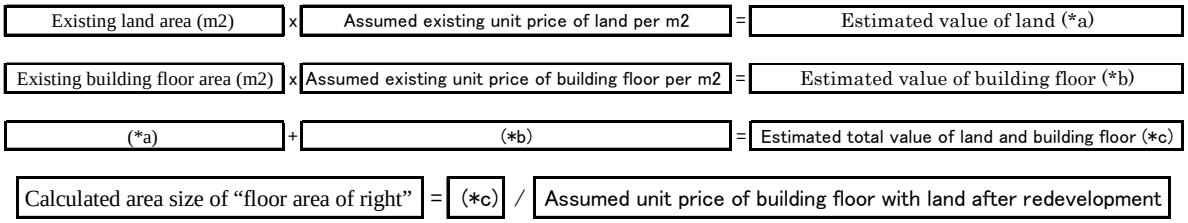


Figure A. 2. 1 Calculation Flow for Floor Area of Right

3) Setting-up of Area Size of "Reserved Floor Area"

All the related redevelopment costs (all the costs related to "floor area of right" and "reserved floor area") are covered by the sales amount of "reserved floor area.".

In this financial analysis, the area size of "reserved floor area" will be set up assuming that a nearly break-even result will be secured in the final year in the cash flow table, representing approximately 3% of the cash flow surplus ratio to the total costs.

2.3.2 Assumption on Implementation Period

1) Preparatory Stage

The total period for the preparatory work items of substitute rental housing (or temporary housing), residents moving, and demolishing is assumed to be approximately one year.

2) Construction Stage

The total period for the construction/development of building, road, and infrastructure is assumed to be approximately four years with the residents moving.

2.3.3 Assumption on Related Costs and Revenues

The unit costs and prices mentioned below are assumed based on the obtained information from counterparts, general contractors in Tehran, etc.

1) Building (Building floor)

The floor use is assumed to the three types of residential, commercial, and office. The assumed unit construction costs of building and share percentage by type are shown in Table A. 2. 6.

Table A. 2. 6 Assumed Unit Construction Cost of Building

Floor Use	Share Percentage	Unit Construction Cost per Floor m^2 (Rial million)	Weighted Average Unit Construction Cost per Floor m^2 (Rial million)
Residential	90%	1.80	
Commercial	5%	1.80	
Office	5%	1.80	
Total (Average)	100%		1.80

Source: JICA Study Team

The assumed unit sales prices of building by type ("reserved floor area") are shown in Table A. 2. 7.

Table A. 2. 7 Assumed Unit Sales Price of Building

Floor Use	Share Percentage	Unit Sales Price per Floor m^2 (Rial million)	Weighted Average Unit Sales Price per Floor m^2 (Rial million)
Residential	90%	7.50	
Commercial	5%	20.00	
Office	5%	10.00	
Total (Average)	100%		8.25

Source: JICA Study Team

2) Road

The unit road construction cost is assumed to be Rial 0.5 million per square meter.

3) Substitute Rental Housing

As a base case, the substitute rental housing is assumed for the housing of the existing residents during the construction period.

The monthly rental cost per household is assumed to be Rial 1.7 million. The average rental housing period per household is assumed to be four years and half (54 months).

4) Temporary Housing (as an Option)

As an optional calculation case, temporary housing is assumed instead of the substitute rental housing. The unit land cost is assumed to be Rial 2.0 million per square meter. The building floor cost is assumed to be Rial 1.8 million per square meter. In the cost estimates, the required land area and the floor area size are assumed to be the same as the existing ones. The other cost factor of 20% is additionally assumed of the above land cost and building cost to cover the required costs of infrastructures, etc. In this financial analysis, this temporary housing facility is assumed to be utilized not only one time for this project, but several times also for other projects. The turnover of six times is assumed.

5) Residents Moving

The unit residents moving cost is assumed to be Rial 0.5 million per household.

6) Demolishing

The direct unit cost for demolishing is not available. However, the unit volume of debris per floor area square meter and the unit delivery cost of debris are available, that is, the debris of 0.75 ton per floor area square meter and the unit delivery cost of Rial 0.123 million per ton, respectively. Thus, the unit delivery cost per floor area square meter is estimated to be Rial 0.09225 million. Assuming the cost factor for demolishing itself of 20% of the delivery cost, the unit demolishing cost per floor area square meter is estimated to be Rial 0.1107 million.

7) Infrastructure

As an infrastructure cost, 10% of total of the building construction cost and the road construction cost is assumed.

8) Design, Supervision, etc.

As a cost for design, supervision, etc., 10% of the total of the above cost items is assumed.

9) Interest Rate

The interest rate of 15% is assumed.

10) Costs Related to Such Facilities as School

In the future land use plan, the land for school is prepared. However, in this financial analysis, it is assumed that the construction of school will be carried out by the authority concerned. Therefore, the construction cost related to such facilities as school is assumed to be out of scope of cost estimates in this project.

2.3.4 Assumption on Implementation Schedule

The implementation schedules are dependent on the procedure of the housing for the existing residents during construction (i.e., substitute rental housing or temporary housing) and/or the procedure of redevelopment (i.e., conventional procedure or procedure utilizing such existing vacant land area as governmental land).

The following implementation schedules in accordance with annual cost distribution are assumed:

1) Substitute Rental Housing

The implementation schedule in accordance with annual cost distribution for "substitute rental housing" is shown in Table A. 2. 8.

Table A. 2. 8 Implementation Schedule (Substitute Rental Housing)

Item/Year	1st	2nd	3rd	4th	5th	6th
Substitute Rental Housing	----------	----------	----------	----------	----------	
Residents Moving	----------					
Demolishing	----------					
Reconstruction		----------	----------	----------	----------	
Residents Moving					----------	

Source: JICA Study Team

2) Temporary Housing

The implementation schedule in accordance with annual cost distribution for "temporary housing" is shown in Table A. 2. 9.

Table A. 2. 9 Implementation Schedule (Temporary Housing)

Item/Year	1st	2nd	3rd	4th	5th	6th
Preparation of Temporary Housing	----------					
Residents Moving	----------					
Demolishing	----------					
Reconstruction		----------	----------	----------	----------	
Residents Moving					----------	

Source: JICA Study Team

3) Using Existing Vacant Land

The implementation schedule in accordance with annual cost distribution for "using existing vacant land" is shown in Table A. 2. 10.

Table A. 2. 10 Implementation Schedule (Using Existing Vacant Land)

Item/Year	1st	2nd	3rd	4th	5th	6th
Reconstruction	----------	----------	----------	----------		
Residents Moving					----------	
Demolishing					----------	

Source: JICA Study Team

For all the above cases, it is assumed that the timing of sales of "reserved floor area" will be done in the 6th year.

2.3.5 Assumption on Financing

It is assumed that the required costs for the implementation will be financed by such financial scheme as loan or bond (with interest cost).

2.3.6 Calculation Cases

1) Base Case

First, as a base case, the calculation was carried out under the following conditions:

(The assumptions are made based on the obtained information from counterparts, general contractors in Tehran, etc.)

- Assumed existing unit price of land per square meter: Rial 2.0 million
- Assumed existing unit price of building floor per square meter : Rial 2.0 million
- Assumed unit price of building floor with land per square meter: Rial 6.0 million

Under these assumptions, the area size of "floor area of right" was estimated. Under the financial target on the surplus ratio to the total costs, the area size of the "reserved floor area" was obtained as summarized in Table A. 2. 11.

Table A. 2. 11 Estimated Area Size of Floor Area (Base Case)

	Area Size (m^2)
Estimated Floor Area of Right	20,014
Estimated Reserved Floor Area	43,300
Total	63,314

Source: JICA Study Team

However, the "floor area of right" ratio compared to the existing floor area shows only approximately 53%. (20,014 / 37,707 = 53%; the figure of 37,707 is referred to Table A. 2. 2)

Therefore, the calculation case with a larger area size of “floor area of right” was tried as Revised Base Case.

2) Revised Base Case

The incremental cost caused by the increase in area size of “floor area of right” is obliged to be covered by the incremental sales revenues by the increase in area size of “reserved floor area.” The calculation results of floor area in the Revised Base Case were summarized in Table A. 2. 12 with the “floor area of right” ratio compared to the existing floor area of approximately 66% (about two-thirds). (25,018 / 37,707 = 66%; the figure of 37,707 is referred to Table A. 2. 2)

Table A. 2. 12 Estimated Area Size of Floor Area (Revised Base Case)

	Area Size (m^2)
Estimated Floor Area of Right	25,018
Estimated Reserved Floor Area	47,400
Total	72,418

Source: JICA Study Team

The estimated redevelopment costs for the Revised Base Case are summarized in Table A. 2. 13.

Table A. 2. 13 Summary of Estimated Redevelopment Cost for Revised Base Case

Cost Item		Estimated Cost (Rial Million)
Preparatory		
	Substitute Rental Housing	50,582
	(Temporary Housing)	(0)
	Residents Moving	276
	Demolishing	4,174
	Residents Moving	276
	(Subtotal)	55,307
Redevelopment		
	Buildings	130,352
	Roads	3,500
	Infrastructure	13,385
	(Subtotal)	147,237
	(Total excl. Design, etc.)	202,544
	Design, Supervision, etc	20,254
	(Total incl. Design, etc.)	222,799
Interest Cost		
	Interest During Construction	107,691
	Interest	49,573
	(Total)	157,264
Grand Total		380,063

Source: JICA Study Team

3) Alternative Case 1 (Temporary Housing)

Following the Revised Base Case, the alternative calculation case regarding the procedure of the housing for the existing residents during construction was tried, in which the temporary housing

was adopted instead of the substitute rental housing. The calculation results of floor area in the Alternative Case 1 were summarized in Table A. 2. 14.

Table A. 2. 14 Estimated Area Size of Floor Area (Alternative Case 1)

	Area Size (m^2)
Estimated Floor Area of Right	25,018
Estimated Reserved Floor Area	37,800
Total	62,818

Source: JICA Study Team

In the Alternative Case 1, due to the cost decrease in the item of "temporary housing" compared to the case of "substitute rental housing," the required area size of reserved floor area has decreased.

4) Alternative Case 2 (Using Vacant Land)

Following the Revised Base Case, the alternative calculation case regarding the redevelopment procedure was tried, in which the procedure utilizing such existing vacant land area as governmental land was adopted instead of the conventional redevelopment procedure. The calculation results of floor area in the Alternative Case 2 were summarized in Table A. 2. 15.

Table A. 2. 15 Estimated Area Size of Floor Area (Alternative Case 2)

	Area Size (m^2)
Estimated Floor Area of Right	25,018
Estimated Reserved Floor Area	30,100
Total	55,118

Source: JICA Study Team

In the Alternative Case 2, due to the cost decrease for the reason of the non-necessity of such cost items of the housing for the existing residents during construction as "substitute rental housing" or "temporary housing," etc. compared to the case of "conventional redevelopment procedure," the required area size of reserved floor area has decreased.

5) Alternative Case 3 (Favorable Interest Rate of 8%)

Following the Revised Base Case, the alternative calculation case regarding the interest rate was tried, in which assuming the favorable interest rate to be available, the interest rate of 8% was adopted instead of the interest rate of 15%. The calculation results of floor area in the Alternative Case 3 were summarized in Table A. 2. 16.

Table A. 2. 16 Estimated Area Size of Floor Area (Alternative Case 3)

	Area Size (m^2)
Estimated Floor Area of Right	25,018
Estimated Reserved Floor Area	31,400
Total	56,418

Source: JICA Study Team

In the Alternative Case 3, due to the cost decrease in the interest cost compared to the Revised Base Case, the required area size of reserved floor area has decreased.

6) Alternative Case 4 (Alternative Case 2 + Favorable Interest Rate of 8%)

Following the Alternative Case 2 (the alternative procedure utilizing such existing vacant land area as governmental land was adopted instead of the conventional redevelopment procedure), the alternative calculation case regarding the interest rate was tried, in which the favorable interest rate of 8% was adopted instead of the interest rate of 15%. The calculation results of floor area in the Alternative Case 4 were summarized in Table A. 2. 17.

Table A. 2. 17 Estimated Area Size of Floor Area (Alternative Case 4)

	Area Size (m^2)
Estimated Floor Area of Right	25,018
Estimated Reserved Floor Area	18,000
Total	43,018

Source: JICA Study Team

In the Alternative Case 4, due to both the cost decrease for the reason of the non-necessity of the cost items of the housing for the existing residents during construction similar to the Alternative Case 2, and the cost decrease in the interest cost, the required area size of reserved floor area has decreased.

2.3.7 Cash Flow Table

The cash flow tables for the above respective calculation cases are shown in Table A. 2. 20 to Table A. 2. 25.

2.3.8 Summary of Calculation Results

The summary of calculation results for the above respective calculation cases is shown in Table A. 2. 26.

2.3.9 Points at Issue

In this section, several factors that could possibly affect the success or failure of the implementation of urban redevelopment project are enumerated as follows:

- Validity regarding the area size of “floor area of right” is to be examined.
- Validity regarding the unit costs of building construction is to be examined.
- Validity regarding the unit sales price and sales plan of building floor (“reserved floor area”) is to be examined.
- For the housing of the existing residents during construction period, “temporary housing” is tried as an option. “Temporary housing” will require the land acquisition. The availability of such land acquisition is to be examined.

- As an implementation procedure alternative, “using vacant land” is tried. The availability of acquisition of such vacant land as governmental land is to be examined.
- In this financial analysis, the financing of the required costs for the implementation is assumed by such financial scheme as loan or bond (with interest cost) for the period of 5 years. The availability of such a financing is to be examined.
- Such figures as the average floor area ratio and the average number of floor will be obtained from the total area size of “floor area of right” and “reserved floor area.” The validity regarding such figures is to be examined in terms of legal aspect and landscape aspect.

2.4 Economic Analysis

2.4.1 General

Through the implementation of the urban redevelopment, the following effects are expected:

- Strengthening of preventive condition against disaster,
- Improvement of urban environment,
- Upgrade of regional amenity, and
- Improvement of regional traffic condition.

As a result, it can be said that the value of land will be enhanced reflecting especially a preventive condition against disaster together with a general improvement in living and environmental condition for the people.

In this economic analysis, such an enhancement of land value is assumed to possibly consider as a quantitative benefit.

However, the measurement of changes of land value is difficult in nature, both for the existing one and also the future one after redevelopment.

Consequently, this economic analysis is obliged to be a calculation based on some assumptions.

For the assumption of the existing land value in the objective pilot urban redevelopment plan area, the information obtained from counterparts, general contractors in Tehran, etc. is much counted on. As a result, the existing land value is assumed to be Rial 2.0 million per square meter. For the assumption of the future land value, the data of “Building data base for taxation” was utilized.

According to the above data source, the ratio of land value per square meter in the objective pilot urban redevelopment plan area compared to the several adjacent areas is as follows:

Table A. 2. 18 Ratio of Land Value Per Square Meter in Objective Pilot Urban Redevelopment Plan Area Compared to Several Adjacent Areas

Area	Ratio of average land value per square meter (compared to that in the objective pilot urban redevelopment plan area)
Mahalle 7 in District 17 (Representing the highest land value per m2 in District 17)	1.9
Mahalles (except the above 7) in District 17	Ranging from 0.8 to 1.2
Average in Whole District 17	1.1
Average in Whole District 10 (Northern district to District 17)	1.8
Mahalles (20, 21, 22, 25, and 26) in District 10 close to the Objective Pilot Plan Area	Ranging from 1.4 to 1.7

Source: JICA Study Team

In this economic analysis, considering the above figures, the changing rate regarding land value per square meter after urban redevelopment is assumed to be approximately 1.5 times as an effect of urban redevelopment, resulting in the estimated future land value of Rial 3.0 million per square meter.

The difference between the existing land value and the future land value after urban redevelopment is treated as a benefit.

2.4.2 Economic Analysis

1) Estimated benefits

Based on the above assumption, the economic benefits are calculated by land area multipled with the difference of land value.

The land area stands for 32,120 square meters. As a result, the economic benefits are estimated to be Rial 32,120 million per annum.

2) EIRR calculation

Regarding the costs, in this economic analysis, the financial costs used in the section of financial analysis are adopted. However, the cost component of interest cost is excluded. Following the conventional discounted cash flow method, Economic Internal Rate of Return (EIRR) is calculated. The calculation period is assumed to be 25 years comprising the redevelopment implementation period of 5 years and the project life of 20 years.

As a result, the calculation results are summarized in Table A. 2. 19.

Table A. 2. 19 Calculation Results of EIRR

Calculation Case	EIRR Value
Base Case	11.5%
Revised Base Case	10.4%
Alternative Case 1	13.3%
Alternative Case 2	-
Alternative Case 3	12.5%
Alternative Case 4	-

Source: JICA Study Team

Note: The calculation cases of Alternative Case 2 and 4 of "using vacant land" are omitted, because the land area after redevelopment is different from the initial land area.

In this economic analysis, the amounts of estimated benefits are fixed for all the calculation cases, and the EIRR value will show higher accordingly when the required implementation costs are smaller by calculation case.

(Note: Formula of EIRR)

Economic analysis follows a conventional cost-benefit analysis of discounted cash flow methodology. The cost-benefit analysis is made by comparison between economic benefits and costs. The formula of EIRR is shown below:

$$\sum_{t=1}^{n} \frac{Benefits_t}{(1+R)^t} = \sum_{t=1}^{n} \frac{Costs_t}{(1+R)^t}$$

where:

$Benefits_t$: Benefits in year t
$Costs_t$: Investment costs in year t
n : Calculation period
t : Year t (from 1 to n)
R : Value of EIRR

Table A. 2. 20 Cash Flow Table: Base Case

(Rial Million)

Cash Flow Table	1	2	3	4	5	6	7	8	
1) In-Flow	20,994	56,176	64,602	74,292	85,752	357,225			
Pre-Sale	0	0	0	0	0				
Equity	0	0	0	0	0				0
Equity (For Interest during Const.)	0	0	0	0	0				0
(Equity Total)	0	0	0	0	0				0
Loan	18,256	46,110	46,110	46,110	46,385				202,971
Loan (For Interest during Const.)	2,738	10,066	18,492	28,182	39,367				98,845
(Loan Total)	20,994	56,176	64,602	74,292	85,752				301,816
Revenues						357,225			357,225
2) Out-Flow	20,994	56,176	64,602	74,292	85,752	347,089			
Initial Investment	18,256	46,110	46,110	46,110	46,385				202,971
Interest during Const.	2,738	10,066	18,492	28,182	39,367				98,845
Interest Payment						45,272			45,272
Loan Repayment	0	0	0	0	0	301,816			301,816
3) In-Flow Minus Out-Flow	0	0	0	0	0	10,136			
Surplus	0	0	0	0	0	10,136			
Accumulated Surplus	0	0	0	0	0	10,136			

(Base Case)
Substitute Rental Housing
Interest Rate: 15%
Floor Area of Right: 20,014 (m2)
Reserved Floor Area: 43,300 (m2)
Total Floor Area: 63,314 (m2)

(Surplus)	10,136	5.0%
(Inv. Cost)	202,971	
(Surplus)	10,136	2.9%
(Inv. Cost + Interest Cost)	347,089	

Source: JICA Study Team

Table A. 2. 21 Cash Flow Table: Revised Base Case

(Rial Million)

Cash Flow Table	1	2	3	4	5	6	7	8	
1) In-Flow	21,410	61,835	71,110	81,777	94,359	391,050			
Pre-Sale	0	0	0	0	0				
Equity	0	0	0	0	0				0
Equity (For Interest during Const.)	0	0	0	0	0				0
(Equity Total)	0	0	0	0	0				0
Loan	18,617	50,977	50,977	50,977	51,252				222,799
Loan (For Interest during Const.)	2,793	10,858	20,133	30,800	43,107				107,691
(Loan Total)	21,410	61,835	71,110	81,777	94,359				330,490
Revenues						391,050			391,050
2) Out-Flow	21,410	61,835	71,110	81,777	94,359	380,063			
Initial Investment	18,617	50,977	50,977	50,977	51,252				222,799
Interest during Const.	2,793	10,858	20,133	30,800	43,107				107,691
Interest Payment						49,573			49,573
Loan Repayment	0	0	0	0	0	330,490			330,490
3) In-Flow Minus Out-Flow	0	0	0	0	0	10,987			
Surplus	0	0	0	0	0	10,987			
Accumulated Surplus	0	0	0	0	0	10,987			

(Revised Base Case)
Substitute Rental Housing
Interest Rate: 15%
Floor Area of Right: 25,018 (m2)
Reserved Floor Area: 47,400 (m2)
Total Floor Area: 72,418 (m2)

(Surplus)	10,987	4.9%
(Inv. Cost)	222,799	
(Surplus)	10,987	2.9%
(Inv. Cost + Interest Cost)	380,063	

Source: JICA Study Team

Table A. 2. 22 Cash Flow Table: Alternative Case 1

(Rial Million)

Cash Flow Table	1	2	3	4	5	6	7	8	
1) In-Flow	35,047	45,708	52,564	60,449	69,833	311,850			
Pre-Sale	0	0	0	0	0				
Equity	0	0	0	0	0				0
Equity (For Interest during Const.)	0	0	0	0	0				0
(Equity Total)	0	0	0	0	0				0
Loan	30,476	35,175	35,175	35,175	35,450				171,450
Loan (For Interest during Const.)	4,571	10,533	17,389	25,274	34,383				92,150
(Loan Total)	35,047	45,708	52,564	60,449	69,833				263,600
Revenues						311,850			311,850
2) Out-Flow	35,047	45,708	52,564	60,449	69,833	303,140			
Initial Investment	30,476	35,175	35,175	35,175	35,450				171,450
Interest during Const.	4,571	10,533	17,389	25,274	34,383				92,150
Interest Payment						39,540			39,540
Loan Repayment	0	0	0	0	0	263,600			263,600
3) In-Flow Minus Out-Flow	0	0	0	0	0	8,710			
Surplus	0	0	0	0	0	8,710			
Accumulated Surplus	0	0	0	0	0	8,710			

(Alternative Case 1)
Temporary Housing
Interest Rate: 15%
Floor Area of Right: 25,018 (m2)
Reserved Floor Area: 37,800 (m2)
Total Floor Area: 62,818 (m2)

(Surplus)	8,710	5.1%
(Inv. Cost)	171,450	
(Surplus)	8,710	2.9%
(Inv. Cost + Interest Cost)	303,140	

Source: JICA Study Team

Table A. 2. 23 Cash Flow Table: Alternative Case 2

(Rial Million)

Cash Flow Table	1	2	3	4	5	6	7	8	
1) In-Flow	35,184	40,462	46,531	53,510	34,171	248,325			
Pre-Sale	0	0	0	0	0				
Equity	0	0	0	0	0				0
Equity (For Interest during Const.)	0	0	0	0	0				0
(Equity Total)	0	0	0	0	0				0
Loan	30,595	30,595	30,595	30,595	6,798				129,176
Loan (For Interest during Const.)	4,589	9,867	15,936	22,915	27,373				80,680
(Loan Total)	35,184	40,462	46,531	53,510	34,171				209,856
Revenues						248,325			248,325
2) Out-Flow	35,184	40,462	46,531	53,510	34,171	241,335			
Initial Investment	30,595	30,595	30,595	30,595	6,798				129,176
Interest during Const.	4,589	9,867	15,936	22,915	27,373				80,680
Interest Payment						31,478			31,478
Loan Repayment	0	0	0	0	0	209,856			209,856
3) In-Flow Minus Out-Flow	0	0	0	0	0	6,990			
Surplus	0	0	0	0	0	6,990			
Accumulated Surplus	0	0	0	0	0	6,990			

(Surplus)	6,990	5.4%
(Inv. Cost)	129,176	
(Surplus)	6,990	2.9%
(Inv. Cost + Interest Cost)	241,335	

(Alternative Case 2)
Using Vacant Land
Interest Rate: 15%
Floor Area of Right: 25,018 (m2)
Reserved Floor Area: 30,100 (m2)
Total Floor Area: 55,118 (m2)

Source: JICA Study Team

Table A. 2. 24 Cash Flow Table: Alternative Case 3

(Rial Million)

Cash Flow Table	1	2	3	4	5	6	7	8	
1) In-Flow	19,422	47,371	51,160	55,253	59,971	259,050			
Pre-Sale	0	0	0	0	0				
Equity	0	0	0	0	0				0
Equity (For Interest during Const.)	0	0	0	0	0				0
(Equity Total)	0	0	0	0	0				0
Loan	17,983	42,423	42,423	42,423	42,699				187,951
Loan (For Interest during Const.)	1,439	4,948	8,737	12,830	17,272				45,226
(Loan Total)	19,422	47,371	51,160	55,253	59,971				233,177
Revenues						259,050			259,050
2) Out-Flow	19,422	47,371	51,160	55,253	59,971	251,831			
Initial Investment	17,983	42,423	42,423	42,423	42,699				187,951
Interest during Const.	1,439	4,948	8,737	12,830	17,272				45,226
Interest Payment						18,654			18,654
Loan Repayment	0	0	0	0	0	233,177			233,177
3) In-Flow Minus Out-Flow	0	0	0	0	0	7,219			
Surplus	0	0	0	0	0	7,219			
Accumulated Surplus	0	0	0	0	0	7,219			

(Alternative Case 3)
Substitute Rental Housing
Interest Rate: 8%
Floor Area of Right: 25,018 (m2)
Reserved Floor Area: 31,400 (m2)
Total Floor Area: 56,418 (m2)

(Surplus)	7,219	3.8%
(Inv. Cost)	187,951	
(Surplus)	7,219	2.9%
(Inv. Cost + Interest Cost)	251,831	

Source: JICA Study Team

Table A. 2. 25 Cash Flow Table: Alternative Case 4

(Rial Million)

Cash Flow Table	1	2	3	4	5	6	7	8	
1) In-Flow	26,056	28,141	30,392	32,823	16,217	148,500			
Pre-Sale	0	0	0	0	0				
Equity	0	0	0	0	0				0
Equity (For Interest during Const.)	0	0	0	0	0				0
(Equity Total)	0	0	0	0	0				0
Loan	24,126	24,126	24,126	24,126	6,319				102,823
Loan (For Interest during Const.)	1,930	4,015	6,266	8,697	9,898				30,806
(Loan Total)	26,056	28,141	30,392	32,823	16,217				133,629
Revenues						148,500			148,500
2) Out-Flow	26,056	28,141	30,392	32,823	16,217	144,319			
Initial Investment	24,126	24,126	24,126	24,126	6,319				102,823
Interest during Const.	1,930	4,015	6,266	8,697	9,898				30,806
Interest Payment						10,690			10,690
Loan Repayment	0	0	0	0	0	133,629			133,629
3) In-Flow Minus Out-Flow	0	0	0	0	0	4,181			
Surplus	0	0	0	0	0	4,181			
Accumulated Surplus	0	0	0	0	0	4,181			

Alternative Case 4)
Using Vacant Land
Interest Rate: 8%
Floor Area of Right: 25,018 (m2)
Reserved Floor Area: 18,000 (m2)
Total Floor Area: 43,018 (m2)

(Surplus)	4,181	4.1%
(Inv. Cost)	102,823	
(Surplus)	4,181	2.9%
(Inv. Cost + Interest Cost)	144,319	

Source: JICA Study Team

Table A. 2. 26 Summary of Calculation Results by Case

			Base Case	Revised Base Case	Alt. Case 1	Alt. Case 2	Alt. Case 3 Revised Base Case Int.Rate=8%	Alt. Case 4 Alt. Case 2 Int.Rate=8%
Implementation Alternative			Substitute Rental Housing	Substitute Rental Housing	Temporary Housing	Using Vacant Governmental Land	Substitute Rental Housing	Using Vacant Governmental Land
Land Use								
Total		m2	32,120	32,120	32,120	32,120	32,120	32,120
Road		m2	7,000	7,000	7,000	7,000	7,000	7,000
Public Space		m2	5,500	5,500	5,500	5,500	5,500	5,500
Remaining Private Property	(*1)	m2	19,620	19,620	19,620	19,620	19,620	19,620
Building Coverage	(*2)	m2	9,810	9,810	9,810	9,810	9,810	9,810
Floor Area								
Floor Area of Right		m2	20,014	25,018	25,018	25,018	25,018	25,018
Ratio Compared to Existing Floor Area	37,707		(53%)	(66%)	(66%)	(66%)	(66%)	(66%)
Reserved Floor Area		m2	43,300	47,400	37,800	30,100	31,400	18,000
Total	(*3)	m2	63,314	72,418	62,818	55,118	56,418	43,018
(Reserved Floor Area)								
Residential 90%		m2	(38,970)	(42,660)	(34,020)	(27,090)	(28,260)	(16,200)
Commercial 5%		m2	(2,165)	(2,370)	(1,890)	(1,505)	(1,570)	(900)
Office 5%		m2	(2,165)	(2,370)	(1,890)	(1,505)	(1,570)	(900)
Total 100%		m2	(43,300)	(47,400)	(37,800)	(30,100)	(31,400)	(18,000)
Average Floor Area Ratio	= (*3)/(*1)		323%	369%	320%	281%	288%	219%
Average No. of Floor	= (*3)/(*2)		6.5	7.4	6.4	5.6	5.8	4.4
Floor Sales Revenues		Million Rial	357,225	391,050	311,850	248,325	259,050	148,500
Cost		Million Rial						
Redevelopment Cost								
Preparatory Cost								
Substitute Rental Housing			(50,582)	(50,582)	(0)	(0)	(50,582)	(0)
Temporary Building			(0)	(0)	(22,209)	(0)	(0)	(0)
Residents Moving			(276)	(276)	(276)	(0)	(276)	(0)
Demolishing Existing Building			(4,174)	(4,174)	(4,174)	(4,174)	(4,174)	(4,174)
Residents Moving			(276)	(276)	(276)	(276)	(276)	(276)
(Subtotal)			(55,307)	(55,307)	(27,634)	(4,450)	(55,307)	(4,450)
Construction Cost								
Building								
Floor Area of Right			(36,026)	(45,032)	(45,032)	(45,032)	(45,032)	(45,032)
Reserved Floor Area			(77,940)	(85,320)	(68,040)	(54,180)	(56,520)	(32,400)
(Subtotal)			113,966	130,352	113,072	99,212	101,552	77,432
Road			3,500	3,500	3,500	3,500	3,500	3,500
Infrastructure			11,747	13,385	11,657	10,271	10,505	8,093
(Subtotal)			129,212	147,237	128,229	112,983	115,557	89,025
Preparatory Cost + Construction Cost			184,519	202,544	155,864	117,433	170,864	93,475
Design, Supervision, etc.			18,452	20,254	15,586	11,743	17,086	9,348
(Total)	(*4)		202,971	222,799	171,450	129,176	187,951	102,823
Interest Cost		Million Rial						
Assumed Interest Rate			15%	15%	15%	15%	8%	8%
Interest During Construction			(98,845)	(107,691)	(92,150)	(80,680)	(45,226)	(30,806)
Interest			(45,272)	(49,573)	(39,540)	(31,478)	(18,654)	(10,690)
Total			144,117	157,264	131,690	112,158	63,880	41,496
"Redevelopment Cost"+"Interest Cost"	(*5)	Million Rial	347,088	380,063	303,140	241,334	251,831	144,319
Surplus	(*6)	Million Rial	10,136	10,987	8,710	6,990	7,219	4,181
Ratio of Surplus to Redvlp. Cost (excluding Interest Cost)	= (*6)/(*4)		(5.0%)	(4.9%)	(5.1%)	(5.4%)	(3.8%)	(4.1%)
Ratio of Surplus to (Redvlp. Cost + Int. Cost)	= (*6)/(*5)		2.9%	2.9%	2.9%	2.9%	2.9%	2.9%

Source: JICA Study Team

3 COMMUNITY DISASTER PREVENTION AND MANAGEMENT

3. COMMUNITY DISASTER PREVENTION AND MANAGEMENT

3.1 Existing Situations

3.1.1 Characteristics of the Local People in Tehran Municipality

The social structure of Tehran Municipality is very complex and diverse. There are people of various social, cultural and economic backgrounds and living style living together in the same district. For example, in one district, some parts are categorized in low-income level and some are in middle and high levels. Or some parts have modern flats and some parts have traditional small residences. In some districts, population flow is rapid and/or residents have modern life style and the number of nuclear family increases and neighbors are not familiar with each other. In other districts, people have been living there for a long time and know each other very well. Generally, in the area with low level of economy and education, people are likely to be more religious and traditional, and the people's relationship is rather strong. Mutual help can be seen in daily life and in some special occasions (e.g. religious events and ceremonies). Therefore, once some of the residents get information and attend a meeting, that information will be spread to the neighbors by word of mouth soon. Regarding the living style, there are high-rise apartments, low and middle-rise rented or own residences and very vulnerable small houses, etc. People living in northern part are likely to be unfamiliar with each other. In this context, it is very difficult to express the characteristics of the community in Tehran in a word and to find a typical community to be utilized for disaster management for generalization.

1) Mahale Councils

The objectives of the mahale councils are to serve as a bridge between the local people and City Council (government) for urban issues. Since council members are directly elected by members of their localities, they are bound to be more accountable to local needs. The councils, in turn, may demand a higher level of accountability from the central government. In this way there is a higher chance that local demands will be reflected in the disaster mitigation process. Overall, the councils can facilitate the interaction between the Municipal government and local communities. This will particularly be the case should the government successfully transfer the responsibility of planning and implementing infrastructure or disaster mitigation projects to the mahale councils. There are several active groups to be established in the mahale council associations and one of them is "active group against unexpected events". This group has the following responsibility:

- Detecting weak points and vulnerabilities during an occurrence of an unexpected disaster;

- Providing local ideas and innovations in respect to prevention and struggle against unexpected disasters;
- Training the community in order to increase its strength and awareness in preparedness and mitigation of unexpected disasters;
- Practical cooperation during an occurrence of a disaster and rescue for the victims; and
- Organizing rescue training, fire fighting, first aid, etc. workshops in order to increase the community's awareness of an occurrence of a disaster.

After the active group is established, the mahale councils will organize and give the required training according to the active group's interests and responsibilities. Therefore, this organization can be considered for utilizing as a leading group for community activities for disaster management. The establishment activities of mahale councils, however, differ district by district. Some districts have already organized many councils with high expectation of their roles and others have not. Additionally, the policy of the Tehran Municipality toward mahale council has changed somehow recently and the establishment procedure is stagnant now and their roles for future are unforeseeable.

2) Changes of Key Local Government Staff in Disaster-Related Offices

The recent reshuffle of major positions including disaster-related staff, which has a large impact on the plan and activities already started. Since it is still the transition period, the future direction for community participation in disaster management is not clear enough. The continuation and stability of the policy and activities regarding community participation for future may be unstable depending on the intention of the decision-makers. Therefore, it is necessary for the disaster management to work at the community level as well as the government.

3) Media

(1) Print-media

There is no coordinated program to use the print-media to raise public awareness prior to disaster. Generally, following disaster, the print-media picks up the subject and numerous reports are prepared on the disaster. However, not all aspects of disaster in general and earthquake in particular are covered in the media as a result. Print-media outlets themselves do not seem to be so interested in the subject unless a disaster has just hit a locality. Regarding the activities of the JICA Study Team, some coverage by newspaper, newsletter and magazines can be found.

(2) Television

Considering that television channels are publicly owned, they can be more easily used by public agencies concerned about earthquake preparedness to educate the public. In fact,

International Research Center on Seismology and Earthquake Engineering (IIEES) has been successful in broadcasting educational programs since 1998 in the Islamic Republic of Iran Broadcasting (IRIB). Several films and public service announcements that were prepared by IIEES have been broadcasted on national channels. They include the necessity to prepare for earthquakes, necessity to make buildings resistant to earthquakes, and necessary training for performance during earthquakes and safety maneuver at schools, etc. Since the repeated news of the destruction brought about by the Bam earthquake in the end of 2003, public awareness of disaster management has increased. Additionally, the workshops organized by JICA Study Team targeting various types of communities might stimulate mass media. TV and radios have produced some special programs on disaster and preparedness and introduced activities in workshops. This tendency is accelerated by another earthquake in northern Iran that occurred in May 2004.

4) Training by Red Crescent Society

Red Crescent Society is the only organization that has provided disaster-related training widely from the viewpoints of area and target groups. However, its capacity cannot cover all groups and areas that are willing to be trained and should be trained. Also, the Society has focused on training for rescue and relief and first aid and has little experience on disaster preparedness as shown in the training syllabus below.

Table 3.1.1 Basic General Course for Relief and First Aid

No.	Topic	Training Hours
1	Method of treating the injured	2
2	Resuscitation (CPR)	2
3	Sores, bleedings and trauma and basic principles for dressing and bandaging	2
4	Environmental incidents (fractions, poisoning, etc.)	2
Total training hours		8

Source: Red Crescent Society (Rescue and Relief Organization)

Table 3.1.2 Advanced General Course for Relief and First Aid

No.	Topic	Training Hours
1	Principles and objectives of relief and first aid	1
2	Acquaintance with international movement of Red Cross and Red Crescent	1
3	Method of treating the injured	2
4	Suffocations	2
5	Heart-lung revival (CPR)-Practical work	2
6	Shock (trauma)	1
7	Sores, bleedings, dressing principles	2
8	Bone-joint-muscle damages	1
9	Bandage and splint	2
10	Transferring the injured	2
11	Acquaintance with medical emergencies (epilepsy, heart attack, brain stroke, diabetes, etc.)	2
12	Poisoning	2
13	Burns	1
14	Safety and self-aid principles (preventive and pre-event measures)	3
15	Damages caused by heat and cold	1
16	Recognition of environmental incidents and events	2
17	Mental support	2
18	Preventive measures against AIDS and HIV	1
19	Final quiz (written and practical)	2
Total training hours		32

Source: Red Crescent Society (Rescue and Relief Organization)

The training courses include 8-hour and 32-hour general courses, 160-hour advanced course, 100-hour technical instructors' training course, and specialized training course. All courses are provided free of charge. The number of courses provided in 2002 was 1,415 for the general course and 39 for the advanced course. The number of trainees in 2002 was 53,360 for the general course and 1,315 for the specialized course. Excepting the 8-hour general course, all participants can get certificates and develop for the specialized and trained human forces for disaster response operations at different levels. Through these courses, the Society has tried to increase the number of skilled members for emergency responses. Also, the Society has voluntary system with volunteers who can contribute in terms of finance, material and labor. Volunteer work covers various fields related to emergency responses and rehabilitations.

Due to the ever-increasing development of sciences and technologies in training field and to meet diverse requests, remote non-participatory trainings provided by the Society have an important role in planning and public awareness for disaster management. The non-participatory training program has the schemes of (a) corresponding training, (b) TV and radio training, (c) visual and video training, (d) audio cassette training, and (e) press training. Some of them have started but most of them are still under planning. Additionally, training courses intended for the residents in high-rise complexes and users of art and cultural centers will be new trials.

5) Maneuvers for Disaster Preparedness

The media - both newspapers and radio-television – have become active in pre-announcing the Disaster Mitigation Week in the last two years. The program for the Week is organized by the Natural Disaster Task Force. It revolves around a main drill event, holding seminars to educate government officials and a media campaign. The purpose of the drill is to increase preparedness against natural disasters– identifying weak points in planning, enhancing coordination among various organizations, clarifying roles, ensuring operational effectiveness, and testing the present capabilities. The third maneuver for disaster preparedness is now under preparation and the active participation of the local community is considered. Besides, drills in school that have been done individually will be integrated and focused inviting many related agencies including mass media.

6) NGOs and CBOs

Favorable government policies have allowed for an exponential growth in NGOs. These NGOs are engaged in a variety of activities but mainly they fall into the following categories.

- Children and Youth
- Women
- Environment
- Science and Technology
- Population and Health
- Culture
- Human Rights

These NGOs are involved in a variety of activities, including the provision of services, information sharing and educational activities, and limited lobbying and advocacy efforts. Because many of them have been formed in recent years, their capacities as organizations tend to be weak. However, several NGO support organizations and NGOs with great experience, which have been in existence for a longer period time, are actively engaged in conducting capacity building efforts and trainings of NGOs. This signifies the growing awareness that exists among NGOs and NGO leaders as to the important and vital role that this sector of civil society can play in development efforts as well as the provision of social services and in shaping Iranian society as a whole.

The traditional community-based organizations (CBOs), with their strong roots in the community and long history of activities, can be characterized as Iran's true NGOs. The ideological basis for the existence of these organizations is rooted in Iranian and Islamic tradition of charity work. The spontaneous development of these organizations and the

expansive safety net they provide for vulnerable populations is noteworthy. CBOs can be classified into four groups.

- Relief and charitable organizations which provide services to vulnerable populations
- Medical organizations, which set up charity hospitals and clinics
- Educational charities, which are actively involved in the building of schools and administrative educational facilities and non-profit schools
- Community charity funds, which provide no interest or very low interest loans to disadvantaged populations

While many CBOs are registered as charitable organizations, many have not formally completed the registration process, but still maintain a strong relationship with the community and conduct their activities accordingly.

Traditionally, Iranians have a tendency to engage in relief activities. While CBOs can be viewed as a formal venue for these types of activities, in responding to disaster, community members have traditionally organized into spontaneous networks to provide relief and emergency services. For example, volunteers have always been relied on in responding to earthquake victims. However, there exists no formal policy or mechanism for engaging the NGO and CBO sectors and volunteers in these efforts. At national level, the Ministry of Interior, through the Natural Disaster Task Force, prepared a national emergency plan and chapter 4 of the document on Public Participation and Awareness implies the involvement of NGOs and CBOs in disaster management. At Tehran Municipality level, "Standard Operation Plan: Public Participation" prepared by CEMS (now TDMMC) in 2001 includes the necessity of NGOs' involvement. Both of them, however, do not describe details on how they are involved and what they should do in case of emergency. Under the present condition that even the database of all CBOs and NGOs is not still constructed, the comprehensive plan for their involvement seems to be difficult to consider.

7) Housing Complex

There are several large-scale housing complexes in Tehran and the number of construction is increasing. Among them, Shahrake Omid in District 4 has a group of self-disaster management consisting of 10 members and already started its activities. It can be said to be a most advanced housing complex in respect to disaster management. One of the reasons for its success is the homogeneous texture of the residents. However, more important thing is the drive and discipline of the local residents with intention for improving their living conditions in the area. Their efforts for disaster management are integrated well into the development plan for a safe and clean community. This Shahrake has mayoral system, established spontaneously by the residents. Staff at sub-district level has contact with this mayor regularly to discuss the whole matters of the community including disaster. They tackle disaster

management seriously on the supposition that the earthquake will occur in Tehran sometime soon and outside help is not expected. The group has agreements with the Tehran Emergency Office, Fire Fighting Department and Red Crescent Society. The present activities cannot be established in a moment. The group spent a long time for preparation and negotiation with district government, agencies and residents. The residents are provided necessary information related to disaster management and training courses and information for disaster management and their awareness has been increasing gradually. The group has a disaster management plan according to the HQs of Disaster Management of Tehran and District. One of the targets is that one member at least in each household should receive training on disaster management.

3.1.2 Background for Organizing the Community-Based Workshops

Phases I, II and III of the Study outlined above showed that there are many possibilities and issues for community-based disaster management. Under the conditions of various and complicated society structure, the governments themselves have been facing difficulties in planning and implementing urban and social welfare development. Since all different types of communities cannot be covered in a short time, it is recognized that some representative communities will be targeted as sample communities for further activities, observing whether these communities are workable for the purpose, have willingness and capacity and can become model communities. If they are not available, it is important to find the reasons and the other ways to achieve the purposes of the study. However, these trial activities will contribute to increase public awareness and disseminate information of disaster management more or less. Community-based activities were implemented with the following settings.

Table 3.1.3 Background of the Workshops

Activities	Target Group	Expected Impact
Workshop (1)	- Government (national, municipal and district levels) - Disaster-related organizations - City council and mahale councils - NGOs, CBOs - Local people	- Recognize the consequences of an earthquake - Create some awareness of disaster management among the stakeholders - Chance to meet different groups of society and exchange ideas
Workshop (2)	- Different types of community	- Some area not still serious about the disaster - Create some awareness of disaster management - Start to consider disaster management - Notice of consequences of an earthquake - Start to be anxious about an earthquake occurrence
Workshop (3)	- ditto-	- Start to consider the actual activities by the community - Some volunteers to start the efforts
Workshop (4) - Follow-up Activities	- School children - Housing complex - High vulnerable area	- Create awareness of disaster management among children - Start to consider the actual activities - Start some activities by the community
Workshop (5)	- Schoolteachers	- Increase awareness and capacity of disaster management in school - Start to be leaders in schools and neighboring communities
Workshop (6)	- School students	- Increase awareness and capacity of disaster management in school, communities and houses
Workshop (7)	- Basij members	- Increase awareness and capacity of disaster management in Basij members and communities - Start to be leaders in communities

Source: JICA Study Team

3.1.3 The Results of Workshop (2)

1) Objectives of the Workshop (2)

Following the Workshop (1) held on July 2, 2003, the Workshop (2) was organized at community level on August 5, 6, 7 and 13 in 2003. Four communities from District 2, 10 and 17 are selected as a pilot community to try disaster preparedness activities. The criteria of this selection are:

- Economic level,
- Religious base,
- Relationship among the local residents,
- Willingness of the district government (Mayor, Deputy of Social Affairs, especially) to do activities,
- Vulnerability for earthquake, and
- Housing conditions.

Table 3.1.4 Criteria of Community Selection

Criteria / Community	Economic level	Religious base	Relationship among the people	Willingness of the district government	Vulnerability for earthquake	Housing condition
District 2-1 (Marzdaran Highway Cooperative Housing Area)	High	Weak	Weak	Strong	Middle	Official residences
District 2-2 (Nastaran Housing Complex of Shahrake Gods)	High	Medium	Medium	Strong	Middle	Modern dwellings including high-rise housing
District 10 *	Middle	Medium	Strong	Medium	High	Middle-rise houses standing close together with many blind alleys
District 17 (Hashed Metri Toos)	Low	Strong	Strong	Strong	High	Low-rise old houses along narrow alleys

The community is a pilot project area of Mahale IT Development by UNDP.

Source: JICA Study Team

The objectives of the workshop are:

- To start disaster preparedness activities at community level,
- To identify the disaster strength and weakness in the communities (neighboring areas), and
- To strengthen network among neighbors.

The workshop program (with date and venue) is attached in Appendix 3-1. The responsible organizations of each district are as follows.

- District 2: Deputy of Social Affairs, Disaster Management Center and Youth Association
- District 10: Deputy of Social Affairs, Disaster Management Center and NGO Participation Center
- District 17: Deputy of Social Affairs and Public Participation Center

2) Participants in the Workshop

The participants were local residents and selected by Deputy of Social Affairs in each district and district staff. Total number of participants (local residents) was 102. Facilitators and their assistants for the group discussion–staff of Deputy of Social Affairs, staff of Public

Participation Center, and staff of TDMMC–were trained beforehand by the JICA Study Team. They are supposed to be facilitators for the similar workshops in future. The number of participants was smaller than that of the invited persons, which partly shows the low level of public awareness of disaster preparedness. All participants were grouped into 3 or 4 consisting of 5-8 members for group discussion and mapping. As the workshops were held in daytime of the weekday, most of the participants were students, the retired and housewives. And the younger the participants are, the more active their performance is.

3) Good and Bad Points of the Community in General

The participants discussed what the good points and bad points in their communities are in general. The purposes of this discussion are to overview and reevaluate their town before the discussion on disaster management. Each community has its own major characteristics as in Table 3.1.5 (details are given in Appendix 3-1).

Table 3.1.5 Good Points and Bad Points of the Community

Community	Good Points	Bad Points
District 2-1	- Open space and green environment - Close relationship with neighbors - Close to major road	- Heavy traffic and population increase
District 2-2	- Wide and good road - Open space - High educational level - Good security	- High-rise buildings with many glasses and mirrors - Lack pf cooperation among the community - Lack of people's trust to the local government - Lack of the facilities for disaster management
District 10	- Many cultural and religious centers	- Narrow streets - Many old houses and new buildings under construction along the streets
District 17	- Good relationship among the community - Many cultural and religious facilities	- Narrow streets - Drug addicts - Vulnerable old houses stand close to each other - Overpopulation

Source: JICA Study Team

The points raised are partial to relationship among the community, structure of housing and infrastructure (road and open space). Other points are related to education, drug addicts and youth. Many of the participants of Districts 10 and 17 mentioned that they have not so many good points. They have rather pessimistic ideas toward their community, which is stronger in District 17.

At the beginning of the workshop, the participants expressed doubt on the significance of the workshop because of inexperience of earthquake in their life and other serious and urgent issues they are facing in actual life. However, despite being unfamiliar with disaster management and some complaints, many of their ideas resulted in those related to disaster management. It means that the residents evaluated their community at the point whether it is a

safe and comfortable town excepting some social issues such as drug addiction, and factors of disaster management can be treated as town development.

4) Disaster Map

The participants brainstormed on what are (a) disaster risk/danger, (b) disaster resource, (c) resource person, and (d) vulnerable person (please see the detail in Appendix 3-1). There was no great difference among the items raised in all groups. After the listing of these four categories, the participants walked around the town with base maps in a group. It took about 1-1.5 hours to check the points carefully. The participants made a disaster map after walking the town including the above four components. Copies of all disaster maps made by the participants are attached in the Appendix 3-1. Each group had different legend, which shows the different observation and information gathered. Some groups had only one or two members who are familiar with the residents in the area and the rest of the group just followed them. Also, the same objectives were considered as different viewpoint; for example, a school can be used as information supplier with a loud speaker but it can be a dangerous place if many people evacuate at one time.

5) Weakness and Strength of the Community for Disaster Preparedness

As the participants were already more familiar with their community than before the workshop, they could consider what points are weak and strong from the viewpoint of disaster preparedness. Details are referred to Appendix 3-1. Some communities listed up weakness mostly and were anxious about their future.

Table 3.1.6 Disaster Weakness and Strength of the Community

Community	Weakness	Strength
District 2-1	- Many glass windows of buildings - Lack of medical offices - Lack of fire stations - Many gas pipes	- Open space - Wide streets - Many experts to be used for emergency
District 2-2	- Lack of cooperation among the residents - Many glass windows of high-rise buildings - Lack of emergency equipment	- Open space - Wide streets - Many shops
District 10	- Lack of open spaces - Many old buildings - Narrow streets - Lack of hydrants	- Many religious and cultural facilities - Many shops
District 17	- Narrow streets - Many children and aged - Small, old and crowded houses	- Open spaces - Water resources - Police stations - Hospitals

Source: JICA Study Team

6) Findings

- Most of the participants did not understand the objectives of the workshop clearly at the beginning. Also, as there are many other social problems to be considered in each district, disaster management was a kind of issue out of their concern. Inexperience of disaster and inaccessibility to information related to disaster are also reasons for this. Therefore, their discussion and activities were stagnant in the morning session.
- This type of participatory workshop is not usual in Iran and the topic of disaster preparedness is not also something that is familiar with the participants, which was a cause of embarrassment for them. At the end of the workshop, however, all participants have become aware of the importance of public participation and collaboration among the community for the topic.
- The participants in District 2 found out the issues regarding the human relationship. They considered the lack of cooperation among neighbors and the lack of human resources for disaster preparedness as weak points. The participants in District 17 worried about the narrow road and dangerous infrastructure more. Judging from the sight that many local residents showed up from houses and other places to see and ask about the workshop activities, it can be said that there existed a close relationship among the local residents in District 17. On the other hand, in District 2, few residents went outside and observed the activities. Most of the participants in District 12 were the aged and had difficulties to discuss the new issue.
- The participants have many ideas and opinions but do not know the approaches to implement them. They regretted the lack of support from the government, especially in District 2.

3.1.4 The Results of the Workshop (3)

1) Objectives of the Workshop (3)

The Workshop (2) was followed by the Workshop (3) on August 18, 2003. The objectives are:

- To consider how to utilize the community disaster map prepared in the Workshop (2),
- To consider the ways to overcome the weakness and to utilize the strength in the community for disaster preparedness,
- To prepare the community-based disaster preparedness plan, and
- To imagine the actual implementation of the plan.

The program of the workshop is attached in Appendix 3-2.

2) Participants in the Workshop and Grouping

Ten participants from each district were invited selectively among those in the Workshop (2). The selection was based on their active participation and possibility of becoming leaders in the community. Total number of the local residents is 34. The list of participants is attached.

3) Usage of the Disaster Map

The participants discussed how to use the disaster map they made in the Workshop (2). The major usages are summarized in Table 3.1.7 below. Details can be referred to the Appendix 3-2.

Table 3.1.7 Usage of the Disaster Map

Community / Usage	District 2-1	District 2-2	District 10	District 17
1. Distribution	Small size map to local people with explanation	Small size map in the existing local publication to show the local people with questionnaire for further information	Publication of newsletter including small size map	Small size map at schools and mosques
2. Display	Large map put up on billboard in busy area, in front of the Youth Center	----	Large map put up on billboard in public areas including mosques	Large map put up on noticeable places such as mahale council office and shops in town
3. Training material	Invite many local people to explain the map and disaster preparedness	Organizing educational and recreational programs to introduce the map	----	Education to the local people and students for disaster preparedness using map

Source: JICA Study Team

The responsible persons who will perform the above activities are the participants in the workshop (3), residents' association of housing complex and local NGOs with community donation in District 2, residents' association and mahale council with local community financial contribution, support from mahale council and district office in District 10, and district office and NGOs in District 17.

4) Community-based Plan of Disaster Preparedness

Among the many weaknesses raised in the Workshop (2), the participants put the priority on some weaknesses to be overcome for disaster preparedness. The participants made a plan of disaster preparedness at community level. The participants in District 10 are likely to consider the disaster preparedness starting from hard facility. The weaknesses discussed in districts are shown in Table 3.1.8.

Table 3.1.8 Weakness of the Community

No.	Weakness	District 2-1	District 2-2	District 10	District 17
1	Lack of disaster-related information	X			X
2	Lack of resource persons for disaster management		X	X	X
3	No cooperation of the community	X	X		
4	Dangerous and deteriorating infrastructure			X	X

Source: JICA Study Team

The plans in short-term, mid-term and long-term are tabled as shown Table 3.1.9.

Table 3.1.9 Short-term and Long-term Plans for Disaster Preparedness

No.	Short-term Plan	District 2-1	District 2-2	District 10	District 17
1	Gathering people for education of disaster management and training for first aid and rescue/relief	X	X		X
2	Organizing groups of the people interested in disaster preparedness	X			
No.	Mid-term Plan				
1	Organizing workshops and seminars to educate the community	X	X		
2	Preparing educational programs and booklets for the community and school children				X
3	Training the local people in first aid and rescue/relief	X			
4	Organizing the groups of the trained people				X
5	Repairing houses and removing dangerous areas in the community			X	
No.	Long-term Plan				
1	Repairing houses and removing dangerous areas in the community	X		X	
2	Organizing the community-based groups for disaster management		X		
3	Preparing a complete list of the residents for disaster management	X			
4	Organizing frequent training for the local people in disaster management		X		X

Source: JICA Study Team

The details are shown in Appendix 3-2.

5) Activities to be Implemented by the Community

Based on the community-based plan, the participants continued to think about activities they can implement by themselves. The proposed activities are shown in Table 3.1.10. Details are in the Appendix 3-2.

Table 3.1.10 Activities to be Implemented by Community

No.	Activities	District 2-1	District 2-2	District 10	District 17
1	Establishing local groups for disaster management	X			X
2	Training for rescue and drills		X	X	X
3	Requesting repair and development of infrastructure for disaster preparedness			X	

Source: JICA study Team

The responsible persons for implementation of the above activities are various. District 2 is more independent. They said that the participants in the workshops (2) and (3) and local representatives will lead the other community members for activity and financial resource.

6) Comments from the Participants

Based on the questionnaires for the effects of the workshop distributed at the end of the workshops, the following main comments are listed in order of frequency. Details are in Appendix3-2.

Table 3.1.11 Comments on the Workshop

No.	Comments
1	Good understanding of weakness and strength in the community
2	Some understanding of how to overcome the weakness for disaster
3	Recognition of the importance of training
4	Recognition of the importance of public participation
5	Recognition of the importance of cooperation among the community in case of disaster
6	The workshop should be continued and developed
7	Recognition of the activities to be implemented before and during disaster
8	Recognition of the importance of establishing local groups for disaster preparedness

Source: JICA Study Team

7) Findings

- The participatory activities where the participants make plans by themselves was not understandable at the beginning and especially the activities by themselves in short-term was considered as unrealistic. There was a mood that the local people cannot change the present conditions if the government cannot do it as well. However, they finally found that there is another way that they did not before but should challenge to improve their conditions.
- All participants, especially the younger generation, have many ideas and flexible attitudes toward changing the present conditions and facing the challenge for disaster management. If there is a leader from the community and local government to lead them, the systematic and sustainable implementation of activities for disaster management may be possible.
- Activity implementation needs financial resources, more or less. If the community is high at economic level, they can contribute to the activities but for other communities it is difficult. Therefore, the governmental support is very important.
- Compared to the previous Workshop (2), it is clear that the awareness level of the participants have increased. They started to consider the disaster management for their community as a whole seriously.

3.1.5 The Results of the Follow-Up Activities: Workshop (4)

1) Objectives

- To implement the activities proposed by the participants in the Workshop (3)
- To strengthen community network and cooperation for disaster preparedness
- To increase awareness among other residents and communities

2) Detailed Activities

Different types of the community have implemented different activities considering their characteristics and needs as follows.

(1) Meeting for Information Exchange among Housing Complexes

Establishing of community-based groups is recognized as one of the important measures for disaster management during the workshop (2) and (3). A good example of this is a housing complex, Shahrake Omid, in District 4. There is a community-based group of self-disaster management, which works very systematically in collaboration with district office, fire fighting office and Red Crescent Society. A meeting was held on September 14, 2003 with the following objectives:

- To exchange information of disaster preparedness and emergency response among the major housing complexes (Shahrake Omid, Shahrake Gods, and Shahrake Ekbatan),
- To form a network among the housing complexes for future cooperation, and
- To promote cooperation between housing complex and local government.

Related information (program and participants list) is attached in Appendix 3-3.

In the meeting, the background of establishing a group in Omid, its activities and future plan were presented. In this presentation, the leader of the group emphasized that the consciousness of self-protection of their life and area is important taking the emergency case seriously, and also did that the cooperation with Municipality and districts is necessary for continuous, wider and systematic disaster management. The group showed the emergency tunnel, which will be used for storage in normal time and shelter in emergency case. The participants agreed on that there should be a follow-up meeting with initiative of Deputy of Social Affairs, District 4. The meeting was eventually held on September 22, 2003. If all housing complexes in Tehran are networked and collaborated with support from districts, the measures of disaster management in housing complexes can be established.

(2) Type of Community of High Vulnerability like District 17

District 17 well recognizes its weakness from disaster viewpoint. The leadership of the Deputy of Social Affairs and Center for Public Participation is very strong. Soon after the workshop (3), they invited some key local persons including the participants in the workshop (2) and (3) in order to discuss the follow-up activities of their own accord. District will set up a group of self-disaster management and develop the disaster map for information distribution and educational purpose. The JICA Study Team observed their activities and was requested to provide technical support. The communities with high vulnerability and complicated socio-economic issues had better be guided by district governments.

(3) Video Edition for the Manual of Public Participation in the Disaster Preparedness

A CD format of the manual on how to organize similar workshops for disaster management involving local community was prepared and will be distributed to the district offices and the

relevant organizations in charge of disaster management and community. The video-recorded activities during the workshops were edited for this purpose. It can be used as a tool to show the procedures for public participation in the disaster management.

3.1.6 Children's Poster Competition

1) Objectives of the Competition

Some children have already acquired information of earthquake, including mechanism of earthquake occurrence, preparedness against earthquake, behaviors during earthquake, among other things, through school education, after-school activities, etc. During the workshop (2), the participants found that the education and training among the children is one important measure of disaster preparedness. For the potential children with flexible understanding and ideas, poster drawing can be utilized for raising children's awareness of earthquake disaster mitigation and preparedness. The major objectives of the competition are to increase awareness of disaster preparedness and mitigation not only among the children but also among the school staff, families of the children and the general public as a whole.

2) Detailed Activities

TDMMC and the JICA Study Team organized a poster competition in cooperation with the Institute for the Intellectual Development of Children and Young Adults (Kanoon). Kanoon is a social and cultural organization under the Ministry of Education to develop the capacity of children providing various activities after school and during the holidays. There are 55 classes in Tehran and students can cultivate their aesthetic talents through literature, art and culture, learning to develop various abilities besides the study in school. Therefore, this institute is a good place for children to learn disaster management.

The target children for the competition are third and fifth grades of elementary school and first grade of secondary school students in Tehran. The announcement of the competition is attached. The schedule is as Table 3.1.12.

Table 3.1.12 Schedule of Poster Competition

Activity	August, 2003	September	October	November	December	January, 2004
Announcement	▬	▬	▬			
Deadline of submission			▲			
Judgment				▬		
Announcement of the winners					▲	
Awarding ceremony					▲	
Exhibition of some works					▬	▬
Utilization of the winning posters						▬

Source: JICA Study Team

There were 125 entries (97 girls and 28 boys) screened by the JICA Study Team, TDMMC and the Institutes for the first, second and third prizes as follows.

Table 3.1.13 Winners of the Competition

Prize	Age (years old)	Sex
1st	9	Girl
2nd	11	Boy
	10	Girl
3rd	9	Boy
	12	Girl
	10	Girl
	10	Girl
	9	Girl
	9	Girl
	9	Girl
	9	Girl
	8	Girl
	8	Girl

The winners were awarded their prizes during the seminar conducted by the JICA Study Team on December 23, 2003 (see attached photos). The awarded works were exhibited at the Workshops (5), (6) and (7) of Schoolteachers, School students and Basij and will be shown in a TV special program of disaster in Iran. Also, these posters will be displayed at Kanoon classes and other busy places in Iran as well as in Japan to attract the attention of as many people as possible.

3.1.7 Workshop (4): School Children on Disaster Preparedness

1) Objectives of the Workshop (4)

Children are also important target groups for disaster education. They have large possibilities for disaster management from a long-term viewpoint. If the children are provided with education and training for disaster preparedness, their acquired information and know-how can be transferred to their family members and neighbors. The major objectives of the workshop (4) are:

- To increase awareness of disaster preparedness and mitigation among the school children,
- To recognize the importance of collaboration and self-protection in case of emergency, and
- To increase awareness of disaster preparedness and mitigation among the educational staff and families of the children, and their neighbors.

Kanoon is a good place for disaster education. However, the instructors and children here have not received disaster education except fire fighting provided to some instructors by a fire brigade in the summer of 2002. Kanoon as a whole should prepare the emergency plan and the system to educate not only children but also instructors and parents. Considering the various conditions of classes and students in different classes, the plan should be prepared accordingly based on the policy of Kanoon in collaboration with the Ministry of Education.

2) Children's Attitudes and Ideas for Disaster Management

The following tables summarize the results of the workshop held on September 15, 2003 (details are referred to Appendix3-5). Firstly, the participants viewed many photos showing damages from the earthquakes in Qazvin and Kobe and were asked to comment about them. The major comments are as in Table 3.1.14.

Table 3.1.14 Comments on the Photos of Earthquake

No.	Comments
1	I am upset, very fearful, worried, and feel sad.
2	I want to help them.
3	I worry about many homeless people, the dead and orphans.
4	They lost everything.

They expressed fear, sadness, uneasiness and pain, etc. and then worry about the sufferers including children. Some felt strongly about helping these people.

Answers given by the participants on other questions posed are as in Table 3.1.15.

Table 3.1.15 Replies on the Questionnaires

Q: What kind of fearful things will happen in the city if a large earthquake hits Tehran?
1. Homes and schools are destroyed. 2. People are injured and killed. 3. My family and people need help. 4. Many people feel terrible. 5. My family and I will die.
Q: What will happen if a large earthquake hits Tehran while you are in school?
1. I will go under desks, chairs, and stand behind a door. 2. I will help friends and teachers. 3. Friends and teachers are pressed under debris and die. 4. I will worry about family and home. 5. I will run out from classroom or out in the yard or go back home.
Q: What should you usually do in order to protect yourself from the earthquake?
1. Go to safe places, open spaces (away from electricity posts, trees, buildings and other dangerous areas). 2. Escape under desks, beds, tables and chairs. 3. Escape from home, leave town to the other safe area. 4. Keep hands and pillows over the head. 5. Keep cool, not lose hope for life
Q: What are the worries in case of a large earthquake?
1. My family or myself will be injured or die. 2. Foods and water are not enough. 3. My house is fallen down and collapsed. 4. I am separated from family. 5. News and announcement regarding disaster and damages are not accessible.

Source: JICA Study Team

They fear for their life and family, about their home and school collapsing, and the possibility of many people getting injured or dying. Still, there is the feeling of wanting to help their family and other people. Regarding earthquake preparedness, most of the children have no idea about it and instead cited some actions to be taken in case of emergency. They said they will go under desks, chairs and stand behind doors in emergency, which everybody have learned in school. Also, they will try to help their friends and teachers.

When the participants were asked whether they can do the following things, they answered that maybe they can do them except the evacuation.

- I will not be upset, not cry and not be absent-minded.
- I can go back to my home by myself.
- I can contact my family even if I stray from my family.
- I can survive by myself.
- I can help my neighbors.

3) Findings

- Since the participated children have never experienced earthquake, giving images of earthquake in a short time is very difficult. However, thanks to the efforts of the instructors, many of them started to consider the disaster seriously and to worry about the consequences and their families, friends and neighbors.
- The participants know they should go under the desks, chairs and other safe places in case of emergency, which are learned in school. Activities during earthquake and damages after the event are noticed but the preparedness for disaster has not been studied before. Since they have willingness to help the injured and other people in emergency case, they may function effectively for emergency responses if they are provided with training and organized in a group.
- Many of the children consider their houses in the city are much stronger against the earthquake compared with those in rural area like Qazvin. Only one student answered that homes should be made stronger for earthquake resistance. Therefore, the vulnerability of Tehran should be presented to school students.
- The results of the questionnaire distributed at the end of the workshop are as follows. All the students answered that they want to join this kind of workshop again. Also, they are willing to talk with their families about this activity.

Table 3.1.16 Comments on the Workshop

No.	Comments
1	Learned many things including what to prepare before the earthquake and how to act during the earthquake
2	Some want to help the injured
3	Learned what should be done and what not to do in case of emergency
4	What are the consequences of the earthquake
5	Learned the importance of cooperation
6	Learned that protecting oneself is important

Source: JICA Study Team

3.1.8 Workshop (5): Schoolteachers and Disaster Management

1) Objectives of the Workshop (5)

The Fifth Workshop invited schoolteachers as other target group of disaster preparedness and management activities in the JICA Study. It is considered that schoolteachers have large impacts on students, their families and their community as well. In view of this, teachers should be trained expecting multiple effects on the society.

The major objectives of the workshop (5) are:

- To increase awareness of disaster preparedness and mitigation among the schoolteachers,
- To recognize the important roles of school and schoolteachers in disaster preparedness and in case of emergency,
- To increase capacity of teachers to manage disaster effectively and to be leaders in schools and the community, and
- To coordinate among school, neighboring community and government.

There are 53 schoolteachers (30 women and 23 men) that participated in the workshop. They teach geography and preparedness of war (defense from war) in schools and education and training organizations in Tehran. Many of them are also heads of teachers' groups of the two subjects in each district.

2) Teachers' Consideration on Disaster Weakness and Resources

The participants were divided into two groups (Group 1 for defense from war and Group 2 for geography) and had discussion on disaster weakness and strength in and around their schools. Since the participants are from different schools, the physical and non-physical conditions of the schools are various. The strong and weak points in terms of disaster based on their discussion can be summarized as follows. Details are referred in Appendix 3-4.

- Strong points from physical aspect are location of school, structure, equipment and facilities to be utilized in case of disaster in school. Non-physical strong points are knowledge of disaster related information, experience of wartime, participation of disaster maneuver, etc.
- Physical weaknesses are categorized into equipment and establishment (fragile, unstable, with possibility of falling, etc.) and dangerous structure and items around schools.

Non-physical weak points are crowded classrooms with students and items, lack of serious attention to disaster and possibility of students' emotional disorder in case of emergency.

The participants suggested some ideas to overcome the above weaknesses and utilize their strengths as follows.

- Group of teachers of defense from war raised the importance of education and training and strict control of building structure.
- Group of teachers of geography concluded that education and training is indispensable. Additionally, dangerous items should be stabilized and removed, structure of schools should be checked and controlled strictly.
- Organization of some disaster management groups and policy of disaster education and management in school were referred but not major opinions.
- Because of the participants' specialization (geography and defense from war), they are aware that their role in disaster management is important. Importance of education and training is recognized well. But they do not know how to proceed. Some teachers have already tried various ways but feel their limitations. All

participants request the government (especially the Ministry of Education) support and strong instruction to involve many teachers seriously into disaster education.

3) Findings

- Teachers are not familiar with the participatory workshop that participants discuss and solve the problems by themselves, which is also found in the last community workshops. Therefore, they were embarrassed at the group discussion for a while. However, the capacity of disaster management can be developed not by passive lecture but in the process of trial and error, experience and participatory activities. This training system should be introduced in Iran for disaster management.
- Removal of dangerous and hazardous items in schools and fixing unstable and fragile items are well known by the participants. Importance of structure retrofitting is also somehow considered. However, the participants have no idea of organization of disaster groups and committees in school and network of teachers for disaster education and preparation of guideline and manuals yet. Attention should be called upon these matters and powerful leaders among the teachers should be created by training and awareness programs for teachers.
- As the participants proposed, the assistance of the government is necessary for promotion of teachers' roles in disaster education and management. Some unified policy, regulation and guideline, etc. are issued and then the teachers can take actions following the government instruction. Additionally, the government should provide training and information to the teachers to build their capacity.

3.1.9 Workshop (6): School Students and Disaster Preparedness

1) Objectives of the Workshop (6)

One workshop for schoolchildren (Workshop (4)) was already conducted in phase II of the Study because of the importance of the children's role in disaster preparedness and management. This time, the workshop (6), held on June 9, 2004, targeted older students for more practical activities. The number of the participants was 53 (20 boys and 35 girls) and some parents observed the activities. A strong earthquake that shook northern Iran on May 28, 2004 created such a big impact on Tehran citizens. And some inappropriate information after the event that spread among the people made them more uneasy and upset. The attitude of some people toward earthquake became more serious and that of some others became even fatalistic. The ideas and feelings of children should be identified and be guided to the appropriate ways.

The major objectives of this workshop are:

- To increase awareness of disaster preparedness and mitigation among the school students,
- To recognize the importance of identification of dangers and resources in term of disaster in daily life and consider the countermeasures, and
- To promote collaboration with others for preparedness and management.

Razavi Art and Cultural Center is attached to a mosque and provides many art and cultural classes for children. This center has a clinic too. Neither the instructors/staff nor children here have received any disaster education and considered the safety of the Center.

2) Children's Ideas for Disaster Preparedness and Management

The following tables outline the results of the workshop (details are referred to Appendix3-5). First table shows the replies to questions on the latest earthquake. Most of the students experienced a big earthquake for the first time and did not know what to do. Most of them spent the night outside without sleeping well. The information of that earthquake was acquired correctly by the participants but the following inadequate and inappropriate information made them scared.

Table 3.1.17 Reactions to the Earthquake

Q1: What were you doing and what did you do when the earthquake occurred in northern Iran on May 28, 2004?
1. Sleeping, studying, having a party, watching TV, staying alone and rushed out corridor, downstairs, yard, street from the room 2. Went under the tables, stuck to the wall, stood behind the door 3. Could not do anything but cry 4. Walking in the street and did not feel anything because of road construction and noises 5. Calling out to other family members, shouting "earthquake!" 6. Frightened and did not understand it was an earthquake; this is the first time to feel earthquake and quite shocked 7. Hand and feet were shaking from fear 8. Tried to keep cool and avoid any dangers 9. Slept the night outside (yard, park, in a tent)
Q: Did you get any information of the earthquake? If so, what is the information source?
About 80% of the participants got some information such as epicenter, magnitude, death toll, building damages and road damages. 1. Car Radio 2. Radio 3. By word of mouth, from neighbors 4. Telephone
Q: What should you do for disaster preparedness?
Building structure: 1. Retrofitting of the houses 2. Municipality should not issue permits for high rise building construction **Awareness and skill improvement:** 1. Take necessary training and transfer the techniques and knowledge learned to other people 2. Some family members should participate in training courses so that they can lead the whole family and also the neighbors **Avoiding dangers:** 1. Stick special films on glasses 2. Remove hanging things from walls and ceilings and fix them 3. Prepare a sack containing emergency goods to carry in case of emergency 4. Identify the strong and safe places and shelters before earthquake 5. Prepare first aid kit, whistles 6. Make disaster management plan in case of emergency 7. Not sleep and not stand near/under dangerous and fragile things **Points to pay attention to in case of emergency:** 1. Stay behind doors, under tables and benches and narrow corridors during the earthquake 2. Disconnect the gas, electricity when leaving the house 3. Listen to news on TV and radio, pay attention to warning signs and do not believe rumors 4. Go to open spaces or yard

Source: JICA Study Team

The following table shows the category of major disaster dangers and resources in the Center after the students walked around and drew the disaster map in four groups.

Table 3.1.18 Disaster Dangers and Resources

Disaster Dangers	Disaster Resources
1. Ornamental objectives (vases, paintings, mirrors, clocks, aquariums)	1. Columns
2. Shelves, cabinets	2. Tables
3. Ceiling lamps, fans	3. Doors
4. Window glasses	4. First aid kits
5. Electricity cables, gas valves, water pipes	5. Fire extinguishers
	6. Clinic

Source: JICA Study Team

Finally, the participants concluded the following messages based on the activities and confirmed their behaviors and roles for disaster preparedness and management.

Table 3.1.19 Behaviors and Roles of the Participants

Protect oneself:
1. Keeping cool
2. Standing behind doors, corners, narrow corridors and going under tables
3. Putting hand over the head to protect head from falling objects
4. Staying away from falling objects, dangerous and fragile things, shelves and cabinets
5. Going to open spaces and safe places
6. Preparing a sack containing emergency goods
Damage mitigation:
1. Fixing and repairing or staying away from dangerous things
2. Checking the resistance against earthquake before buying houses, retrofitting houses
3. Identifying the conditions of living area, houses, schools and communities for disaster management, identifying dangers and resources in advance, preparing disaster maps
4. Preparing the emergency plan (where to go/not to go, what to do/not to do)
5. Collecting information related to earthquake, listening for alarm and information, not making jokes
Cooperation:
1. Helping each other and assisting those who cannot escape
2. Taking training and sharing the information with others

Source: JICA Study Team

Additionally, the participants were requested to draw and submit their disaster map of their houses or neighborhood to TDMMC and the JICA Study Team. Some superior maps will be awarded at the final seminar of the Study to be scheduled in August 2004.

3) Findings

- All participants were very active and interested in the activities during the workshop. Their awareness in general is likely to increase because of the latest experience of a large shake from the earthquake. While many students still had some lingering fear of the earthquake, a few made noises using earthquake as a theme (e.g. shaking desks, shouting “earthquake” when the Center had a power failure for a while).
- There are many ideas and questions on predictability of earthquake. Most of the participants considered earthquake can be predicted using highly technical method and some natural symptoms. Once they understood the impossibility of prediction, they started to think of the importance of the daily preparation through training and collecting information and knowledge.
- Many questions were raised on mechanism of earthquake and countermeasures of the events, which means that the disaster education is not provided enough to the school students.
- Besides the popular measures to be taken in case of emergency such as “keep cool”, “go under tables or behind doors”, and “stay away from falling objects”, more

technical and humane ideas were proposed such as retrofitting, training and cooperation.

Disaster map prepared this time is only for inside the building of the Center. The participants, however, understood well that the concept of the map is available from small area (house) to wide area (schools and communities). They got the basic ways of identifying dangers and resources easily.

3.1.10 Workshop (7): Basij Members and Disaster Management

1) Objectives of the Workshop (7)

Since many community workshops organized by the JICA Study Team and the accompanying activities were introduced in many occasions (mass media, meetings, by word of mouth, etc.), requests for the workshops from many organizations, groups and individuals increased. One such request came from the Basij, which is one of the most influential organizations in the communities and with many members. Considering their strong willingness of working for disaster management in the community and mobilizing their members, Basij can be considered to become a leader of community disaster management. The workshop was held on June 16, 2004 with 61 participants (58 men and 23 women). The objectives of the workshop (7) are:

- To increase awareness of disaster preparedness and mitigation among the Basij members and their communities,
- To improve the approaches to play a role of leading the community in disaster preparedness and management, and
- To start to exchange and disseminate the concept and activities of disaster preparedness and management among the Basij members and the communities in Tehran.

The venue of the workshop was NGO Center located in District 6. This is a place of public participation such as NGO activities and information exchanges among NGOs and other groups and communities. Around the Center, there are parks, government offices, shops, residences, etc. with busy traffic.

2) Disaster Dangers and Resources around the Participants

A total of 61 participants were divided into four groups and they walked around the NGO Center to check the dangers and resources. Table 3.1.20 and Table 3.1.21 sum up disaster dangers and resources (details by group can be referred to Appendix3-6).

Table 3.1.20 Disaster Dangers and Resources

Dangers	Resources
1. Gas pipe 2. Water pipe 3. Electricity posts and cables 4. High and old buildings 5. Dead end and narrow alleys 6. Road blocked by construction materials and wastes 7. Sign boards 8. Window glasses and fragile facades 9. Outdoor units of air conditioners 10. Underground wells and canals	1. Open space and park 2. Clinic 3. Pooled water

Source: JICA Study Team

The participants found many dangers and were surprised by the conditions around them. The limited resources identified were explained partly by the participants' unfamiliarity with the area and the little information available, especially the human resources.

The participants confirmed roles of Basij members in disaster management based on the workshop. The major items are shown in the following table.

Table 3.1.21 Roles of Basij Members

1. Teaching knowledge and technique acquired and discussed in the workshop to the colleagues, families, friends, relatives, neighbors, etc.
2. Determining dangers and resources in general and becoming familiar with them
3. Identifying the living area and community
4. Preparing disaster map, a plan and programs for emergency and trying to implement them
5. Increasing information and knowledge and skills on earthquake, disaster preparedness and management
6. Cooperating among the people and authorities for disaster mitigation

Source: JICA Study Team

The participants have strong intentions to utilize the results of the workshop. They recognized that not only transferring their knowledge to others but also increasing their own skills and knowledge is their responsibility.

3) Application of the Disaster Map to their Covered Communities

After the completion of the disaster map around the NGO Center, the participants tried to do DIG (Disaster Imagination Game) using transparent sheet on the disaster map. To make the participants imagine the earthquake and the damages vividly, the videos of earthquake simulation were shown in advance. Due to the time limitation, the DIG activities were very simple and not completed ones. The results are summarized below in the table. The conditions supposed are:

- Earthquake occurs in Tehran with Magnitude 6.5 at 13:30 on June 16, 2004.
- Everybody feels the shaking intensely and objects in the rooms are falling.
- Shake continues for 2 minutes and stops. There are serious damages around and the Center building itself.
- Details of the earthquake are not known yet.

Table 3.1.22 Activities in case of Emergency

Q1: What will happen around you / here?
1. Fires break out
2. High and old buildings are collapsed
3. Glasses break and fall
4. Attached objects to the facades fall down
5. Roads are blocked by cars, buildings are damaged and objects are falling down
6. Electricity posts fall down and cause fires
7. Water and sewerage overflow
8. Canals and waterways are damaged
Q2: What will you do during the shake?
1. Ask God and Imam for help
2. Keep cool, shout to others
3. Go to park and safe places
4. Go under tables, behind doors
5. Not move for a moment and wait until the shaking stops
6. Help the injured and the weak
7. Stand beside columns, room corners
8. 8. Disconnect gas, water and electricity
9 Announce dangerous conditions by loud speakers or shout “earthquake!”
Q3: What will you do after the big shake stops?
1. Help the people for rapid evacuation
2. Go back home, try to reach family
3. Rescue the injured
4. Go to hospitals
5. Sedate the people, colleagues and take them to open space
6. Ask the people for help
7. Identify the proper place for accommodation
8. Ask specialized people for cooperation
Q4: How do you lead the people outside to the evacuation place?
1. By using loudspeaker
2. By standing on the way and leading the people
3. By shouting
4. By using telephones
5. By moving around by motorbike
6. By Informing each person on foot
Q5: How will you communicate with the family members and confirm their safety?
1. Already decided what to do and where to go (move to the corridors, go to the nearest park, to be near house, nearest mosque, hospital, to meet parents’ house, etc.)
Q6: Where / how will you spend the night?
1. Leaving town
2. Staying outside, tent
3. Helping the injured
4. Providing primary facilities for living
5. Helping rescue team

Source: JICA Study Team

As the area is not familiar with the participants, their imagination might be limited.

4) Findings

- Despite the unfamiliarity of the place among the participants, they were very active in discussion and serious to get skills and ideas to be transferred to other members. They have never thought of earthquakes in detail (mechanism, aftermath, responses, etc.) and this workshop contributes to increase their awareness of disaster and to know how to consider the earthquake. Their will to transfer the knowledge and technique learned to their colleagues and communities after the workshop could be

felt strongly. The male participants are rather older compared with the women, but their influence in their community and offices might be large.

- Predictability of the earthquake and mechanism of the earthquake were asked by many participants. It is desirable that formal and correct information should be provided to the public.
- Workshop itself is very primary using simple approaches. The preparation for earthquake and the approaches can be understandable for the participants. Since the participants desire a series of the workshops (advanced and specialized courses), the follow-up activities are preferable.

3.2 Planning Issues

Based on the findings from various workshops, observation, collected information and interviews to many organizations and individuals, the following issues should be solved.

- Lack of information and skills of disaster preparedness and emergency response;
- Lack of public participation and collaboration among the community (not only in case of emergency but also in normal condition);
- Non-existence of organizations for community-based disaster preparedness;
- Lack of network and collaboration between community and district government

3.2.1 Lack of Information and Skills of Disaster Preparedness and Emergency Response

Appropriate information and skills for disaster management are missing among the community. The reason for this is few media covering this topic in daily programs, government's efforts to provide information are not enough and the local people have no contact with disaster preparedness activities. Some information and skills may not be appropriate and understandable for the people, if they are technical and theoretical. Some are facing other problems in daily life and have no time to think of that. Most of the population in Tehran has no experience of earthquake and no image of the consequence of the event, which makes them less interested in earthquake. Even the Bam earthquake in 2003 was likely to be made light of because it did not happen in Tehran. Then, after an earthquake shook Tehran in 2004, suddenly Tehran residents are terrified, and the various information spreading confused them.

Additionally, the local residents have little opportunities to participate in training courses and workshops for first aid and rescue/relief and drills for evacuation and do not know how to access them. Therefore, the number of skilled persons to be utilized in emergency case is very limited. Without information and skills, the people cannot become aware of the importance of the disaster preparedness, and preparation for disaster cannot be started. Furthermore, the people cannot increase their capacity of disaster preparedness and cannot protect themselves from disaster and rescue neighbors once disaster occurs.

3.2.2 Lack of Public Participation and Collaboration among the Community

People become unconcerned with their neighbors as lifestyle has changed (nuclear family and diversified living) and population movement has become rapid. Especially, this trend can be found remarkably in northern part and in modern apartments and large housing complexes. Also, some governmental control for the local people to form groups is one of the reasons for making the people live under the principle of "peace-at-any-price". Additionally, the people are convinced that they can help mutually in case of emergency because they have such cultural and historical backgrounds.

As already explained to the participants many times during the workshops, the support from the government and the other organizations cannot be expected in emergency case. Therefore, the people should protect themselves from earthquake and should act for rescue and relief. In particular, rescue activities and firefighting that require immediate attention need the help of nearby residents. Since this cannot be done at the moment of the disaster, the local people should cooperate in daily life. The people can respond to the disaster systematically and effectively, if they are ready for disaster preparedness. The information of the neighbors will be helpful for rescue and relief activities and inquiry on their safety. If the people know the resource persons among the neighbors, they can take quick actions for first aid and rescue until an emergency team arrives.

3.2.3 Non-existence of Organizations for Community-Based Disaster Preparedness

In spite of the many traditional community-based organizations (CBOs) and NGOs working for the community, the groups including the activities related to disaster cannot be found. This is because of the original characteristics of CBOs and NGOs, that is, being charitable groups. They have been working to improve the present conditions of the target people. Without experience of earthquake, CBOs and NGOs have no idea for their activities to be prepared. It is found that many CBOs and NGOs worked and were newly established during and after the Qazvin earthquake. After the Bam earthquake, many NGOs have continued working there but it is said that most of their activities are not organized well and near-sighted. Without the group activities, no one can supplement the limited capacities of individuals and the government. Not only in emergency case, but also in routine works, the groups can be utilized for information distribution and increase of awareness. In order to make the existing groups effective both in normal condition and emergency case, their characteristics should be made good use of and their original activities for disaster management should be involved. Since they have very close relationship with the local community in a charitable sense, disaster components to mitigate the damages from disaster will be transferred to the people directly.

3.2.4 Lack of Network and Collaboration between Community and District Government

Between district and local community, there is no intermediary for information and services. Also, some of the communities and local government do not have a good relationship and some communities are not well supported. The reason for this situation is that the government has no experience in involving the community into their activities. And the local people have given up to rely on the government because the development planning of the area has often changed or come up suddenly without any understandable explanation to the local people or without people's needs. Also, the community's requests have not been taken up by the government. There is few occasion for meetings and discussions between the government and the local people for community development. If this continues, the community will lose their willingness to establish a good relationship with the district government.

Without network and collaboration between government and community, neither only the local people nor only the government can respond to a large disaster. The local people only have a limitation of getting correct information and skills for disaster management. And the disaster capacity of whole Tehran cannot increase and the damages from earthquake will be large. Also, the haphazard and independent activities have little ripple effect to other areas in Tehran. In order to continue the community-based activities, the technical and financial support for the community is indispensable. On the other hand, at district level, the promotion and continuation of activities depend heavily on the characteristics and interest of the staff. In order to extend the activities, not only the districts but also Tehran Municipality should clarify the total policy how to cooperate between the government and community. Therefore, the governments should provide information, skills and finance to the local community and, in turn, the local community should inform the government about the present conditions of the community, request and ideas for development of the area and various reporting. This kind of cooperation is necessary. Additionally, without consistent policy and guideline at Tehran Municipality level, the coordination and continuous operation cannot be expected. If each district has its own objectives and targets for different directions, the power for disaster management as a whole in Tehran will not increase. Therefore, under the Municipal guideline, individual measures in accordance with characteristics of the district will be left to each district's discretion.

3.3 Strategies

Given the circumstances, the following strategies are proposed to fulfill the objectives and to solve the issues.

1) Provide appropriate information and skills

For providing information, education and utilization of media should be considered in various places, time and to the target groups. For example, in the area where the residents' economic and educational levels are low, audio-visual material, learning by experience and simulation will be much more effective than lectures using printed materials. Some examples of videotapes produced by Tokyo Metropolitan Government are;

- Disaster Prevention in Tokyo: Preparing for Major Earthquakes
- Earthquake with Hypocenter Directly Below Tokyo
- - The Disaster Countermeasures for Citizens and Cities: The Role of the Citizens' Disaster Prevention Teams
- - Design of Safety: Earthquake Prevention Center: Securing the Safety of Tokyo's Citizens
- - Tokyo Metropolitan Disaster Prevention Center: Securing the Safety of Tokyo Citizens
- - Earthquake! What Would You Do?
- - If You Prepare ---: 1,2,3 of Earthquake Countermeasures of My Family

Appropriate and understandable information and skills should be provided. For providing skills, various training courses and drills and education should be provided. Regarding dissemination of the knowledge, PR activities, campaigns, seminars, workshops, utilization of mass media, school education and social education, etc. are available. Considering the wide coverage of the population by television, TV programs can provide some impacts. Also, the experience of the sufferers will be passed down, the images of earthquake in and out of the country and other disaster information should be distributed as much as possible. The academic and scientific research done by universities and research institutes should be presented in simple language to the general public. Drills and maneuvers for evacuation, fire fighting, fist aid, rescue and relief, etc, need to be provided to the people as necessary skills depending on the level of the people's abilities. Without the drills and maneuvers, the people's knowledge and skills cannot be given full play in emergency case.

The evaluation ways for this activity are the number of experts, trained persons, training courses held, media coverage, etc.

2) Emphasizing the significance of public participation and collaboration

If the public participation and collaboration among the community members has to be promoted, its importance for disaster management should be appealed to the people. If it is made clear who should be rescued and who are missing in case of emergency, and clarified the resource persons to be requested for their help, the emergency responses are quick and can minimize the damages. Confidence of mutual help in the neighborhood may become weak if

damages are huge and severe. Participation and collaboration should be systemized for efficiency and certainty. For these purposes, leadership and governmental support are indispensable. Media, PR activities by the government to the people and education should also be utilized. Moreover, cultural and social activities can be utilized as the place to provide the people the concept of public participation and collaboration for disaster management. Public participation and collaboration cannot be established in a short period; the gathering and meeting should be held frequently to discuss safety town and community development for better living conditions. These meetings should be devised to be attractive and catchy for different target groups. Furthermore, the PR activities are extended appealing to the community that these collaborative conditions can make disaster preparedness and mitigation possible.

In order to improve local people's abilities take proper countermeasures, the people must take proper steps on their homes and their districts. Followings are some Japanese cases each resident should deep in mind. "10 points to remember when an earthquake strikes" are

No1. Protect the safety of yourself and family members.
No.2 If you feel a vibration, turn off any heat sources. If a fire breaks out, extinguish it quickly.
No.3 Do not rush outside.
No.4 Ensure an exit by opening doors.
No.5 When outside, protect your head and avoid hazardous materials.
No.6 If a place such as a department store or a theater, listen to the staff and follow their orders.
No.7 If in an automobile, park on the left-hand side. Driving is prohibited in restricted areas.
No.8 Watch for falling rocks, landslides and tsunami (tidal waves).
No.9 Evacuate on foot, carrying only what you need.
No.10 Do not be fooled by groundless rumors. Take the proper action by following the correct information.

When an earthquake occurs, proper procedure will differ according to the time passed since the occurrence. The following Japanese examples are different procedures which should be taken according to how much time has passed since the disaster, and the countermeasures which should be taken beforehand.

Table 3.2.1 Manual of Procedures for Districts and Households in case of Disaster

Event	Earthquake strikes! (0-2 minutes)	Immediately following an earthquake 2-5 minutes.	5-10 minutes after the earthquake	10 minutes to a half day after the earthquakes strikes	Half a day to 3 days after the earthquake strikes	3 days after the earthquake
Actions	First, ensure your own safety!	It is vital to extinguish fires completely! Prevent fire outbreaks!	After extinguishing fires, ensure the safety of your family!	Confirm the safety of your neighbors and help each other!	Have essentials for surviving 2-3 days on your own.	Full-scale restoration measures will begin.
Situation	When vibrations are felt, protect yourself from falling objects. Hide under a table, and stay away from furniture. Always check the safety of your home. Stabilizing your furniture can be done quite easily.	You have 3 chances to dispose of a fire. - When you feel the earthquake - After the vibrations stop - When the fire breaks out Cut the breaker when evacuating. Do not panic, and act calmly!	After protecting your own safety, ensure the safety of family members	There is a limit to what one person can do. Let's cooperation with our neighbors and perform emergency measures together.	Following an earthquake, there will be an interruption of lifeline services including water, gas, electricity, telephone and food supplies. Make preparations to be able to survive on your own for 2-3 days.	Disaster prevention organizations will step up their emergency and recovery steps, and a full-scale restoration of the lifelines will begin. Volunteer work will also begin. Residents, companies and city administration s work as one to start the rebuilding of the city.
Counter-measures	Let's check your home's safety! - Conduct a safety inspection of the building and improve its resistance. - Stabilize furniture and avoid placing objects on them. - Take appropriate precautions for maintaining and storing heating appliances such as oil stoves and other hazardous objects.	In order to dispose of fires confidently, get involved with training on a regular basis. Store water in a bathtub or other containers.	Hold a family meeting on disaster prevention at least once a month. Clarify each member's responsibilities and designate refuge sites and communication methods. Prepare emergency supplies and designate a storage location to prepare for power failures at night. Prepare rescue equipment.	Let's establish cooperation system with neighbors to prepare for an emergency. - Discuss possible situations. - Get involved with citizne7s disaster prevention team. - Get involved with disaster prevention drills.	Make preparations to "Ensure our Livelihood". Make emergency supplies according to your family's needs!	

Source: JICA Study Team

Evaluation measures are the increase of community activities and meetings as to disaster management and the lists of households and resource persons, etc.

3) Trying to find appropriate existing groups

The existing CBOs and NGOs should be utilized for disaster management. For this purpose, appropriate CBOs and NGOs in the aspect of their contents of activities, membership and impact level on the community should be selected. Some activities related to disaster management should be incorporated into their activities without disturbing their original purposes. Level of their involvement varies depending on their characteristics. Therefore, some groups can be used as just catalysts between district government and local community and some can be used as foremost leaders for this purpose. If there are no CBOs and NGOs to be used, new organizations may be considered, if possible. Also, industries, commercial complexes, housing complexes, other large-scale multi-purpose buildings, etc. can be considered as members of the community and make them target groups to find a group of community-based disaster preparedness.

Relationship among the related organizations and groups in Japan is shown below for reference.

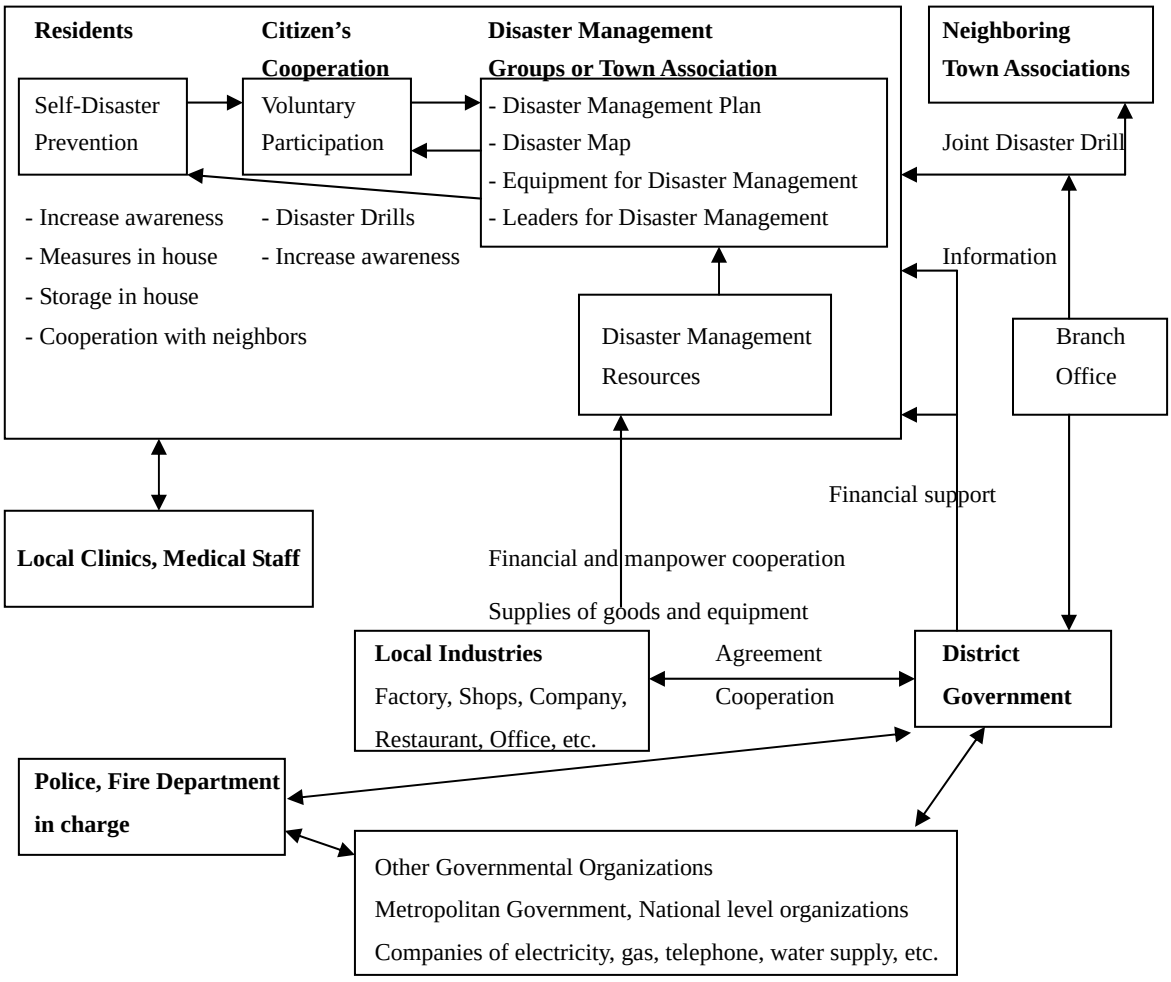


Figure 3.3.1 Community Disaster Management

Evaluation measures are the number of groups of self-disaster management and condition of activities of CBOs and NGOs.

4) Utilization of the existing local places

It takes time to establish good and collaborative relationship between government and local community. Since collaboration and network cannot be established at individual level, the organizations working as bridge between them are necessary to develop and improve their relationship. The gatherings and public hearings should be opened, various public information and messages from the government even including emergency case should be channeled in various ways, and counseling office that the local people can access easily should be opened to absorb the opinions and requests from the local residents and providing necessary information to them.

Evaluation measures are the frequency of gatherings and the number of announcement to the local community by the government, the level of utilization of the existing places for information exchanges and the level of utilization of counseling offices by the local people.

3.4 Plan

In order to implement the strategies, the following plan will be prepared.

1) Education for Disaster Preparedness

In order to increase public awareness, information in general education for disaster preparedness and training/drills for practical capability is necessary. The plan will be designed by target group because the characteristics, activities, and functions of each target group in disaster management are different.

(1) Education for Government Staff at Tehran Municipality and District Levels

For developing the appropriate judgement to be used in case of earthquake and taking necessary activities, the staff of local government and disaster-related organizations will be given disaster education thoroughly. Also, necesary knowledge and preparation as local government staff will be educated so as to promote disaster management measures actively during the administrative works and to implement the disaster preparedness activities with initiative in the covered area.

(2) Education for School Students

It is important that students will understand the dangers to occur in case of earthquake and take safe actions according to the development level of students. For this purpose, deputy of education and training and deputy if health from at national to district levels will guide students to understand well emergency responses through total schooling such as school curriculum, school events and extracurricular activities. Ministry of Education, Deputy of Education in tehran Municipality and International Research Cneter on Seismology and Earthquake Engineering (IIEES) will manage and control the regared items in order to promote disater education in schools and other educational facilities.

(3) Education for the General Public

If a large-scale earthquake occurs, governmemt becomes inundated with many helps and it is difficult for the government to deal with all the emregency. People's living patterns are different and nobody except where they will be whenan earthquake hits. They may be working, studying, involved in social activities, or be at home. Therefore, the local residents should protect themselves and act on their own judgment. Tehran Municipality and district offices, with Deputy of Education and Deputy of Social Affairs as leaders in collaboration with IIEES and TDMMC, will enlighten the local residents providing correct knowledge of earthquake and measures for disaster through drills and trainings and other enlightening activities. Especially, during the weak of disaster mitigation in October, responses in case of sudden earthquake and countermeasures at individual house will be enlightened intensively.

Activities can be broken down into the following.

- General Enlightenment
- Social Education
- Education for Drivers
- Education for Managerial Staff of Facilities in need of Disaster Management
- Consulting Office

(4) Education for the Disaster Weak

In order to secure the safety of the disaster weak such as the elderly ridding in bed, the handicapped, retarded, the injured and sick persons, foreigners and infants and babies, etc., the diffusion of knowledge of disaster preparedness by distributing pamphlets and leaflets, PR magazines, newsletters, etc. will be done. Tehran Municipality and district offices, especially, Deputies of Education, Social Affairs, Health, etc., will establish the policy for social welfare facilities and develop the system of rescue and relief in collaboration with the local residents and the related organizations

2) Community-based Activities for Disaster Preparedness

Information and skills to be acquired by the above education should be put into practice in daily life by the community members to work in emergency. Therefore, each community member should recognize his or her role and tasks for disaster management and try to make the effort to do one's part. This section of the plan will contain how to do their duties.

(1) Tasks and Role of Local Residents

The role of local residents is very important for disaster management. Local residents have to have the intension of protecting their safety by themselves and to implement the available measures of disaster preparedness steadily as the appropriate items in the normal condition and in the outbreak of earthquake.

(2) Roles of Local Community-based Groups

It is more effective that the disaster preparedness measures in the community are implemented in collaboration with community-based groups such as CBOs, NGOs, resident' association in housing complex, etc. If the groups have definite purpose to work for disaster management, they will cooperate with district offices and start to do the necessary activities.

(3) Roles of Workplaces

The persons who manage or operate the workplaces and facilities will protect the safe of the employers and users and implement appropriate activities for disaster preparedness in order to

prevent the area from expanding the disaster. Additionally, the workplaces will make efforts to participate in the activities for disaster preparedness such as rescue of the affected people as a member of the community. For this purpose, workplaces will make groups of self-disaster preparedness, contact with other groups of self-disaster management in the related area and try to secure the safety of the workplaces and the related area actively. The activities of disaster preparedness in the workplaces will be implemented with support from Tehran Municipality and district, especially, TDMMC, Deputies of Labor and Social Affairs, etc. based on the actual conditions of the workplaces.

(4) Support and Guidance from Tehran Municipality and District Offices

Tehran Municipality and district offices will promote involvement of the existing CBOs and NGOs and establishment of groups for self-disaster management in Tehran and support for vitalization of their activities. Areas to be considered with attention are areas (i) with high population density, (ii) with many disaster weak, (iii) with high vulnerability of housing and facilities, (iv) with less collaboration among the residents, and (v) with shortage of water for fire extinguishing. Supports to be considered are;

- establishment of committee for promotion of NGOs, CBOs and groups of self-disaster management
- development plan of groups of self-disaster management
- development of community file for safety and relief
- utilization of community centers, and
- subsidy for groups for self-disaster management.

3) Community Level Organization

As to administrative level, there exists sub-district under district. Since mahale is not an administrative division, there is no formal links between district office and local residents. In considering the disaster preparedness and emergency responses, the bridge between district offices and individual local resident is indispensable.

The prerequisite conditions for the linkage between district office and local community are

- Many people gather, mostly the local people in the area
- People existing in that place and area are confirmed
- Dissemination of information is rather easy
- Some relationship with district office already exists
- Some communication network and equipment exist to be used in emergency case such as loud speakers, wireless and other measures

The candidate places are;

- housing complex
- mahale council
- school
- office, factory and bazaar
- mosque
- cultural center
- health center
- sports center
- NGOs and CBOs
- Red Crescent Society
- Public participation center, etc.

These places can be a center for disseminating information and collecting people for training and seminars provided by district offices. And also, the people in these places will be able to respond emergency in a group if they are provided with information and training. Since the social structure in Tehran is very complex and diversified, these networks should be combined accordingly for the purpose to cover all area of Tehran. However, in order to make all these bridges work well, they have to be provided education and training in advance and be ready and affirmed to act in emergency case.

(1) Group of Disaster Management in Housing Complex

If the complex has a group of self-disaster management, it will be made full use of in emergency case to fulfill its essential purpose. In the housing complexes without such groups, board of directors and resident' associations can be applied as a bridge between district office and the large number of local residents. From the local office, the announcement of earthquake breakout, evacuation, information of the damage conditions and other necessary activities to be done by local people will be provided using communication network through the board and the association and their substructure in order to make the local people act effectively and systematically for emergency response. On the other hand, from the housing complex to the district office, requests, issues to be solved and conditions in the local area will be reported.

(2) Utilization of Other Existing Organizations and Facilities

There are many patterns to utilize the existing groups in emergency case. If mahale councils work well, they can be used. Public participation centers and NGO centers will directly access the local residents, if they have wireless, inter-net and other communication tools. NGOs and CBOs can work using their usual channels with local residents if their own activities include

some activities related to disaster management. Mosques are still places to make the people get together and have loud speakers, which can play a role of providing information to the people for emergency. Schools have also many students in daytime, and information can be spread by loud speakers. Also, health center and communicators can be used as information transmitting to the local resident. Of course, Red Crescent Society is a major player in emergency response involving their own volunteers. The responsibilities of these organizations and facilities are depending on their characteristics and level of their owned equipment and relationship with local residents

3.5 Recommendation

The following recommendations are made to solve each issue:

1) Providing Information and Skills

- Preparation of supplementary textbooks for disaster education in safety learning of school curriculum
- Creation of the educational programs and information and announcement related to disaster and disaster management utilized by mass media, which will be broadcasted in regular programs and special programs
- Upgrading of the capacity of Red Crescent Society to meet the continuously increasing demand for training
- Review and evaluation of existing educational materials to avoid duplication and to improve their quality

2) Promoting Public Participation and Cooperation among the Community

- Active involvement of different community groups into the maneuver implemented by the government with clarification of their roles and tasks
- Utilization of the Day and Week of Disaster Mitigation in Iran (Poster competition, seminars, workshops, media coverage, and other activities attracting the general public at different levels, etc.)
- Establishment of a committee in Tehran Municipality for promoting community involvement in activities for disaster management (Committee members consist of related deputies and organizations. Guidelines for public participation for disaster management to be used at district, sub-district and mahale levels will be prepared.)

3) Establishing Organizations for Community-based Disaster Preparedness

- Providing basic equipment and materials for emergency responses to the selected CBOs and NGOs
- Implementing surveys and listing the existing CBOs and NGOs at district and mahale levels and screening the appropriate groups for disaster management based on the survey and lists

4) Establishing Network and Collaboration between Community and District Government

- Organizing town meetings to discuss community development from the viewpoint of disaster management between community and district offices
- Explaining the importance of network and collaboration for disaster management to Municipality and District and community

3.6 Project List

Long list of the project is considered as follows.

3.6.1 Provision of Earthquake Information and Education

1) Development of Facility for Disaster Education in Disaster Education Center

Training facilities (training rooms and equipment, photo exhibition of disasters in and out of Iran and simulation facilities, library with disaster-related books, theater showing films, etc.) will be included in Disaster Management Center to be constructed. Anybody can use this center for increase of awareness and to take training courses.

2) Training of Trainers of Governmental Staff for Disaster Management

Despite the increasing demand for training from many communities and organizations, the only organization, that is, Red Crescent Society cannot cover all of them. Therefore, the number of qualified trainers should be increased as soon as possible. Instructors of the training courses will be invited from within and outside of Iran in the appropriate fields. The trainees may go to other countries to be trained. Also, curriculum and syllabus for each target group will be prepared and developed by experts accordingly.

3) Creation of Leaders for Disaster Management in the Society

In order to increase the capacity for disaster management in the community, there should be leaders. Candidates in the existing CBOs and NGOs, workplaces, schools, etc. will be trained to be leaders and all leaders trained well will be in a group for exchanges of information and resources, network establishment for cooperation with sharing of works and skill development. Considering the high possibility of damages of schools, offices, factories, etc. from earthquake, teachers should act to protect the students, while employers and managers should communicate with the families of their employees. Not only development of manual and guideline for them for emergency responses but also training should be provided to act effectively in case of emergency. Curriculum and syllabus for each target group will be prepared and developed by experts accordingly.

4) Enhancement of Awareness and Capacity of School Staff and Students for Disaster and Its Management through Model Schools

There are already many model schools selected in Tehran for disaster drills. However, since the disaster education should cover from the preparedness to the restoration, model schools should be designated to experiment continuous measures of disaster management. School disaster management plan will be prepared including retrofitting the school structure for earthquake resistance, designation of the school as evacuation site and/or temporary shelter if possible and secure handing over the students to their families, and cooperation with the neighboring area, etc. These activities will be tried and evaluated. In the designated model schools, not only students but also educational staff will be trained. The procedures will be monitored and other schools can visit to observe their activities and exchange information. After evaluation and modification by the Ministry of Education, Tehran Municipality, IIEES and TDMMC, the improved programs will be continued.

5) Enhancement of Community Resistance to Disaster through Social Education on Disaster Preparedness and Management

During the community-based workshop, many participants recognized the lack of opportunities of training and seminars. In order to acquire the ability to manage disaster, the people should not only receive the disaster-related information passively through media but also participate in the training and seminars actively. Activities in the workshop and seminars can increase the people's awareness through learning by experience. However, the number of the training and seminars is not enough to cover the local people and the target groups are not fixed yet. The training programs and materials should also be organized well.

6) Information Dissemination through Effective Utilization of Mass Media

It is clear that the one major tool to disseminate information is mass media. There are some articles and news providing information related to disaster through such media as TV, radio, newspaper and magazine, etc. However, their issues and broadcasting are not based on the long-term schedule and target. In order to utilize mass media effectively and efficiently for increase of public awareness of disaster and capacity of disaster management, all available mass media should be organized with unified policy of disaster information dissemination and also make use of the different characteristics of each medium.

3.6.2 Establishment of Community Level Disaster Management Organizations

As described above, the communities in Tehran have various textures and difficulties to be controlled by one instruction. Following the activities done by the JICA Study Team, more model communities including the selected communities this time will be set up and various

activities for disaster management will be continued in accordance with local characteristics. Their activities will be monitored and evaluated by TDMMC, Tehran Municipality and districts and improvement of the programs will be considered. The activities include formation of groups of self-disaster management, preparation of list of households, information regarding disaster resources, resource persons and vulnerable persons, etc., and disaster management plan, creation of community-based disaster maps, utilization of the maps, drills in cooperation with local residents and schools, and trainings provided by Red Crescent Society and Fire Brigade, etc. As the number of community increases, the results will be compiled and most of the communities in Tehran can be categorized into some types for creating manuals.

Appendix 3-1

Community-based Disaster Preparedness Workshop (2)

Program

8:00	Registration
8:30	Explanation about the purposes and program of the workshop
9:00	Group Discussion: Disaster resources, dangers and vulnerable people
10:00	Walking in the town
11:00	Creation of maps
12:00	Lunch
13:00	Creation of maps
14:30	Group Discussion: Findings from disaster maps (Disaster strength and weakness)
15:30	Group Presentation
16:10	Closing

Participants in the 2nd Workshop (District 2-1,2-2)

(August 6, 2003)
District 2-1

No.	Name	Occupation	Age	Sex	Years of living
(Group A)					
1	Hossein Dianati	Student	-	Male	-
2	Zahra Motojaded	Student	19	Female	7
3	Nafise Bozorgi	Student	20	Female	21
4	Maryam Chodaran	Student	20	Female	19
5	Maral Soltanpour	Student	15	Female	15
6	Abolfazl Azizi	-	-	Male	-
7	Amir Azizi	Student	17	Male	18
8	Parisa Nazh	Student	16	Female	14
(Group B)					
1	Shahbanoo Hashemi	Housewife	60	Female	20
2	Vandan Vosooghi	Student	24	Male	18
3	Mohammad Bidokhti	Student	23	Male	3
4	Keihan Khadiv	Retired	63	Male	19
5	Narges Mirzaiee	Student	19	Female	7
6	Fatima Parnian	Teacher	46	Female	14
7	Mina Parnian	Student	14	Female	14
8	Farshad Ghafari	Student	22	Male	13
(Group C)					
1	Nahid Hasanizade	Retired	52	Female	4
2	Maryam Mirzaiee	Student	21	Female	11
3	Nasrin Habibi	Housewife	51	Female	19
4	Sanaz Najafi	Student	14	Female	19
5	Elham Nazh	Unemployed	20	Female	14
6	Mehdi Najafi	Teacher	56	Male	19
7	Fereshte Noormohamadi	Unemployed	20	Female	8
(Group D)					
1	Maryam Saieedi	Student	17	Female	16
2	Fazlallah Tamjidi	Retired	55	Male	18
3	Alireza Sadeghi	Student	19	Male	5
4	Elham Farhadzade	Student	21	Female	15
5	Maryam Parnian	Student	21	Female	16
District 2-2					
(Group A)					
1	Mir Kazem Shokri	Airline Inspector	-	Male	-
2	Mansoore Tondkar	Housewife	57	Female	2
3	Zhale Hootan	Retired	-	Female	-
4	Javad Assaiee	Retired	64	Male	24
5	Ali Salmanian	Retired	60	Male	15
6	Mansour	Retired	-	Male	-
7	Mahammad Hojat	Physician	-	Male	-
8	Manoochehr Setayesh	Engineer	65	Male	10
9	Fatima Deilamghani	Housewife	68	Female	15
(Group B and C)					
1	Khosro Malekmohamadi	Retired	65	Male	12
2	Anahita Khakparvar	Government officer	31	Female	12
3	Marzie Kordestani	Retired	55	Female	23
4	Ahmad Vahdat	Retired	62	Male	10
5	Mohhamadreza Seif	Retired	50	Male	21
6	Manizhe Meimanat	Retired	51	Female	12
7	Medi Saffar	Retired	58	Male	15
(Group D)					
1	Amid Masoudiu	Engineer	60	Male	20
2	Hosseinali Vakili	Retired	72	Male	20
3	Farzane Khatibi	Senior environment expert	-	Female	-
4	Pari Jaberi	Housewife	62	Female	22
5	Mitra Assi Ansari	Housewife	32	Female	22

Participants in the 2nd Workshop (District 10,17)

No.	Name	Occupation	Age	Sex	Years of living
District 10					
(Group A)					
1	Fatima Chapardar	Unemployed	26	Female	26
2	Maryam Rafieepour	Student	17	Female	10
3	Mohammad Chapardar	Unemployed	24	Male	24
4	Sahar Panahifar	Student	26	Female	13
5	Mansoore Norouzi	Government officer	19	Female	-
6	Jalal Kamali	Government officer	21	Male	21
7	S.M. Zolfakhari	Student	20	Male	-
8	Amir Didange	Student	16	Male	-
(Group B and D)					
1	Saieed Mohammadi	Student	21	Male	16
2	Majid Maadi	Student	19	Male	19
3	Hamide Afshri	Housewife	46	Female	45
4	Alireza Etemadi	Unemployed	25	Male	25
5	Mehdi Khademian	Student	20	Male	-
6	Mryam Zarezadeh	-	32	Female	15
(Group C)					
1	Zahra Nozad	Housewife	24	Female	10
2	Assie Eghrari	Student	17	Female	8
3	Zohre Eslahchi	Housewife	41	Female	6
4	Sakine Afshari	Housewife	51	Female	40
5	Saieed Dasdar	Barber	19	Male	12
6	Hossein Mashayekh	Retired	66	Male	29
7	Fariba Rezazadeh	Student	20	Female	3
8	Farnoosh Kharazan	Student	12	Female	4
9	Mahdie Ramazani	Student	14	Female	5
District 17					
(Group A)					
1	Niazkhani	Student	21	Female	8
2	S. Hosseini	Student	22	Male	-
3	Maryam Heidari	Student	14	Female	22
4	Abbas Bakhtiari	Student	17	Male	-
5	Reza Arabi	Businessman	25	Male	32
6	Zagheri	-	37	Male	-
7	Maryam Reza Zadeh	-	-	Female	-
(Group B)					
1	Amirkhani	Housewife	34	Female	20
2	Somayye Ghorbani	Housewife	18	Female	18
3	Samira Nikkhah	Housewife	18	Female	19
4	Rezaiee	Student	20	Male	8
5	Tahere Imani	Housewife	23	Female	10
6	Javad Matin	-	22	Male	-
7	F. Esmaieelpour	Student	24	Male	-
8	Atefe Keshavarz	Government officer	23	Female	18
9	Mahsa Hedyelou	Student	12	Female	12
(Group C)					
1	S. Hossein Fallahnia	Religious student	22	Male	11
2	Tooba Khajavi	Housewife	50	Female	-
3	Ahmad Afshari	Student	22	Male	22
4	Mohsen Aghajani	Government officer	42	Male	35
5	Hossein Ghofeli	Retired	-	Male	25
6	Ashraf Karimi	Painter	43	Female	20
7	Raisi	-	42	Female	35
(Group D)					
1	Abedin Ghofeili	Pasdar	38	Male	25
2	Haj Mohammadkani	Housewife	33	Female	8
3	Saeed Soleimanbeigi	-	23	Male	23
4	Shirin Soleimanbeigi	Teacher	29	Female	29
5	Soltanali Mahmoodloo	Businessman	50	Male	35
6	Mahmood Dodange	Retired	48	Male	35
7	Mohammad Mozafar	Policeman	-	Male	-

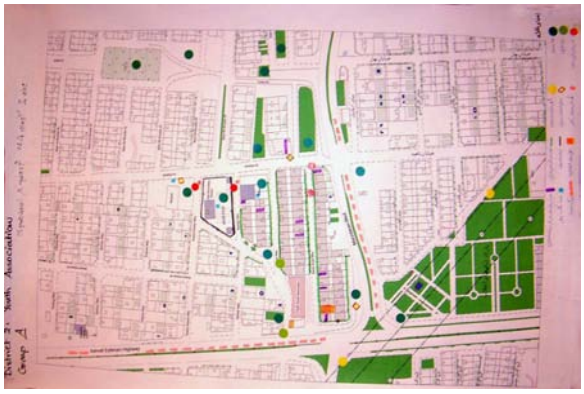
Results of the 2nd Workshop (District 2-1,2-2)

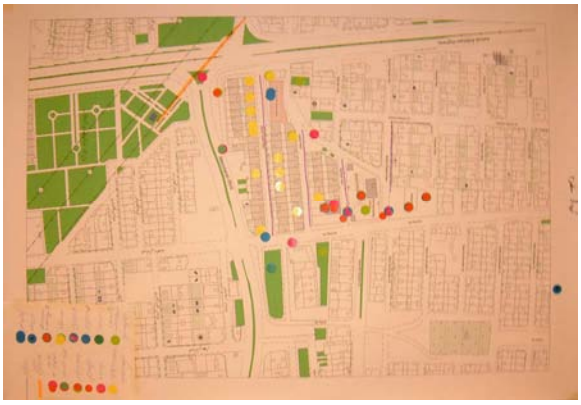
No.	Good	Bad
District 2-1		
(Group A)		
1	Security of the building complex	Buildings with many glasses and mirrors
2	Fire extinguishing facility including fire hydrant	Inaccessibility to the area because of destroyed bridge
3	Open space with wood and mud	Not knowing the neighbors each other
4	Wide streets	Gas distribution pipe lines
5	Existance of active persons	
(Group B and C)		
1	High literate rate of the local residents	Lack of experience of city management
2	Good road condition and accessibility to the area	Lack of organized cooperation among the community
3	Existence of awareness of disaster among the community	Lack of information among the neighbors
4	Open space	All city projects have never reached successful results
5		Lack of people's trust in the local government
6		Low standard of building construction
7		Lackof necessary facilities for safety against earthquake
(Group D)		
1	High level of education	Lack of trust and cooperation among the community
2	Knowledge of earthquake	Lack of sense of responsibility among the community
3	Moderate strong building construction against earthquake	Lack of facilities for disaster preparedness
4	Local security	
District 2-2		
(Group A)		
1	Neighbors' cooperation, close interaction among the local community	Lack of information as to rescue and relief in the community
2	Easy accessibility by rescue operation due to nearby expressway	Heavy traffic and population flows to go into this area
3	Existence of local association	
4	Existence of Youth Association with hard working members	
(Group B)		
1	Clean air	Poor relation among the community
2	Existence of Cultural Association	Old construction of buildings and houses
3	Close to the major road	Large houses making the evacuation more strenuous
4	Wide streets	Loitering youths in front of the local library and parks
5	Green environment	Lack of overhead bypasses on major roads
6	Safety and tranquility	Lack of educational institutes and high schools
7	Close relation with the neighbors	Lack of recreational and sports grounds
8	Strong building construction	Garbages accumulated in the library yard
9	Existence of mosque nearby	Numerous theft incidents
10		Construction materials stored inorderly
(Group C)		
1	Existence of open space	Inactive participation in Social Association meetings
2	Good neighbors	Busy and populated streets
3	Existence of Social Association	Noisy students and schools
4	Educated and intellectual persons	
(Group D)		
1	Good relationship with the neighbors	Not knowing the community members well
2	Wide streets	Multistoried buildings with low construction standard
3	Small population in the strees	Gas pipes
4	Many low leveled houses	Destruction of school walls
5	High level of torelence for disaster damages	Electric lamp posts

Results of the 2nd Workshop (District 10, 17)

No.	Good	Bad
District 10		
(Group A)		
1	Existence of green spaces such as parks	Numerous apartment buildings along the streets
2	Existence of mosques	A large amount of trash
3	Existence of numerous public assembly halls	Narrow streets and deteriorating texture area
4	Existence of cultural centers	Large building construction in narrow streets
5	Having a good mayor	Over population
6	No good points	New buildings with low standard of construction
(Group B and D)		
1	No positive points	Deteriorating texture area
2	Wide roads	Old buildings
3	Kind and concerned neighbors	Underground water canal
4	Good relationship among community each other	Narrow streets
5	Existence of Quran cultural center	Lack of green spaces
(Group C)		
1	Existence of local parks	Many multistoried buildings
2	Existence of good neighbors	Inappropriate local sewerage system
3	Good cooperation among neighbors	Many old houses
4		Over population
District 17		
(Group A)		
1	Green environment and tranquility in the community	Weak construction of buildings
2	Existence of open spaces	Deteriorating texture area
3	Existence of library and sports grounds	Narrow streets
4	Existence of hydrants	Lack of the community's knowledge as to health matters
5	No positive points	Drug addicts
(Group B)		
1	Green environment	Crowded houses (very close each other)
2	Cooperation among the neighbors	Irregular building constructions and procedures
3	Existence of mosques and religious centers	Unstable building materials
4	Cultural cooperation	Youth drug problems and loitering
5	Good educational environment	Drug sellers
6		Lack of sports facilities
7		Low standard of education
8		Noise pollution
9		Narrow streets
10		Water sewerage
(Group C)		
1	Community cooperation and collaborations	Lack of community's knowledge as to disaster mitigation
2	Existence of hospitals and health centers	Irregular building constructions and procedures
3	Local communicators for first aid training to the community	Deteriorating textile area
4	Recognition of the local environment and communal coopereation in regard to disaster management	Small and over populated houses
5		Narrow streets
(Group D)		
1	Availability of mosques	Drugs
2	Availability of parks	Old schools and buildings
3	Availability of hospitals and health centers nearby	Narrow streets
4	Kind and close relationship among the neighbors	Fire station being far away
5	Existence of schools	Over population

Disaster Maps from Workshop (2)






District 2 : Shahrak Gharb
Group A


District 10 / Group A


High School
Mosque
Public Participation


District 10 / Group A


Group A


District 2: Youth Association
Group A

Disaster Resources / Disaster Dangers / Resource Persons / Vulnerable Persons (District 2-1)

No.	Disaster Resources	Disaster Dangers	Resource Persons	Vulnerable Persons
District 2-1				
(Group A)				
1	Transportaion vehicles	Dried and scattered grasses	Sportsmen	Children
2	Suppliers of foods and clothes	Glass windows of buildings	Rescue people	The aged
3	Open space	Electric cabels	Doctors, nurses and social service staff	Sick persons
4	Fire station	Gas pipes	Managers of building complexes	Handicapped persons
5	Tents, large sunshades	Unstable staircases	Trained persons with first aid	
6	Sleeping bags	Fixtures in the house (chandeliers, pictures, frames)		
7	Oxygen tanks	Bridge		
8	Stretchers			
(Group B and C)				
1	Drinking water	Destructed buildings	Local doctors	Children
2	Medical equipment	Bursting gas and water pipes	Groups of rescue specialits	The aged
3	Health centers and hospitals	Residential and commercial buildings without minimum safety facilities	Trained persons with disaster management	Handicapped people
4	Emergency routes		Trained youth in first aid	Sick persons
5	Fire extinguishing system		Technical persons (plumbers, electricians, carpenters, etc.)	
6	Fire station			
7	Emergency stairs of complexes			
8	Open spaces			
9	First aid kits			
10	Electricity line			
11	Shovels, picks, levers, ladders, water tankers, etc.			
(Group D)				
1	Water wells	Tall buildings	Young people	People without knowledge of first aid
2	Fire station	Buildings with low standard of construction	Police	Children
3	Wide roads	Destructed prison	Members of complex board	Sick persons
4	Shopping center	Unfinised construction buildings	People familiar with the area and the district	The aged
5	Fire hydrant and water reserves	Petrol station	Technical persons (plumbers, electricians, carpenters, etc.)	Handicapped people
6	Fire extinguisher	Energy resources (gas, water, electricity)		Pregnant women
7	Emergency bags prepared by families	Chemical warehouses		Homeless people
8	Domestic animals such as dogs	Paint shops		

Disaster Resources / Disaster Dangers / Resource Persons / Vulnerable Persons (District 2-2)

No.	Disaster Resources	Disaster Dangers	Resource Persons	Vulnerable Persons
District 2-2				
(Group A)				
1	Green environment	Electricity polls	Trained rescue team	Children
2	Doorways and school desks	Water pipes	Employer in hospitals	School kids
3	Open spaces	Tall apartment buildings	Local charitable people	The aged
4	Mosques	Gas pipes	Local technicians (electrical engineers, carpenters, etc.)	Handicapped people
5	Grocery shops	Houses and buildings with low standard of construction		
6	Mobile phones			
7	Major freeways			
(Group B)				
1	Water tanks	Electric cables	Experts with first aid	The aged
2	Evacuation routes	Stairs	Doctors and nurses	Children
3	Large square	New buildings with low standard of construction	Red Crescent Society	Handicapped people
4	Fire hydrant		People who have experienced earthquake	Sick persons
5	Local health centers		God	
6	School courtyard, parks		Shop and supermarket owners	
7	Freeways		Technical persons (plumbers, electricians, carpenters, etc.)	
8	Sports halls		Basij	
9	First aid kits			
(Group C)				
1	Loud speakers	Gas pipes	Fire brigade staff	Children
2	Open spaces	Multistoried buildings	Rescue team	The aged
3	Mobile phones	Electric polls	Active youth force	Sick persons
4	Food suppliers	Heavy household items	Paramaedics and nurses	Handicapped people
5	Oxygen masks	Weak walls	Technicians, electricians, etc.	Pregnant women
6	Storage of emergency/rescue equipmenr and materials	Large chandeliers	Municipality staff	Sensitive people
7	Battery and radio	Glass windows of buildings		
8		Swimming pools on top of the high building		
(Group D)				
1	Fire hydrant	Large sized household items such as wardrobes, chandeliers, refrigerators, etc.	Army	The aged
2	Fire extinguishers	Water sewerage canals	Police force	Children
3	First aid kits	Electric polls	Red Crescent Society	Drug addicts
4	Water containers at homes	Electric lamp posts	Basij	Handicapped people
5	Open space	Old constructed buildings	Emergency forces	Sick people
6	Equipment such as ropes, buckets, crow bars, picks, shovels, etc.)	Gas pipes	Local technicians such as electricians, plumbers, etc.	
7	Rescue equipment	Water tanks	Local doctors	
8		Gas and petrol stations	Rescue team	
9			Neighbors well informed of the community	

Disaster Resources / Disaster Dangers / Resource Persons / Vulnerable Persons (District 10)

No.	Disaster Resources	Disaster Dangers	Resource Persons	Vulnerable Persons
District 10				
(Group A)				
1	Hospitals and health centers	Gas distribution station	First aid experts	The aged
2	Local water board company	Petrol stations	Psychologist and psychiatrist	Handicapped people
3	Large parks	Electric polls	24-hours phamacies and doctors and nurses on call	Children
4	Fire station	Street parking	Rescue people	Drug addicts
5	Open space	Higher levels buildings	Fire fighters	People without knowledge of rescue measures
6	Satellite telecommunication system	Electricity distribution stations	Police force	
7		Gas regulator stations	Basij	
8			Building construction workers	
9			Building managers	
(Group B and D)				
1	Water	Narrow streets	Local doctors	Children
2	Medicines	Old houses	Young people	The aged
3	Stretchers	Gas pipe lines	Rescue forces	Handicapped people
4	First aid kits	Undergraound wells and canals	Fire brigade staff	Sick persons
5	Fire hydrants	Residential and commercial buildings with low standard of construction	Plumbers abd electricians	
6	Recue equipments such as shovels, picks, etc.		People familiar with first aid	People without knowledge of first aid and rescue
7	Health centers			
8	Fire stations			
9	Tables, chairs and beds			
10	Food suppliers			
11	Lighting			
12	Medical equipment and facilities			
13	Open spaces			
14	Blankets and duvets			
15	Warm clothing			
16	Companies of water, gas and electricity			
(Group C)				
1	Fire hydrants	Deteriorating electricitry cables	Doctors and nurses	The aged
2	Quran cultural center	Old houses	Civil engineers	Children
3	Newly constructed schools	Paint shops	Electricians and plumbers	Social misfits and addicts
4	Sports halls	Small and blind alleys	Rescue people	Sick persons
5	Local parks	Gas line	Experts with first aid	Handicapped people
6	Parkings			
7	Exit ways			
8	Telecommunication building			
9	Emptied and unused warehouses			

Disaster Resources / Disaster Dangers / Resource Persons / Vulnerable Persons (District 17)

No.	Disaster Resources	Disaster Dangers	Resource Persons	Vulnerable Persons
District 17				
(Group A)				
1	First aid kits	Gas and electricity pipes	Police force	Children
2	Open spaces	Schools with tall and battered walls	Fire brigades	Old people
3	Water hydrant	Narrow streets	Trained rescue people	Handicapped people
4	Hospitals and health centers	Fallen debris	Trained people with first aid	
5	Municipality offices	Cesspools under houses	Doctors and nurses	
6	Water company	Eletric posts	Electricians and plumbers	
7	Police stations			
(Group B)				
1	Basements of houses	Blocked roads	Doctors and nurses	Handicapped people
2	Electric polls	Houses being constructed too close with each other	People with first aid	Children
3	Open spaces such as parks		Fire brigades	The aged
4	Sports centers		Rescue team	People without knowledge of first aid
5	School courtyard		Police	Sick persons
6	Wide avenues		Medical staff	
7			District staff	
			Knowledgeable people of the neighbors	
(Group C)				
1	First aid kits	Tall and thin walls	Local people familiar with first aid	Children
2	Evacuation kits including lightsm clothing, tin food	Narrow streets	Trained rescue people	The aged
3	Equipment such as shovels, picks, etc.	Small houses	Basij	Handicapped people
4	Schools, mosques	Bildings constructed too close each other	Police force	Sick persons
5	Water resources	Cesspools under houses		
(Group D)				
1	Schools	Flammable materials used in paint production workshops	Youths	The aged
2	Local police stations	Old and deteriorated buildings	Basij	Children
3	Large hospitals	Narrow streets	Electricians and plumbers	Sick persons
4	Water wells	Weak gas pipes	Gas line experts	Handicapped people
5	Open spaces	Overpopulated houses	People familiar with first aid	
6	Water hydrant	High voltage electric posts	Rescuers	
7	Main roads	Old school buildings with weak and tall walls	Police force	
8		Gas pressure adjustment equipment	Doctors and nurses	

Strength and Weakness of the Community in Disaster Preparedness (District 2-1)

No.	Strength	Weakness
District 2-1		
(Group A)		
1	Open space	Insufficient public participation in the social activities
2	Green areas	Glass walls and gypsum walls
3	Many kinds of shops	Gas pipelines
4	Mosques	Aerial power lines
5	Portable bakery	Gas main regulators too close to the buildings
6	Wide streets	Lack of trust on the government
7	Health center	Unstale windows in buildings
8		Shortage of first aid kits
(Group B and C)		
1	Access to medical clinics	Lack of parks
2	Open space	Lack of fire stations
3	Outdoor bakery with capability of utilizing multi energy sources	Lack of schools
4	Schools	Lack of community inter-relation
5	Local police stations	Local community without consciousness of available local resources
6	Mosques	Shortage of emergency stairs
7	Shopping centers, supermarkets and grocery shops	Shortage of emergency equipments
8	Fire hydrant	Lack of first aid kits and medication
9	Water faucets located around the area	Shortage of water faucets in the area
10	High youth population	
11	Restaurants	
(Group D)		
1	Communication facilities	Bumpy roads, streets and areas
2	Doctors and nurses	Inaccessibility of the locals to the evacuated location
3	Fire extinguishing facilities	Lack of cooperation among the people
4	Local cooperative shops	Glass windows of buildings
5	Water wells and resources	Unfinished construction buildings
6	Night watchmen	Lack of emergency staircases in multistoried buildings
7	Small number of petrol stations	Electric cables
8	Sportsmen to be used for rescue peocedures	Lack of a local police station
9	Complexes parkings	Gas distribution centers
10	Open space	
11	Food suppliers including bakecy and grocery shops	
12	Drug stores	
13	Loud speakers	
14	Small number of warehouses and manufactures using	
15	flammable materials	

Strength and Weakness of the Community in Disaster Preparedness (District 2-2)

No.	Strength	Weakness
District 2-2		
(Group A)		
1	Doctors and nurses	Many children and the aged
2	Strong unity among the community	Not knowing the new neighbors
3	Availability of grocery shops and restaurants	Gas pipes
4	Open spaces	Tall buildings with many glass windows
5	Equipment for public announcement (loud speakers)	Local paint shops with flammable materials
6		Tall walls
7		Lack of water tanks
8		Lack of local fire station
9		Electric posts
10		Lack of fire extinguishers in residents
11		Gas pipes
12		Lack of presence of a guardian (father and chief) at home
13		Various local institutes caused traffic and population increase
14		Lack of medical clinic
(Group B)		
1	Local basij	Lakc of experts
2	Availability of fire hydrant	Lack of health clinics, hospitals and charity institutes
3	Open spaces such as parks	Lack of people familiar with first aid
4	School courtyards	Electric polls
5	Wide streets close to the major roads	Lack of police force
6	Shopping centers	Overpopulated schools located opposite each other
7	Trained persons with first aid	Lack of supermarkets
8	Storing food and water supplies	Lack of fire extinguishers at homes and on the streets
9	Storing water in houses for emergency times	Lack of access to water tanks
(Group C)		
1	Open spaces such as schools	Overpopulated area
2	Wide streets	Electric polls
3	Bakery and grocery shops	Lack of swerage system
4	Water tankers	Buildings with a lot of glass windows
5	Fire hydrant	Gas pipes
6	Schools and mosques with loud speakers	Installed heavy equipment such as air conditioners on walls
7	Technicians	Lack of local hospitals
8	Accessibility to major highways	Lack of local fire stations
9	Newly constructed buildings	Many children and the aged
10		Many handicapped, sick and injured persons
(Group D)		
1	Open spaces	Building with glass facades
2	Availability of various experts	Neighbors without enough imformation as to each other
3	Fire hydrant	Cables close to the ground
4	Knowledgeable people such as technicians and rescue forces	Gas pipes
5		Houses with low standard of construction

Strength and Weakness of the Community in Disaster Preparedness (District 10)

No.	Strength	Weakness
District 10		
(Group A)		
1	Open spaces	Lack of fire hydrants
2	Local community relationship	Lack of local green spaces such as parks
3	Strong building construction	Shortage of open spaces
4	Numerous mosques and loud speakers	Numerous apartment buildings
5	24 hours pharmacies	Telephone cables
6	Doctors and nurses	Old buildings
7		Lack of water distributing tanks
8		Lack of location for storage of first aid kits and rescue equipment
9		Lack of schools with large courtyards
10		Overused glasses in high rise buildings
11		Shortage of rescue people
12		Shortage of health centers
13		Underground water canals
14		Narrow streets
15		Cesspools in some houses
(Group B and D)		
1	Bakery	Lack of green space
2	Schools	Lack of fire hydrant
3	Health center	Narrow streets
4	Numerous mosques	Insufficient budget
5	Grocery shops	Electricity polls
6	Sports centers	Lack of knowledge of rescue measures among the community
		Narrow water canals
		Numerous old buildings
		Shortage of hospitals
		Lack of suitable sewerage system
		Lack of suitabale pavement
		Lack of branches of Red Crescent Society
		Over population
		Shortage of public telephones
		Chemical production shops
(Group C)		
1	Local high schools	Old houses almost collapsed
2	Health center and its open space	Narrow streets
3	Mosque's open space	Lack of fire hydrants
4	Grocery supermarkets, bakery	Lack of pathways
5	Warehouses	Lack of health centers
6	Telecommunication company	Lack of sufficient amount of green spaces
7	Public parking	

Strength and Weakness of the Community in Disaster Preparedness (District 17)

No.	Strength	Weakness
Dstrict 17		
(Group A)		
1	Water hydrants	Underground cesspools
2	Unity and trust among the community	Lack of fire stations
3	Water resources	Lack of water tanks
4	Health centers	Many gas pipes
5	Police force	Tall walls
6	Open space such as parks	Flammable materials used by shoe production workshops
7	School sourtyards	Drug addicts
8	Playgrounds	Narrow streets
9	Many grocery shops	Many old people and children
10	Loudspeakers	
11	Mosques for coordination and meetings	
(Group B)		
1	Open spaces	Narrow streets
2	Sports ground	Old and battered buildings
3	Police force	Drug peoblems
4	Mosques	Over population
5	Water resources	Trees
6	School courtyards	Small houses built closely to each other
7	Municipality	Eletric lights
8	Hospitals	
(Group C)		
1	Availability of water wells	Shortage of water hydrant
2	Hospitals	Cesspools underneath the houses
3	Reliable and helpful people	Narrow streets
4	Open spaces	Over population
5	Water resources	Small and closely built houses
6	Basij and mosque	Tall walls
7	Police station	Lack of primary rescue equipments
8		Lack of community training for disaster preparedness
9		Demolished buildings
10		Many children and the aged
(Group D)		
1	Availability of grocery shops and restaurants	Lamp posts in the middle of the streets
2	Sports centers	Narrow streets
3	Local municipality	Old buildings and schools
4	Fire extinguishers in shops and official centers	Old schols
5	Loudspeakers in mosques, schools, police stations and public halls	Lack of fire stations Shortage of expert forces
6	Young human forces	Shortage of medical and health facilities
7	Water hydrants	Nursery and orphanage
8	Hospitals	Trees
9	Police station	Potted plants above the doorways of houses
10	Open spaces	Many handicapped persons
11	Water wells and resources	Flammable materials in make-up and perfume factories
12	Local traffic department	Flammable materials used in shoe production workshops
13	Schools	Gas pressure adjustment equipment
14		Electric posts
15		Many children and the aged

Photos Taken During the Workshop (2) 1/2

Photos Taken During the Workshop (2) 2/2

Appendix 3-2

Community-Based Disaster Preparedness Workshop (3)

Program

August 18 (Monday), 2003 at Public Participation Center in District 17

8:00	Registration
8:20	Reading Holly Koran / Opening Remarks
8:35	Address by Mayor of District 17
8:50	Presentation on Community Disaster Map
10:00	Break (Video on Japanese Community Activities on Disaster Preparedness, Quiz of disaster-related information)
10:30	Group Discussion: How and who can overcome the disaster weakness in your community?
12:00	Lunch
13:00	Group Discussion: What can you do now for disaster preparedness in your community?
14:00	Presentation of the Group Results
15:00	Closing

Participants in the 3rd Workshop (August 18, 2003)

No.	Name	Occupation	Sex	Age	Years of living
(District 2-1)					
1	Mohammad Bidokhti	Student	Male	24	3
2	Zahra Motojaded	Unemployed	Female	19	11
3	Maryam Parnian	Student	Female	21	17
4	Elham Farhadzade	Student	Female	21	17
5	Vandad Vosooghi	Student	Male	24	18
6	Maryam Saieedi	Student	Female	17	16
7	Elham Nazh	Student	Female	20	16
8	Parisa Nazh	Student	Female	16	16
9	Maryam Miraizee	Student	Female	21	9
(District 2-2)					
1	Mohammad. j-Assaie	Retired	Male	63	23
2	Mirkazem Shokri	Bank officer	Male	58	24
3	Ali Salmanian	Government officer	Male	60	14
4	Farzane Sheikh Khatibi	Eznvironment researcher	Female	38	10
5	Mohammad Seif	Government officer	Male	50	22
6	Mitra Ansari	Unemployed	Female	32	22
(District 10)					
1	Fatima Chapardar	Unemployed	Female	26	26
2	Assie Eghrari	Student	Female	17	8
3	Mohammad. S. Chapardar	Unemployed	Male	24	24
4	Majid Maadi	-	Male	19	19
5	Saeed Mohmmadi	Student	Male	21	16
6	Jalal Kamali	Government officer	Male	21	21
7	Sakine Afshari	Housewife	Female	51	40
8	Zahra Nozad	Housewife	Female	24	10
9	Maryan Rafieepour	Student	Female	17	10
(District 17)					
1	Niazkhani	Student	Female	21	8
2	Abedin Ghofeili	Pasdar ?	Male	38	25
3	Ahmad Afshari	Student	Male	22	22
4	Abbas Bakhatiari	Student	Male	17	17
5	Haj Mohammadkhani	Housewife	Female	33	8
6	F. Esmaieelpour	Student	Male	24	2 months
7	Maryam Reza Zadeh	Obstetrician	Female	37	5
8	Mohammad Mozafar	Policeman	Male	-	-
9	Saeed Soleimanbeigi	Student	Male	23	23
10	Saeed Samaiee	Obstetrician	Male	30	-

Usage of Community-based Disaster Map

No.	Usage	How	Who	Budget
District 2-1				
1	Distribution of small maps among the local people	- Distribution of a small map with explanation to each house	- Those who have attended the workshops - Selected representatives	- Collecting expenses from the local people
2	Owning a large scale map by the community	- Putting a large map on billboards in the area and gathering places - Installing a framed map with glass in front of Youth Association	- Those who have attended the workshops	- Collecting expenses from the local people
3	Gathering the local people in a place and teaching them disaster preparedness using the map	- Gathering the selected persons in the area	- Those who have attended the workshops - Well-known persons in the community	- Establishing a local group by the people and municipality
District 2-2				
1	Distribution of small size maps to the community with questionnaires to get further information for improvement	- Utilizing the available local publication	- Local association - Active local NGOs - School authorities	- Community donation
2	Organizing educational and recreational programs to introduce the map		- Local association - Active local NGOs - Youth Association	- Community donation
Distirct 10				
1	Preparation of newsletter including the map	- Local shorayari will do this - Local association will do this	- Local association - Local shorayari	- Local community's contribution - Shorayari - District office
2	Putting up bills in public areas, and mosques to inform the map	- Local shorayari will do this	- Local association - Local shorayari	- Local community's contribution - Shorayari - District office
3	Distribution of small sized maps	- Local shorayari will do this - Local association will do this	- Local association - Local shorayari	- Local community's contribution - Shorayari - District office
District 17				
1	Distribution of small -sized maps at school and mosques	- Produce small size maps or booklet or pronted at the backside of advertizement	- District office - NGOs	
2	Putting up a large-scale map on the noticing palces such as billboard, shorayari office, shops in town, library, etc.	- Evaluating the map and making large and clear maps		
3	Education of the local people and students using maps	- Utilizing training classes in health centers	- Health communicators	

Community-based Plan of Disaster Preparedness

No.	Weakness to be Overcome	Who	Short-term	Mid-term	Long-term	Target
District 2-1						
1	No information of disaster	- Participants of the workshops (2) and (3) - Trained persons - Key persons who know the community	- Gathering people to educate in mosques, Youth Association and schools - Organizing groups of interested people	- Organizing workshops - Training of rescues/ relief and fist aid	- Reparing houses - Removing dangerous areas in the community - Preparation of complete list of residents for disaster paredness	- Establishing local disaster management groups with experts - Creating sense of cooperation among the the residents
2	No cooperation of community people	- People who know the community well - People who attended the workshop (2) and (3)				
District 2-2						
1	Lack of resource persons	- Leaders of housing complex board - Skilled persons in the community	- Appointment of interested people in rescues training	- Organizing workshops and seminars to educate the community with assistance of the government	- Organization of the groups for disaster preparedness - Providing educational programs	
2	Lack of inter-relation among the neighbors					
3	Lack of motivation for community cooperation					
District 10						
1	Shortage of trained persons in disater preparedness	- Fire brigades - Municipality		- Installation , repaire, and development of dangerous area, facilities, houses, etc.	- Renovation of buildings and areas	
2	Many dangerous infrastructure and buildings					
District 17						
1	Lack of knowledge of disaster preparedness	- Health communi-cators - Mesia - University	- Training with assistance of educatio-nadl and development organizations - Training at schools and mosques for first aid	- Preparation of ecucational book for schools - Organizing groups of trained persons - Providing all residents with educational booklets	- Frequent training for the local people	- Establishing a local disaster group - Training the community for first aid and rescue - Workshop of disaster prepared-ness for all residents - Using disaster map informing safe locations and evacuation routes
2	No groups prepared for disaster	- Mosques - Red Crescent Society - TDPMC				
3	Deteriorating of buildings, areas and life lines	- Trained people in disaster workshops - Education and development organi-zations				

Activities to be Implemented by Community

No.	Activities	Who	Task	Place/Time	Budget
District 2-1					
1	Establishing local groups fo disaster preparedness	- Trained persons - All participants in the workshop (2) and (3) - Representatives of each alley - Key persons and skilled persons	- Management and training - Providing informatio to the local residents - Collecting expenses - Updating disaster map and teaching the local residents - Preparation and districbution of brochures	- Youth Association - Schools - Mosques - Every Saturdays. every 15 days, once a month	- Local residents
District 2-2					
1	Organizing and training for rescue and maneuvers of disaster preparedness	- Local association - Red Crescent Society - Fire Brigade - Mosques, basij	- Encouragement of the community - Production of an educational program - Requesting rescue/ training programs for relevant organizations	- Complex building assembly hall - Cultural Center - Local association hall - Kanoon	- Community mutual cooperation - Complex manage-ment fee - Advertizement fee in the local publications
District 10					
1	Organizing training courses for disaster preparedness	- Mahale council - Local association - Participants in the workshops (2) and '(3)	- Requesting and follwong up Red Crescent Society and Fire Brigade	- Fire Brigade - Cultural Center Community Center	- Free of charge - Companies of water, sewerage, and electricity
2	Requiring for repair and install of infrastructure for disaster preparedness				
District 17					
1		- Basij - Mosques - Police		- Mosques - Public assembly center - Once a week - Once a 15 days - Once a month	

Comments

After Workshop (2)

No.	Comments	Frequency
Workshop (2)		
(District 2-1)		
1	Good understanding of weakness and strength in the neighboring area from viewpoint of disater	18
2	Good understanding of disaster resources and dangers in the community	5
3	Establishing of evacuation place in the community is necessary	2
4	Supplying nbasic equipment and materials for emergency is necessary	1
5	Good understanding of what to do before and during disaster	9
6	Good understanding of the damages in case of disaster	6
7	The view and attitude toward the community has changed	7
8	Participants became familiar with each other	4
9	Establishing of a group for disaster in the community is necessary	3
10	Broadcasting and planning for disaster management is necessary	3
11	Recognized of the importance of public participation	1
12	Training is important	3
13	Broadcasting of information related to disaster management is necessary	2
14	This kind of workshops should be continued	2
15	Recognized of the importance of cooperation among the community	4
16	This kind of workshops should be organized in many communities	1
(District 2-2)		
1	Public participation is important	7
2	Collaboration among the community is important	6
3	Groups for disaster management should be established.	1
4	Existing local groups should be utilized for disaster managemtn	2
5	Good understanding of how to act in case of earthquake	1
6	Good understanding of weakness and strength in the neighboring area from viewpoint of disater	2
7	More information of disaster should be distributed	3
8	The participants became familiar each other	1
9	Good understanding of basic information of disaster	2
10	Training is important	3
11	Good understanding of disaster resources and dangers in the community	2
12	Cooperation mong the community is important	2
(District 10)		
1	Good understanding of the importance of disaster preparedness	2
2	Good understanding of weakness and strength in the neighboring area from viewpoint of disater	18
3	This kind of workshop shold be continued	3
4	Good understanding of disaster resources and dangers in the community	9
5	Training is important	1
6	Disaster related information should be distributed	1
7	This kind of workshop should be expanded to other communities	3
8	Collaboration among the community is important	2
9	Good understanding of what to do before and during disaster	3
10	View and attitudes toward the community has changed	1
(District 17)		
1	Good understanding of weakness and strength in the neighboring area from viewpoint of disater	22
2	Good understanding of disaster resources and dangers in the community	13
3	Many information related to earthquake is acquired	15
4	Good understanding of what to do before and during disaster	5
5	Training is important	2
6	Cooperation mong the community is important	2
7	Local groups should be established.	1
8	This kind of workshop should be expanded to other communities	1
9	This kind of workshop should be continued	1
10	View and attitudes toward the community has changed	1

Comments

After Workshop (3)

No.	Comments	Frequency
Workshop (3)		
1	Good understanding of weakness and strength in the community	17
2	Basic information of disaster preparedness	2
3	Recognized the importance of public participation	8
4	Many points have never discussed and thought	1
5	This kind of workshop should be expanded to other communities	1
6	Some understanding of eqrthquake consequences	3
7	Recognized the importance of cooperation among the community in case of disaster	7
8	The workshop should be developed continuously.	7
9	Recognized activities to be implemented before and during disaster	6
10	Recognized the importance of establishing local groups	5
11	Recognised the importance of training	9
12	Recognized the neccesity of informing and distributing the disaster maps to other people	1
13	Recognized the importance of planning for disaster preparedness	1
14	Some understanding of how to overcome the weakness for disaster	11
15	Higher officials from district should attend	1
16	Experiences and examples of other countries should be introduced more	2
17	Massmedia should be utilized more	2

Photos Taken During the Workshop (3)

Appendix 3-3

Program of Workshop (4) for Information Exchange on Disaster Preparedness among Housing Complexes

Date: September 14,2003 (Sunday)

Venue: Meeting Room in Shahrake Omid, District 4

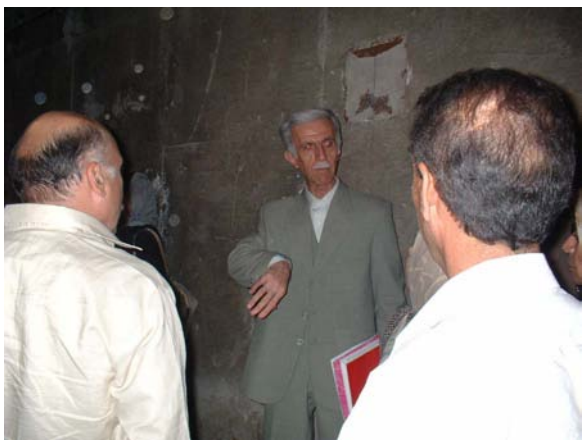
Program:

3:30	Registration
4:00	Opening Remarks
4:05	Reading of Holly Quran
4:10	Explanation about the purposes and program of the workshop
4:20	Presentation of the experience of Shahrake Omid regarding disaster management
5:00	Presentation of maneuver scenario by TDPMC
5:10	Break
5:25	Presentation of the activities of district 4 regarding disaster management
5:55	Question and answer
6:05	Conclusion
6:15	Closing

Participants for Information Exchange Meeting among Housing Complex

No.	Name	Title	Sex
1	Kamali Nasab	Deputy of Social Affairs of District 4	M
2	Nosratollah Vaziri	Managing Director of Shahrake Omid	M
3	Mohammadali Fayazi	Disaster Manager	M
4	Firroz Afshar	Financial Manager	M
5	Gholamhossein Asadi	Procurement Manager	M
6	Manoochehr Rahimikia	Servie Manager	M
7	Changiz Malek Hosseini	Green Space Affaris	M
8	Abdolreza Khodaie	Telecommunication Affairs	M
9	Farokh Zareiee	Electricity Affairs	M
10	Massoud Saiedi	Managing Director of Building 2	M
11	Mohammadali Mehraban	Managing Director of Building 4	M
12	Assadollah Zangane	Chairman of Boar of Director of Building 7	M
13	Seifallah Rahimi	Managing Director of Building 10	M
14	Abdolrassoul Shirinipour	Chairman of Boar of Director of Building 10	M
15	Sirius Mehraban	Managing Director of Building 21	M
16	Abolhassan Mazandarani	Deputy of Social Affairs of District 2	M
17	Mohammad Assaiee	Managing Director of Local Association in Shahrake Gods	M
18	Mohammadreza Ariamand	Managing Director of Building 8	M
19	Mnijhe Meimanet	Resident	F
20	Ali Najfi	Resident	M
21	Mohammad Mosghim	Resident	M
22	Ali Salmanian	Resident	M
23	Mohammadreza Seif	Resident	M
24	Mirkazem Seyed Shokri	Inspector of Bank	M
25	Tabrizi	Member of Shorayari in Shahrake Ekbatan	F
26	Eshrat Khalkhali	Elderly Association	F
27	Bakhtare Azami	Elderly Association	F
28	Kobra Tousi	Elderly Association	F
29	Parvin Kasraian	Elderly Association	F
30	Malakenejhad Farabi	Elderly Association	F
31	Shahrbanoo Hormozi	Elderly Association	F
32	Seyed Hormozi	Health Communicator	F
33	Parvindokht Mesbah	Health Communicator	F
34	Saiede Salhghafari	Health Communicator	F
35	Maryam Mirhashemi	Health Communicator	F
36	Shahin Rezaiee	Women Association	F
37	Yegane	TDPMC	M
38	Nahoko Nakazawa	JICA Study Team	F
39	Saleh	Urban Planning in Tehran Municipality	F
40	Mizui	JICA Study Team	M
41	Afra	JICA Study Team	F
42	Mitrana	JICA Study Team	F
43	Ali	JICA Study Team	M

Photos Taken During the Meeting



Program of Workshop (4) for Children on Disaster Preparedness

Date: September 15,2003 (Monday)

Venue: Library of Institute for the Intellectual Development of Children and Young Adults (Kanoon) in District 1

Morning Session

9:00 Registration
9:20 Opening Remarks
9:25 Explanation of the Program
9:40 Exchange of impressions after showing disaster photos of Qazvin and Japan
10:40 Evacuation game using disaster related materials
11:10 Break
11:30 Communication relay of disaster information
11:50 Quiz of disaster Preparedness
12:00 Questionnaire
12:10 Closing

Afternoon Session

14:00 Registration
14:20 Opening Remarks
14:25 Explanation of the Program
14:40 Exchange of impressions after showing disaster photos of Qazvin and Japan
15:40 Evacuation game using disaster related materials
16:10 Break
16:30 Communication relay of disaster information
16:50 Quiz of disaster Preparedness
17:00 Questionnaire
17:10 Closing

List of Participants of Children Workshop (4) for Disaster Preparedness

(Morning Session)

No.	Name	Sex	Age
1	Kasra Babashahi	M	8
2	Kia Babashahi	M	11
3	yazdan Sakhaiee	M	12
4	AmirhosseuTavakolizade	M	9
5	Alireza Allahverdian	M	8
6	Shaghayegh Habiballahi	F	9
7	Terme Ershadian	F	9
8	Parmis Meshki	F	9
9	Nafise Zari	F	11
10	Helie Tabatabaie	F	9
11	Negin Mohagegi	F	10
12	Faeze Kia	F	8
13	Soheil Shafiee	M	12
14	Ali Tavasoli	M	8
15	Masood Shariatmadar	M	9
16	Amirhossien Mirmohammad	M	10
17	Shahriar Moezi	M	8
18	Fatima Naghdabadi	F	9
19	Rejhin Roghani	F	11
20	Maryam Egazi	F	9
21	Nikita Haghighatjoo	F	10
22	Ghazale Ghezel Ayagh	F	12
23	Atoosa Jhila	F	11
24	Binazir Brookhian	F	10
25	Reza Mortazavi	M	11
26	Amjir Mirmehdi	M	9
27	Hoora Mohammad	M	10
28	Kasra Taheri	M	8
29	Kirash Farmani	M	10
30	Mona Soltanmajdi	F	9
31	Sarvnaz Hosseini	F	9
32	Saba Mebah	F	11
33	Mina Ejazi	F	8
34	Soode Karimi	F	9
35	Yasaman Matin	F	9
36	Hoora Madani	F	10

(Afternonn Session)

No.	Name	Sex	Age
37	Iman Foroozan	M	9
38	Erfan Taheri	M	10
39	Siavash Rezaiee	M	12
40	Aysan Khalili	M	9
41	Shakiba Rajaiee	F	10
42	Shermine Shamloo	F	12
43	Yasamin Mehrabadi	F	11
44	Shakiba Jalilvand	F	10
45	Nazanin Gomnam	F	9
46	Negin Gomnam	F	8
47	Irshad Aliasgari	M	10
48	Amirreza Zakerhosseini	M	7
49	Ali Namakian	M	9
50	Shakoora Rajaiee	F	10
51	Anita Jadiri	F	8
52	Sharare Ibrahimzade	F	9
53	Alale Bakhtar	F	11
54	Mona Naghedi	F	11
55	Zahra Moieenzade	F	10
56	Morteza Zosherafatian	M	12
57	Soroosh Aliasgari	M	12
58	Erfan Khorma	M	9
59	Niloofar Mehrabadi	F	10
60	Mersede Niavarani	F	10
61	Shahrzad Mir Soltani	F	10
62	Nastaran Safarali	F	10
63	Shirine Niavarani	F	8
64	Melodi Yashar	F	9
65	Yasaman Rajaiee	F	11

Result of Children Workshop on Disaster Preparedness 1/2

Q1: What do you feel and find after seeing the photos of earthquake in Qazvin and Japan?

No.	Feelings	Frequency
1	Upset, fearful, worry, sad	42
2	Want to help them	8
3	Warry about many homeless people, dead, orphans	8
4	Lose everything	7
5	Feel pity for the sufferers	4
6	Want to do something	4
7	Should protect myself	3
8	Hope that I will stay safe even if earthquake occurs	2
9	There are thirst and hunger	1

Q2: What kind of fearful things will happen in city if a large earthquake hits Tehran?

No.	Happenings	Frequency
1	Homes and schools are destroyed	33
2	People are injured and killed	12
3	Families and people need help	8
4	Many people feel terrible	6
5	I myself or families are dead	6
6	Families are in trouble	5
7	Everything is destoryed	4
8	I separate from families	4
9	I lose everything	3
10	Starvation is spread	3
11	Ground is cracked and people get into the chasm	2
12	I prays for God	2
13	I do not want to think about this matter	2
14	I hope friends will survive	1
15	Diseases spread	1
16	I hide myself under the table	1

Q3: What will happen in the class if a large earthquake hits Tehran during we are studying here or in school?

No.	Happenings	Frequency
1	Go under desks, chairs, doorframes	14
2	Help friends and teachers	14
3	Friends and teachers are pressed under debris and die	14
4	Worry about family and home	12
5	Escape from classroom or run out the yard or go home	12
6	School is collapsed	7
7	Stand at the corner of the room	4
8	Pray for God	4
9	Find Red Crescent Society or Emergency to come	3
10	Follow the teachers' instruction	3
11	Class is stopped and students cannot study for an indefinite time	3
12	No news from family (All are working and studying)	1

Result of Children Workshop on Disaster Preparedness 2/2

Q6: What should you usually do in order to protect yourself from the earthquake?

No.	Activities	Frequency
1	Go to safe places, open spaces (away from electricity posts, trees, buildings, and other dangerous objectives)	25
2	Hide myself under desks, beds, tables, chairs	11
3	Escape from home, leave town to other safe area	6
4	Keep hands and pillows over the head	6
5	Keep cool, not lose his/her hope for life	5
6	Stand beside the colums of the room or door frames	4
7	Help others	3
8	Stay at the corner of the room	2
9	Evacuate in storage	1
10	Call fire fighter	1
11	Make home stronger against earthquake	1

Q4: Can you do the following activities if a large earthquake occurs?

Q	Activities	Frequency
A-1	I am sure that I will not be upset, not cry, and not be absent-minded.	13
A-2	Maybe I will not be upset, not cry, and not be absent-minded.	27
A-3	I am sure than I will be upset, cry, and be absent-minded.	25
B-1	I am sure that I can go back to my home by myself.	18
B-2	Maybe I can do this.	26
B-3	I cannot do this.	21
C-1	I am sure that I can go to the designated place for evacuation by myself.	16
C-2	Maybe I can do this.	23
C-3	I cannot do this.	26
D-1	I am sure that I can contact with my family even if I stray from my family.	14
D-2	Maybe I can do this.	33
D-3	I cannot do this.	18
E-1	I am sure that I can survive by myself.	13
E-2	Maybe I can do this.	41
E-3	I cannot do this.	11
F-1	I am sure that I can help my neighbors.	20
F-2	Maybe I can do this.	39
F-3	I cannot do this.	8

Q5: What are the worries in case of a large earthquake?

No.	Worries	Frequency
1	Your house is fallen down and collapsed.	40
2	Your house is burned by fire.	20
3	Roads are damaged and not usable.	29
4	You are separated from your family.	40
5	Your family or you youself are injured or die.	43
6	News and announcement regarding disaster and damages are not accessible.	39
7	Foods and water are not enough.	42
8	You cannot study at school.	35
9	Nobody around you helps you and your family.	25
10	You have to stay at evacuation site for many days.	33

Photos Taken During the Children's Workshop, TV News Coverage

Photos Taken During the Seminar II
(Prize Giving Ceremony to Winners of Poster Making)

Certificate Presented to the Participants &
Poster Competition Announcement

به نام خدا

گواهی می شود خانم / آقای

در کارگاه آموزشی کودکان با موضوع "**آمادگی مقابله با بحران**" که با همکاری گروه مطالعاتی آژانس همکاری های بین المللی ژاپن (جایکا)، مرکز پیشگیری و مدیریت بحران شهر تهران و کانون پرورش فکری کودکان و نوجوانان در تاریخ ۲۴ شهریور ۱۳۸۲ در کتابخانه شماره ۱۶ کانون پرورش فکری کودکان و نوجوانان واقع در زعفرانیه برگزار گردید، شرکت کرده اند.

Ichiro Kobayashi
Deputy Team Leader,
JICA Study Team

علی دانش
رئیس مرکز پیشگیری و
مدیریت بحران شهر تهران

به نام خدا

گواهی می شود خانم/آقای

در کارگاه آموزشی یکروزه "آمادگی مقابله با بحران در سطح محله" که توسط گروه مطالعاتی آژانس همکاری های بین المللی ژاپن (جایکا) و مرکز پیشگیری و مدیریت بحران شهر تهران در تاریخ ۸۴/۵/۲۲ در محل هماهنگی تشکل های مردمی (منطقه ۱۲) برگزار گردید، شرکت کرده‌اند.

Ichiro Kobayashi
Deputy Team Leader
JICA Study Team

علی دانش
رئیس مرکز پیشگیری
و مدیریت بحران شهر تهران

Certificate Presented to the Participants & Poster Competition Announcement

برگزاری کارگاه آمادگی آموزشی مقابله با بحران در مجتمع نسترن شهرک غرب

آیا به خطر زلزله اندیشیده اید؟

شهرداری منطقه ۲ شهرک JICA (مشاور مرکز پیشگیری مدیریت بحران شهر تهران) را معرفی نمود که با همکاری انجمن محلی و مدیریت مجتمع مسکونی و به دنبال تشکیل کارگاه های مشابه در مناطق ۱۰ و ۱۷ یک اثر نیکوی اجتماعی به جای گزارده شود. مدیران ژاپنی این طرح در تماس با آقای آسائی، این مجتمع را انتخاب و روز ۱۶ مرداد از ساعت ۸ صبح الی ۱۶ را بدین منظور اختصاص دادند. قبلاً راههای فرار، استخرها، ایستگاههای خطر همچون گاز و برق فشار قوی و محلی برای مجتمع موقت (هنگام وقوع حادثه) بازدید شد. توجیه اهداف و برنامه های کارگاه بحث گروهی منابع بحران، خطرات و افراد آسیب پذیر، گردش در شهر، تهیه نقشه بحران و بحث گروهی برنامه این کارگاه آموزشی بود و با عنایت به خطر زلزله که هر لحظه ما را تهدید می‌کند بسیار مناسب بود که به خصوص خانمها در جریان قرار گیرند.

نمایندگان سه گروه متشکله گزارش دادند: تجهیز افراد خاصه جوانان شناخت افراد چاره ساز تقویت حس مسئولیت، آشنایی حقوق شهروندی، مشارکت محوری، آموزشی در مدارس، ملموظ نظر داشتن نکات ایمنی هنگام ساخت و سازو صدور پروانه شهرداری از اهم موارد قابل توجه است و با تشکیل گروه سازمان یافته در هر محله خطرات را کاهش خواهیم داد نکته قابل توجه فضاهای باز موجود در شهرک بود که به کمک گروههای نجات خواهد رسید. این برنامه ها تداوم می‌یابد و شرکت کنندگان آمادگی همکاریهای بیشتر را اعلام داشتند. در دومین جلسه که در منطقه ۱۷ تشکیل شد بر انجمن محلی سازمان یافته شهرک به توانایی جلب مشارکت مردم و ایجاد و تشکیلات خود امدادی تأکید شد شناسایی رهبران مدیریت بحران عکس العملها در تقلیل بحران مورد توجه بود.


روزنامه بین المللی صبح ایران

خبر

۵۰ تومان

امارات: ۱/۵ درهم

دومین کارگاه آمادگی مقابله با بحران زلزله در تشکل‌های مردمی شهرداری منطقه ۱۷

مرکز امور هماهنگی تشکلهای مردمی منطقه ۱۷


انتخاب

مرکز امور هماهنگی تشکلهای مردمی منطقه ۱۷

اطلاعات

سه شنبه ۱۴ مرداد ۱۳۸۶ ـ ۲ جمادی الثانی ۲

به منظور شناسایی راهکارهای بالقوه در محله

دومین کارگاه آمادگی مقابله با بحران زلزله در تهران تشکیل شد

سرویس اجتماعی: دومین کارگاه آمادگی مقابله با بحران زلزله در منطقه ۱۷ شهرداری تهران تشکیل شد. به گزارش روابط عمومی شهرداری منطقه ۱۷، هدف از برگزاری این کارگاه، تشویق مشارکتهای مردمی در پیشگیری از بحران، شناخت ظرفیتهای دستگی و ترویج همکاریهای سازمان‌یافته مردمی در سطح محله، که در زمان بروز حوادث غیرمترقبه براساس این گزارش،

دوشنبه ۱۳ مرداد ۱۳۸۶ ـ ۵ جمادی الثانی ۱۴۲۸ ـ ۴ اگوست ۲۰۰۳ ـ سال یازدهم ـ شماره ۳۱۲۶

پرسه در محله ها

تشکلهای مردمی آماده مقابله با بحران زلزله می‌شوند

گروه شهری: مراکز امور فرهنگی تشکلهای مردمی شهرداری منطقه ۱۷ ، فردا دومین کارگاه آمادگی مقابله با بحران در سطح محله را برگزار می کند.

این کارگاه به منظور تشویق مشارکتهای مردمی در فعالیتهای پیشگیری از بحران و تبیین ظرفیت‌های ممکن و ترویج همکاریهای سازمان یافته مردمی در سطح محله‌ای در مواقع بروز حوادث غیرمترقبه برگزار می شود.

Appendix 3-4

Program of Workshop (5) of Schoolteachers on Disaster Prevention and Mitigation

Date: February 28, 2004 (Saturday)

Place: Mofid Educational Complex (District 1)

Participants: 60 teachers

Objectives: - To increase awareness of disaster prevention and mitigation

- To improve capacity of disaster prevention and management of teachers as key persons of the school as well as communities

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Program:

8:30- Registration

9:00- Opening (TDMMC)

9:15- General Information of Earthquake and Structure in Japan (Dr. Hosseini, Dr. Hayashi)

9:40- Japanese Experiences of Earthquake (Mr. Nishii)

10:00- Role of Schools and Education Staff in Japan (Dr. Nakazawa)

10:40- Tea Break

11:00- Group Discussions on Disaster Weakness and Resources in and around the Schools – divided into 3 groups

12:00- Lunch

13:00- First Aid Training with Emergency Kit by Group (TDMMC)

13:45- Solution of Group Discussions – How to overcome the disaster weakness and utilize resources

14:45- Presentation of Results of the Group Discussions

15:45- Conclusion for Improvement of the Present Conditions – What can/should the participants do now?

16:15- Closing

List of Participants of Workshop (5) of Schoolteachers

Women

No.	Organization
1	District 15
2	District 13
3	District 5
4	District 10
5	Training and Education Organization
6	Educational group of District 4
7	Educational group of District 1
8	Educational group of District 2
9	Educational group of District 9
10	District 15
11	District 6
12	District 16
13	District 19
14	District 11
15	District 13
16	District 13
17	District 12
18	District 18
19	District 6
20	District 3
21	District 10
22	Training and Education Organization
23	District 19
24	Training and Education Organization
25	District 14
26	Distr4ict 5
27	District 8
28	District 14
29	District 4
30	District 1

Men

No.	Organization
1	District 12
2	Training and Education Organization
3	Training and Education Organization
4	District 8
5	District 2
6	District 1
7	District 1
8	District 1
9	District 1
10	District 1
11	District 1
12	Training and Education Organization
13	District 6
14	District 7
15	Training and Education Organization
16	Training and Education Organization
17	Training and Education Organization
18	Training and Education Organization
19	District 1
20	District 1
21	Distrixt 1
22	District 1
23	District 1

Strong Points and Weak Points in and around Schools

Group 1(Defense from War)

No.	Strong Points		Weak Points	
	Physical	Non-physical	Physical	Non-physical
1	Maintenance of electricity cables	Knowledge and information about safe places by teacher	Windows	Lack of knowledge and facilities related disater in school
2	Structure of stairways and wide corridors	Organizing students' rescue team	Inflammable materials in schools	No forces for aid in emergency case in school
3	Doors of the building and corners of the school	Participation to earthquake maneuver	Blocking gas lines	No experience of disaster
4	School yard	Stundens' knowledge of rescue and relief	Mirrors in toilets	No knowledge of disaster by teachers and students parents
5	Design of schools	Knowledge about usage of fire extinguishers	Bookshelves	Disabled and small students
6	Trees planted in and around schools	Educational level of students	Old structure of the school	Lack of training by students
7	Emergency exits of schools	Knowledge of gas and water counters to disconnect	Laboratory with many equipment	Crowed class rooms
8	Park near the school		Narrow streets around school	Lack of serious attention to disaster
9	Shelter and basement in school		Unprotected staiways	Possibility of emotional instability and panic of students
10	Fire extinguishers in school		Kitchen in school	
11	Strong fences around the school		High buildings adjacent to schools	
12	Chairs in the class rooms		Aquarium	
13	Storage of bottles of drinking water		Gas lines	

Group 2 (Geography)

No.	Strong Points		Weak Points	
	Physical	Non-physical	Physical	Non-physical
1	Near the fire station	Cooperation atmosphere among students and community	Electric posts	Feeling of fear and insecurity for disaster
2	Wide alleys and strees around schools	Geographical knowledge of the neaby area	Pedestrian bridges near the schools	Worrying of rescue delay
3	Near hospitals and health centers	Experience of living during the war time (Iran and Iraq)	Narrow streets around school	Possibility of robbery in case of disaster
4	Easy place for evacuation	Students' awareness of disaster	Glasses façade of building	Crowded classrooms
5	Open spaces around the school	Providing first aid training in class	Oil and gas reservoirs near the schools	Unawareness of disaster by teachers and students
6	High walls surrounding school	Teachers' management ability of school is high	High buildings adjacent to schools	Lack of first aid
7	Fire extinguishers in school	Earthquake drill experience	Gas pipes underground	Many archive files
8	School yard	Controlling the fear of children in case of disaster	Water ditches	Possibility of kidnapping in case of emergency
9	Metal fences in front of windows	Many young teachers	Heavy traffic around schools	
10	Shelters built in the yard during war time		No open spaces around schools	
11	Euqipment fixed by metals		Billboards around schools	
12	Strong RC concrete structure		Far from hospitals and emergency center	
13			Many closets and shelves	
14			Laboratory equipments	
15			Narrow stairs	
16			No emergency exists	
17			Boards, frames, boxes not fixed tightly	

Solutions to be Suggested by Teachers

No.	Group 1	Group 2
1	All shelves, cabinets and hanging materials in school should be fixed.	Students' groups for disaster management should be created.
2	If the government provides helps, nothing will change.	Windows should be secured not to fly into pieces.
3	Training and evacuation drills are necessary.	Equipment for relief and rescue should be prepared.
4	Safe places in school should be specified.	Shelves, frames, cabinets and other fragile items should be fixed.
5	First aid kits and fire extinguisher should be ready.	Emergency exists should be available.
6	School structure should be double cheked.	School structure should be checked and any dangerous buildings should be prohibited.
7	Especially, laboratory should be secured from hazardous materials.	More than 3 storied buildings should be prohibited for school.
8	Disaster committee and self-protection groups should be organized.	Learning many experiences in other countries.
9	Some courses related to disaster should be in subjects.	First aid kit should be prepared.
10	Earthquake maneuver should be mandatory for schools.	Safe places in and around school should be specified.
11	Brochures, books and films for disaster and management should be prepared.	Training and evacuation drills should be provided.
12	Disaster map should be prepared in each district and distributed to the people	Each students should always carry ID card.
13	Budget of training courses for students and teachers should be allocated.	Complete knowledge of the area and evacuation information should be provided.
14	Rebuilding and retrofitting should be started with strong legal support.	The assistance of the government is necessary.

Appendix 3-5

Program of Workshop (6) for Students on Disaster Management

Target Groups: Students' groups
50 students as a whole to be divided into 4 groups

Date: 9 June 2004 (Wednesday)

Place: Razavi- Art and Cultural Center in District 5

Objectives:

(1) To increase awareness for disaster prevention among the students, educational staff and their families

(2) To start to consider the actual preparedness and management of disaster to be applied to the participants' communities

Program:

8:30 Registration
9:00 Reading Holly Koran/Opening Remarks
9:15 Explanation of the Program
10:00 Group Activity: Preparation of the Disaster Map in the Center: "What are danger and resources in the center?"
12:00 Lunch
13:00 Group Activity: Preparation of the Disaster Map (continued) and Group Discussion: "What can you do for disaster preparedness in the center and your home?"
14:00 Presentation of the Group Results
15:00 Closing

List of Participants of Workshop (6) for School Students

No.	Boy (Age)	Girl (Age)
1	18	15
2	18	15
3	16	15
4	14	14
5	14	14
6	13	14
7	13	14
8	13	14
9	13	14
10	13	14
11	13	14
12	12	14
13	12	14
14	12	13
15	12	13
16	12	13
17	12	13
18	12	13
19	11	13
20	9	13

No.	Girl (Age)
21	13
22	13
23	12
24	12
25	12
26	12
27	12
28	12
29	12
30	12
31	11
32	11
33	10
34	9
35	-
Total: 55	

Reactions to Earthquake

Q1. What did you do when the earthquake occurred?	
1	Sleeping, studying, having a party, watching TV, staying alone and rushed out the yard, street
2	Rushed out corridor, downstairs from the rooms
3	Moved under the tables, stuck to the wall, stood at the doorframe
4	Could not do anything but cry
5	Walking in the street and did not feel anything because of road construction and noises
6	Calling family members each other
7	Freightend and did not understand it was the earthquake, First time of earthquake and quite shocked
8	Try to keep cool and avoid any dangers
9	Slept the night outside (yard, park, in a tent)

Q2. What did you feel at that time?	
1	Frightened, Fear, Schocked, Strange feeling, very bad, dangerous
2	Hands and feet were shaking
3	Crying
4	No feeling

Q3. Did you get any information of the earthquake? If so, what is the information source?	
	44 participants among 53 got some information of epicenter, magnitude, death toll, building damages, road damages, etc.
1	Car radio
2	Radio
3	TV
4	People's word of mouth, Neighbors
5	Telephone

Q4. What should you do for disaster preparedness?	
Building Structure:	
1	Retrofitting of the houses
2	Municipality should not issue the permisson of high rise building construction
Awareness and skill improvement:	
1	Take necessary training and transfer the technique and knowledge learnt to other people
2	Some family members should take training courses so that they can lead a whole family and also the neighbors
3	Try to help other people as key persons and cooperate each other
Avoid Dangers:	
1	Stick special films on glasses
2	Remove hanging things from walls and ceilings and fix them
3	Prepare a sack containing emergency goods to carry for evacuation
4	Identify the strong and safe places and shelters before earthquake
5	Prepare first aid kit
6	Prepare whistles
7	Make disaster management plan in case of emergency
8	Not sleep and stand near/under the dangerous and fragile things
Points pay attention to in case of emergency	
1	Stay under the doorframes, tables, benches and narrow corridors during the earthquake
2	Disconnect the gas, electricity when leaving the houses
3	Listen the news on TV and radio and do not follow the gossip
4	Pay attention to warning signs to be issued
5	Go to open spaces or yard

Disaster Dangers and Resources

Group 1

	Disaster Dangers		Disaster Resources
1	Ornamental objects (flower vase, paintings	1	Columns
2	Shelves, cabinets	2	Tables
3	Ceiling lamps, fans	3	Narrow corridors
4	Wall clock	4	Door frames
5	Black board, white board	5	First aid kits
6	Electricity cables		
7	Gas valves		
8	Water pipes		
9	Lift		
10	Kitchen		
11	Stove		
12	Patio		
13	Cooler ducts		
14	Ventilation fans		

Group 2

	Disaster Danger		Disaster Resources
1	Mirrors and glasses	1	Columns in the hall
2	Ceiling lights, fans	2	Fire extinguishers
3	Shelves	3	First aid kit
4	Picture frames	4	Open spaces
5	Vases	5	Door frames
6	Gas capsules	6	Water
7	Aquariums	7	Canned food and preserved food
8	TV and audio instruments	8	Whistles
9	Baloconies	9	Flash lights
10	Speakers		
11	Oxygen capsules		
12	White board		
13	Gas pipes		
14	Electrictiy lines		

Group 3

	Disaster Danger		Disaster Resources
1	Gas pipes	1	Alarms
2	Heavy pictures on the wall	2	Door frames
3	Window glasses	3	Water tanks
4	Water pipes	4	Loud speakers

Group 4

	Disaster Danger		Disaster Resources
1	Gas pipes	1	Whistle
2	Ceiling lights	2	Narrow stairs
3	Picture frames	3	Fire extinguishers
4	Window glasses	4	Drinking water
5	Heavy closet, shelves	5	Radio
6	Refrigerators	6	Preserved food
7	Electricity wires and cables	7	Flash light
8	Vases	8	Mobile phones
		9	Door frames
		10	Colums
		11	Tables
		12	First aid kit
		13	Clinic

Results of the Checking in the Center

Group 1

1	Going under the tables
2	Standing under the door frames
3	Putting a blanket over fire to extinguish fire
4	Standing in the corners or near internal walls, near columns, narrow corridors
5	Putting hands over the heads to protect oneselves from doppings items
6	Away from falling objects and fragile things such as ceiling fans and lights, glasses
7	Away from kitchen
8	Going to open spaces
9	Away from high shelves, electricity lines

Group 2

1	Keeping cool
2	Going to open spaces
3	Everything should be fixed at its place and repair the dangerous places for earthquake
4	This center is full of unsafe glass partitions so takew them away, not stand near the glasses
5	Locate the storage in a proper place
6	Help each other and assist those who cannot escape
7	Don't take the earthquake as a joke
8	Emergency sack whould be prepared
9	Use fire extinguishers if fire occurs after earthquake
10	A lot of bare wires hanging in the center should be gatherd and covered
11	Need first aid technique
12	Prepare canned food, mineral water and flash light, identification card, bank documents
13	Not stand under ceiling fans, lights, water pipes, high shelves, windows and other hanging things
14	Not get on lifts in earthquake

Group 3

1	Keep cool, try not be panicked
2	Identify disaster resources and dangers in advance and avoid dangers
3	Strengthening buildings, checking the resistance before purchasing houses
4	Going under tables and safe places
5	Identifying own living area, houses and communities for disaster management
6	Prepare canned food, mineral water and flash light , clothes and first aid kit, identification card
7	Share the information with others
8	Prepare the plan for emergency (where to go/ not to go, what to do/not to do)
9	Fix falling objects and repair broken and dangerous items
10	Prepare disaster map of house and neighborhood
11	Listen to alarms and information from TV and radio for preparedness and emergency management

Group 4

1	Having strong buildings for earthquake (retrofitting and reconstruction)
2	Prepare first aid kit, food, water, blanket, clothes, identification card, bank documents
3	Collecting information of earthquake and learn
4	Listening radio and watching TV for appropriate information
5	Knowing the neighbors and help each other
6	Knowing the own buildings and identifying the safe places
7	Not standing, sleeping near the glasses, shelves, closets and lights
8	At least one member of the family should be trained and transfer technique to other members
9	Keeping cool

Appendix 3-6

Program of Workshop (7) for Basij on Disaster Management

Target Groups: Members of Basij
65 members as a whole to be divided into 4 groups

Date: 16 June 2004 (Wednesday)

Place: NGO Center in District 6

Objectives:

(1) To increase awareness for disaster prevention and management among the members, and their communities
(2) To improve the approaches to play a role of leading the community in disaster preparedness and management
(1) To start to exchange and disseminate the concept and activities of disaster preparedness and management among the Basij members and the communities in Tehran

Program:

8:00 Registration
8:30 Reading Holly Koran/Opening Remarks
8:40 Explanation of the Program
9:00 Video Show (Simulation of Earthquake in Tokyo and Recapturing of Kobe)
9:15 Grouping and Preparation of the Disaster Map in the area: "What are the disaster danger and resources in the area?" and the Community Watching
12:00 Lunch
13:00 Continue Preparation of the Disaster Map, Disaster Imagination Game (DIG) and Group Discussion: "What should you do if an earthquake hits Tehran now?"
14:30 Presentation of the Group Results
15:30 Closing

List of Participants of Workshop (7) for Basij

Group 1

No.	Sex	Organization	Title
1	M	Municipality District 8	
2	M	Municipality District 6	
3	M	Municipality District 4	
4	M	Municipality District 2	
5	M	Municipality District 1	
6	M	Municipality District 3	
7	M	Cultural and Art Organization	
8	M	Basij Center in Tehran Municipality	
9	M		
10	F	Municipality District 17	
11	F	Municipality District 17	
12	F		
13	F		
14	F		
15	F		
16	F		

Group 2

No.	M	Municipality District 11	Basij Commander
1	M	Municipality District 14	Basij Commander
2	M	Municipality District 15	Suppliers
3	M	Municipality District 19	Basij Commander
4	M	Municipality District 6	Head of Planning Section
5	M	Municipality of Tehran (Center)	Public Relations
6	M		
7	M		
8	M		
9	M		
10	M		
11	M		
12	M		
13	F	Tehran Pakrs and Green Spaced Organization	Secretary of Financial Administrative Affiars Deputy
14	F	Municipality District 2	
15	F	Behesht-Zahra Organization	Administrative staff
16	F	Municipality District 3	Manager of Rehabilitation Group
17	F	Municipality District 3	Mayor Consultant in Custom Depository Affairs
18	F	Municipality of Tehran (Center)	

Group 3

1	M	Municipality Distrrct 13	
2	M	Municipality Distrrct 12	
3	M	Municipality District 20	
4	M	Engineering Organization	
5	M	Terminals Organization	
6	F	Municipality District 6	
7	F	Deputy of Urban Planning	
8	F	Behesht-Zahra Organization	
9	F	Welfare General Office	
10	F		

Group 4

1	M	Motor Services	Basij Commander
2	M	Welfare General Office	Basij Head
3	M	Traffic Organization	Basij Commander
4	M	Municipalty of Tehcan (Center)	Basij Commander
5	M	Municipalty District 14	Member of Basij Central Council
6	M	Municipality District 15	Head of Public Relations
7	M	Municipality District 10	Social Consultant of District Mayor
8	M	Municipality District 10	Member of Basij Central Council
9	M	Tehran Parks and Green Spaces Organization	Basij Commander
10	M	Municipality of Tehran (Center)	Central Council
11	M	Motor Services	
12	M	Municipality of Tehran (Center)	Administrative Staff
13	F	Municipality District 16	Public Relation Staff
14	F	Municipality District 6	Public Relation Staff
15	F	Municipality District 19	Urban Planning Staff
16	F	Municipality District 1	Head of Women Basij
17	F	Public Particpation Center of District 6	Head of Public Relations

Total: 61 persons (39 men and 23 women)

Disaster Dangers and Resources (Workshop of Basij)

Group 1

	Dangers		Resources
1	High, old buildings	1	Open space, parks
2	Gas pipes	2	Pooled water
3	Water pipes	3	Police station
4	Electricity cables, posts	4	Wide road
5	Dead-end and narrow alleys	5	Automatic electricity disconnectionsystem
6	Road blokage by construction goods, wastes, parked cars	6	Clinic
7	Sewage		
8	Gas stations		
9	Fuel tanks		
10	Paint and chemical substitute factory		
11	Broken glasses, windows of buildings		

Group 2

	Danger		Resources
1	Balconies	1	Doorframes
2	Signboards of shops and offices	2	Open spaces, parks
3	Electricity distribution boxes, wires and poles	3	Water tanks
4	Moving cars	4	Strong tables
5	Old and high buildings in narrow streets		
6	Buildings under construction		
7	Glasses and stones façade		
8	Stairs		
9	Cooler system in roof		
10	Fuel tanks		
11	Gas pipes		
12	Narrow alleys		
13	Pedestrian bridge		

Group 3

	Dangers		Resources
1	Gas pipes	1	Parks
2	High and old buildings	2	Food stuff, drinking water
3	Electricity poles	3	First aid kit
4	Sewage	4	Clinic
5	Glasses and windows	5	Fire extinguishers
6	Water pipes		
7	Narrow roads		
8	Undergraound wells and canals		

Group 4

	Dangers		Resources
1	High and old buildings	1	First aid kit
2	Glasses and windows	2	Open space and parks
3	Electricity posts	3	Hydrant
4	Gas valves and pipelines	4	Water pool
5	Pedestrian bridges		
6	Biullboards		
7	Undergraound wells and canals		
8	Water and sewage pipes		

Roles of Basij (Workshop of Basij)

Group 1

1	Determining dangers and resources in general and becoming familiar with them
2	Transfering information and techniqes learnt in the workshop to colleagues, families, friends, relatives, neighbors, etc.
3	Knowing how to help the people
4	Identifying the living area and community
5	Preparing disaster maps
6	Cooperating among the people and authorities for disaster mitigation
7	Fixing, repairing and removing dangerous objects
8	Equipping with rescue team in the Basij building
9	Preparing the necessary base for teaching, training on disaster for the public

Group 2

1	Teaching the other people, colleagues and families
2	Getting more information on earthquake and skills
3	Identifying the living area and community
4	Identifying dangers and resources in general

Group 3

1	Determining dangers and resources in general
2	Identifying the neighboring communities well
3	Preparing disaster maps

Group 4

1	Preparing the plan and programs for emergency and trying to implement them
2	Teaching disaster related knowledge and techniques colleagues, neighbors and families
3	Getting familiar with dangers and resources
4	Increasing information on earthquake and damages
5	Identifying the living community
6	Preparing disaster maps
7	Cooperating among the people and authorities for disaster mitigation

Result of DIG (Disaster Information Game)
1/5

Q1: What will happen around you here?

Group 1

1. Fires break out
2. High and old building collapsed
3. Glasses and windows break and fall down
4. Attached objects to the facades fall down
5. Roads are blocked by vehicles and debris
6. Electricity posts fall down and cause fire
7. Water and sewage flow on the strees
8. Water pipes break
9. Canals and water ways are damaged

Group 2

1. Glasses and window frames break
2.Lights fall down
3. Fires break out
4. Walls crack
5. Boards fall down
6. Ceilings collapse and fall down
7. Gas pipes break
8. Ground cracks
9. Electricity is disconnected
10. Tables and chairs move
11. Air conditioners fall down
12. Cars crash
13. Stairs fall down
14. Gas stations and tanks explode

Group 3

1. Fires break out
2. Electricty, water and gas lines are disconnected
3. Glasses break
4. Many people are injured
5. Gas pipes explode
6. Roads are blocked
7. Roads crack and split
8. Coolers and roofs fall down

Group 4

1. Tables, chairs and other furnitures shake and move
2. Electricity posts fall down
3. Buildings collapse
4. Gas pipes break
5. Air is full of dust and bad smell
6. Frames and pictures fall down
7. Facades fall down
8. Ceiling lights fall down
9. Many people are injured
10. Exit doors are blocked
11. Coolers fall down

Result of DIG (Disaster Information Game)

2/5

Q2: What will you do during the shake?

Group 1

1. Asking God and Imam for help
2. Keeping cool
3. Going to safe place, parks
4. Going under tables and door frames
5. Not moving at that moment
6. Helping the injured and weaks
7. Standing beside the columns, in the room corners
8. Disconnecting gas, water and electricity
9. Soothing other people
10. Covering head by hands
11. Announcing dangerous conditions by loud speakers

Group 2

1. Rescuing and reliefing the injured
2. Standing near the exit door
3. Trying to keep cool
4. Asking God and Imam for help
5. Trying to find safe places
6. Identifying the conditions

Group 3

1. Disconnecting gas, water and electricity
2. Keeping cool
3. Going under table, standing on the doorframes
4. Evacuating of the building quickly
5. Going to the yard and open space, parks
6. Keeping hand over the head

Group 4

1. Asking God for help
2. Soothing other people
3. Rushing to the yard
4. Running out to see what happened

Result of DIG (Disaster Information Game)

3/5

Q3: What will you do after the shake stops?

Group 1

1. Helping people and families
2. Going back home
3. Leading the injured
4. Tranquilizing the colleagues and taking them to open space
5. Asking police for help
6. Identifying proper safe place for accommodation
7. Asking the specialized people for cooperation

Group 2

1. Getting away from the building
2. Trying to know the families and relatives
3. Going to open spaces quickly
4. Trying to find the way to get out
5. Thanking God
6. Helping rescue teams for saving the injured
7. Trying to disconnect gas, water ad electricity
8. Preparing Basij team for rescue
9. Trying to help for opening the blocked roads

Group 3

1. Disconnecting water, gas and electricity
2. Keeping cool and trying to help and rescuing the others
3. Going out and to safe place
4. Triying to contact the emergency and rescue centers
5. Trying to find safe places
6. Providing food

Group 4

1. Getting information about earthquake
2. Soothing people
3. Praying God
4. Looking for the family
5. Rushing to the yard
6. Running out to see what has happened

Result of DIG (Disaster Information Game)
4/5

Q4: How do you lead the people outside to the evacuation place?

Group 1

1. By using loudspeakers of the mosque and the center
2. By placards
3. Standing on the way and leading the people
4. Shouting to lead the safe place
5. Using telephone, evacuation information is spread
6. Using motorbikes to inform the people
7. Informing one by one on foot

Group 2

1. Using whistles
2. Making a group of Basij to lead people
3. Installing a board showing the safe place

Group 3

1. Soothing people first
2. Cooperating with rescue teams

Group 4

1. By using loud speakers of the mosques and the center
2. Guiding each other
3. Shouting to show the way to the park
4. Using motorbikes to inform the people
5. Informing one by one on foot

Q5: How will you communicate with your family and confirm their safety?

Group 1

1. Already decided where to go and what to do (go to corridors, go to the nearest park, hospital, apark, parents' house, etc.)

Group 2

1. Trying contact with telephones, Internet
2. Going back home

Group 3

1. Trying to contact with close relatives, friends to confirm their safety
2. Trying to go back home
3. Enquiring relief forces, police and Basij forces

Group 4

1. Trying to contact by telephone because their staying places are clear
2. Trying to go back home

Result of DIG (Disaster Information Game)
5/5

Q6: How will you spend the night?

Group 1

1. Leaving town
2. Spending outside in park, in tent
3. Helping the injured
4. Helping the rescue teams

Group 2

1. Finding safe places for family and continuing rescue the people
2. Spending in open space
3. Taking necessary objects from home and going safe place
4. Trying to help the people

Group 3

1. Asking God for mercy
2. Soothing other people
3. Keeping cool and staying in safe place
4. Trying to provide with basic facilities for others

Group 4

1. Helping the injured, neighbors
2. Collecting food
3. Spending in park
4. Getting prepared for facing the after-shokcs
5. Wating for the help of rescue team
6. While receiving news by any means, trying to join rescue teams

4 INSTITUTION AND FINANCE

4. INSTITUTION AND FINANCE

4.1 Introduction

This Sector Report presents a description and analysis of the prevailing regulatory frameworks as well as the disaster organization and management systems that govern disaster management in the Tehran Municipality, status as of first half of 2004. The point-of-view adopted is that of system analysis. The projects relevant to the disaster organization and management system that are recommended for implementation over the period 2004 to 2015 are to a large extent based on the analytical results summarized in here.

The Islamic Republic of Iran (I.R.I.) is a disaster-prone country affected regularly by earthquakes, floods and other natural calamities that cause significant loss in lives and considerable damage to private and public sector property, including national sites and monuments of important historical value.[1] In fact, Iran regularly experiences light to medium-strong earthquakes all over the country and major earthquakes have occurred in the last decade or so in Manjil, Quazvin and recently in Bam in December 2003.

The area that is now occupied by the capital city of Tehran has experienced its last disastrous earthquake in 1830 and seismologists expect, based on historical seismic data, that a major earthquake could occur in the Greater Tehran Area (GTA) in the foreseeable future. Tehran accounts presently for roughly 11% of the total population[2] and about 30% of total GDP. The seriousness of the economic, social and political consequences resulting from a major disastrous earthquake occurring in Tehran can be imagined[3] by translating the scale of damage that occurred in Bam into the Tehran context.

Since the early 90s, the Government of Iran (GOI) has become increasingly aware of the need to establish a suitable and adequate disaster management system in Iran and the GOI has, with the assistance of the international donor community, realized important planning projects and it has implemented various regulatory measures toward achieving that end. The milestones in this process are:

- Formulation of the "Integrated National Disaster Management Plan" (INDPM), which was prepared in cooperation with the United Nations Development Program (UNDP). The project has been under implementation since the early 90s and is currently subject to a UNDP internal evaluation exercise.[4]

[1]) The December 26, 2003 Bam earthquake, for example, destroyed the world's oldest brick structure, the Arg-e Bam citadel.
[2]) The 1996/97 FY (1375 Iranian year) counted a total Iranian population of around 60.05 million. The total population for Tehran Province is quoted by the statistical yearbook for FY 2000/2001 as approximately 11.17 million people. It is not clear whether the number of Tehran inhabitants is correct, due to a possible high margin of "illegal" residents.
[3]) Calculation for numerical values of the risk assessment were carried out under this project.
[4]) This project has resulted in significant progress in the area of disaster management and considerable documentation. In Farsi alone, there are over thirty documents that deal with all aspects of disaster management. In English there are some seven summary documents accounting

- Preparation of a microzoning study for Tehran proper. The sponsor of this project was Japan International Cooperation Agency (JICA), and the project was implemented over the period 1999 to 2000.
- The JICA-sponsored microzoning study is followed-up with the on-going JICA-sponsored "The Comprehensive Master Plan Study on Urban Seismic Disaster Prevention and Management for the Greater Tehran Area in the Islamic Republic of Iran". The emphasis of this project, which is to be completed in the second half of 2004, is to assist the Iranian authorities in the formulation and adoption of a comprehensive disaster management plan for Tehran Municipality.

The above planning efforts are complemented by significant developments that have materialized over the recent past. These developments encompass:

- The approval by the Council of Ministers on April 6, 2003 of a Decree covering the national level "Rescue & Relief Comprehensive Plan (RRCP)". Because of its far-reaching implications for both national and Tehran level disaster management systems and organization.
- The formal establishment in April 2003 of the "Tehran Disaster Mitigation and Management Center" (TDMMC)[5] by merging the former non-formal institutions of CEST and CEMS.
- The establishment by Tehran's City Council of a Commission of the Council that addresses, *inter alia*, urban safety and disaster management related issues. The formal title of the Commission is "Urban Technical Construction and Architecture Commission".
- The approval by the World Bank (WB) on February 27, 2003 of an "Earthquake Emergency Response Project" roughly in the order of magnitude of US dollars 180 million, including Government Counterpart Contribution.[6] The WB project covers the four provinces of Khorasan, Khoozestan, Hamedan and Tehran. The WB project comprises three main components, namely (i) local community development, (ii) support to vulnerable groups and pilot initiatives, and (iii) provincial and local-level institution building, monitoring, evaluation and learning.
- The recent decision of the "State Exigency Council (SEC)", which is headed by the former President Mr. Rafsanjani, on the implementation of "Basic Policies for Disaster Mitigation and Prevention". This policy guidance emphasizes the importance of adopting proper mitigation and preparedness measures.

The narrative of the presentation in the Sector Report is tailored in such a manner that the Sector Report can be read on a stand-alone-basis, i.e. without in-depth knowledge of any other project documentation. The report begins in section 4.2 with a presentation of the major elements of the overall regulatory frameworks at national and Tehran Municipality levels. Section 4.3 introduces the "disaster management system", its major features, elements and organizational entities, their mandates and functions and their interrelationships in terms of levels of authority and hierarchical structure. The picture of the "prevailing situation" is then enhanced in section 4.4 by a brief cross-country analysis. This is done with a view to

for over nine hundred pages.

[5]) TDMMC was formally established by integrating the former CEST and CEMS organizational entities by a Decree of the Mayor of Tehran.

[6] Details about this WB loan project are given later in this report.

determine any “lesson-learned” that may be applied to the disaster management system in Tehran. Section 4.5 scrutinizes the disaster management system in place so far from a “system analyses” point-of-view for system-inherent inconsistency, organizational and functional constraints and obstacles.

Section 4.6 recommends, based on the results of the above analytical steps, a priority project for strengthening the Tehran disaster management system and it introduces the priority project’s brief outline. Section 4.7 finally lists measures that should be reflected in an Action and/or Implementation Program that would strengthen the disaster management system as a whole with a view to upgrade capacity, capability and efficiency of the system for coping with a major disaster that is predicted for the Greater Tehran Area.

Data and documents that are vital for supporting the findings, conclusions and recommendations contained in this Sector Report are attached in various Appendices. Material that has been presented and discussed in depth in previous reports may not be repeated here, in order to keep the overall volume of the Sector Report within a reasonable range. Whenever necessary for understanding the line-of-argumentation, reference is made in footnotes to relevant previous reports, documents and data.

4.2 Main Features of The Regulatory Framework – The Prevailing Laws, Decrees and Regulations

4.2.1 General Overview

The legal and administrative foundations, including the prevailing policy directions, for the regulatory frameworks governing at national and Tehran Municipality levels, the disaster management system as a whole, including the system’s major features, components, functions and procedures, are codified in few legal, policy and/or administrative documents as listed in Table 4.2.1.

Table 4.2.1 The Regulatory Framework - Policy Directions & Executive Orders

Regulatory Framework	Primary Function & Level of Relevance	Fundamental Character
The 1979/1989 Constitution	Governs the basic principles and establishes the responsibilities of the Government	Fundamental Legal Basis
"Law of Foundation of National Committee for Mitigation of Natural Disaster Effects"(NCNDR)	The documentation available contains the text of the law as well as a cover letter signed by the then President. The law establishes the Committee and relevant sub-committees.	Law & Executive Regulation
Council of Minister's Decree (s)	Of concern here mainly: The decision of April 06th, 2003 approving the "Rescue & Relief Comprehensice Plan". The plan stipulates the basic disaster management system structure and major functions of the systems.	Policy Direction & Executive Order
Decisions of the "State Exigency Council - SEC"	This entity has provided guidelines in its early 2004 decision "Basic Policies for Disaster Mitigation and Prevention"	Policy Direction & Executive Order
Decree of the Major of Tehran	Of concern here mainly: The decree of early 2003 that regulates the establishment and functions of TDMMC	Executive Order
Resolution by Disaster Related Committee(s)	Of concern here mainly are the resolutions of those of the "National Disaster Task Force - NDTF"	Planning Guideline

Note: Reference to the relevant texts is made in the main text of the Sector Report.

Source: JICA Study Team compilation.

The national and Tehran levels disaster management systems including organizational set-up and mandate are tailored around four principal functions (see Table 4.2.2), namely (i) mitigation, (ii) preparedness, (iii) emergency response (ER), and (iv) reconstruction & rehabilitation (R&R). The system is also clearly mandated at both national and Tehran Municipality levels to address, in principle, most potential types of disasters. A general typology of disaster types as identified by World Bank research is presented in Table 4.2.3.

It is necessary, in order to grasp the disaster management system at national, provincial and municipality levels, to briefly introduce and discuss the essential reference points as contained in the Constitution, the Law that establishes the National Committee and two more executive orders.

Table 4.2.2 Principal Functions of the Disaster Management System in I.R.I.

Disaster Mitigation	Disaster Preparedness	Emergency Response	Reconstruction and Rehabilitation
Is defined as "Being the aggregate operations which shall be carriet out prior to, at the time of, and after occurrence of crisis with the objective of preventing or mitigating the adverse effects of crisis."	Is defined as "Being the aggregate operations which shall result in enhancement of the social abilities of the government and the people in carrying out the various phases of crisis management. Preparedness shall include collectionof data and information, research activities, planning, creation of management structures, education, supply of resources, exercise, drills, and comprise public and expert training through civil foundations, industries and vocations, mass media and radio	Is defined as "… the supply of urgent services after occurence of crisis with the objective of salvation of the lives and property of the people and creation of relative welfare for them and preventing expansion of damamges. ER includes rescue operations, supply of hygiene, treatment, creation of security, transportation, communication, burial of the dead, solid waste removal, sewage control, fire control, hazardous material control, supply of fuel, supply of	Is defined as "… the restoration of conditions in an effected and damamged area, after the occurrence of crisis, back to normal with due consideration of the characteristics of sustained development and all safety standards."

Note: The definitions are based on an unofficial translation of Article 2 of the "Rescue & Relief Comprhensive Plan", adopetd in April 2003 by Council of Ministers' decision.
Source: JICA Study Team.

Table 4.2.3 World Bank - General Typology of Disasters

Water Related Events	Geology Related Events	Other Events
WRE 1: Winds	GRE 1: Eartquakes	OE 1: Pest Infections
WRE 2: Storms	GRE 2: Volcano Eruptions	OE 2: Industrial Accidents
WRE 3: Floods	GRE 3: Landslides	OE 3: Epidemics (Infectious Diseases)
WRE 4: Droughts		
WRE 5: Forest Fires		OE 4: Human Conflict

Source: Roy Gilbert/Alcira Kreimer: "Learning from the World Bank's Experience of Natural Disaster Related Assistance"; The World Bank; Urban Development Division; Washington D.C.; 1999; p. 6

4.2.2 The National Level Regulatory Framework & Laws

1) "Constitution" and "National Committee Law"

The 1979 Constitution of the Islamic Republic of Iran (I.R.I.), effective since December 3, 1979 and amended on July 28, 1989, contains two articles indirectly relevant to disaster management. "Article 29 [Welfare Rights]"[7] and "Article 31 [Housing]"[8] implicitly refer to the Government's responsibility for providing assistance to Iran's population in coping with disaster related effects, though the term "disaster" is not explicitly referred to in the Constitution. The Islamic Consultative Assembly or Majlis approved on July 31, 1991, as a first step toward the establishment of a comprehensive disaster management system, a law titled "The Law of Foundation of National Committee for Mitigation of Natural Disaster

[7]) The article reads according to a 1992 translation by the Iranian Embassy in London as follows: "(1) To benefit from social security with respect to retirement, unemployment, old age, disability, absence of a guardian, and benefits relating to being stranded, accidents, health services, and medical care and treatment, provided through insurance or other means, is accepted as a universal right. (2) The government must provide the foregoing services and financial support for every individual citizen by drawing, in accordance with the law, on the national revenues and funds obtained through public contributions."
[8] The article reads according to a 1992 translation by the Iranian Embassy in London as follows: "It is the right of every Iranian individual and family to possess housing commensurate with his needs. The government must make land available for the implementation of this article, according to priority to those whose need is greatest, in particular the rural population and the workers."

Effects".[9] This proposed law in turn was certified on August 7, 1991 by the Council of Guardians[10] and signed into binding law by the President of I.R.I. on August 13, 2002.

This law, which was complemented in 2003 by a Decree of the Council of Ministers', establishes the fundamentals of Iran's disaster management system in the following manner:

- The law establishes the Ministry of the Interior (MOI) as the supervisory body for disaster management related entities and activities.
- It explicitly identifies the following disasters that need to be addressed, namely: storm, flood, drought, cold stroke, botanic pests, air pollution, earthquake and land slides, and reflux of seas, lakes and rivers.
- It identifies 14 individual line ministries, government entities and NGOs as the principal entities in disaster management and it delegates the authority to include and/or call on the assistance of any other entity to the Head of the National Committee (the Minister of the Interior).
- It passes the authority to establish the required sub-committees to the National Committee and it empowers this Committee to announce any emergency situation.
- It delegates the authority to the National Committee to approve the budget (credit) needed by the above entities for the realization of their responsibilities.
- It charges the Ministry of the Interior to issue the necessary instructions for the establishment of provincial level committees to be under the supervision of the governor of each province.
- It charges the Ministry of the Interior to inform all Islamic Consultative Assembly Commissions of the results of the activities of all involved entities at a six months cycle.

Execution of the above law is further detailed by the April 12, 2003 Council of Ministers' decision, which comprises 14 individual articles and one attachment that deals with the individual duties of the Sub-committee for risk assessment. Article 1 of this Council of Ministers' Decree identifies the core-function(s) for nine specialized Sub-committees established by the Decree as summarized in Table 4.2.4.

Article 2 to Article 14 regulate general meeting schedules, administrative matters and some procedural issues. Two Articles, however, should be highlighted. Article 10 defines the duties of the nine Sub-Committees thus:

"The overall and general duties of subcommittees are implementation of studies and research to provide resolutions that intend to prevent the natural incidents happening or that mitigate their effects. The details of duties of subcommittees will be prepared by the members of the relevant committee and will be approved by the National Committee for Mitigation of Natural Disaster Effects."

[9]) The JICA Study Team translated the formal title of this law into English, though it is not an official translation.
[10] Please consult Section 3.2.4 of Progress Report (1) about the mandate and functions of the Guardian Council and the legislative process in I.R.I. .

Article 4 defines the decision mechanism of the Sub-Committees, i.e. a quorum is established through the attendance of two-thirds of its members and a decision is valid and effective as approved, if a quorum has been established and a majority vote in favor of the motion.

The detailed responsibilities of the Sub-Committee that is responsible for risk assessment (earthquakes and landslides) comprises 12 paragraphs. It suffices in this context to highlight the gist of the responsibilities of this national-level Sub-Committee, though the exact meaning of some elaborations is not always completely clear.[11] The Sub-Committee is responsible for studies, research and educational plans in risk estimation; the creation of an alarm and early-warning system, the preparation of relevant laws, regulations, criteria and standards, coordination with the province-level Sub-Committees, educational and training programs, the holding of scientific, educational and research seminars and, finally, for proposing the annual planning and budget for research and studies to be conducted under the guidance of the various Sub-Committees.

[11]) For example, when the text uses terms such as “holding” or “preparing”, it is not clear whether this means in a supervisory capacity or to be implemented by the committee itself (which appears to be somewhat unlikely).

Table 4.2.4 Core Functions of Nine National Level Disaster Sub-Committees

Core Functions of Sub-committee	Members & Operational Direction(s)
Risk Assessment for Earthquake and Landslides	Responsible entity: Ministry of Housing and Urban Development Sub-Committee Members: the committee has twelve (12) members, overwhelmingly ministerial and non-ministerial level entities. Tehran Municipality is a member.
Pest, Botanic Disease & Frost-bite Control	Responsible entity: Ministry of Agriculture Jihad Sub-Committee Members: the committee has ten (10) ministerial and non-ministerial level entities.
Restoraution of Pastures & Drought Mitigation	Responsible entity: Is the Affiliate to the Ministry of Agriculture Jihad: Construction Crusade (this organization is now merged into the Ministry) Sub-Committee Members: there are eight (8) ministerial and non-ministerial member organizations.
Flood, sea-flux, reflux, and river overflow mitigation	Responsible entity: Ministry of Energy Sub-Committee Members: the committee has eleven (11) ministerial and non-ministerial level entities.
Air Pollution Control Measures	Responsible entity: Environment Protection Organization; Office of the President Sub-Committee Members: the committee has fourteen (14) ministerial and non-ministerial level entities. Tehran Minicipality is a member.
Mitigation of Storm risks	Responsible entity: Meteorology Organization Sub-Committee Members: the committee has seven (7) ministerial and non-ministerial level entities. Tehran Minicipality is a member.
Relief & Rescue Operations	Responsible entity: Red Crescent Society (RCS) (under the Ministry of Health & Medical Education Sub-Committee Members: the committee has nine (9) ministerial and non-ministerial level
Loss & Damage Compensation	Responsible entity: Management & Planning Organization (MPO); Office of the President Sub-Committee Members: the committee has nine (9) ministerial and non-ministerial level entities.
Health & Treatment	Responsible entity: Ministry of Health, Treatment and Medical Education Sub-Committee Members: the committee has seven (7) ministerial and non-ministerial level entities.

Note: Some of the entities identified above, such as the previous Ministry of Construction Crusade, have been merged with other government entities. Hence, titles for the presently prevailing system may not in all cases be identical.

Source: JICA Study Team compilation based on an unofficial translation of the Farsi document.

2) April 2003 Council of Ministers' Decree – Adopting the "RRCP"

The Government of Iran (GOI) in a further step approved and put into force by Council of Ministers' Decree dated April 12, 2003 the national level "Rescue & Relief Comprehensive Plan" (hereinafter referred to as "RRCP"),[12] which is a legally fully binding executive order. The RRCP is a lengthy and rather comprehensive document comprising 57 individual articles, the essence of which needs to be understood, because of its far-reaching implications for the disaster organization and management system and sub-systems at various Government levels, i.e. national, provincial and township level. The most important normative and regulatory issues addressed in the RRCP are:

- Article 1 of the RRCP defines what constitutes a "crisis", a "national crisis", "crisis management", "risk management", and "rescue & relief".

[12]) The discussion of the RRCP is based on the text of an unofficial English translation prepared by a Tehran law firm.

- Article 2 defines the four core areas of disaster management, namely "mitigation", "preparedness", "emergency response", and "reconstruction & rehabilitation".[13] In other words, it appears that though the title of the Decree refers to rescue & relief, the RRCP is to cover all four disaster management fields.
- The overall objective of the RRCP as defined in Article 3 is to establish the *"… exact role and duties of all administrative organizations"*.
- Article 4 establishes the six fundamental functions of the plan as identified in Table 4.2.5.

Table 4.2.5 Core Functions of the RRCP

Core Function	Descriptions
1	To realize scientific study and research that transfers modern and advanced disaster management methods from inside and outside of the Islamic Republic of Iran (I.R.I.) to the administrative system
2	To implement national and district level plans and investment with priority attached to prevention and mitigation
3	To provide a unified management and to outline the duties and responsibilities of all executive branch organizations
4	To attract people's participation and to organize and train volunteer forces of a disaster management network
5	To ensure efficient utilization of government and non-government resources
6	To ensure the required support of line ministries, other organizations and the Armed Forces, in particualr the "Resistance Mobilization Force"

Note: Based on Article 4 of the April 06th, 2003 RRCP.

Source: JICA Study Team compilation based on an unofficial translation of the oroginal Farsi document.

- Article 2 to Article 4 promulgate a nation-wide disaster organization and management structure comprising three tiers, namely national level, provincial level and township level.
- In addition, the RRCP requires the establishment of national and provincial level preparation committees, as well as the formation of an operational expert sub-committee, a risk prevention & management sub-committee and a training expert sub-committee. Specific responsibilities and tasks are assigned to all the above entities.
- Specific tasks are also assigned to the Ministry of Education and Training, the Ministry of Science, Research and Technology, the Ministry of Islamic Culture and Guidance, I.R.I.B., the Ministry of Labor and Social Affairs, the Police and Mobilization Forces and the Welfare Organization.

Section 4.5 of the RRCP, in addition to the mainly organizational and management related issues identified above, which is titled "Other Rules", contains essential decisions with respect to financing, cash flow, remuneration levels, insurance and the establishment of individual "Disaster Management Groups" at various public and private sector levels. These stipulations have fundamental disaster management related consequences. They are, therefore, listed here without elaborating:

[13]) The definitions of the RRCP are used in Table 4.1.2.

- Article 46 of the RRCP regulates the authority and control of financial matters. It stipulates that financial resources originating from non-governmental organizations in- and outside of the country fall under the jurisdiction and management of the Red Crescent Society, while the authority on governmental financial resources from in- and outside of the country fall under the jurisdiction and management of the Secretariat of the "Task Force Organization (national level)." The article prohibits explicitly any interference by any other "legal or real entity" into the financial matters as defined by the RRCP.
- Article 47 identifies the Management and Planning Organization (MPO)[14] as the responsible entity for preparing within the national budget the budgetary allocations needed for the realization of measures that address all four stages of disaster management as defined earlier in Article 2 of the RRCP. The article reiterates the jurisdiction and responsibility of the Secretariat of the "Task Force Organization (national level)" for ensuring that any particular budget is allocated and spent in accordance with the policies and instructions of the "Task Force Organization (national level)".
- Article 49 requires all entities of the executive branch to put the equipment and facilities under their jurisdiction at the disposal of the Head of "Provincial Task Force Organization" (i.e. the Governor) in case of an emergency.
- Article 50 stipulates that, in case of disaster, production facilities[15] have to provide the relevant organizations with their products, for which they may charge their costs later. Article 51 makes the same provisions for public and private transport organizations and Article 52 apparently refers to professionals. It is clearly stated that private transport entities and professionals will be remunerated for their services.
- Article 53 is essential, since it refers explicitly to the Tehran Comprehensive Emergency Management Plan (TCEMP) that was approved so far only by the 8th Session of the National Committee for Natural Disaster Reduction in June 2001.[16] The wording of the article does not indicate clearly whether the TCEMP is still valid, or needs confirmation and approval by Task Force Organization (national level) and/or other legislative entities, such as the Tehran City Council.
- Article 54 is essential in that it defines the criteria that govern the legally mandated need for establishing a Disaster Management Group (DMG) in both urban and rural areas. Any location and/or entity that has over 25 residents or employees receives over 25 visitors daily, exceeds six floors and any structure that has been damaged and/or causes danger for the vicinity must form a DMG. The responsibility for compliance with this article falls on the respective municipalities for urban areas and the Secretariat of the Provincial Office for rural areas.
- Article 55 stipulates that the Secretariat of the Provincial Office is to promote disaster insurance in cooperation with Iran Central Insurance and that it is the Preparatory National Committee's (PNC) responsibility to update rules & regulations pertaining to insurance matters and to adopt measures that make such rules & regulations obligatory.

[14] The Management and Planning Organization falls under the jurisdiction of the Office of the President. Please see Appendix 3 for a brief overview of the entities under the Office of the President.

[15] This may refer to state-owned and/or state-controlled entities, commonly referred to as "affiliates" of line ministries. However, the coverage of this article is not entirely clear.

[16] Cabinet ordered in January 1999 the preparation of a "Tehran Comprehensive Emergency Management Plan" (TCEMP) and the "National Committee for Natural Disaster Reduction" approved in its 6th Session in March 1999 that the plan should be prepared by the Municipality, in cooperation with MOI. A TCEMP was prepared as of May 2000 and it was approved in the 8th meeting in June 2001 of the National Committee for Natural Disaster Reduction.

- Article 56 assigns the responsibility to the Ministry of Economic Affairs & Finance to prepare a status report by 2004 that reports/indicates whether at least 50% of handicraft, residential and industrial structures as well as urban and rural constructions are under effective disaster insurance coverage. The same Ministry is to follow up on this matter by 2009. As regards agriculture and livestock, such responsibility rests with the Ministry for Agricultural Jihad.

3) Policy Direction of the Council for Determination of Exigencies

The December 2003 earthquake in Bam that killed around 60,000 people out of a population of some 100,000 has re-emphasized the clear and imminent urgency to accelerate activities relevant to disaster management. Subsequently, the State Exigency Council (SEC) issued a policy directive and executive order that addresses issues directly or indirectly relevant to disaster mitigation and prevention. Key objectives of the policy direction/executive order are:[17]

- To reduce vulnerability against earthquakes in urban and rural areas through (i) strengthening and retrofitting of buildings, lifelines, infrastructures and area redevelopment; (ii) upgrading of construction management; (iii) enforcement of all standards and codes; (iv) formulation of appropriate urban and rural development plans that take seismic risk into account; (v) standardization of materials, and (vi) preparation of the necessary laws and regulations;
- To systematize and strengthen the National Disaster Management Plan mainly through the promotion of preparedness measures;
- To expand and promote overall scientific research through the strengthening of scientific and research centers;
- To provide the necessary training and increase awareness; and
- To establish an evaluation system for national disaster management.

Except for the required evaluation system, which is a new element introduced into the disaster management system in I.R.I., the policy directive/executive order does not really refer to something that has not already been indirectly or directly covered in the so far existing regulatory frameworks, but it attaches highest political weight to the timely and adequate realization of all previous policies and measures.

4) Other Regulatory Frameworks Considerations

According to information provided by the Ministry of the Interior, total disaster related (but not only earthquake induced) damage to infrastructure over the decade 1990 to 2000 amounted to roughly US dollar 420 million.[18] It is not possible, due to lack of reliable data, to verify this estimation. However, the point that needs to be made is that technical line Ministries must also have had in the past some sort of policy guideline and administrative rules or regulations that

[17]) The complete text in unofficial English translation is attached as Appendix III.
[18]) At an exchange rate of Rial 8,350 per US$ 1.

governed the replacement of such damaged infrastructure and that enabled these line Ministries to draw upon resources from the central budget.

4.2.3 The Tehran Municipality Level Regulatory Framework

There are two principal sources for understanding the Tehran-specific regulatory framework and related organizational set-up for disaster management. The two sources are the (i) "Tehran Comprehensive Emergency Management Plan" (TCEMP) and the Tehran Mayor's Decree of May 2003 that establishes in formal terms the "Tehran Disaster Mitigation and Management Center" (TDMMC). The long history of both the TCEMP and TDMMC may not concern us here, though that history naturally has some consequences for the existing disaster management set-up at Tehran Municipality level.[19]

Though the TCEMP is, in the strict sense, a planning and not a regulatory reference document that will be introduced more in detail in section 4.3, its major features are briefly highlighted.

The Tehran Comprehensive Emergency Management Plan (TCEMP) is an emergency response plan (ERP) that organizes 24 organizations under the umbrella of 22 committees to address an emergency situation that may arise within the Tehran Municipality covering all types of disasters as defined by the TCEMP itself and other related national level disaster management policy and planning documents. This ERP is tailored around three major functions as summarized in Table 4.2.6 and its implementation is on-going as further detailed and discussed in section 4.3. TDMMC is currently the responsible entity for the ERP, fully in charge of supervising and coordinating the realization of the TCEMP.

The May 2003 Decree of the Mayor of the Tehran Municipality is a fundamental and vital document, since it establishes in formal legal and institutional terms TDMMC as the entity responsible for disaster management, including emergency response, in the Tehran Municipality and it defines the mandate and individual functions to be carried out by TDMMC.

[19]) For a more detailed presentation of that history and its implications, kindly refer to Chapter 3 in Progress Report (1).

Table 4.2.6 Tehran Municipality – TCEMP Planning Framework

Core Functon of TCEMP	Description of Individual Tasks by Sub-Committee
Core Function 1: Relief and Rescure Management	The individual planning functions are undertaken under the umbrella of four (4) sub-committees for: (a) waste & debris removal; (b) health & treatment; [c] relief & rescue; and (d) burial affairs
Core Function 2: Settlement Management	The individual planning functions are undertaken under the umbrella of nine (9) sub-committees for: (a) settlement issues; (b) gas issues; [c] fixed communications issues; (d) electricity issues; (e) water issues; (f) sewage issues; (g) mobile and satellite communications; (h) oil products & fuel supplies; (i) transportation and traffic issues
Core Function 3: Logistics Management	The individual planning functions are undertaken under the umbrella of nine (9) sub-committees for: (a) legal affairs; (b) provincial adjustment affairs; [c] safety issues & police department; (d) loss evaluation; (e) public contribution affairs; (f) information dissemination; (g) budget insurance and financial affairs; (h) fire brigade and safety services; (i) mental and social

Source: JICA Study Team compilation based on interviews with staff members of the previous CEMS institution.

The Mayor's Decree defines the center's functions in 21 individual articles and one explanatory footnote. It suffices at this place to highlight the gist, scope and depth of the implied responsibilities. An assessment of suitability and adequacy of TDMMC's mandate and functions is discussed in section 4.3.

TDMMC's functions can be grouped into three distinctly different categories that vary in terms of character, implied expertise and manpower and executive authority. The three groups are:

- Coordination functions, including supervisory authority and power over other entities of the Municipality and or national level line Ministries,
- Direct formulation and preparation functions, and
- Direct executive function, such is the case for the preparation, conduct and evaluation of drill exercises and the coordination among the 24 committees that are involved in the preparation of the individual emergency response plans.

4.3 Organizational Set-Up and Management System at National and Tehran Municipality Levels

4.3.1 The National Level Organizational Set-up and Management Approach

The national level organizational set-up and its adopted management approach required in response to the April 2003 "Rescue & Relief Comprehensive Plan" (RRCP) has broadened and deepened the organizational disaster management structure and increased the level of complexity to a significant degree. The pre-RRCP organizational set-up as depicted in Figure 4.3.1 was basically a two-tier hierarchical system at national and provincial levels, supported by policy and inter-agency coordinating task forces at both levels. The responsibility for disaster management planning and execution for all types of disasters and all four disaster

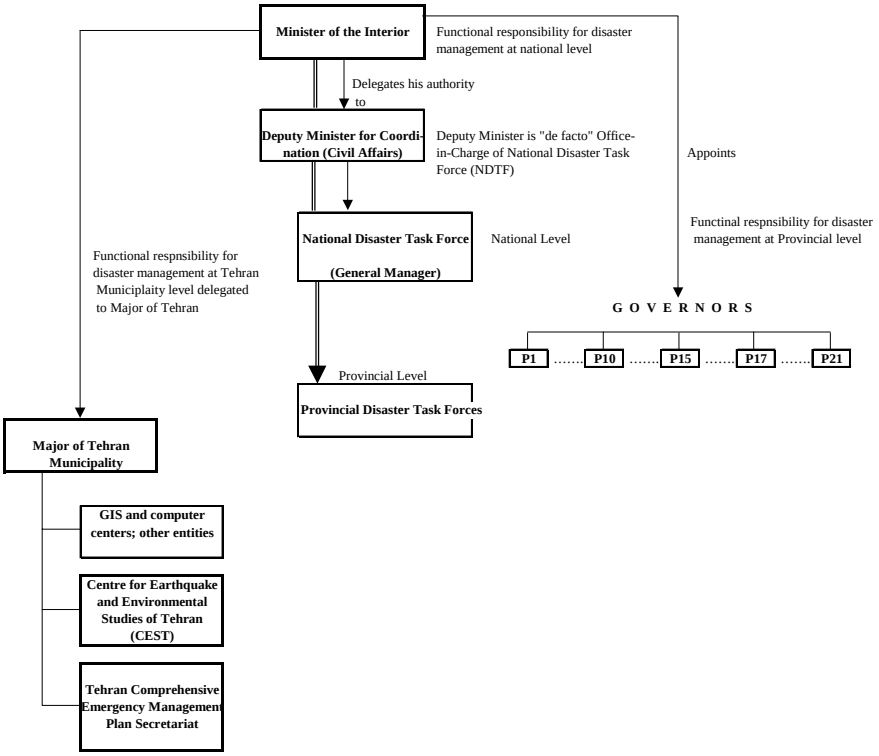
management core functions, i.e. mitigation, preparedness, emergency response and rehabilitation and reconstruction, rested with the Ministry of Interior (MOI) and the Governors of the respective provinces. Only the Tehran Municipality was an exception to the rule with the Mayor being responsible for the Tehran Municipality. The Mayor of Tehran was supported in the execution of his responsibilities by the activities of CEST and CEMS, which fell under the responsibility of a Deputy Mayor.

The revised system as depicted in Figure 4.3.2 has, as already indicated above, significantly increased the level of complexity. Major changes and alterations in the whole system configuration as compared to the previous organizational set-up are:

- The township level has been added and integrated into the formalized organizational set-up, thereby adding 299 administrative entities to the organization chart[20]. Townships have, under the prevailing system, also a Governor (*Farmandar* in Farsi as compared to *Ostandar* for a province), who is appointed by the Ministry of Interior. It must be assumed that all major functions for disaster management will be mirrored at township level, though the RRCP is not explicit on this matter.
- City and community levels are not mentioned in the RRCP. There are presently 889 entities in I.R.I. officially classified as cities. According to unconfirmed information, discussions are still on going within government circles as to whether to formally include cities into the organizational set-up as well. According to information available, this matter has not been decided yet.
- Hence, the revised system has significantly increased the need to either appoint existing administrative personnel and/or recruit new personnel at township level with a view to assign disaster management functions to them. Also, if it is furthermore decided to establish standing secretariats at township level, the necessity to either considerably train existing staff and/or recruit additional staff will multiply again.

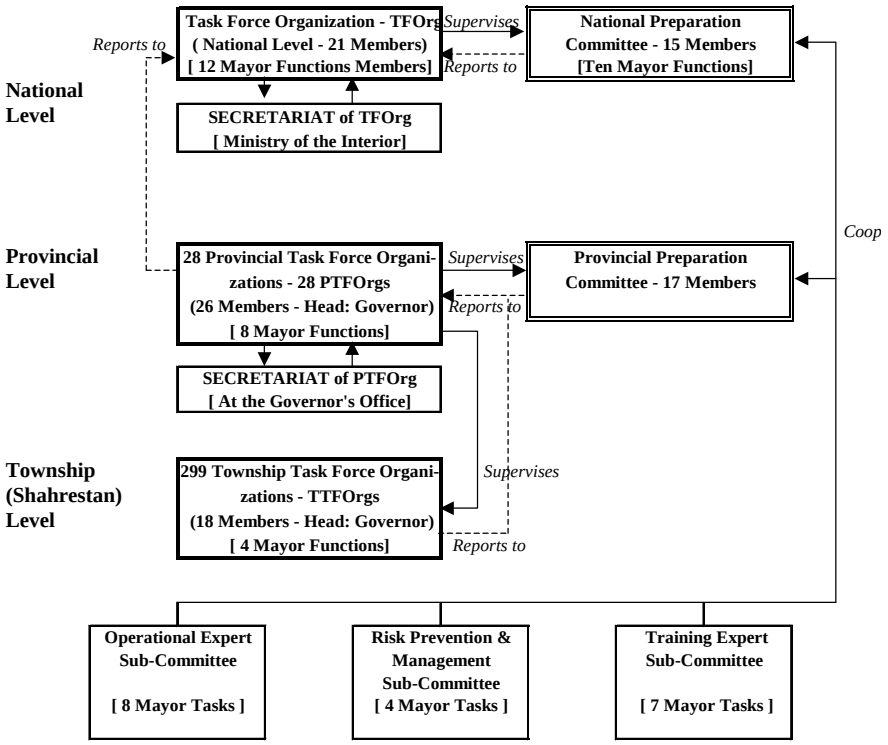
In addition to these significant changes introduced by the RRCP into the overall disaster management system configuration, the RRCP stipulates the following mandates and core functions for the various entities at hierarchical levels of the revised system configuration:

[20]) Townships are comparable to sub-provinces.



Source: JICA Study Team, based on Figure 3.4.1, Progress Report (1), p.3-24.

Figure 4.3.1 Pre-RRCP National Disaster Management Organizational Set-up



Source: JICA Study Team, based on the RRCP document, April 2003.

Figure 4.3.2 Simplified National Level Structure of the "Rescue & Relief Comprehensive Plan"

- The principal functions, Article 5 of the RRCP, of the National Task Force Organization (TFOrg.) are (i) national policy formulation, (ii) national level planning, and (iii) overall supervision of disaster management in I.R.I. It is important to highlight that the RRCP states explicitly that, with its approval and the subsequent establishment of the "TFOrg.", all previously issued responsibilities and authorizations to other organizations have been effectively transferred to the TFOrg.
- TFOrg., which is at minister level and chaired by the Minister of Interior, comprises 21 members, out of which thirteen are ministers of line ministries and eight are heads of various organizations.[21] TFOrg. should convene under normal circumstances four times a year.
- TFOrg. has twelve principal functions, of which the important ones are: (i) national policy formulation and national level planning for the disaster management system as a whole; (ii) determining the functions, duties and responsibilities of all sectors and governmental and non-governmental organization in that system; (iii) drafting legal bills, rules and procedures to be submitted for approval to the Council of Ministers through the Minister of Interior; (iv) giving advice on, supervising of and appraising disaster management plans of governmental and non-governmental organizations involved in disaster management; (v) approving requests for ODA assistance; (vi) announcing the national and/or provincial level disaster situation; and (vii) preparing the budget outline and/or budget request for the disaster management system in I.R.I.[22]
- In the event of a real disaster, all line ministries, governmental organizations and police forces fall under the authority and command of the head of TFOrg., that is the Minister of Interior, who is the commander-in-chief (CIC).
- A Secretariat that is to be established in the Ministry of the Interior is to support the activities of the TFOrg. The composition and membership of the Secretariat is not identified in the RRCP. The Secretariat has, however, 15 principal functions, of which the major ones are: (i) to undertake research and applied research in support of the mandate and activities of TFOrg., including relations with relevant institutions within and outside of the I.R.I., as well as the supervision of research undertaken by sub-organizations; (ii) to manage the information network for disaster management, including the public disaster announcement system; (iii) to manage financial affairs within approved credit ceilings; (iv) to evaluate activities undertaken by entities supporting TFOrg.; (v) to follow-up on the proper execution of rules, procedures and so on established by TFOrg.; (vi) to inspect and audit the required credit ceilings of the task force organizations for the four main disaster management areas;[23] (vii) and to undertake public-relations (PR) activities geared at increasing public awareness and promoting a culture of safety.

As illustrated in Table 4.2.6, the organizational structure at national level is mirrored at Provincial level. The RRCP requires the establishment of 28 Provincial Task Force Organizations (PTFOrgs.) that are to be headed by the Governor and that are to comprise 26

[21]) The line ministries are: Ministry of Interior, Ministry of Health & Medical Education, Ministry of Information and Communication, Ministry of Education and Training, Ministry of Defense & Armed Forces, Ministry of Roads & Transport, Ministry of Energy, Ministry of Housing & Urban Development, Ministry of Agricultural Jihad, Ministry of Islamic Culture and Guidance, Ministry of Economic Affairs & Finance, Ministry of Foreign Affairs, and Ministry of Science, Research & Technology. The organizations are Management & Planning Organization, Red Crescent Society, Radio & Television Organization, Armed Forces Organization, Iran Municipalities' Organization, Police Department of Iran, Islamic Revolution Housing Foundation, and Resistance Mobilization Force (Basidj).
[22]) In accordance with items 1 to 12 of Article 7 of the RRCP.
[23]) As introduced in Table 4.1.2.

members[24] each. Any single one of the 28 PTFOrg. is mandated with eight identical principal functions, the most important of which are:

- To formulate and adopt disaster management policies at provincial level;
- To manage disaster prevention, emergency response and reconstruction & rehabilitation, including the practice of drills;
- To manage disaster preparedness in close cooperation with the Provincial Preparation Committee;
- To manage the allocation of credit ceilings and financial means; and
- To announce the provincial disaster situation to the TFOrg.

All offices, governmental institutions and police forces are, as is the case at national level, obliged by law to participate in disaster operations with all their facilities and human resources. The Secretariat for each of the 28 PTFOrg. must be established in all offices of the Governors of the 28 Provinces. The principal functions of the Provincial level Secretariat are not identified in the RRCP, but it can be assumed that they are the same or similar to those attached to the national level Secretariat.

Articles 16 to 20 of the RRCP regulate the establishment of task force organizations at Township level. The Township Task Force Organization (TTFOrg.) comprises 18 members[25] and it has four principal functions. The principal functions of the TTFOrg.are:

- To manage disaster at prevention, emergency response and reconstruction & rehabilitation levels;
- To manage credit ceilings and financial facilities needed for disaster management; and
- To announce the Township disaster situation through the TFOrg.

[24]) These members are: The Governor, the Manager of Red Crescent Society, the Dean of the Medical Science University and Health and Treatment Services of the Province, the Manager of the Telecommunication Company, the Manager of the Water & Sewage Company, the Manager of the District Electricity Company, the Head of the Management & Planning Organization, the SEPAAH High Commander of the district, the Military High Commander of the District, the Commander of the Resistance Mobilization Force (Basij), the Head of the Trading Organization, the Manager of IRIB, the Head of the Housing and Urban Construction Organization, the Head of the Road and Transport Organization, the Head of the Agricultural Jihad , the Head of the Islamic Council, the Head of the Welfare organization, the Director of Economic Affairs and Finance, the Director of Islamic Culture, the General Manager of the Judicial Office, the Head of the Education Organization, the Mayor of the Provincial Capital, the Head of the Islamic Revolution Housing Foundation, the General Manager for Environmental Protection, the Head of the Municipalities' Organization, and the Commander of the Police Department.

[25]) The TTFOrg. is headed by the Governor and it comprises the Head of the Red Crescent Branch, the Mayor of the Township Center, the Head of the City Council of the Township, the Commander of the District Police of the Township, the Commander of the Resistance Mobilization Force of the Township, the Head of the Health and Treatment network of the Township, the Head of the Telecommunication Office of the Township, the Head of the Electricity Office of the Township, the Head of Water and Sewage Office of the Township, the Head of Road and Transport Organization, the Head of Agricultural Jihad, the Head of the Registration Office, the Head of the Gas Company, the Head of the Judicial Office, and the Head of the Islamic Advertisement Organization of the Township.

4.3.2 Tehran Municipality Level Organizational Set-up And Management Approach

1) General Consideration

As has been discussed above, the "Tehran Disaster Mitigation and Management Center" (TDMMC) was formally established as a merger between the previous CEST and CEMS institutions and its status within the Municipality has been upgraded from falling under the responsibility of a Deputy Mayor to now falling directly under the supervision and responsibility of the Mayor of Tehran. In the absence of any new decrees and/or policy decisions, it must be assumed that the mandate and core functions are still determined by the May 2003 Mayor's Decree, the stipulations contained in the RRCP as they directly or indirectly refer to the Municipality of Tehran, and the realities "on the ground" of existing TDMMC staff, facilities and TDMMC on-going activities and, finally, the existing TCDMP. In fact, the RRCP states explicitly that the TCDMP is and remains "in-force" unless otherwise decided by TFOrg.

It suffices in this context, in view of this situation in progress, to highlight the following features:

- TDMMC mandate, organizational set-up, personnel, facilities and on-going activities, and
- The position of the Tehran-specific organizational set-up and management approach within the overall national level system.

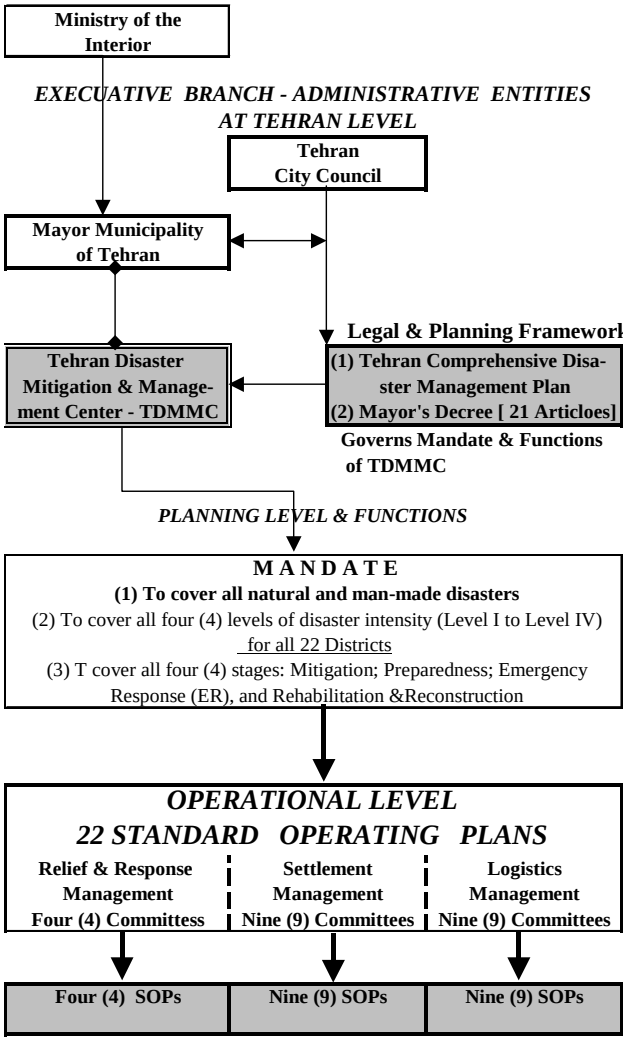
1) TDMMC Mandate & Organizational Set-Up

TDMMC's core mandate and individual functions remain to be governed by the 21 Articles of the May 2003 Decree of the Mayor of Tehran as well as the activities stipulated in the Tehran Comprehensive Disaster Management Plan. The Tehran Municipality is the only local Government entity in I.R.I. that is, though embedded in the national system, somewhat "outside" the "main stream" of the disaster management system, with the Mayor as Commander-in-Chief of the Tehran-system and the City Council as a regulatory body that may call for adjustments in the Tehran level system, as long as they do not bypass and/or contradict national level stipulations.

- TDMMC is, at present, not yet a revised and firmly approved organizational structure in place. The two organizational structures proposed by the previous non-formalized CEST and CEMS can only serve as a rough guideline for a suitable TDMMC organization structure. This issue will be addressed more in detail in section 4.6.

Figure 4.3.3 provides a stylized overview of the existing Tehran Municipality disaster management system configuration and its core mandates. The key features are:

- The core mandate of TDMMC remains in line with Article 1 of the RRCP to cover all natural and man-made disasters;
- TDMMC is responsible for appropriate measures that address all four areas of disaster management, that is, mitigation, preparedness, emergency response, reconstruction and rehabilitation, and at all defined levels of disaster intensity I to IV; and
- TDMMC continues to implement the requirements of the "Emergency Response Plan" (ERP) by establishing the definition and introduction of "Standard Operating Procedures" (SOPs) and the Incident Command System (ICS) in all relevant participating organizations a unified management structure.



Source: JICA Study Team.

Figure 4.3.3 Tehran Municipality Disaster Management System and Mandate

CEMS, one of the two predecessor-organizations to TDMMC, has sourced standard operating plans from similar organizations in other countries, the selection criteria being "best-practice". All 22 SOPs have been finalized and distributed to the participating organizations for application. All SOPs are quite general in nature covering the following typical headlines and

explanations: (i) introduction; (ii) objectives of the plan; (iii) purpose of preparing the plan; (iv) policy-making; (v) hypothesis; (vi) disaster levels; (vii) chart of main activities; (viii) action plan for different disaster levels; (ix) organizations in-charge, partners and backup; (x) diagram of activities related to disaster resolution, and (xi) table of level of participation among organizations. Table 4.3.1 shows, for illustrative purposes, an example for the level of participating organizations in "debris removal".

Table 4.3.1 SOP Example – Organizations Responsible for Debris Removal

Organization	Production of Waste Material					Temporary Storage					Collection					Transfer Station					Recycling & processing					Disposal				
	E1	E2	E3	E4	E5	E1	E2	E3	E4	E5	E1	E2	E3	E4	E5	E1	E2	E3	E4	E5	E1	E2	E3	E4	E5	E1	E2	E3	E4	E5
Recycling Organization	p					ic	ic					p				ic	p	p	p	p	ic	ic	ic	ic	ic	ic	ic	ic	ic	ic
Tehran Disaster Management Center	b	b			b			b																						
Private companies active in management of solid waste material					p	p	p	p	p			p	p		p					p										
Environment Protection Organization	b	b	b	b	b																b	b	b	b	b					
Ministry of Industries and Mines	b	b	b	b	b																	b	b	b	b					
Min. of Health, Tratment & Medical Education	b	b	b	b	b																	b	b	b	b					
Min. of Sciences, Research & Technoligy	b	b	b	b	b																									
NGOs (*Basij* and NGOs)	b		b	b	b																									
Deputy for Urban Services/Tehran Municipality and affiliated organizations						b	b	b	p	p	ic	p	ic	ic	p	b	b	b	b	b	b	b	b	b	b	b	p		p
Deputy for District Affairs of Tehran Municipality						b																								
Mass Media					b	b	b	b	b	b						b														
Basij Forces						b	b	b								b														
Disciplinary (police) forces						p	p	p	p																					
Workers in construction sites						p	p	p	p	p																				
Deputy for Training & Research and Public Relation in Recycling Org.	ic	ic	ic	ic	p																									
Service sector of major centers and units producing solid waste material (factories, hospitals, hotels , …)						p	p	p	p	p																				
Other urban producers						ic	p	p	p	p																				
Deputies for Urban Services in District Municipalities						ic	p	p	p	p	p	p	p	p	p			p	b	b										p
Motorized Services Org. in Tehran Municipality							p					ic				p	p	p	p	p										
Deputies for Social & Cultural Affairs in district municipalities		p	b	p	p																									
Private suppliers of machineries											b	b	b	b	b			b	b	b	b									
Relevant organizations and agencies											p																			
Relevant governmental and privatesorganizations and agencies																					p	p	p	p	p					
Contractors (transportation, storage, etc.)											p	p	p	p	p	p	p	p	p	p			p		p	p	p	p	p	p
Producers of solid waste material											p	p	p	p	p															
Tehran Emergency Center																b	b	b	b	b										
Fire Brigade and Safety Services																b	b	b	b	b										
Transportation & traffic Org.																b														
Relevant Governmental Organizations for site selection and land cession including Natural Resources Gen. Office, Environment Org., Army																										b	b	b	b	b
Min. of Education & training		b	b	b	b																									
IRIB (Radio-TV Org.)		b																			p									
Temporary daily paid workers through urban services contractors												p			p			p	p	p										
Companies and organizations that have necessary facilities and equipments												b	b	p	b			b	b									b	b	b
Traffic Police General Office												b	b	b	b							b	b	b	b					
Min. of Commerce																						b	b	b	b					

Notes: 1) ic = in charge; b = back up; p = participating.
Source: Debris Removal SOP, TDMMC.

In line with the requirements of the Tehran Comprehensive Disaster Management Plan (TCDMP), the emergency response (ER) employs an Incident Command System (ICS) that is divided into six principal phases and that is still under implementation. These stages and their status in implementation are summarized in Table 4.3.2.

It may be said in summary, according to information provided by TDMMC, that (i) step 3 is completed to over 50% and (ii) steps 4 and 5 are currently under realization in line with the ICS approach.

Table 4.3.2 Stages of Emergency Response System Realization and Current Status

ERP Phases	Tasks to be Performed	Implementation Status
Phase 0	Definition of organizations; lead; supporting organizations and entities	Completed
Phase 1	Design of operational plans by the twenty-two committees	Completed
Phase 2	Determination of "key-people", that is top-level persons in the chain-of-command	Completed
Phase 3	Determination of human and non-human resources, that is a resource assessment under the twenty-two committees	On-going (About 70% complete)
Phase 4	Determination of other "key persons" in the established chain-of-command	On-going
Phase 5	Definition of duties & responsibilities of all personnel within the given chain-of con	On-going
Phase 6	Determination of sufficient resources needed for enabling TDMMC to carry out its mission efficiently and effectively	Not yet started

Source: JICA Study Team, based on information from TDMMC.

The rationale for using an ICS is to introduce among the various participating entities a common language that uses standardized terms, and also to realize within the participating organizations a uniform command structure in terms of functional assignments and responsibilities that should facilitate inter-agency communications. It must be stressed that this is a functional hierarchy that should not be confused with an organizational structure.

TDMMC's institutional capability and capacity to respond to its mandate in an efficient and effective manner is obviously a direct function of the institute's endowment in terms of skills, personnel (quantity and quality) and financial resources. The history of personnel-development at the predecessors of TDMMC[26] does not need to concern us here and figures for previous years are for illustrative purposes only. Table 4.3.3 summarizes the number of professional personnel and professional personnel supporting staff that works presently at TDMMC as of March 2004.

The staffing level of some 29 professionals in 2004 should be interpreted, at this point in time, keeping in mind the following circumstances:

- TDMMC lacks so far, except for the un-revised 2003 Mayor's Decree, proper statutes that have been approved by the relevant authorities and that are, therefore, of finally binding nature;
- TDMMC still operates on ad-hoc annual budget requests, though the City Council appears to have approved an expenditure ceiling for the coming Fiscal Year March 21, 2004 to March 20, 2005 of approximately US$ 10 million;[27]
- Most of the staff increases and some of the expertise (for example in earthquake engineering and GIS) result from either the personnel changes at TDMMC, or are transfers from the old CEMS entity and/or are staff members currently attached to the on-going JICA project, but not yet regular TDMMC staff members; and
- Pending a proper definition of the institutional core functions, it may be pre-mature to draw any conclusions on the adequacy and suitability of the staffing.

[26]) For a discussion of this matter, please consult with Section 3.4.2 in Progress Report (1).
[27]) The figure represents a "ceiling" up to which TDMMC may incur expenditures during the coming FY; it is not a regular budget figure.

Table 4.3.3 TDMMC Actual Manning Situation By Area of Expertise (March 2004)

Category/ Parameter	Calendar Year	2000	2001	2002	2003	2004 (March)
Professional Staff	Level					
Architecture	n.a.	n.a.	n.a.	n.a.	1	0
Civil Engineering	B.S.	n.a.	n.a.	n.a.	1	4
Computer Science	B.S.	n.a.	n.a.	n.a.	1	1
Earthquake Engin.	Dr.	n.a.	n.a.	n.a.	n.a.	2
Environmental Health	B.S.	n.a.	n.a.	n.a.	n.a.	1
Geophysics	n.a.	n.a.	n.a.	n.a.	n.a.	1
GIS Experts	B.S.	n.a.	n.a.	n.a.	n.a.	2
Medical Doctors	M.D.	n.a.	n.a.	n.a.	2	4
Public Relations	M.S.	n.a.	n.a.	n.a.	1	1
Search & Rescue Mgmt.	B.S.	n.a.	n.a.	n.a.	n.a.	4
Structural Engin.	B.S.	n.a.	n.a.	n.a.	n.a.	3
Transportation	PhD	n.a.	n.a.	n.a.	1	1
Urban Planning	M.S./B.S.	n.a.	n.a.	n.a.	2	2
Languages	B.S.	n.a.	n.a.	n.a.	1	1
Sub-Total		n.a.	n.a.	n.a.	10	27
Supporting Staff	n.a.	n.a.	n.a.	n.a.	2	2
Other Staff	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
TOTAL		6	9	12	12	29

Notes: 1.) The number are only indicative, since not all personnel shown in 2004 is on the permanent payroll of TDMMC yet.

2.) The manning table has not yet been approved by the relevant authorities.

3.) The term other staff refers to drivers, cleaners, gardeners, and cafeteria staff.

Source: JICA Study Team compilation based on information provided by TDMMC.

It is likewise not clear, at this point in time, how the existing expertise structure actually relates to the individual types of disasters that fall, at least in theory, under the jurisdiction of TDMMC. [28] For example, much of the activities are geared toward addressing earthquake-related disasters, but what about floods and/or industrial accidents?

There are two more major areas of concern, which also at least in theory are indirectly linked with TDMMC mandate and functions. These matters refer to the measures needed in case of an emergency response, covering:

- Hazardous materials in general and hazardous chemicals in particular, and
- Urban area and/or redevelopment as a means for proper disaster mitigation.

The "Organization for Transfer of Hazardous Industries" falls under the jurisdiction of Tehran's Deputy Mayor for Social Affairs. Its principal mandate, based on Article 22 of the Municipality Law, is to re-locate out of Tehran boundaries industries and/or warehouses that use and/or store hazardous materials. The core function of this unit of Tehran Municipality is

[28]) The exact listing is provided in Table 2.1.3, General Typology of Disasters, Chapter 2 of this Sector Report.

"re-location" and the unit has, according to information provided by them, neither the mandate, nor the human or financial resources and/or expertise to address in an emergency situation disasters arising from hazardous materials. The units' operations are based on the "Executive Code for Hygienic Control and Supervision On Poisons and Chemicals" that was approved on September 5, 1999. Article 3 of the Code stipulates:

"Supply, sale, distribution, packing and storing of any kind of poison in food stuff, procurement and distribution centers is prohibited. As for domestic poisons and insecticides in small and ready-to-use packing, they should be treated according to regulations of relevant legal organizations."

In a normal situation, the unit cooperates with the Tehran Municipality Fire Brigade in investigating the occurrence (storage, use and so on) of hazardous materials. But even the Fire Brigade has, at present, no legal foundation and/or mandate to take into custody and/or remove such materials. At present, 24 chemical warehouses that belong to some line ministries form the largest concern to Tehran.

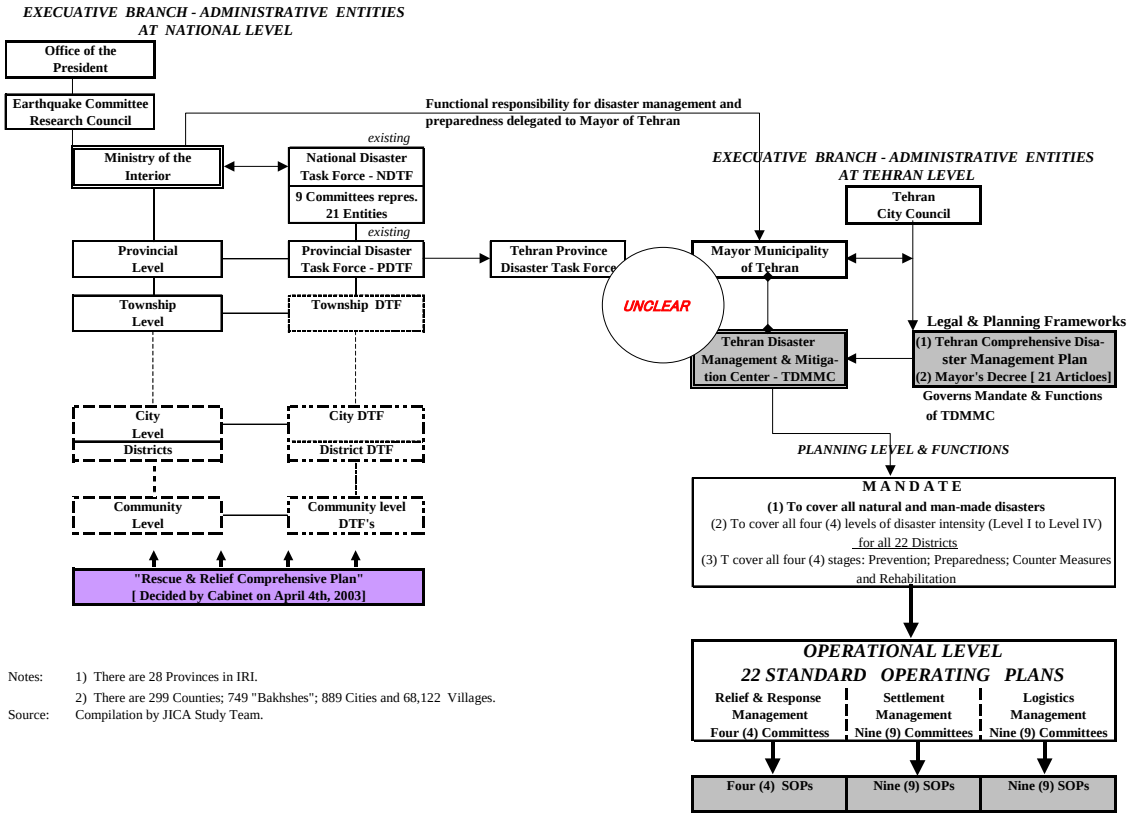
It could not be determined with certainty which entity and/or organization actually has the legal mandate and the institutional capability and capacity to deal with an emergency involving hazardous materials that results from a major disaster.

A similar situation prevails with regard to the disaster management related core function of rehabilitation and reconstruction. The Tehran Urban Renewal Organization of the Tehran Municipality falls under the direct control of the Mayor's Office. However, according to information received during an interview, this organization is involved in area development perhaps more in the sense of real estate than urban renewal development. The renewal organization acts, in principle, as a project manager and not as a developer. The organization has currently one pilot project under implementation in District 15 that involves 30 ha. Out of this total 1 to 2 ha are under implementation using the renewal organization's design, while 28 ha will be implemented using a private sector developer's design. In principle, the organization attempts to combine concepts of urban redevelopment with principles of seismic safety.

Finally, it is useful to provide a snapshot overview as of March 2004 of the Tehran Municipality disaster organization and management system as it presents itself within the context of the overall national level system. Figure 4.3.4 provides a panoramic overview of that position. The essential issues for further concern about the inter-relationship between Tehran Municipality and the national level system are as follows:

Tehran Municipality is the only administrative entity in I.R.I. in which the Mayor and not the Governor of the Province is the Commander-in-Chief who would direct, under the overall control of the Ministry of Interior, in an emergency situation resource deployment and use.

Such a set-up has naturally its merits and demerits. However, the system designer should take a close look at the practical implications, in particular for a disaster situation as predicted;



Notes: 1) There are 28 Provinces in IRI.
2) There are 299 Counties; 749 "Bakhshes"; 889 Cities and 68,122 Villages.
Source: Compilation by JICA Study Team.

Figure 4.3.4 Tehran Disaster Management System Within The National Context

- The mandate and core functions of TDMMC need to be scrutinized with a view to establish firmly whether TDMMC should remain a local institution or whether it should, over the long run, develop into a national level entity;
- The RRCP, which is legally binding for all government and non-government entities and therefore also for any local level disaster management entities, contains many stipulations that need to be reviewed and, if necessary, be integrated into the mandate and/or functions of TDMMC. One example would be that of training Government officials at various levels for disaster management related activities; and
- There is a well recognized need for a fully functional Emergency Operations Center (EOC) at Tehran and perhaps also at national level. It needs to be further scrutinized whether to combine these two centers, taking into account all technical and financial implications.

4.4 Cross-Country Analysis - Typology of Disaster Management System Configurations

4.4.1 General

Cross-country analyses show that disaster management systems under realization in countries with considerable differences in historical and cultural experience and different levels in

disaster exposure can still be characterized in form of a typology that depicts the structure and level of complexity of the system itself. A simple overview of the three selected major disaster management system configurations is presented in Figure 4.4.1 and Figure 4.4.2. The characteristics of the three major configuration types are briefly introduced.

4.4.2 Disaster Management System Configuration "Type 1"

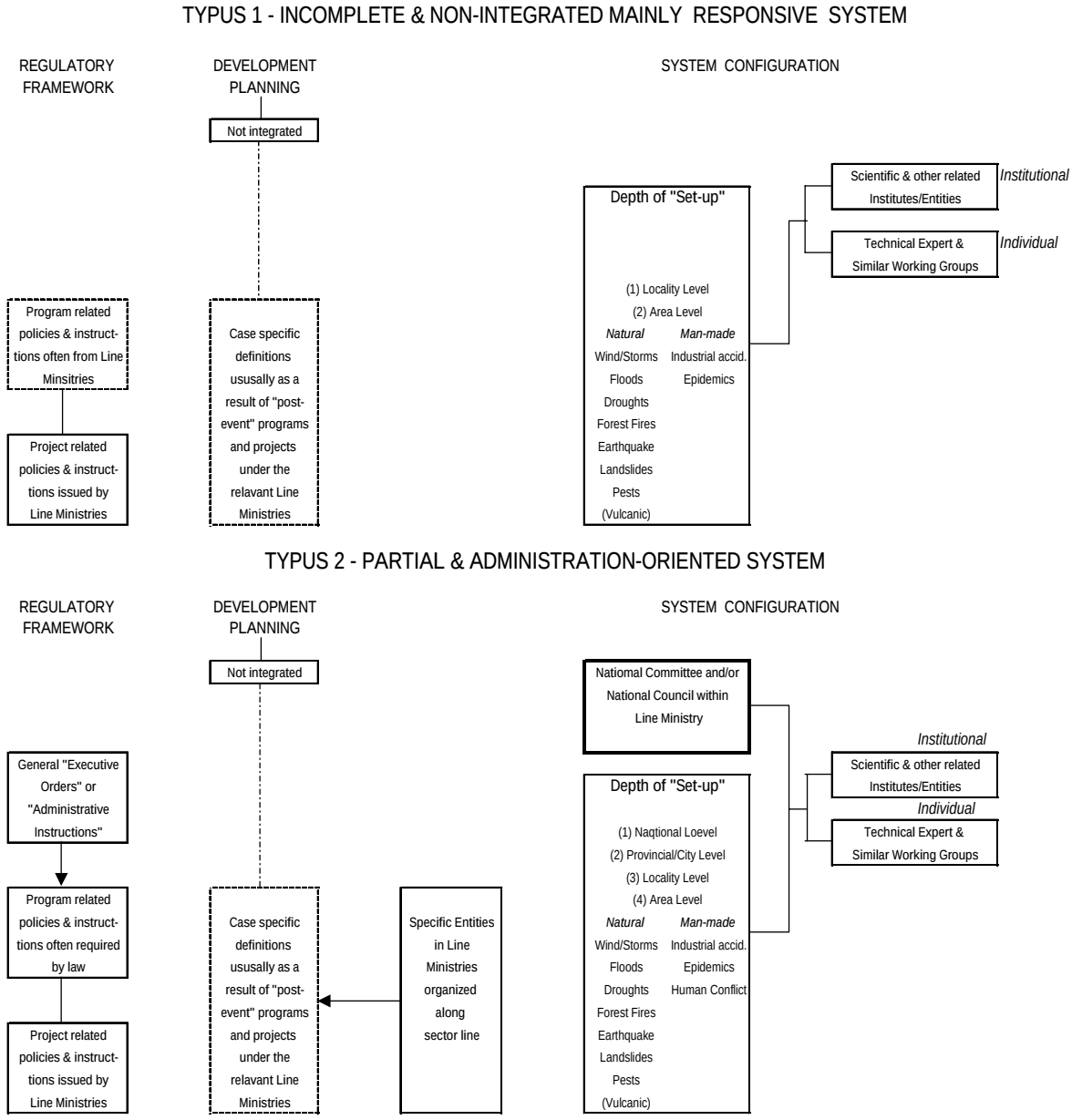
This type of system is incomplete in terms of regulatory framework, integration into development planning and execution and also incomplete in terms of overall system configuration. The major features of this "simplest form" are that individual sector-specific aspects of disaster management are only sometimes part of program and/or project design of individual line ministries (say, flood control projects). Disaster management relevant aspects are project-specific and no integration into the overall development planning process is intended and/or realized.

Consequently, disaster management activities and measures are usually "ex-post" in the form of "rehabilitation and reconstruction", i.e. in response to and after occurrence of an event. Advantage of scientific and technical expertise is taken into account on a case-by-case basis and in an unsystematic manner. Disaster management expertise is concentrated and restricted to individual project parameter with little or no institutionalized system-wide knowledge.

4.4.3 Disaster Management System Configuration "Type 2"

This type of disaster management system configuration is somewhat an "intermediary" step toward a comprehensive & management oriented disaster management system. Its main characteristics are that it has typically a high-powered Executive Order or Administrative Instruction originating from a national-level and/or Cabinet-rank institution.

While disaster management and its various cross-sector aspects are not formally integrated into the overall national/regional and sector-specific development frameworks, there are usually disaster-type related guidelines and principles to be observed by line Ministries. The system configuration is typically headed by a national-level committee or council with mainly policy and inter-agency coordinating functions. Depending on the individual country case, disaster management functions are defined at national and/or intermediate level (at province level or in accordance with other than administrative disaster management zoning criteria). These semi-comprehensive systems encounter usually practical and operational problems, due to the lack of clear comprehensive legal mandates, rules & regulations.



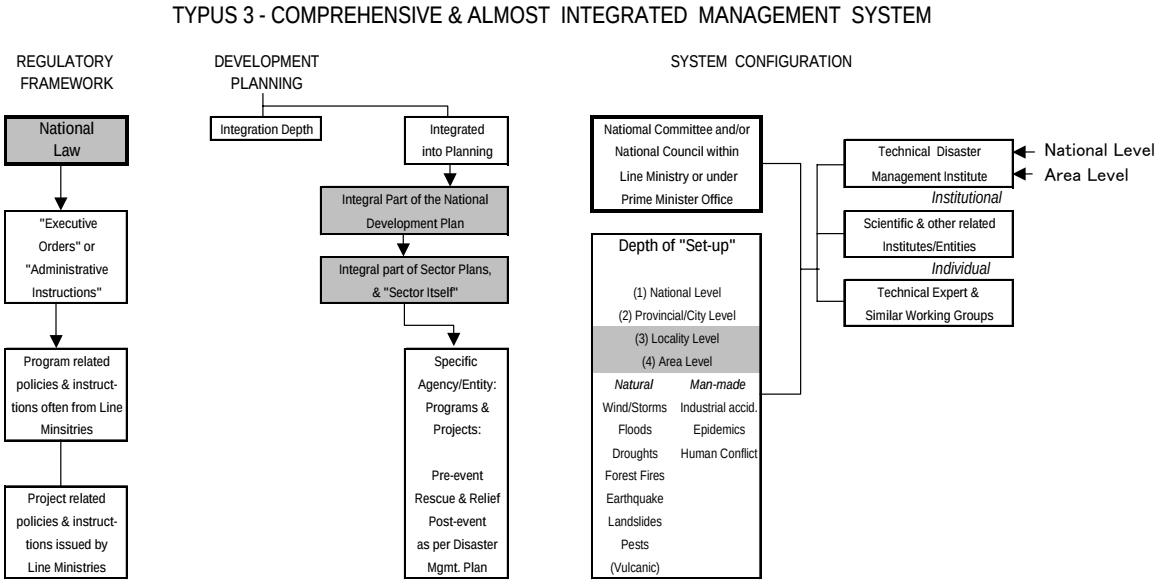
Source: JICA Study Team

Figure 4.4.1 Disaster Management Typology – Configuration "Typos" 1 and 2

1) Disaster Management System Configuration "Type 3"

This type is the most advanced system in terms of completeness and comprehensive management orientation. The foundation of the regulatory framework is typically formed by a national disaster law that regulates basic jurisdictions, mandates and functions and that, at the same time, ensures compliance or enforceability.

In addition, such law allows for more suitable executive orders and/or administrative instructions that leave little room for arbitrary interpretation by individual line ministries and/or organizations, thereby making the whole configuration more transparent and also accountable.



Source: JICA Study Team.

Figure 4.4.2 Disaster Management Typology – Configuration "Typo 3"

Disaster management in its various forms and shapes is fully integrated into the development planning machinery with guidelines and requirements identified and specified for national and local government entities. This type of system configuration is headed by a national-level committee or council that has basic policy formulation functions. The need for inter-agency coordination is minimal, due to the legal framework.

The vertical depth is often quite deep, with disaster management functions being realized down to grassroots level, mainly through institutionalized participatory models. Technical expertise is often institutionalized (for example, through the establishment of a national disaster management institute) and such expertise and/or institute support all other policy, implementation and operational entities involved at various levels in disaster management.

It would be necessary, in order to draw reliable conclusions about the suitability of disaster management system configurations, to scientifically compare the effectiveness and efficiency of the different configurations with reductions achieved in disaster-generated effects. This type of analyses that provides more than just general principles is, however, not readily available. Notwithstanding this fact, the GOI may wish to investigate the following issues:

- Undertake a full-scale cross-country analysis of the different types of disaster management systems and, based on the results, determine whether there is any statistically significant correlation between disaster management system configuration and effectiveness and efficiency of the systems.
- Undertake a full-fledged appraisal of the experience made so far in I.R.I. with its own system in particular in the area of emergency response and rehabilitation & reconstruction.
- Draw conclusions for modifications of Iran's system taking into account Iran's peculiarities.

Some initial proposals for areas that appear to need further investigation and study are introduced in section 4.6.

4.5 Brief Appraisal of National and Tehran Level Disaster Management System Configurations

4.5.1 The National Level System

The Council of Ministers[29] has two major responsibilities: the approval of legal bills and the establishment of implementation rules and regulations that are required to safeguard the implementation of laws. Such regulations are referred to as "Directions" and/or "Directions for Executing Laws",[30] commonly referred to in other countries as "Decrees" or "Executive Orders" (EO). The RRCP is, therefore, by its nature a Decree that stipulates rules, regulations and procedures relevant to the implementation of Article 44 of the "Third Economic, Social & Cultural Development Plan" that was approved in 1998.[31] Article 44 explicitly requests the Red Crescent Society to prepare in coordination with the Ministry of Interior a rescue and relief master plan.

In other words, the RRCP is not a national level law that has passed through the normal legislative process[32] and it appears, therefore, that disaster management and disaster

[29]) In Iranian documentation, the term "Council of Ministers" is synonymous with "Cabinet".
[30]) Acquaintance With Government Organizations in the Islamic Republic of Iran; Higher Institute for Training & Research, Management & Planning; Tehran; 2002/03; pages 36-38.
[31]) Article 44 of the "Third Economic, Social & Cultural Development Plan" that was approved in 1998 says, more or less, (according to an unauthorized translation) the following: "For the purpose of prevention and mitigation of natural disaster's effects and for preparing the general public and formulating the exact role and duties of administrative organizations for adopting countermeasures, the Red Crescent Society of Iran is to prepare for submission and approval by Cabinet the "Rescue & Relief Master Plan" in coordination with the Ministry of Interior and the Basidj Resistance Force within the first year of the development Plan. The plan is to include disaster management, training and preparing people, the ways & means of administrative organizations' participation, the role of IRIB and the mass media, administrative operations and measures, financial resources, and so on." NOTE: The Basidj Resistance Force is to become a member of the Task Force Organization.
[32]) The normal legislative process in I.R.I. requires approval by the Majlis, which submits the legislation to the "Council of Guardians of the

management related institutional and procedural issues are not yet covered by a comprehensive national level law or national level legal framework.

Such a situation is actually not unusual as the cross-country analysis on disaster management system configurations suggests. However, as is the case for many other countries, it may have potentially fundamental regulatory, institutional and managerial consequences, should the Iranian Parliament, the Majlis, decide some time in future to consider and adopt such a law. The gist and content of the RRCP may, seen from legislative and administrative perspectives, become the object of considerable re-definitions and/or even become immaterial, should I.R.I pass a relevant fundamental law and/or should the gist and contents of the next development plan change in terms of coverage, scope and development direction.

Some indicative results of the cross-country analyses summarized in section 2.4 suggest the following:

- Governments tend to mobilize the needed political will and adopt some selected disaster management measures only in response and after a major event has occurred (for example, California, Mexico and Nicaragua);33
- Emphasis remains on "rescue & relief" and integration into the overall socio-economic planning framework and a shifting toward prevention remains often weak or rather inconsequential;
- Because of the above, resource allocation remains often with technical line ministries, which resist re-location and pooling of resources;
- System configurations differ, reflecting individual country peculiarities. However, most countries have some form of high level inter-agency coordination and policy body, usually in the form of a national council or committee;
- Only a few have fully integrated systems (administratively, organizationally, policy-making and planning-wise. A good reference point is Nicaragua); and
- No country has the human, material and financial means to establish a "perfect system", since nobody can afford it.

It must suffice in the context of the Sector Report to:

- Highlight some of the more obvious critical points in system design as they appear from the written documents made available so far;
- Suggest alterations, where appropriate. Such suggestions fall into three principal categories, namely: (i) principal considerations with respect to the overall system configuration; (ii) major and minor adjustments to system elements and processes, and (iii) matters of fine-tuning; and
- Highlight the resource implications (facilities, human and financial ones) by full and/or altered system realization. This point is significant, since it does not make sense to adopt a system configuration that cannot be realized (principles of suitability, adequacy and implementation ability).

Constitution" for ratification. After the proposed legislation is ratified by the Council, it is passed to the President, who then signs it into law. .

[33]) It should be kept in mind that this Chapter was drafted before the December 2003 earthquake in Bam and that no reference to this particular event is implied here.

The principles applied in modern performance oriented management systems in the private and public sectors tend nowadays to be increasingly "knowledge-intensive" and "lean/streamlined" organizational set-ups with:

- A clear core mission (core competence) and clear objectives,
- Well defined tasks and measurable performance standards,
- A human and financial resource endowment that is both suitable and adequate to support the organization's mandate and objectives, and
- Relatively decentralized decision-making mechanisms.

Iran's national level disaster management system configuration as stipulated, *inter alia*, in the RRCP, represents a grand-design for an "administrative super structure" in disaster management organized at three principal managerial layers (national, provincial and township levels). It is unclear whether additional tiers, for example at City level, will be added. The mandates of the organizational entities are supported by "preparation sub-committees" of a more technical nature at national and provincial levels, as well as 19 expert working groups, which are organized along sector or thematic lines.

It is the declared policy of the central Government to reduce, or at least not to increase, public sector employment. It appears in this context that the mandates and functions as outlined in the RRCP are actually superimposed, so to speak, on existing administrative/public entities and their organizational, human and financial resources.

Table 4.5.1 summarizes, as far as can be deduced from the material available, the major functions and personnel endowment implied by the current structure. Full-time and/or contract-based civil servants alone in the three-tier-structure in the various policy, coordination and management entities, that is, without the Secretariats for the TFOrg. and the 28 PTFOrg., will involve in total some 5,000 people, who presumably so far have little or no knowledge of disaster management related issues and who can be considered disaster management part-timers, so to speak.

Given the major functional assignments for the TFOrg. Secretariat, it is not unreasonable to assume around 10 professionals and 5 supporting staff (at an assumed ratio of 2 professionals to 1 supporting staff and without drivers), bringing that number to 15 people in total, all of whom will have to be full-time employees. At provincial level, the Secretariats may do at a minimum with 2 professionals and 1 supporting staff (without drivers), that is a total of say 84 people, all of whom will have to be full-time employees.

It is assumed that supporting staff for the TTFOrgs. will be already existing staff positions. Hence, their disaster related activities are categorized as "part-time". Also, at TTFOrg. level, there has to be at least one full-time professional in the area of operational disaster

management, implying a full-time staff level across-the-board of 299 professionals in these organizational entities.

In short, around some 5,400 professionals and people are needed[34] to render that system at least "theoretically operational". This assumes that the structure will not be extended to City level and that functional assignments remain, more or less, as they are suggested in the RRCP.

As far as the above very roughly computed personnel endowment is concerned, the major issue is that it may actually be insufficient in quantitative terms, and in any event, intensive training for all personnel skill-categories, as well as part-time and full-time staff, will certainly be needed.

Implied direct personnel cost for the above structure is neither extraordinary, nor dramatic, in particular in view of the fact that many of the salaries, for example for task force members, are anyway already on the payroll of the government. Therefore, if all members at the three hierarchical tiers were counted, some 6,131 people would be involved at a minimum representing a payroll of some Tuman 36.78 billion per annum, roughly equivalent to some US$ 4.4 million.[35] As mentioned, this amount is under the present system approach already on the Government's payroll.

[34] This number is likely to be considerably underestimated, since all types of natural and human-made disasters are to be addressed with many areas of special skill requirements, even within the broad discipline of disaster management.
[35]) At an assumed monthly average salary of gross Tuman 500,000 per month and an exchange rate of Rial 8,350 per one US dollar.

Table 4.5.1 Summary Sheet - RRCP System & Selected Personnel Resource Implications

Organizational Entities	Principal Mandate	Membership	Major Functional Areas	Comments & Observations
National Task Force Organization & Secretariat	(1) Policy formulation (2) Drafting legal bills (3) Planning national level maagement system (4) Appraising disaster management plans (5) Approving implementation rules & procedures for disaster management (6) Approving ODA requests (7) Preparing the draft budget	21 Members almost all at Minister Level Secretariat Staff to be determined for one secretariat in MOI	(a) Research & Applied Research, including liaison with research center in and outside of Iran (b) Information Network Management (c) Management of Budgetary Resouces; Audit (d) Appraisal of the performance of system entities (e) Promotion and awareness measures	(I) Policies are needed for funactional areas (a); (d) and (e) (II) Staffing of the Secretariat needs to be determined, including number; educational background and skill levels (III) Formulation of needed implementation procedures and rules
Provincial Task Force Organization & Secretariat	(1) Policy formulation fo roperational disaster management (2) Bugetary management & control	26 Members mainly at Director & Manager levels Total Staff: in PTFOrgs alone, 728 people, excluding secretariat staff Secretariat Staff: to be determined for 28 secretariats	(a) Operational management in disaster stages of prevention; ER and R&R (b) Conducting drills (c) Financial management (d) Determining and announcing the disaster level	(I) Policies are needed for funactional areas (a) and (b) (II) Staffing of the Secretariat needs to be determined, including number; educational background and skill levels
Township Task Force Organization (Township refers to Shahrestan)	(1) Operational disaster management (2) Budgetary management & control	18 Members mainly at Section Head & Sub-Manager Level Total Staff: in TTFOrgs alone, 5,382 people, excluding supporting staff Secretariat Staff: to be determined for 299 Township	(a) Operational management in disaster stages of prevention; ER and R&R (b) Determination and announcement of disaster level	(I) Operational procedures & plans have to be established (II) Suitable staff needs to be identified & assigned and trained

Notes: 1) Chapter 1, Arrticle 1 of the DEMP defines a disaster event as either natural or human made.
2) Article 2 of the same master plan defines the four stages of disaster management, namely "prevention"; "preparation"; " counter- measures (meaning Emergency response)"; and "rehabilitation". The national level master plan deals mainly with issues pertaining to preparation and/or preparedness.

Source: JICA Study Team compilation from various sources.

The RRCP identifies the functions of system and sub-system entities, but it does not identify clear core-missions[36] and objectives. In view of the above, tasks either explicitly or implicitly defined for individual entities (say working groups or line ministries) are rather fragmented and do not allow for measurable performance standards. For example, it is unclear if and when say the "ABCD" sub-committee has done a proper job and how this could be monitored and measured. The whole structure is rather "administration-oriented" than "management-oriented" with a strict top-down command-line and not so structured interfaces or nodal points. And more importantly, disaster management by its very nature is highly "inter-disciplinary" and it needs to be explained how that harmonizes with sector-line organization principles.

In brief, as regards the national level disaster management system configuration, the following critical issues are identified for further scrutiny under the headings indicated below:

- Basic spatial disaster management unit. There is actually no compelling empirical evidence, logic and/or logistical necessity to organize the basic spatial disaster management units along administrative lines (though the approach may be, admittedly, convenient from an administrative point-of-view). In fact, basic disaster management units/areas should be decided based on a combination of various

[36] The four defined phases or stages of disaster management do not constitute core missions that are usually entity/institution-specific.

factors, such as population density; asset density; mega-projects (dams, power stations and so on); likelihood of occurrence and response capability of the disaster management system and, last but not least, the results of the underlying risk assessment. Also, and importantly, as mandated by the RRCP, all types of natural and man-made disasters must be covered by such countrywide "disaster management mapping". There may be a necessity to review the criteria for the basic spatial disaster management unit at national level.

- Hierarchical tiers and depth. Simply mirroring downward the national level structure to lower local government entities adds only "interfaces" to the information and decision making flow and complicates matters from a system's design and management perspective. There is ample evidence, in particular, from research into the performance excellence of private sector enterprises that slim organizations with a dedicated and professional staff are more effective and efficient in carrying out their mission.

- In Japan, for example, the responsibility for response rests with the municipalities with technical nodal points at prefecture (similar to province) level. Hence, there may also be a need to review carefully whether the proposed complicated system is really needed. For many "spatial disaster management areas" it may suffice to have a provincial level "focal point" of responsibility.

- Skill and personnel requirements. Skill and personnel requirements multiply down the hierarchical ladder automatically. No firm data are available on how many people exist in I.R.I. who have formal training in any of the disaster management relevant fields. It is fair to state, nevertheless, that training needs will be substantial, even if major disaster management functions are "superimposed" on existing administrative personnel. This would imply that disaster management in I.R.I. could be effectively and efficiently handled as a part-time function, so to speak. Experience in other countries would suggest that such (an) approach has serious deficiencies. The authorities should make honest assessment of the skill requirements and number of personnel needed, once a final disaster management configuration at national level has been decided upon.

- Emergency Operations Center. The same cautious logic applies to the question of "Emergency Operations Centers". The Study Team has been informed that the authorities have already decided to establish two such centers, one for national level and another for Tehran Municipality level. It is highly questionable whether such duplication is actually needed, and that argument holds true from a "principal" point of view as well as an efficient resource use point-of-view. Hence, the modalities for such centers need to be looked at again very cautiously.

- Suitability and adequacy of system design. It is fair to observe that no country can simply copy the system adopted by another country with a different evolutionary process underlying the matter under consideration. In other words, it must not be forgotten that complex/complicated system designs, for example, rest very often on the fundamental assumption of significant federal support (as is the case for the American FEMA system).

- Whatever the final concept design of the disaster management system may eventually be, there is a strong need to (i) delineate functions rationally and to (ii) sufficiently operationalize such functions with clear "objectives", "inputs & activities", "outputs" and implementation time frames. A useful and practical guide for such operationalization exercises is the "Logical Framework Approach" employed for project formulation. The logical framework compels designers to think clearly and coherently.

4.5.2 The Tehran Level System

1) TDMMC Mandate and Core Functions

It will hardly be controversial to note that the essential element in deciding TDMMC's short-, medium- and long-term institutional development requirements is anchored in the definition of the institute's mandate and core functions. There are only three main legal and regulatory reference points in this context, namely the RRCP, the Tehran-specific TCEMP, and the TDMMC-specific Decree of the Mayor of Tehran dated May 2003. The Mayor's Decree of May 2003 is selected as the most logical starting point.

(1) Definition of Mandate

There is an urgent need to review and decide on the mandate of TDMMC. Local Government stipulations cannot contradict national level framework stipulations. Therefore, the following criteria should be taken into consideration when re-confirming TDMMC's mandate:

- RRCP and May 2003 Decree of the Mayor stipulations,
- Expertise already accumulated at TDMMC,
- Local Tehran Municipality peculiarities (if any) in combination with the expected intensity level of the "event",
- Financial resources earmarked for TDMMC, and
- A development goal for TDMMC.

In line with the definitions and delineations of the RRCP, TDMMC should address all four fields of disaster management.

- Mitigation
- Preparedness
- Emergency Response
- Reconstruction and Rehabilitation

Those are defined for the national level disaster management system in I.R.I. in Article 2 of the RRCP. In addition, and also in line with the requirements of the RRCP, all natural and man-made disasters should be covered by the management system, as long as they are of direct relevance to the Municipality of Tehran and the GTA. Figure 4.5.1 combines the four areas of a disaster management system with the particular types of disasters that need to be addressed. The matrix suggests that for various reasons, TDMMC should not necessarily cover: (i) winds and storms; (ii) droughts and forest fires; (iii) pests; and (iv) disasters related to human conflict, though safety and safety consideration in the context of the other areas should remain under the jurisdiction of TDMMC.

Taking also into account that the TCEMP delegates responsibility for emergency management to what is now TDMMC, the mandate may be grouped into two main categories, namely mandate during "Normal Times" and mandate during an "Emergency Response Situation".

DISASTER TYPES	MITIGATION	PREPAREDNESS	EMERGENCY RESPONSE	REHABILITATION & RECONSTRUCTION	COMMENT & OBSERVATIONS
(1) WEATHER RELATED					
Winds	not applicable	not applicable	not applicable	not applicable	Not empirical data, but unlikely.
Storms	⊙	⊙	⊙	⊙	There is evidence for past occurrence.
Floods	⊙	⊙	⊙	⊙	There is evidence for past occurrence.
Droughts	not applicable	not applicable	not applicable	not applicable	Not applicable in the narrow sense.
Forest Fires	not applicable	not applicable	not applicable	not applicable	Not empirical data, but unlikely.
(2) GEOLOGY RELATED					
Earthquakes	❒	❒	❒	❒	Major clear & present threat.
Landslides	❒	❒	❒	❒	There is evidence for past occurrence.
(3) OTHER THREATS					
Pests	not applicable	not applicable	not applicable	not applicable	Not applicable in the narrow sense.
Industrial Accidents	❒	❒	❒	❒	Potential threat exists.
Epidemics	❒	❒	❒	❒	Potential threat exists.
Human Conflict	not applicable	not applicable	not applicable	not applicable	Outside jurisdiction.

Note: ⊙ = Somewhat applicable
❒ = Fully applicable

Source: JICA Study Team

Figure 4.5.1 Potential TDMMC Mandate according to RRCP

It is therefore suggested for further deliberations with the authorities to define the future mandate for TDMMC as depicted in Table 4.5.2.

Table 4.5.2 Recommended Institutional Mandate For TDMMC

DISASTER TYPE	(1) MITIGATION (2) PREPAREDNESS (3) RECON. & REHAB.	EMERGENCY RESPONSE
Earthquakes	❒	❒
Industrial accidents	❒	❒
Epidemics	❒	❒
Landslides	❒	❒
Floods	⊙	⊙
Storms	⊙	⊙

Note: ⊙ = Somewhat applicable
❒ = Fully applicable

Source: JICA Study Team

(2) Definition of Core Functions

It is necessary in a next step to clearly delineate the institute's future core functions and individual functional activities by reviewing the May 2003 Mayor's Decree and screening it with the above recommended mandate in mind. It is useful in this context to review the May 2003 Decree, establish the entities over which the Municipality and therefore the Mayor has direct control and authority, and to look at this picture finally from the normative perspective of what an institute with the above recommended mandate should use its resources for.

Table 4.5.3 to Table 4.5.6 discusses the individual requirements as stipulated in the May 2003 Decree and it comments on these stipulations – whether they should be considered a TDMMC core function. This is complemented by discussing which activities would have to be considered vital in an emergency response situation, say within the first 72 hours. In a final analytical step, these elements are combined and core functions for TDMMC institution capability and capacity building are recommended.

The results of the review and screening process are summarized as follows.

- Out of the 21 functions and implied activities, 11 functions are core functions, five functions are core functions-related, but the present TDMMC has no or not enough in-house expertise in these areas, four functions should be delegated to other institutions with a clearer mandate in these areas, and one function is an "open" function (i.e. it can mean anything) that need not to be considered further here.

Table 4.5.3 Review of May 5th Decree – Part 1

Function as per Mayor Decree Dated May 5th 2003	Comments & Observations
Paragraph 1: "Preparation and formulation of regulations, directions and procedures related to strengthening Tehran Disaster Management and follow-up the matter until final approval."	(1) This is a CORE FUNCTION of TDMMC to be maintained without any alterations. 2) However, some capacity build-up in TDMMC is needed.
Paragraph 2: "Preparation and formulation of regulations, directions and procedures related to retrofitting of the buildings, bridges, infrastructure and urban environment in general in direction of reducing vulnerabilities during disaster and follow-up the matter until final approval."	(1) This is a function requiring in-depth technical expertise in the fields of construction engineering, bridge engineering and legal aspects. At present, TDMMC has no in-house expertise in these areas. (2) Some in-house capability/capacity build-up is needed or, alternatively, a reliable out-house expertise source needs to be secured.
Paragraph 3: "Supervision on proper implementation of approved rules, regulations and directions."	(1) This is a complex function requiring in-depth interdisciplinary expertise currently not available in-house. Also, the term "supervision" should be interpreted to mean "evaluation or assessment", not implying any instructional powers to any other entities. (2) TDMMC has presently no in-house expertise/capability in this field.
Paragraph 4: " Establishment of an automated and up-dated database of buildings, infra-structures, bridges, routes, gas, electricity, and water stations and all hazardous industrial, chemical and non-chemical locations, or transfer of such materials at City level and implementation methods for controlling, super-vising and checking the contractors, cosultants and all entities somehow in-volved in above services in Tehran.	(1) The data-base function is a TDMMC CORE FUNCTION, for which the groundwork is established through the JICA GIS data-base. However, data-base management & data-base up-dating is data hungry, time consuming and personnel intensive. This function will need additional personnel. (2) However, the second part of this function that refers to hazardous materials and controlling & supervising other entities should be deleted and/or transferred to the existing Municipality entity in charge of hazardous materials.

Source: JICA Study Team

- Core functions are those related to regulations, directions and procedures geared at strengthening the Tehran disaster management system as a whole (para. 1); operations and updating of the GIS data base (para. 4); supervision of plans for mitigation; preparedness; emergency response and rehabilitation and reconstruction (para. 5); coordination for mitigation plans (para. 10); coordination of all the participating organizations (para. 13); coordination and supervision pf preparedness plans (para. 15); supervision of public and specialized training (para. 16); coordination and supervision of drills (para. 17); coordination and delivery of emergency services (para. 18); coordination in recovery (para. 19); preparation of an evacuation location master plan for districts (para. 20).

Table 4.5.4 Review of May 5th Decree – Part 2

Function as per Mayor Decree Dated May 5th 2003	Comments & Observations
Paragraph 5: "Preparation, formulation and supervision on plans for prevention and reduction of the disaster effects, preparedness , encountering the events and rehabilitation."	(1) The meaning of the functions is interpreted as "Coordination in the preparation, formulation and supervision…." and so on. This is a CORE FUNCTION of TDMMC. (2) However, TDMMC has not yet enough in-house capability in this field.
Paragraph 6: "Accomplishment studies and researches on seismic engineering, engineering seismology and engineering and urban geology. Geophysics engineering and disaster management in the Greater Tehran Area."	(1) TDMMC can, at best, generate some ideas and proposals for research, but not undertake the research itself, which should be left to scientific entities. (2) TDMMC has presently only very limited in-house capabilities in these fields. This is not needed as a core function.
Paragraph 7: "Continuous seismic microzoning studies in the Greater Tehran Area, risk assessment and earthquake risk vulnerability analysis and up-dating such studies, in order to achieve the highest possible preparedness for encoun-tering the probable events."	(1) TDMMC can have, at best, some coordinating function in this field. (2) The function should otherwise be deleted.
Paragraph 8: "Study and assessment of vulnerability of different structures and presenting the most appropriate methods for their improvement and reinforcement."	(1) TDMMC can have, at best, some coordinating function in this field. (2) The function should otherwise be deleted.
Paragraph 9: "Supervising the studies on the methods of efficiency and continuation of per-formance of lifelines during and after the event."	(1) This is also highly technical and TDMMC can have, at best, a coordinating function only. Presently, TDMMC has no in-house capability in the relevant technical fields. (2) The function should otherwise be deleted.

Source: JICA Study Team

- Functions with insufficient capability and/or expertise and capacity are: preparation of regulations and so on for retrofitting of buildings, bridges and so on (para. 2); supervision of proper rule implementation (para. 3); continuous study for improving

preparedness and so on (para. 11 and 12); and cooperation with local and foreign organizations (para. 14).

- Functions that should be deleted or transferred are: research in seismic engineering and so on (para. 6); continuous seismic microzoning studies for Tehran (para. 7); assessment of vulnerability of different structures (para. 8); and supervising lifelines (para. 9).

In addition, since responsibility only makes sense in unity with authority, it is useful to have a quick look at which organizations fall under the direct authority of the Mayor of Tehran and which do not. This overview is summarized in Table 4.5.7. Table 4.5.8 concludes this analysis by identifying and prioritizing the seven core activities that need to be managed and coordinated during the emergency response situation.

Table 4.5.5 Review of May 5th Decree – Part 3

Function as per Mayor Decree Dated May 5th 2003	Comments & Observations
Paragraph 10: "Coordination of plans for reduction of effects of disaster."	(1) This is a TDMMC coordination CORE FUNCTION, for which there is in-sufficent in-house capacity. (2) In-house capacity needs to be build-up.
Paragraph 11: "Continuous study and review in relation with identifying the current status of the society, improvement methods and increasing preparedness and reducing vulnerability of the society against probable hazards." **Paragraph 12:** "Coordination and supervision of public awareness through mass media at Tehran level and maintaining public preparedness during event."	(1) These two function refer apparently to preparedness efforts. They should be merged into one focused preparedness fucntion. (2) However, TDMMC has presently not sufficient in-house capacity for coordi-nating such efforts involving public awareness campaigns, the media, schools, and so on.
Paragraph 13: "Coordinating the organizations in charge of 24 affairs with the Center for Disaster Mitigation and Management of Tehran - TDMMC."	(1) This is a TDMMC CORE FUNCTION. (2) Perhaps some capacity build-up os needed in the medium-term.
Paragraph 14: "Establishing overall contact and cooperation with local and foreign organi-zations involved in disaster management and prevention."	(1) This is an important function for institution building presently not utilized to the extent possible. TDMMC should cooperate closely with the regional UNDP project and seek twinnign arrangements. (2) Capacity build-up is needed over the short-term.
Paragraph 15: "Coordination and supervision in formulating preparedness and operational plans by specialized committees against natural disasters."	(1) This is a TDMMC CORE FUNCTION. However, the supervision aspect as well as the limitation to preparedness only should be eliminated. (2) Capacity build-up at TDMMC may be needed over the medium-term.

Source: JICA Study Team

In summary, it is recommended in line with the mandate for TDMMC as explained above, to develop and strengthen TDMMC along two major lines:

- During "normal" time, i.e. non-emergency time, TDMMC should have the capability and capacity to coordinate and supervise all entities and activities related to mitigation, preparedness and preparatory activities for rehabilitation & reconstruction.
- In an emergency situation, however, TDMMC becomes the command center for emergency operations. The time line, usually some 72 hours after the event, but that may depend on the intensity of the situation, should be defined. In order to execute this core function properly, an EOC and a suitable emergency communication and disaster information system will be needed.

Table 4.5.6 Review of May 5th Decree – Part 4

Function as per Mayor Decree Dated May 5th 2003	Comments & Observations
Paragraph 16: "Supervision of public and specialized training as well as coordination and supervision on training the staff of disaster management headquarters in district and sub-district municipalities."	(1) Coordination of such activities is a TDMMC CORE FUNCTION. However, when it comes to supervsion, then TDMMC will have to establish and expand considerable in-house training capability and capacity, in particular if the disaster management system is expanded to District and Sub-distric levels. Currently, there is no in-house capability in this field. (2) Capability and capacity building is needed over the short to medium-term.
Paragraph 17: "Coordination and supervision on setting a calendar for annual public drills as well as supervising the implementation of high quality drills."	(1) This is a TDMMC CORE FUNCTION. (2) Capability and capacity build-up is needed, however.
Paragraph 18: "Coordination in presenting emergency services right after the event."	(1) This is a TDMMC CORE FUNCTION to be more clearly defined as TDMMC acting as the COMMAND HQs in the Emergency Response Plan. (2) Capability and capacity build-up is needed, however.
Paragraph 19: "Coordination in recovering the society to normal condition and delivering proper urban services after the event."	(1) That is a TDMMC CORE FUNCTION. (2) However, capacity building may be needed over the medium-term.
Paragraph 20: "Preparation of a master plan for evacuation locations in the districts, settlement of the citizens and forecast and coordination for emergency services after the event."	(1) That is a TDMMC CORE FUNCTION that needs to be interpreted meaning coordination with the Red Crescent Society (mainly). (2) Capacity build-up may be needed in the medium-term.
Paragraph 21: "Accomplishment of other relevant affairs."	(1) Should be better defined.

Source: JICA Study Team

Table 4.5.7 Mayor's Jurisdiction over Vital Emergency Response Entities

Entities Under The Direct Authority of the Tehran Mayor	Entities Under The Authority of Line Ministries or Central Government
Fire Brigade	Police Force
Recycling Organization	Red Crescent Society
Traffic Control Center *)	Basij & SEPAH
Park Organization	Hospitals/Universities
Industrial Relocation Org.	Life Lines
Burial Organization	Welfare Organization
	Telecommunications
	Atomic Energy Org. **)

Notes: *) Excluding traffic police.
**) Issue of isotope handling.

Source: JICA Study Team

Table 4.5.8 Relative Importance of Emergency Response Activities with Coordination Needs

Emergency Response Activity	Relative Rank
Security	1
Search, Rescue & Relie	2
Emergency Medical	3
Fire Fighting	4
Debris Removal	5
Evacuation	6
Restore Life Lines	7

Source: JICA Study Team

(3) Expertise and Personnel Requirements

It is not possible, based, *inter alia*, on the recommended mandate and core functions to sketch a required capability and capacity profile for TDMMC. Capability is, in principle, defined as the availability of professional in-house expertise, and capacity, the quantity in which such capability is available in house. The estimated manning table presented in Table 4.5.9 is a first attempt to estimate personnel requirements. The table is, however, not yet a firm staffing requirements assessment.

Hence, the numbers indicated must be interpreted keeping in mind that many factors will shape the annual staff requirements of TDMMC and that some of these factors have not yet been defined to a satisfactory degree (also, such factors may change over time). In this sense, the numbers indicated have illustrative "minimal requirement", meaning what may be summarized as:

- The expertise indicated covers only professional positions and does not include supporting and other staff.
- TDMMC is currently under-staffed and under-endowed in terms of capability and capacity.
- Only in order to bring TDMMC at a near theoretical capability profile needed to support the recommended mandate and core functions that a minimum of 29 people at the appropriate educational level would have to be hired over the short-term, i.e. during the 2005 to 2006 period.

Table 4.5.9 Preliminary Capability and Staffing Assessment, 2005 to 2015

CAPABILITY - EXPERTISE REQUIRED	EXISTING CAPACITY		Existing Manpower 2004 (People)	Manpower Needed			Total Net Additions
	Formal Education (Degree)	Practical Experience		Short-term 2005-06	Medium-term 2007-2010	Long-term 2011-2015	2005-2015
1. Disaster Management (all 4 functions)	none	6	6	6	8	8	2
2. Emergency Medicine	none	4	4	5	6	6	2
3. Search & Rescue	none	1	1	4	6	8	7
4. Fire & Safety	none	none	0	2	3	4	4
5. Flood Disaster Management	none	1	1	1	1	1	0
6. Hazardous Materials Safety & Mgmt.	none	none	0	1	1	1	1
7. Public Security Management	none	none	0	1	1	1	1
8. Traffic/Transport Safety & Mgmt.	none	1	1	2	2	2	1
9. Structural Engineering (Bldgs. & Bridges	3	none	3	3	4	5	2
10. Urban & Spatial Planning	1	1	2	3	4	5	3
11. Telecommunication Science	1	none	1	3	4	5	4
12. EOC (24 hours)	none	none	0	2	8	8	8
13. IT; System Analysis; Computer Science	none	none	0	3	6	6	6
14. GIS & Database Management	2	1	3	6	9	12	9
15. Seismologist	1	none	1	1	1	1	0
16. Geologist	1	none	1	1	1	1	0
17. Economist/Financial Analyst	none	none	0	1	2	2	2
18. Insurance/Damage Assessor	none	none	0	1	2	2	2
19. Lawyer (Civil Service/Municipality Lav	none	none	0	1	1	1	1
20. Architecture	none	none	0	1	1	1	1
21. Business Administration	1	none	1	2	2	2	1
22. Education Planner	none	1	1	3	4	4	3
23. Translators	1	none	1	2	2	2	1
24. PR Specialist	1	none	1	2	3	3	2
		TOTAL	**28**	**57**	**82**	**91**	**63**

Source: JICA Study Team

- Under the assumed scenario, TDMMC would then have to be strengthened in terms of capacity by another 25 people over the medium term, i.e. between 2007 and 2010; and another nine professionals between 2011 and 2015.
- It is self-evident that the phasing of the personnel build-up would look different if certain capabilities and capacities have already to be firmly established at TDMMC over the short-term, i.e. up to 2006.
- Overall, the personnel build-up is modest in terms of number of people and implied recurrent cost. A total manpower of say around 100 people (by 2015) is modest by many standards.

(4) Human Resource Development

TDMMC is by its very nature a highly inter-disciplinary and skill/knowledge intensive institution. This fact should be taken into account by establishing tailor-made skill-upgrading and educational program along the following lines:

- **In-house skill upgrading program** comprising special training courses, seminars, workshops and so on to which domestic and foreign experts with established track records would be invited;

- **Domestic and overseas educational program.** This training program would provide scholarship grants or loans toward the realization of higher-level educational degrees, for example in emergency medicine and so on. The contacts established through, in particular, overseas training could be fully utilized for "twinning arrangements" for TDMMC with similar, either scientific and/or operational, institutions all over the world; and
- **Domestic training program for governmental and non-governmental officials/persons.** Given the significant training needs that are implied in a full realization of the RRCP, the conduct of such training could not only increase significantly the standing and credibility of TDMMC in disaster management in I.R.I., but such programs could, if successful, also be regionalized and even commercialized thereby generating additional revenues for TDMMC.

(5) Twinning Arrangements

Twinning arrangements, i.e. formalized cooperation agreements with overseas institutions/entities in the same or similar fields, can be a very powerful tool to (i) strengthen TDMMC's domestic and international standing and (ii) enhance the institute's in-house capabilities. Such agreements can vary in scope and depth and will depend on the interest(s) of TDMMC and the participating institutions.

It is strongly recommended that TDMMC pursue such arrangements. The following core criteria should be applied in the selection of potential twinning partners:

- To the extent ever possible, it should be ensured that interests in the arrangement are similar or identical in order to avoid future disappointment;
- The scope and depth of the arrangement should be phased, i.e. starting with low-intensity efforts, such as regular exchange of information, and then proceed to scheduled exchanges of researchers/operatives, followed by joint training and joint research and so on; and
- Finally, exchange of institutional staff on a fixed basis could be institutionalized.

2) Organizational Options

The predecessors of TDMMC had organization charts that were quite sophisticated. The following principles should apply in finally deciding on a suitable TDMMC organization chart, which in any event will be needed sooner rather than later for budgeting and recruitment purposes:

- Organization follows mandate and core functions,
- The resource endowment in financial, personnel and facilities terms must match the mandate, functions and responsibilities of the organization,
- The management approach should be highly professional and reflect the inter-disciplinary character of disaster management,
- The old and proven engineering principle should be applied, namely "as much as necessary, and as little as possible",

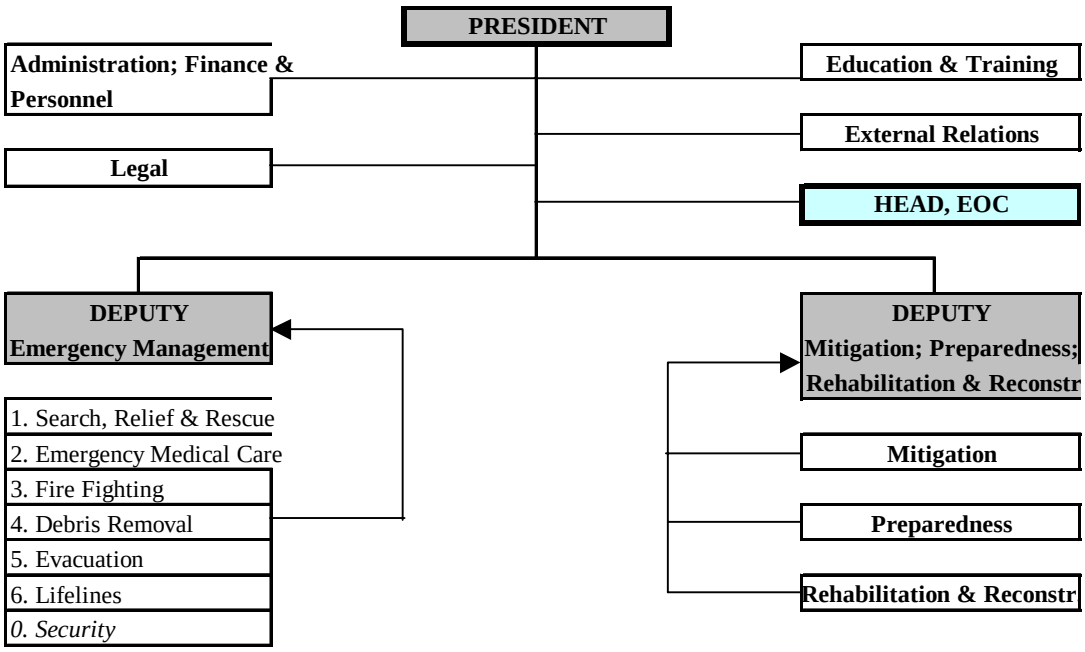
- It should be kept in mind that modern, skill-intensive inter-disciplinary organizations are lean with a high level of flexibility among the organizational "boxes". The high level of flexibility manifests itself usually in the form of inter-department "tasks forces", and
- The organization structure of TDMMC will have, to some extent, to take into account the type of disaster management organization that will be decided for the district-level.

The disaster management system at district level is still under consideration. A June 30, 2003 proposal suggests establishing a three-tier hierarchical system in each district comprising: (i) a command HQ rank consisting of three organization-entities; (ii) an executive rank at district level comprising five organization-entities; and (iii) an operations rank at sub-district level comprising six organization-entities. This description leaves out the additional human and other resources needed under the operations rank, for which the proposal identifies some 16 individual functions.

If one assumes one person each for all of the organization-entities at all three hierarchical levels and, say three people for each of the functional assignments, this approach would need about 63 trained people per district, or around 1,386 for all 22 districts. Furthermore, since neither the set-up exists yet, nor its manpower, these functions would either have to be "superimposed" on existing administrative personnel or new personnel would have to be recruited. It is easy to understand that such system at district level will increase not only the number of hierarchical levels but also the overall complexity of the disaster management system itself.

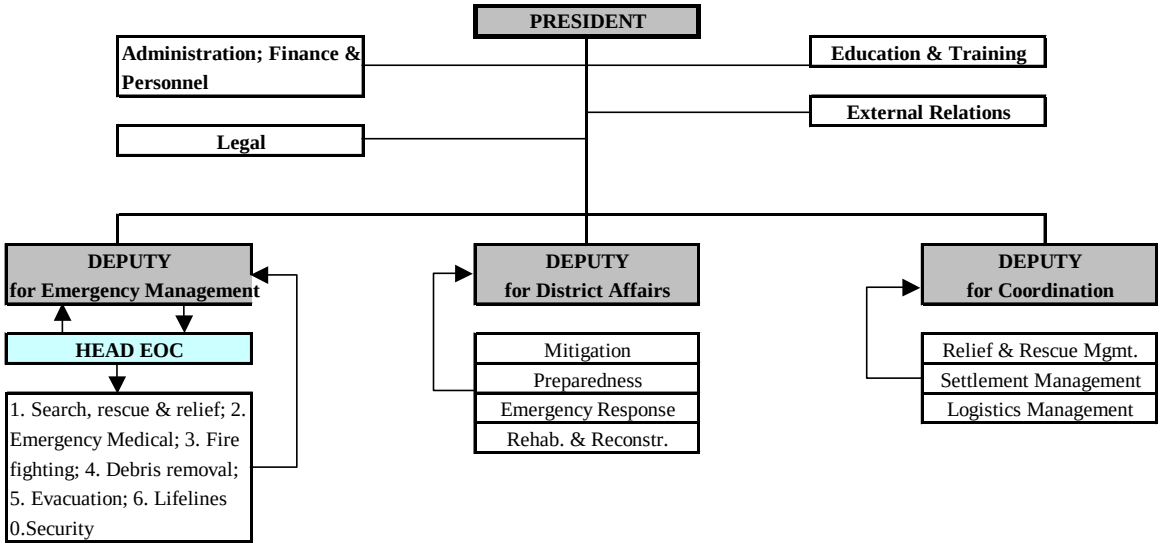
It is a truism derived from research in decision theory that the level of complexity increases exponentially with the number of hierarchical tiers and key people involved. In other words, while it is easy to draw boxes on paper and assign clearly delineated functions to these boxes, it has to be doubted that such approach will actually increase the efficiency and effectiveness of emergency response/disaster management in case of a real event.

It is not recommendable without further in-depth discussion to propose a final organization set-up for TDMMC. However, two principal routes deserve further deliberations: (i) a slim organizational structure along core functions as depicted in Figure 4.5.2, or (ii) a slim organizational structure as in (i), but also reflecting district level organization as depicted in Figure 4.5.3 and with a slightly different bundling of functional assignments.



Source: JICA Study Team

Figure 4.5.2 Mainly Functional Organization Set-up for TDMMC



Source: JICA Study Team

Figure 4.5.3 Second Organization Option for TDMMC

3) EOC Location and Site Selection

Another issue that deserves further in-depth scrutiny is the site selection for the proposed Emergency Operations Center (EOC). The current location of TDMMC is not ideal in terms of location for proper emergency response management (accessibility, structure and dimensions of the existing building, and so on). It is only logical for day-to-day operations

that the EOC and TDMMC should be located on the same compound and/or within the same building facility. Hence, selection of a suitable site becomes of paramount importance.

It is, therefore, recommended on a priority basis, to investigate alternative sites for the future TDMMC/EOC location. Selection criteria for final site selection should include, but not be limited to:

- "Strategic" location for emergency response operations. The location must be easily accessible under disaster conditions (damage assessment parameter, emergency roads and so on);
- Land acquisition should be easy and, if at all possible, surroundings should allow for expansion of the site in future;
- Synergy effects should be utilized, if available. For example, the Municipality's Fire Brigade owns a relatively large site on the southern outskirts of Tehran (the former owner of which was the Recycling Organization), which may be ideal in terms of location, also with plenty of land to the south, east and west that may be easily acquirable. It should be considered whether some form of cooperation with the Fire Brigade could be meaningful, and
- Cost-benefit considerations both in terms of quantity and quality should be employed to support a final decision.

4.6 Strengthening TDMMC – A Matter of Priority Concern

The Interim Report proposed a long-list of potential projects and programs that are recommended for implementation over the total time span of the Master Plan, which is up to the year 2015. Item 8 in the long-list titled "Improvement of Disaster Management System" lists the project 8.1.C "Capacity Building of TDMMC" as one of the projects to be implemented as of 2004 and up to 2015. It is this project that concerns us here.

The rationale for selecting this project not only as a priority, but also as a core project needed for the overall strengthening of the Tehran disaster management system is based on the following considerations:

- First and most important, proper disaster management without a firmly established institutionalized entity that has the proper resource endowment is only possible in a highly fragmented, ad-hoc and ex-post manner that carries extreme economic and social cost. Such a system is highly inappropriate for I.R.I.;
- Hence, proper disaster management planning and realization must start with the most suitable candidate already "on the ground" and that candidate is TDMMC. This is so, not only because of formal requirements as outlined in the regulatory frameworks, but also because TDMMC, though still in its "infant phase" of development, has a relevant stock in terms of expertise, skill, manpower and recently also budget/credit ceilings;
- Furthermore, there is no viable institutionalized alternative, even in the "infant stage", in the area of disaster management; and

- Creating an alternative to or replacing TDMMC would turn the whole process of disaster management in Tehran back by over ten years to a new "zero" point, thereby dispersing all benefits for disaster management that have accrued so far from TDMMC's activities. For obvious reasons, the GOI would be ill advised to pursue this course of action.

Focused and systematic institutional capacity building at TDMMC constitutes an absolute prerequisite for tailoring the overall development of Tehran's disaster management system into a suitable and adequate direction and, hence, this project is recommended for implementation on an absolute priority basis. The presentation of the project outline in the following Section follows the requirements of a standard project format, though this approach entails a certain amount of duplication and repetition covered already elsewhere in the Sector Report.

4.7 Findings, Conclusions and Recommendations

4.7.1 Planning Issues

The results of the analyses of the existing regulatory frameworks, organizational set-ups and management approaches at national and Tehran Municipality levels depict a multi-layered hierarchical system involving many organizations and entities with quite different organizational cultures and requirements, and many vertical (that is, between hierarchical tiers of the system) and horizontal (that is, among entities and individuals at the same hierarchical level) nodal points, making the system as a whole very coordination- and communication-intensive. At present, keeping in mind that major elements of the overall system configuration are only slightly over one year under realization, the whole national and Tehran Municipality disaster management systems appear to be somewhat "superimposed" on an existing administrative structure with its existing personnel and facility endowment (the exception to the rule being Tehran's TDMMC), which is not yet tailored toward an integrated disaster management.

The organizing principles, though on paper involving all relevant sector organizations, remain in essence sector-oriented and it is hoped that overall integration is realized through intensive coordination efforts and a strictly hierarchical chain-of-command.

There are, however, indications from the practical experience with disasters outside of Tehran[37] suggesting that the system does not work to the extent as anticipated by the relevant policy and operations documents. As regards the Tehran Municipality level disaster management system configuration and its elements, the following major findings and conclusions are summarized in form of a listing that is composed from the perspective of planning.

[37]) As, for example, illustrated by the earthquakes that occurred in Quazvin and recently in Bam.

Planning Issue 1: Overall System Configuration & Level of Complexity. Tehran's disaster management system is embedded into the national level system that comprises 37 different organizational entities (including the Tehran Municipality itself), out of which 16 are line ministries, 13 are non-ministerial level entities, three are universities and one is an NGO (i.e. the Red Crescent Society). All entities are, in accordance with requirements of the national disaster management plan, organized around nine sub-committees as identified earlier in this document. The Tehran Municipality is member in four sub-committees, namely "risk assessment", "air pollution control measures", "mitigation of storm risks" and "relief & rescue operations. However, the Tehran Municipality does not assume the "lead-agency" role in any of the sub-committees.

The Tehran Municipality received after the year 2000 the administrative responsibility to formulate, in close cooperation with all other relevant entities, the "Tehran Comprehensive Emergency Management Plan" (TCEMP). In response to this, the Municipality established a non-formalized entity and organized under this entity 22 committees involving 24 organizations for the purpose of formulating and implementing the Tehran emergency management plan. The committees are grouped into three major categories, namely "relief and rescue management", "settlement management" and "logistics management". This categorization is not identical with the subject-orientation of the national level sub-committees.

The disaster management system as a whole has a very high level of complexity, because of the many different entities that are involved in formal terms, making the system very coordination- and communication-intensive. This is so, since the overall concept of disaster management configuration remains anchored along sector-lines. At the same time and because of the coordination intensity, the whole system is slow in implementation already during "normal" times and it can be easily slowed down by bureaucratic "inertia", red tape and simple non-attendance of regular committee members. The level of complexity and its practical and operational implications should be reviewed taking into account the following criteria: (i) adequacy, following the rule of "as much as necessary and as little as possible", (ii) suitability, should establish whether a sector-oriented organization structure in an area which is per se interdisciplinary is suitable, and (iii) cost efficiency, should establish the optimum balance between system configuration, reductions in disaster effects and costs involved.

Planning Issue 2: Institutional Anchor and Core Functions. The Tehran Disaster Mitigation and Management Center (TDMMC), which was formed in May 2003 through the merger of two former non-formalized institutions, is the institutional anchor of disaster management in the Tehran Municipality. It falls now under the direct supervision and authority of the Mayor of Tehran.

TDMMC is mandated to address all four areas of disaster management, namely "mitigation", "preparedness", "emergency response" and "rehabilitation & reconstruction" covering most types of natural and man-made disaster during all defined levels of disaster intensity.

TDMMC is, as the institutional anchor of overall disaster management and emergency response measures in Tehran, still an institution in its "infant stage". There is a need with TDMMC having for the first time received from the Municipality a significant expenditure ceiling to review and clearly define the centers core functions and subordinated functions. The logical starting point for such review is the May 2003 decree of the Mayor of Tehran. This exercise must be accompanied by defining a development direction for TDMMC as a whole. The resource endowment in terms of personnel, facilities, training programs and so on should be decided once the fundamentals for TDMMC have been put into place. Whatever the final mandate and functions for TDMMC will be, it is clear that the center's personnel endowment should be highly professional keeping in mind the inter-disciplinary nature of disaster management.

Planning Issue 3: Tehran Emergency Management Plan. TDMMC has also inherited from its two predecessors the role of being the sole responsible implementing entity for the emergency management plan. The emergency management plan is under implementation using a "Standard Operating Procedure" (SOP) and "Incident Command System" (ICS) management approach with a view to harmonize and facilitate communication among the many participating organizations and entities. Implementation of the emergency management plan is divided into six phases. The resource assessment (phase 3) is so far completed only to about 70%, and the identification of key people within the chain-of-command is on-going.

It is clear from the above that the emergency plan is not yet at an operational level. There are also many areas that need clarification and, if needed, re-definition. The SOPs issued by TDMMC are very general in nature and the actual formulation of the emergency response plans is left to the participating organizations themselves. There is no guarantee that these plans, once they are all available, actually form an integrated overall plan. The ICS involves many hierarchical layers of personnel in participating organizations, defining even minute details. While the whole approach looks well structured on paper, it is not unreasonable to assume that there will be numerous communication and control problems in an actual event. The drill exercises conducted so far are not actually geared at testing the responsiveness and effectiveness of the emergency response system, since they are tailored in such a way that all disaster parameter are known by all participants in advance.

It is, therefore, recommended to review, based on the requirements of a final fundamental mandate and functions for TDMMC, the whole emergency plan system with a view to

simplify and harmonize it. A core issue in this context is the questions whether TDMMC should function as the Emergency Operations Center in case of a real event.

Planning Issue 4: Risk Assessment & Response Capability & Capacity. The JICA master plan study has provided a risk assessment for three potential earthquake events (all other potential disasters falling under the jurisdiction of TDMMC are beyond the TOR for the JICA master plan). It is self-evident that the various emergency management entities at present have neither the capabilities nor the capacities to cope with the effects within the usual emergency response time of say 72 hours.

There is a clear need to map out the emergency response scenario not only in qualitative, but also in quantitative terms. Several analytical and planning steps need to be realized in this context on an ASAP-basis. As a first step it would be advisable to determine a proper disaster management zoning for Tehran. The current thinking is that Districts form the base unit for disaster management. However, Districts are mere administrative units and they do not necessarily form the most logical and/or desirable emergency response base unit.

Secondly, it will be important to establish the quantitative response frameworks for entities, such as hospitals, temporary shelter facilities, water supply and fire brigade, and to correlate these capabilities and capacities with the numerical results of the risk assessment. Naturally, the gap between response requirements and actual capability will most likely be considerable. Notwithstanding this fact, this step is also needed with a view to establish reasonable emergency management zoning.

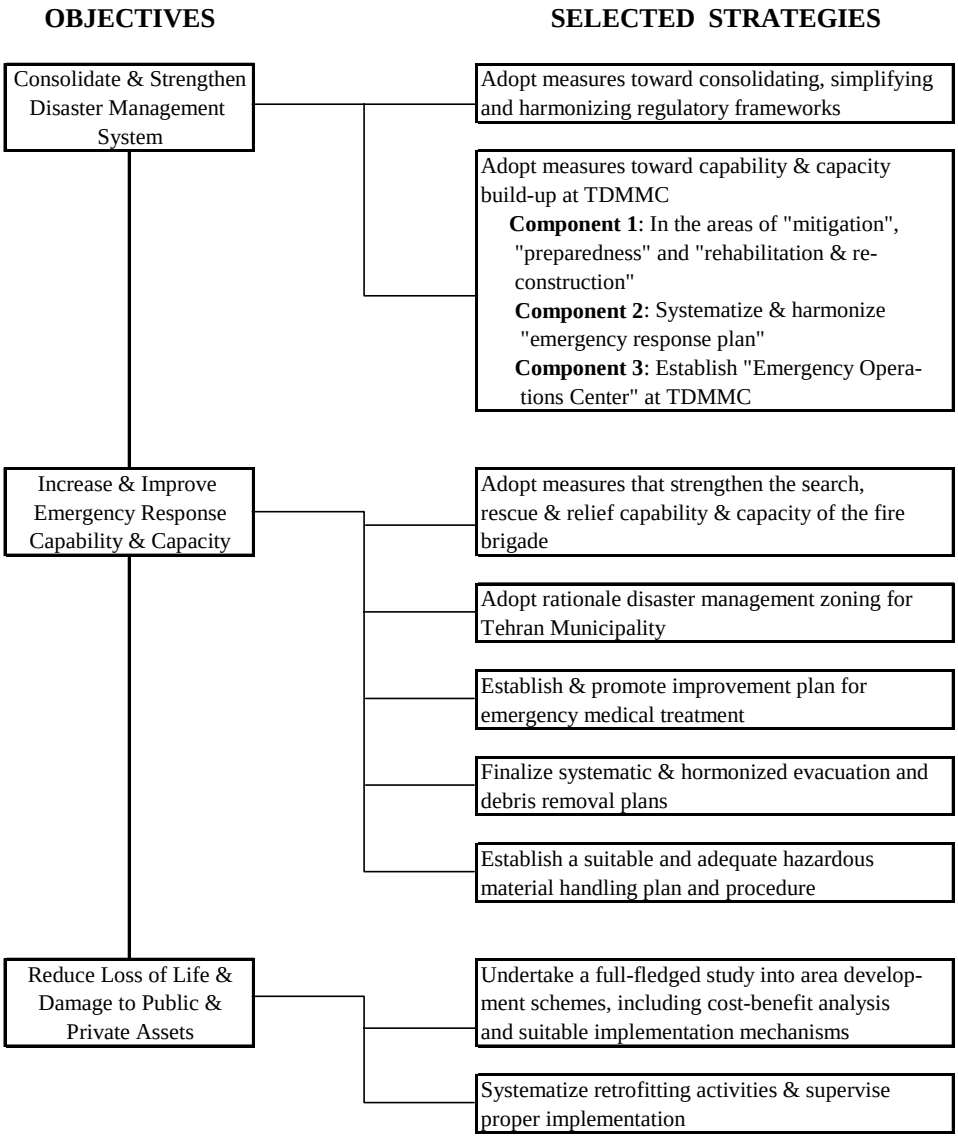
In a final step, all the above can be combined into various scenarios tailored around the disaster intensity levels combined with the resource endowments (manpower, facilities and equipment) needed to cope with a certain level of disaster effects. It is essential in this context that a clear time frame for emergency response is defined. It may be necessary in view of the gravity of the risk assessment for Tehran Municipality to define a time frame well beyond the usual 72 hours.

Planning Issue 5: Emergency Response Personnel & Resource Endowment. Involved in this consideration are (i) TDMMC itself as the emergency operations center, and (ii) all other entities that would be directly or indirectly involved in coping with the effects of the risk assessment. The resource endowment for TDMMC as a planning guideline is already addressed in section 2.6. An assessment for all other entities is, at this point in time, not possible, since the inventory is still on-going under phase 3 of the emergency response plan. These data have not been made available.

4.7.2 Objectives & Strategies

It has been argued at length that disaster management in general and emergency response in particular cannot be realized without a suitable and adequate "institutional anchor", which in turn is embedded into a clear and comprehensive regulatory framework. The objectives and strategies identified in Figure 4.7.1 are adopted from the perspective of TDMMC evolving into the institutional anchor for disaster management and emergency response for the Tehran Municipality.

The major objectives and strategies to be adopted in pursuit of these objectives should concentrate around the following:



Source: JICA Study Team.

Figure 4.7.1 Major Objectives and Strategies for Tehran Disaster Management Improvement

- Keeping in mind the policy guidance, planning and operational measures already developed over the past decade or so, the primary objective and concern should be to consolidate and strengthen the overall disaster management system for Tehran Municipality through (i) the adoption of measures to simplify and harmonize the regulatory frameworks and, (ii) the adoption of measures that are geared toward increasing and improving the institutional capability and capacity of TDMMC.
- Secondly, given the magnitude of the risk assessment for Tehran, priority should be attached to increase and improve the emergency capability and capacity of the relevant entities. Five fundamental strategies should be pursued: (i) to strengthen the search, rescue and relief capability and capacity of the Tehran fire brigade, (ii) to establish a disaster management zoning for Tehran that reflects all relevant parameter, (iii) to establish an improvement plan for emergency medical treatment, (iv) to finalize suitable and adequate evacuation and debris removal plans, and (v) to establish a suitable and adequate hazardous materials handling plan and procedures.
- Finally, a decrease in the potential loss of life and damage to public and private assets should be pursued through strengthened mitigation measures. Retrofitting of important public buildings has been already decided upon and funding for such activities is being solicited. However, the approach should be made more rationale by investigating the technical, economic, financial and social consequences of area development as a supplement to retrofitting and the retrofitting program should be systematized with clearly established selection and decision supporting criteria.

In principle, the above objectives and strategies should cover the whole period of the next two national level development plans (i.e. 2005 to 2015) with emphasis on certain aspects to be readjusted in line with the successful implementation of individual objectives and tasks, that is as and when the need arises.

4.7.3 Tentative Action Program & Project List

The tentative action program lists a series of measures that are recommended for realization within the identified time frames. The list is by no means comprehensive, but concentrates on key elements that need either review, definition or re-definition and/or areas in which new and additional regulatory, administrative or operational initiatives will have to be taken. The action program together with the project list assumes the reader's knowledge of other parts of the disaster management master plan and it assumes familiarity with the project long-list, in particular, priority projects in the fields of emergency operations center, telecommunications and disaster information system and upgrading of medical facilities.

Unless specifically otherwise stated, the recommended actions refer to both national and Tehran level disaster management issues.

Table 4.7.1 Action Program for Improvement of Tehran Disaster Management System

Action Prohgram Area	Target(s)	Action Program Element	Comment
REGULATORY FRAMEWORK	(1) Firmly establish & professionalize disaster management madates & functions	National Disaster Management Law	(a) A national law is not a "condition-sine-qua-non" for effective & efficent disaster management. However, the GOI may consider such aptions, with a view to firmly establish disaster management.
	(2) Eliminate unwarranted inter-agency rivalry & streamline	Streamlining the now existing system	(a) The existing system is too complex/complicated with too many management tiers. Simplify the structure in line with modern management principles. (b) Integrate mitigation, preparedness, emergency response and rehabilitation and reconstruction. [c] Establish a realistic implementation time frame. (d) Establish and imlement a proper monitoring and evaluation system. (e) Design, conduct, supervise and evaluate "realistic" drill exercises.
	(3) Decide on suitable disaster management zoning	Definition of basic "spatial disaster management unit"	(a) The country should be divided into realistic and manageable disaster management units either by law and/or EO.
	(4) Close loopholes in the legal framework	Fire law	(a) There is an urgent need to formulate and pass a fire law that would enable the fire brigade to act with more authority, in particular in the areas of search, rescue & relief as well as the treatment of hazardous materials. Such law is also needed to firmly integrate the fire brigade into emergency response activities.
		Harzardous materials	(b) Investigate possibilities to strengthen the handling of hazardous materials, in particular during emergency response situations. If needed, revise law and strengthen implementation rules & procedures.
DEVELOPMENT PLANNING	(1) Integrate disaster management into the national planning system and process	Identify a clear strategy based on the proposed master plan for Tehran	(a) The present "administrative superstructure" for disaster management needs to be complimented by a clear strategy with clearly identified objectives and measurable performance criteria. (b) Strictly implement the monitoring and evaluation system. [c] Integrate disaster management fully into all planning functions.
		Operationalize on central & local Government levels	(a) Based on a streamlined system, establish clear operational plans for regional and local entities of the system and define a realistic time table. (b) Reflect disaster management in regional/local budgets and planning.
		Integrate disaster management into public sector project defintions.	(a) Mitigation measures as well as emergency response requirments should be integrated in formal terms into public sector project formulation.
URBAN PLANNING	(1) Integrate disaster management into a new Tehran urban development plan	Integrate disaster management with urban planning	(a) Urban planning and disaster mangement planning are done now on a "stand alone" basis. This is a serious flaw with significant consequences that needs to be remedied.
ORGANIZATIONAL STRUCTURE	(1) Lean & knowledge driven TDMMC organization	Streamlining of the Disaster Management System	(a) Review the now existing organizational structure with a view to streamline and convert into modern knowledge-driven entity that is in position to perform effectively and efficiciently. (b) Integration with a possible future "National Disaster Management Institute" (not yet existing) should be positively considered. [c] Keep organization "lean & knowledge driven", manned by professionals that has national and international standing and reputation.
INTERNATIONALIZATION	(1) Integrate the organization into the international network	Design a Program for that purpose	(a) There is a global network of disaster management institutions and experts. Take measures to take full advantage of this situation.
EMERGENCY RESPONSE SYSTEM	(1) Integrate & streamline the "Emergency Response System"	Review the current emergency respons plan and focus it	(a) Combine the results of (i) risk assessment, (ii) emergency response capacity and capability (phase 3 of the current system) and, (iii) a suitable "grass root" organization for establishing suitable "disaster management zoning system" (b) Based on (a), re-define emergency response system
	(2) Establish TDMMC as "Emergency Operations Center - EOC"	Prepare proejct for realization and implement project ASAP	(a) Define mandate, functions, statutes (if needed), five to ten years institutional capacity & capability development plan, including budget, personnel and so on (b) Integrate EOC facilities and telecommunications and disaster information system requirments into the TDMMC development plan [c] Integrate TDMMC into Tehran urban planning as well as national socio economic development planning
	(3) Strengthen Fire Brigade for emergency response activities	Prepare project for realization and implement project ASAP	(a) Establish legal basis (b) Fully integrate Fire Brigade into "Emergency Response System"
	(4) Strengthen hazardous material's handling	Prepare project for realization and implement project ASAP	(a) Review legal basis and, if necessary, strengthen legal requirments (b) Fully integrate these activities into "Emergency Response System"
BUDGET & FINANCING	(1) Ensure adequate financial means	Introduce 5-year budgetary planning	(a) Bring disaster management budgeting in line with development planning & have short (1 year) medium (5years) and long-term (10 years) budget estimates.
	(2) Explore additional financing mechanisms	Investigate complimentary financing resources	(b) Disaster management systems are expensive. Therefore, investigate additional financing sources from purpose-tied levies and so on.
PRIVATIZATION	(1) Identify potential for privatization	Investigate the possibilities	(a) Disaster management is, in principle, a public sector function. However, there are niches in which privatization is possible and advantages.

Source: JICA Study Team

Project Title: Institutional Capacity Building of TDMMC

The project refers to item 8.1.C in the project list of the Interim Report. The project should be combined with the establishment of the Emergency Operations Center (EOC) and the establishment of a suitable emergency telecommunications and disaster information system. **Implementation agency** should be the Municipality of Tehran/TDMMC. The project should be designed to cover the period 2005 to 2010 with a possibility for extension to 2015. The project is the core element in strengthening the Tehran disaster management system/emergency response system.

Project Title: Strengthening of the Tehran Fire Brigade for Emergency Response Activities

The Tehran Fire Brigade, which falls under the direct command of the Tehran Mayor, is the logical executive arm and area commander in the immediate search, rescue & relief activities during an emergency response. The Fire Brigade has an existing (though insufficient) network of stations and equipment within Tehran and an extensive training program for its personnel However, fire brigade activities are currently hampered by a series of legal and regulatory deficiencies. The project should remedy that situation with a view to fully integrate the Fire Brigade into the "Emergency Response System". **Implementing agency** would be the Tehran Municipality.

Project Title: Training Facilities and Center for the Tehran Fire Brigade

Professional training of Fire Brigade personnel for even "normal" operations is very demanding and it requires the availability of suitable and adequate facilities. The Fire Brigade has recently obtained an area south of Tehran, which belonged before to the Municipality's recycling organization. However, that area in particular and the Fire Brigade in general lack suitable space and facilities for normal fire personnel training, but also for emergency response training and the handling of hazardous materials. The project aims at establishing suitable training facilities in form of a "Tehran Municipality Fire Brigade Training Center", including the training for disaster management covering all types of disasters and also including the handling of hazardous materials. The project may be combined with the above project proposal. **Implementing agency** would be the Tehran Municipality.

Project Title: Assistance for Upgrading the Legal Framework

The analyses have identified a series of shortfalls in the overall disaster management related regulatory frameworks that should be removed. Key elements are: (i) integration of disaster management into socio-economic planning and project formulation, (ii) a national level disaster law, (iii) an adequate fire law, and (iv) an adequate regulatory framework and enforcement framework for the handling, storage and processing of hazardous materials. This situation should be corrected as soon as possible for achieving effective and efficient disaster management. These items could be handled as a program or they could be separated and added to other projects proposed here. **Principal implementing entities** would most likely involve the Tehran Municipality, the Ministry of Interior and the Ministry of Justice.

Project Title: Strengthening Hazardous Material Handling

The current emergency response system does not clearly cover this issue, though there are significant facilities within Tehran that store and process hazardous materials. The Industrial Relocation organization, which is charged with enforcing the relocation of hazardous

industries, does not have mandate and no capability for hazardous material handling under emergency response conditions. Also, there are various regulatory loopholes, such as the lack of a fire law and water-tight procedures. The project would assist to remedy this situation by establishing, *inter alia*, an emergency response plan for hazardous materials, including the relevant organizational, regulatory and procedural issues. This project could be integrated either into the Fire Brigade related projects, or the TDMMC institutional capacity building priority project. The **implementing agency** would most likely be the Tehran Municipality.

Project Title: Techno-economic Feasibility Study for Emergency Operations Center

Adding the emergency operations center function to TDMMC is an essential ingredient in the TDMMC institutional capacity building project. Seeking ODA financial assistance for the establishment of the EOC requires the provision of a "bankable" F/S, which would be provided under this project. The implementing agency is the Municipality of Tehran/TDMMC.

Project Title: Tehran Urban Development Plan

It is vital for the case of Tehran to fully integrate the regular urban planning with disaster management functions, both of which are presently handled on a "stand alone" basis. Tehran has a basic urban development plan, which is not adhered to, and the Municipality is presently undertaking a full-scale inventory of actual land use within Municipality boundaries. This could form an excellent starting point for re-doing a Tehran Urban Master Plan that integrates not only urban and disaster planning, but also pressing urban transportation issues. Implementing agency would be the Municipality of Tehran, Urban Planning and Transport Divisions, as well as TDMMC.

Project Title: Industrial Disaster Emergency Response Master Plan(s)

Tehran hosts a number of large-scale industrial facilities, *inter alia*, in the petro-chemical area, which fall in formal terms under the jurisdiction of the respective technical line ministries. The line ministries and/or the state-owned ownership companies are in the technical sense of the word responsible for any actions that respond to an industrial disaster and/or a natural disaster induced emergency situation. However, there are indications that the enterprises and/or the facilities themselves are not sufficiently equipped to deal with such situations. The project would assist all relevant entities to establish a suitable and adequate emergency response plan. The implementing agencies would be the Municipality of Tehran/TDMMC in close cooperation with the relevant line ministries and state-owned enterprises.