CHAPTER 8 DATABASE SYSTEM

8.1 Objectives

In order to implement the Study, a wide range of natural and social data had to be collected, compiled, integrated, analysed and displayed by the proper device/media to evaluate the spatial distribution of an earthquake disaster in the study area. GIS is considered to be the most valuable and powerful methodology for spatial data compilation, integration, analysis and display. Large sets of data showing regional characteristics can be analysed, combined and superimposed by GIS software to display the spatial distribution of characteristics of the earthquake disaster.

The final products of the database are maps and tables showing current conditions and analysed results. All the data and results will be overlapped and utilised for the development of seismic disaster mitigation planning. The database is relatively primitive because of many limitations such as the short study period and lack of data. Therefore, this database should be updated in the future.

8.2 Design

In this study, a "modified UTM" coordinate system, the same as used by the Survey Department, KVTDC and DMG, was adopted. All data obtained in other formats using different coordinate systems were converted to the modified UTM coordinate system before being used in this database. This brought the Team to realise the necessity for providing a precise coordinate system in maps and projections in Nepal, not only for this study but also for all current and future projects and tasks in Nepal, including as the base for urban planning.

Using the database and discussions with counterpart personnel of the Survey Department, the Study Team designed and developed a customised system "Kathmandu Earthquake Risk Mitigation Tool (KERMIT)" that incorporated a new simulation function as shown in attached Figure 8.2.1.

8.3 Specifications

Based on the design of the database system and taking the amount of related data and results into account, the specifications needed to use the database system are as follows:

Hardware consists of a PC with free hard disk space of more than 400 MB, a monitor of 1024 x 768 pixels, and a colour printer/ plotter.

a) Software; Microsoft Windows 95/98/ME, ArcView GIS (Version 3.1 or 3.2) by ESRI, Microsoft Excel 2000, Microsoft Word 2000, Microsoft PowerPoint 2000 and Windows Media Player (Version 6 or 7).
b) The software (KERMIT) developed by the Team for the study can display all data and results of the Study. This software can also make new simulations for various scenario earthquakes.

The adopted coordinate system in this database system is "Modified UTM" and the detail is shown in Table 8.3.1.

Table 8.3.1 Factors of "Modified UTM" coordinate system

Spheroid		Everest 1830
Projection		Universal Transverse Mercator
Origin	Latitude	84 degree East
	Longitude	0 degree North
False co-ordinates of origin		500,000m Easting
		0m Northing
Scale factor at central meridian		0.9999

The municipal wards and the VDCs are adopted as the basic units for the administrative boundaries in this study. Every municipal ward and VDC is identified with an ID Number of five digits.

For various analyses as described in Chapter 1, a grid with a mesh of 500m square was used. Each mesh was identified with an ID number which relates to the coordinates of longitude and latitude.

8.4 Functions

This system, the "Kathmandu Earthquake Risk Mitigation Tool (KERMIT)," is specially developed for the "Study on Earthquake Mitigation in Kathmandu Valley, Kingdom of Nepal". KERMIT has two main functions as follows:

a) View and query the entire results of this study

KERMIT menu dialogs lead the user to the target result that the user is interested in. The user should choose the title in menu dialogs or list box in the submenu.

b) Simulate various scenario earthquakes

Another function is the simulation of ground motion and damages caused by various scenario earthquakes. When the parameters of an earthquake are specified, the results will be automatically calculated from the GIS data and displayed.

8.5 Operations Manual

(1) Installation

As **KERMIT** does not have its own setup function, the user should execute the following two simple operations for the installation.

a) Copy the Directory "*eqdm-ktm*" and all sub-directories from the CD-ROM on which it is provided to the root directory of the computer's C drive.

b) Edit the configuration file "*eqdm.inf*" in directory "¥*eqdm*", using your text editor as following contents.

- First line: directory path which includes the file "*arcview.exe*"
- Second line: directory path which includes the file "*excel.exe*"
- Third line: title of your **ArcView**. See the title bar of active window of **ArcView**

(2) Operation

User can execute "*eqdm.exe*" in "¥*eqdm-ktm* ¥*system*" directory. Main menu appears at centre of the display as shown in Figure 8.5.1. Main menu indicates eight buttons to lead to each category.

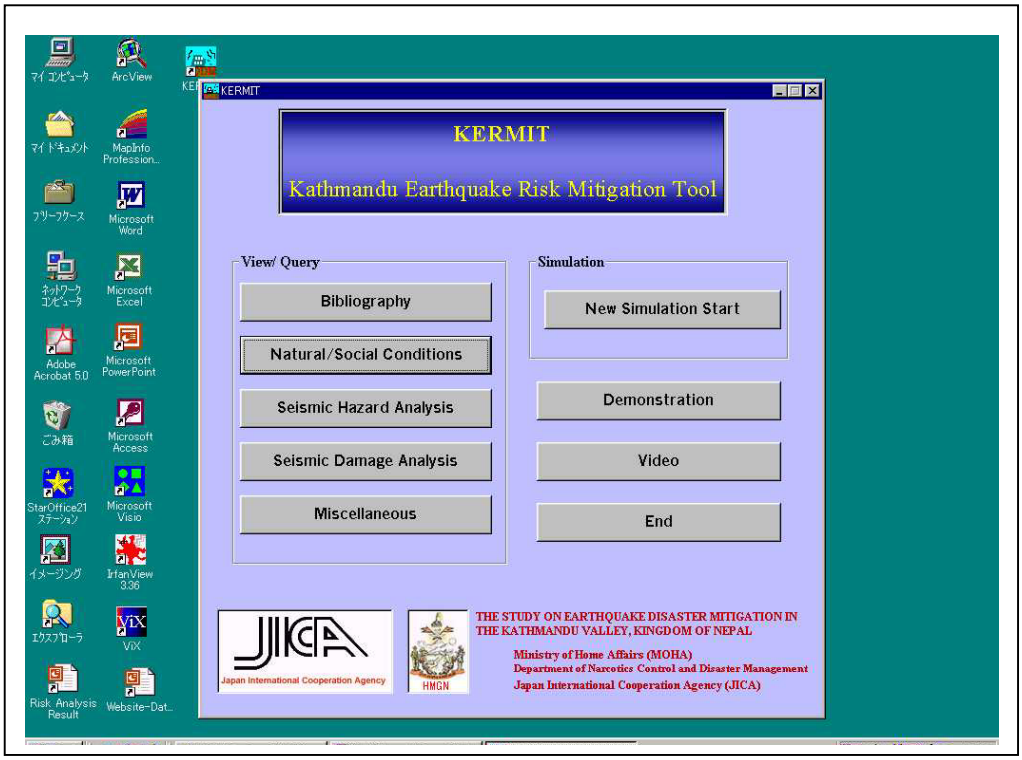

Figure 8.5.1 Main Menu of KERMIT

8.6 Contents

In accordance with the design, the contents of the database were formulated and contents are listed in attached Table 8.6.1.

CHAPTER 9 WEBSITE

The website of this Study was developed and released at the following URL.

http://www.jica-eqdm-ktm.org.np

The top page is shown in Figure 9.1.1.

Figure 9.1.1 Top Page of the Website

PART III

CONCLUSIONS

CHAPTER 10 CONCLUSIONS

10.1 Study Results and Conceivable Programmes for Earthquake Disaster Mitigation

10.1.1 Earthquake Disaster Assessment

The study team assessed earthquake disaster scenario for the Kathmandu Valley to effective disaster mitigation planning. To determine the damage and that would be caused by a future earthquake, data on natural and social conditions were collected and analysed.

Based on the seismic, seismo-tectonic and geological conditions around the Kathmandu Valley, the following three new fault models were selected for disaster assessment.

a) Mid Nepal Earthquake (Magnitude: 8.0)
b) North Bagmati Earthquake (Magnitude: 6.0)
c) KV Local Earthquake (Magnitude: 5.7)

In addition, d) an earthquake equivalent to the 1934 Bihar-Nepal Earthquake (Magnitude: 8.4) was modelled for comparison with the three potential earthquakes.

Seismic intensity was calculated for the four fault models as follows.

a) Mid Nepal earthquake: Except in mountainous areas, MMI VIII would be experienced in the Valley.
b) North Bagmati earthquake: Except in mountainous areas, the Valley would experience MMI VI or VII.
c) KV Local earthquake: The area along the fault would experience MMI IX. Other parts of the Valley, except the mountainous areas, would experience MMI VII or VIII.
d) 1934 Bihar-Nepal earthquake: Most areas of the Valley would experience MMI VIII, and some areas in the eastern part would experience MMI IX.

Although the liquefaction potential for all models was evaluated as relatively low, compared to a previous estimates undertaken by UNDP, the study results indicated that extraordinarily extensive damage would occur if a moderate to great earthquake were to strike the Valley.

It is considered that action should be taken to improve the capacity for earthquake disaster assessment. Thirteen recommended programmes are shown in Table 10.1.1.

Table 10.1.1 List of Programme for Earthquake Disaster Assessment

No.	Items	Reference in Main Report	Responsible Organization								
			National Government				Local Government	Private Sectors			
Earthqauke Disaster Estimation											
ED-1	Seismological Measurements										
ED-1.1	Seismological observation	III-4-a	DMG								
ED-1.2	GPS observation	III-4-a	Survey Dept.								
ED-2	Basic data										
ED-2.1	Regulation of Map data	III-4-b	Survey Dept.								
ED-3	Geological Data										
ED-3.1	Basement structure measurement of Kathmandu valley	III-4-c	DMG					Nepal Geological Society			
ED-3.2	Geological database	III-4-c	DMG					Nepal Geological Society			
ED-4	Infrastructure database										
ED-4.1	Building inventory/Census	III-4-d	MPPW					Nepal Engg Assoc.			
ED-4.2	Lifeline GIS database	III-4-d	MPPW	NEA	NTC						
ED-4.3	Bridge ledger	III-4-d	MPPW								
ED-5	Data clearing house	III-4-e	MOHA	MOCom							
ED-6	Improvement of Damage estimation										
ED-6.1	Historical data gathering and analysis	III-4-f	DMG								
ED-6.2	Strong motion observation network	III-4-f	DMG								
ED-7	Education and Research										
ED-7.1	Earthqake engineering laboratory	III-4-g	MOSE	MPPW	Tribhuvan Univ.			Nepal Engg. Assoc.			
ED-7.2	Training earthquake engineers	III-4-g	MOSE	MPPW	Tribhuvan Univ.			Nepal Engg. Assoc.			

10.1.2 Sustainable Mechanisms for Development of Disaster Management

There is a strong tendency for public authorities and organisations to act independently with little contact or coordination with other bodies; effective disaster management requires close cooperation among ministries and other governmental/societal institutions. In Nepal, several reasons were noted for the existing inadequacy of inter-institutional cooperation:

a) Lack of adequate legal framework, and thus unclear responsibility.
b) Lack of incentives for individual institutions, with inadequate funding being the greatest disincentive.
c) Lack of auditing or system of accountability for public administration.

The biggest difficulty that Nepal faces for earthquake disaster management is the lack of sustainable mechanisms for governmental/community mitigation and preparedness actions, rather than the lack of resources. Though, there appears to be a trend that may begin to overcome this difficulty; decentralisation represented by the Self Governance Act and disaster management actions in some communities.

It is considered that action should be undertaken to improve the capacity for disaster management. Sixteen recommended programmes are shown in Table 10.1.2.

Table 10.1.2 List of Programmes for Sustainable Mechanisms for Development of Disaster Management

No.	Items	Reference in Main Report	Responsible Organization								
			National Government				Local Government	Private Sectors			
Sustainable Mechanism for Development of Disaster Management											
SM-1	Establishment of Legal Foundation	II-3.1.5	PM Office	MOHA							
SM-2	Establishment of Disaster Management Council										
SM-2.1	National Disaster Management Council	II-3.1.5	PM Office	NPC	MOHA	MOLD					
SM-2.2	Kathmandu Valley Disaster Management Council	II-3.1.5	MPPW	MOHA	MOLD		Municipalities				
SM-2.3	Municipality/Ward Disaster Management Council	II-3.1.5	MOLD				Municipalities				
SM-3	Cooperation between Government and Private sector	II-3.1.4	MOHA								
SM-4	Preparation of Disaster Management Plan										
SM-4.1	National Plan	II-3.2.1	NPC	MOHA	MOLD						
SM-4.2	Central government Plans	II-3.2.1	All Ministries								
SM-4.3	Kathmandu Valley Plan	II-3.2.1	MPPW	MOHA	MOLD		Municipalities				
SM-4.4	Municipality Plans	II-3.2.1	MOLD				Municipalities				
SM-4.5	District Plans	II-3.2.1	MOHA				VDC				
SM-4.6	Private Plans	II-3.2.1						Hospital	School	Company	
SM-5	Emphasis of Earthquake Managemenmt in National 5 Year P	II-3.2.2	NPC	All Ministries							
SM-6	Exercises and Education										
SM-6.1	Citizens	II-3.3.1	MOLD				Municipalities				
SM-6.2	School Children	II-3.3.2	MOSE				Municipalities				
SM-6.3	Civil Servants	II-3.3.3	MOLD				Municipalities				
SM-6.4	Masons	II-3.3.4	MPPW				Municipalities				

10.1.3 Maintain Governance

Once a mid-scale to great earthquake occurs, the disaster will escalate through the interaction of natural phenomena, social conditions and human reactions. If the government is unable to provide effective leadership and systematic management of response and recovery operations, the initial response will be one of chaos, resulting in ineffective rescue and relief works, social distrust, and a destabilised society and economy: It will then be difficult for people to pull together, and people must be recoverable to pull together to from a disaster.

It is considered that action should be taken to improve the capacity to maintain governance. Twenty-five recommended programmes are shown in table 10.1.3.

Table 10.1.3 List of Programmes to Maintain Governance

No.	Items	Reference in Main Report	Responsible Organization								
			National Government				Local Government	Private Sectors			
Maintain Governance											
MG-1	Establishment of Real Time Earthquake Information System										
MG-1.1	Earthquake Information System	II-4.2.1	DMG	MOHA			Municipalities				
MG-1.2	Seismic Intensity Information System	II-4.2.2	DMG	MOHA			Municipalities				
MG-1.3	Earthquake Information Reporting System	II-4.2.3	DMG	MOHA			Municipalities				
MG-2	Assesment of Damage Information System										
MG-2.1	Establishment of Lines of Communications	II-4.3.1	All Ministries				Municipalities				
MG-2.2	Improvement of Daily Business Style	II-4.3.1	All Ministries				Municipalities				
MG-2.3	Preparation of Taking Aerial Photos	II-4.3.1	Survey Department								
MG-3	Empowerment of Media										
MG-3.1	Seminars and Trainning	II-4.3.2	MOCom.	Nepal TV	Radio Nepal			Media FM	Newspapers		
MG-3.2	Amendment of National Broadcasting Act	II-4.3.2	MOCom.								
MG-3.3	Publicizing	II-4.3.3	MOHA	MOCom.				Media FM	Newspapers		
MG-4	Establishment of Emergency Communications										
MG-4.1	Identifying the Defects of Radio Wave Propagation	II-4.4.1	MOCom.	NTC							
MG-4.2	Digital Mobil Mulch Channel Access System	II-4.4.2	All Ministries				Municipalities				
MG-4.3	Simultaineous Reporting System	II-4.4.2	MOHA								
MG-4.4	Portable Handset	II-4.4.2	All Ministries				Municipalities				
MG-4.5	Initiatiate Amateur Radio Network	II-4.4.3	MOCom.	NTC				Amatuer Radio Community			
MG-5	Preparation for Emergency Response										
MG-5.1	Control System	II-4.5.1	PM Office								
MG-5.2	Central Government EOC	II-4.5.2	PM Office	All Ministries							
MG-5.3	Municipality/Ward EOC	II-4.5.2	MOLD				Municipalities				
MG-5.4	Plans/Manuals	II-4.5.3, 4.7	MOHA	MOLD	All Ministries		Municipalities				
MG-5.5	Facility for EOC	II-4.5.3	All Ministries				Municipalities				
MG-6	Discipline Public Sector										
MG-6.1	Discipline Public Sector	II-4.6.1, 4.6.2	All Ministries				Municipalities				
MG-6.2	Line of Succession	II-4.6.3	All Ministries				Municipalities				
MG-6.3	Preservation of Vital Record	II-4.6.4	All Ministries				Municipalities				
MG-7	Preparation for Recovery										
MG-7.1	Capacity Building	II-4.8.1	All Ministries				Municipalities				
MG-7.2	Review/Evaluation of Existing Priorities and Projects	II-4.8.2	MPPW								
MG-7.3	Preparedness	II-4.8.3	All Ministries				Municipalities				

10.1.4 Protect Life and Property

This is the ultimate objective for disaster management, although many difficulties are anticipated in responding to the disaster, including search and rescue operations, medical care, cremation, drinking water and food, public health care, security, fire-fighting, management of volunteers, safety inspections of structures and infrastructure, debris removal and disposal, and provision of shelter and temporary housing. When disasters strike, individuals and organisations react and their reactions are guided by whether they know what to do, their degree of preparedness to take appropriate action, and other factors, including their confidence in the safety of loved ones. Effective means of acquiring, assessing, and disseminating disaster information are required.

The availability of logistics to support on-site activities after the occurrence of a disaster is a critical issue. The transportation system must continue to function during and after the occurrence of an earthquake disaster, so that search and rescue can be conducted and other socio-economic activities can continue functioning. Rapid restoration of electrical power and water supplies to the affected areas is equally critical. The existing conditions of these elements of the Valley's infrastructure were discussed to identify any underlying problems.

It is considered that actions are needed to improve the capacity both to protect life and property and to support on-site activities during the initial stages of a disaster. Nineteen recommended programmes are shown in Table 10.1.4.

Table 10.1.4 List of Programmes to Protect Life and Property of the People

No.	Items	Reference in Main Report	Responsible Organization								
			National Government				Local Government	Private Sectors			
Protect Life and Property of the People											
PL-1	Search and Rescue										
PL-1.1	Plan for improvement of research and rescue	II-5.2	MOHA	MOHealth			Municipalities	Red Cros	WHO		
PL-1.2	Acceptance of International Support	II-5.3	MOHA	MOHealth				Red Cros	WHO		
PL-1.3	Improvement of Disaster Medicine	II-5.4	MOHealth					Red Cros	WHO		Hospitals
PL-1.4	Food and water supply	II-5.5.8	MOHealth								
PL-2	Shelter and Evacuation										
PL-2.1	Plan for shelter, evacuation and removal	II-5.6.4	KVTDC				Municipalities				
PL-3	Medical Problem										
PL-3.1	Public Health Care	II-5.7	MOH					Hospital	Red Cross Assoc.		
PL-3.2	Remains	II-5.8	MOH				Municipalities				
PL-4	Other Functions										
PL-4.1	Security	II-5.9.1	MOHA	RNA							
PL-4.2	Firefighting	II-5.9.2	MOHA								
PL-4.3	Management of volunteers	II-5.9.3	MOHA				Municipalities				
PL-4.4	Safety Inspections	II-5.9.4	MPPW				Municipalities	Nepal Engg. Assoc.			
PL-4.5	Debris removal	II-5.9.5	MPPW				Municipalities	Nepal Engg. Assoc.			
PL-5	Transportation System (Roads and Bridges)										
PL-5.1	Database	II-5.10.6	MPPW								
PL-5.2	Temporary Bridges	II-5.10.6	MPPW	RNA							
PL-6	Electricity Supply										
PL-6.1	Database	II-5.11.5	NEA								
PL-6.2	Solar Power	II-5.11.5	NEA								
PL-6.3	Wind Power	II-5.11.5	NEA								
PL-6.4	Diesel generators	II-5.11.5	NEA								
PL-7	Staging area	II-5.12	MOHA								

10.1.5 Strengthen Socio-Economic System

Working towards sustainable development is a natural and necessary companion to working towards effective earthquake disaster management itself, because the ability to deal with earthquake disasters is highly dependent upon the fundamentals of society, economic growth and social stability, all of which are the fruits of sustainable development. Urban society is highly dependent on the socio-economic infrastructure, and any weakness makes it vulnerable to disaster. The vast direct and indirect economic and societal losses caused by disasters can be reduced by reinforcing the infrastructure through sustainable development practices.

It is considered that the action should be taken to strengthen the socio-economic system. Eighteen recommended programmes are shown in Table 10.1.5.

Table 10.1.5 List of Programmes for Strengthening the Socio-Economic System

No.	Items	Reference in Main Report	Responsible Organization								
			National Government				Local Government	Private Sectors			
Strengthen Socio-Economic System											
SE-1	Urban Planning										
SE-1.1	Urban Space Allocation Detail Planning	II-6.1.2	KVTDC	MPPW			Municipality				
SE-1.2	Assignment Planning of Intensive Development Areas	II-6.1.3	KVTDC	MPPW			Municipality				
SE-1.3	Assignment Planning of Mitigation Bypass Routes	II-6.1.3	KVTDC	MPPW			Municipality				
SE-1.4	Urban Zoning for Disaster Mitigation measures	II-6.1.5	KVTDC				Municipality				
SE-2	Transportation Facilities										
SE-2.1	Roads to improve access to the Valley	II-6.2.5	MPPW								
SE-2.2	Roads to improve mobility inside the Valley	II-6.2.5	MPPW								
SE-2.3	Improvement of bridges	II-6.2.5	MPPW								
SE-3	Building										
SE-3.1	Improving Building construction	II-6.3.7	MPPW				Municipalities	Masons			
SE-3.2	National Building Code	II-6.3.7	MPPW					Nepal Engg. Assoc.			
SE-3.2	Training	II-6.3.8	MPPW				Municipalities	Masons	Nepal Engg. Assoc.		
SE-3.4	Inspection of Key Buildings	II-6.3.8	MPPW					Nepal Engg. Assoc.			
SE-4	Electricity										
SE-4.1	Network improvement	II-6.4.3	NEA								
SE-5	Water Supply & Sewerage Facilities										
SE-5.1	Database system	II-6.5.3	NWSC								
SE-5.2	Distribution system by water tankers	II-6.5.3	NWSC								
SE-5.3	Preservation of existing wells and spouts	II-6.5.3	NWSC				Municipalities				
SE-5.4	Preparation of earthquake resistant design ,manual	II-6.5.3	NWSC								
SE-6	Telecommunication facilities	II-6.6.3	MOCom.	NTC							
SE-7	Socio-economic influence	II-6.7.1	MOCommerce								

10.2 Cost Estimate

Regarding soft programmes such as legal/institutional strengthening and capacity building, the cost calculation for programme implementation was based on the probable requirement for the input of experts to assist in the implementation. Regarding construction of infrastructure, the cost of implementation was shown if the programme directly contributes to earthquake disaster mitigation.

The cost of each programme is shown in the attached Table 10.2.1, 10.2.2, and the total cost is shown in Table 10.2.3 below.

Table 10.2.3 Cost Estimate

Item	Total Cost (million yen)
Earthquake Disaster Assessment	3,250
Sustainable Mechanisms for Development of Disaster Management	947
Maintain Governance	3,835
Protect Life and Property of the People	4,950
Strengthen Socio-Economic System	9,630
Grand Total	41,974

10.3 Evaluation of Programmes and Implementation Plan

The programmes listed above are too great in number and quantity to be accomplished within a limited time because they need a tremendous amount of resources and implementing time and, sin some cases, will take time even before there can be consensus among the relevant organisations/people. It could take 50 years or even longer to actually implement all the programmes.

Some programmes must be selected from among the entire list to act as initiatives and stimulation for succeeding works. They must bring visible results to promote further endeavours to achieve, as much as possible, the goals for earthquake disaster reduction.

The proposed programmes were evaluated, based on the following factors.

a) Term

The required duration to complete the programme will be an essential issue. Each programme was rated as A: short term (1 to 5 years), B: middle term (5 to 10 years), or C: long term (more than 10 years).

b) Priority

Taking the following points into consideration, each proposed programme was rated as A: high priority, B: moderate priority, or C: low priority.

- Contribution to accomplishment of one or more of the three goals
- Significance of the problem and effectiveness of the solution (degree to which the problem to be resolved is viewed as significant and degree to which the proposed solution will successfully solve the problem; likelihood of the programme producing the desired outcome)
- Value/impact for dollar/yen spent
- Sustainability/ability to attract or generate further investments in mitigation and preparedness by others.

c) Reality

In terms of now realistic the programmes were, each one was rated as A: highly realistic, B: moderate, realistic, or C: not realistic; according to the following two criteria:

· Feasibility (technical, financial, political, etc.; there is reasonable assurance and consensus that the technology, expertise, materials and equipment etc. available in the country will fix the problem)
· Acceptability (likelihood of receiving the support of the responsible institutions and other stakeholders)

For evaluation of the programmes, the study team applied the following point system.

Score for rating in each category is as follows.

Rating	Score
A	3
B	2
C	1

Programme evaluated, based on the total score of the three categories as follows.

Total Score	Evaluation (Importance)
9	High
6 to 8	Moderate
3-to 5	Low

It is noted that the above-mentioned rating and evaluation are based on the study team's judgement, and other organisations/groups/personnel may have different opinions due to their particular situations. It is recommended that all relevant entities should prepare their own rating and evaluation for implementation planning. Moreover, it is highly recommended that all organisations/groups/personnel discuss and agree on overall implementation planning in order to create a Kathmandu and Nepal that are more secure and better able to resist earthquake disasters.

Since it is impossible to completely prevent an earthquake disaster, continuous effort for disaster mitigation is essential. The attached Tables 10.3.1 and 10.3.2, show an implementation plan that would, with intensive effort, achieve a certain level of mitigation.

10.4 Proposals

The study team selected four projects for urgent implementation. The selected projects include several high-scoring programmes as listed below.

(1) Establishment of Early Earthquake Information System

Related programmes:

- Earthquake Information System (MG-1.1)

- Seismic Intensity Information System (MG-1.2)
- Earthquake Information Reporting System (MG-1.3)
- Seminars and Training for Empowerment of Media (MG-3.1)
- Publicising for Empowerment of Media (MG-3.3)
- Emergency Plans/Manuals for Preparing for Emergency Response (MG-5.4)
- Emphasis of Earthquake Management in National 5 year Plan (SM-5)

(2) Establishment of Municipality Disaster Management Institution and Exercise

Related programmes:

- Establishment of Municipality/Ward Disaster Management Council (SM-2.3)
- Municipality level Disaster Management Planning (SM-4.4)
- Municipality/Ward EOC establishment (MG-5.3)
- Emergency Plans/Manuals for Response in Municipality level (MG-5.4)
- Citizens' Resilience and self-reliance (SM-6.1)
- School Children's Resilience and self-reliance (SM-6.2)
- Civil Servants' Resilience and self-reliance (SM-6.3)
- Urban Space Allocation Detail Planning (SE-1.1)

(3) Building Improvement

Related programmes:

- Improving Building Construction (SE-3.1)
- Improving National Building Codes (SE-3.2)
- Building Training (SE-3.3)
- Inspection of Key Buildings (SE-3.4)
- Masons' Resilience and self-reliance (SM-6.4)

(4) Establishment Comprehensive Database for Earthquake Disaster Mitigation

Related programmes:

- Database for Transportation Systems(Roads and Bridges) (PL-5.1)
- Database for Electricity Supply System (PL-6.1)
- Database for Water Supply & Sewerage Facilities (SE-5.1)
- Establishment of Regulation of Map Data (ED-2.1)
- Building Inventory/Census (ED-4.1)
- Lifeline GIS Database (ED-4.2)
- Bridge ledger (ED-4.3)
- Historical Earthquake Data and Analysis (ED-6.1)

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- District Development Committee Act, 1991
- Village Development Act, 1991
- Motor Vehicle and Transportation Management Act, 1993
- Public Rods Act, 1974
- Solid Waste Management and Resource Mobilization Act, 1987
- Industrial Enterprise Act, 1992
- Labour Act, 1992
- Local Self Government Act, 1999

3. Legislation on Cultural heritage Conservation
- Ancient Monument Protection Act, 1956
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4. Legislation on Natural Resources Use and Conservation
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- Forest Protection (Special Arrangement) Act, 1967
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- Pesticide Control Act,1991
- Breast Milk Substitute (Sales and Distribution Control) Act, 1992

6. Legislation on Land Use
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- Land Revenue Act, 1977
- Land Acquisition Act, 1977
- Local Administration Act, 1971

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- Road Tax Act, 1961
- Motor Vehicles Tax Act, 1974
- Water Tax Act, 1966
- Household Tax Act, 1962
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