II-5 Disaster Imagination Game (DIG)

Ministry of Home Affairs
HMG of Nepal

JICA Study Team on KV EQ
Disaster Mitigation Planning

For More Safety Kathmandu Valley

Report of the DIG
(Disaster Imagination Game)
on
KV Earthquake Disaster Mitigation

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Preface

This is the report of the First DIG (Disaster Imagination Game) in Nepal, which held in August 10, 2001, as afternoon program of The First Seminar on Kathmandu Valley Earthquake Disaster Mitigation.

Nepal is one of earthquake prone country. We, the people engaged in disaster management consider disaster as a matter of balance between hazard and vulnerabilities. Even if the same scale earthquake hit some area again, or even if hit different places at the same time, because of the difference of vulnerabilities, the damages will be quite different. Generally speaking, vulnerabilities are gradually decreasing with the development of human society or economic growth. Nepal is one of the Least Less Developed Countries (LLDC). Because of economic disadvantages, vulnerability (in other word, lack of preparedness against hazard) is quite severe, such as less human resources, less planning, less infrastructure, etc. In addition, because of poor urbanization, population growth and other reasons, Kathmandu Valley (KV), the capital area of Nepal become more vulnerable than it has to be.

DIG was originally invented as a participatory awareness rising program for disaster management. However, concerning the First DIG in Nepal, there were three main purposes. The first purpose is to disseminate the result of scientific estimation of earthquake hazard and damage, which will hit KV within about 50 years. The second purpose is survey of the idea of high-level officials of the HMG of Nepal and related agencies on earthquake disasters mitigation. And the third purpose is dissemination of the know-how of DIG itself.

Before explaining the details of the record of DIG, I have to explain two things. One is What is DIG, and the other is Outline of the Seminar.

What is DIG?

DIG is easy and cost-effective methodology of Table Top Exercises for Disaster Management, invented in 1997 in Mie Prefecture, Japan. DIG is the output of fruitful collaboration of three talents; the first one is the power of local people live in Mie, the second one is the sense of coordination of one public official working in Mie Prefecture Government, and the last one is the knowledge and information of one researcher on Disaster Management. This researcher has some experience in Japanese Military Organization (JSDF: Japan Self Defense Forces) and he became a bridge between the know-how of the SDF and the power of local people. Methodology of how to use map during DIG workshop is basically came from JSDF but modified for easier and more cost-effective way.

There are some basic materials for DIG. Map is the board of this game. Usually we use "The Big Map" like 2 x 2 m (sometimes we need enlargement photocopy, cut and paste, etc) in order to surround the map. Scale of map is depending on the scope of discussion. (For example, discussion for community based organization, 1/1000 to 1/2000 scale map is suitable, and discussion for strategic transportation, 1/50000 scale will be suitable.) We also prepare transparent sheet (to cover the map), permanent pen (oily *magic pen*) and benzene with paper or cloth as eraser. These three items are most fundamental tools of DIG.

Participants are requested to write down information, knowledge, ideas, etc., on map, such as result of survey of disaster prone buildings and bridges, by their own hands. Then we can discuss just like "which road should be the alternative to go to that building" based on map itself and writings on map. What facilitate the discussions is your ideas and your hand writings!

This is all of explanation of basic framework of DIG, so that you understand that DIG is very easy. I hope DIG will facilitate the understanding for Disaster Management.

Outline of the Seminar

The First Seminar of Kathmandu Valley Earthquake Mitigation was held on Aug 10, 2001 at Hotel Himalaya of Patan. Japan International Cooperation Agency (JICA) and Department of

Narcotic Control and Disaster Management, Ministry of Home Affairs (MOHA), HMG of Nepal jointly organized this seminar. Morning program started with welcome speeches and keynote lecture on Earthquake Disaster by Prof. Dr. Upreti of Department of Geology, Tribhuvan University. After keynote lecture, some of members of JICA Study Team explained findings of KV Earthquake Disaster Management.

The DIG workshop is afternoon program of this seminar. Participants are requested to divide into sis groups (sis tables). one group is about ten members. On each tables, there is 1/ 25000 scale map of Kathmandu Valley.

At first, facilitator briefly explained, "What is DIG," because this is ***the first*** DIG in Nepal so that no one in Nepal fully understand the contents of DIG. Next, transparent sheet is distributed and participants were asked to cover the map, so that map became ready for writings. On covered map, facilitator asked participants to write down some information by participants themselves. Present location, the place of Royal Palace, then strategic roads and bridges, rivers, open places, then other places of important facilities and buildings was confirmed on map, such as hospital, telecom center, international airport, temples, etc. For indication of important places, small flag was used. Then, once again, findings of KV earthquake were explained. Participants were asked to write down the damages on map, with their imagination. These are the first phase of DIG.

Second phase of DIG was started with questions. Facilitator launches some questions to participants. Participants were requested to write down their own answers to a small pad (one answer per one pad) and put it on board. Participants were also requested to discuss and prioritize the answers. Naturally the "to be done" list for KV earthquake disaster management is made.

From next page, seven themes, which are all important for KV earthquake disaster management, will be explained. At first, please read "Purpose and Background of the Question" so you will understand why this topic is important. Then, answers from six groups are listed. (Please notify that minimum arrangement for edition was added.) After that, I myself write down "analysis and comment of facilitator." These analysis and comments are completely my own ones, so that there might be some unwilling mistakes. Please notice to the author.

At the end of this report, "Summary of each group" or overall impressions by the participants are reported. Their comment will help you to understand the atmosphere of DIG.

I believe that these records of discussions and comments will help you to think about Earthquake Disaster Mitigation in KV.

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Theme 1
On Strategic Transportation System (especially Road)

Purpose and Background of the Question

Strategic Transportation is the one of the most fundamental element for disaster management in general. Disaster Management means, in some part and especially in emergency phase, matter of transportation toward affected area. Concerning Kathmandu Valley, if Tribhuvan Highway is closed by landslide, it become tremendously difficult to send relief supply from India and other major area of Nepal to KV, except a few air transportation and by others means. Road to Airport is also critical for the acceptance of international relief activities. Facilities of the Airport themselves should be checked. Ring Road is also most fundamental road of the Kathmandu.

The answers of participants are...

Question
Which Strategic Road should be repaired first? And Why?

Answers

Group A

On Roads

1A. Ring Road
1B. Sinamangal - Oldbaneshor - Maitidevi - Dillibazar
2. Roads to main hospitals; Bir Hospital, Teaching Hospital, Patan Hospital
3A. Road from Airport to Hospitals
3B. Old Road & Araniko Highway from Airport to Bhaktupur.
4. Thankot to Tundikhel
5. Other radial roads; Budhanikantha - Tundikhel

On Bridges

1A. Bagmati Bridge (Tinxwe)
1B. Dhobikhola Bridge (Babar mahal)
2A. Manohara Bridge (Arniko high-way)
2B. Hanumante Bridge to BKT
3. Kalimati Bridge (Bishunumati)
4. All Bridges of Ring Road
5. Other bridges of link roads

Other idea of Road and bridge which should be high priority

1. Thapathali bridge
2. Link road from Jawlakhal to Thapathali
3. Kanti Path
4. Soalti to Bir Hospital
5. Road around Tundikhel
6. Trolley Bus Road

Group B

1. Bridge Tunkoml (Bagmati to Airport)
2. Thapathali Bridge (Thapathali to Patan)
3. Hanumante Bridge (Bhaktapur)
4. Ring Road Bridge Tubaokhu
5. Ring Road Balaju Bridge (Rishnu)
6. Maiti Dulli Bridge (Dhobikhk)
7. Guwarkhu Bridge (B & B hospital)

Group C

1. Hospital to Airport
2. Thankot Road
3. Bhaktapur Road (Arniko Highway)
4. Ring Road
5. Thapathali - Lagankhel Road

Group D

1. Airport to Ratna Park
2. Kanti path
3. Ram Shah Path
4. Ring Road
5. Thankot to Kathmandu

Group E

1. Airport - Babarmahal - Bir hospital (Tundikhel)
2. Tundikhel - Teaching hospital
3A. Airport - Koteshwore - Satdobato
3B. Patan hospital - Jawalakhel
3C. Pulchowk - Kupondole - Tripureshwore - Bir hospital
4. Ring Road
5. Connector road to Ring Road

Group F

1. RCAD + BDG to airport
2. Thapathali bridge

3. Manahara bridge
4. Road to Bhaktapur
5. Road to Thankot

Analysis and Comment by the facilitator

It is very surprising that no group mentioned the importance of the road that connects inside and outside of the Valley. JICA Study Team assume epicenter of *the next big one* (named "Mid-Nepal Earthquake") about 100km west of KV. Because of earthquake activities of this area are relatively low, it is reasonable to suppose that potential energy of earthquake is accumulating in this area. Tribhuvan Highway (Prithvi Rajmarg) crosses assumed epicenter and surrounding area so that there might be seriously damaged all around the route. This means the most important ground supply route of the KV will be cut down everywhere. One specialist said that at least it takes two or three months long to repair Tribhuvan Highway.

Compare to other industrial countries and areas, KV looks more resilient against the shortage of supply goods. Even so, for example, lack of fuel or lack of firewood will be critical. In my understanding, Tribhuvan Highway is the most important strategic transportation route for KV.

All group put high priority on road to airport and also, road to hospitals. These answers are very reasonable, at least for emergency phase. Although, strategic transportation system *for* KV will never concluded *within* KV. Strategic transportation for KV should not limit only air transportation. And we should deeply check again about the supplier of our commodities. KV is not self-sufficiency than you expect.

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Theme 2
On Prioritization of Reinforcement of the Key Buildings

Purpose and Background of the Question

"EARTHQUAKES DO NOT KILL PEOPLE, UNSAFE BUILDINGS DO" This is commonly known phrase within the earthquake disaster management society. This phrase itself is correct. Although, the real problem behind this phrase, especially in case of developing countries like Nepal, is the fact that ***"It is easy to talk about mitigation, but it is difficult to implement mitigation, because, Mitigation (in this case reinforcement of the buildings) needs huge cost. Who Pay?"*** Especially in developing countries, situation is more miserable. Under these conditions, the most important element is PRIORITIZATION. Which building should be first, second, third...

The answers of participants are...

Question
Which building should be reinforced first? And Why?

Answers

Group A

1. Hospitals
2. School Buildings (public)
3. Communication (Radio / TV / Telecommunication)
4. Temples and other institution Building (Singha durbar)
5. All other private institution and residential building

GroupB

Vulnerable Area

1. Asan
2. Indrachok
3. Makhan
4. Maru Area
5. Old Baneshwor
6. Baha???

Priority Building; Hospital
(Prioritization Option A)

1. Bir Hospital
2. Prasutigriha
3. Army Hospital

(Prioritization Option B)
1. Tribhuvan University Teaching Hospital
2. Maternity Hospital, Thapathali
3. B & B Hospital, Gbarko
4. Bir Hospital, Ratna Park
5. Patan (umn) Hospital
6. Kathmandu Medical College, Sinamangal
7. Nepal Red Cross, Kalimati
8. Army Hospital, Swayambhu

Group C
1. Hospitals
2. Schools and Colleges with Large Compound (spaces)
3. Government / municipal Buildings
4. Tele Communication Center(s)
5. Reservoirs

Group D
1. Schools
2. Hospitals
3. Supply / Trade Complex
4. Ware houses
5. Facilities

Group E
1. Hospitals
2. Schools/colleges
3. Communication centers (Telecommunication)
4. Water supply system+ food store centers
5. Government Administrative Buildings

Group F
(Prioritization Option A)
1. Communication Tower Buildings
2. Food Depots
3. Electric power stations
4. Bir hospital
5. Teaching hospital
6. Patan hospital
7. Bhaktapur hospital
8. Army hospital

(Prioritization Option B)
1. Institutional buildings
2. Schools / colleges
3. Government Buildings (Offices)

Analysis and Comment by the facilitator

Four groups among six put hospitals on highest priority. One group put school on priority one and the rest also put school to relatively higher priority. These answers were very reasonable and understandable. One is the most important facility for life, and the other is multi-purpose facility for community center, information distribution center, temporary sheltering, ware house, etc.

On the other hand, all groups put government offices on relatively low priority (priority three or below). In some cases it did not appear on the list. What is the meaning of these results? There are some possible interpretations.

One interpretation is that government building are already reinforced that it is not necessary to put them on high priority. This may be right. Relatively speaking, government buildings (Singha Durbar) are new. Although, based on our survey results, except Birendra International Convention Center, all government buildings are not seismically designed. Another interpretation is that even if government buildings will collapse by earthquake, administrative functions will be done in Tent Village in Singha Durbar and we already prepared so that it is not serious problems. Fortunately or unfortunately, this will not true. Another and more reasonable (or frightened) interpretation is that evaluation for government is basically very low so that these results are simple reflections of dairy estimation for government. These results simply show the fact that no one trust government in case of large earthquake. Is it correct interpretations? If it is (unfortunately) correct, what we should do? This causes very serious question.

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Theme 3
On Strategic Usage of Open spaces
(Especially related to medical care)

Purpose and Background of the Question

The management of open spaces, or in other word, how to allocate rescue and relief functions to each open spaces will be one of the most important role of the disaster management HQ in emergency phase. Functions or usages of open spaces are as follows; commanding post, field hospitals, landing/takeoff area for helicopters, parking area, station area for international relief team, temporary shelter (tent village), temporary ware houses, etc. Functions or usages are decided by; scale, location, existing facilities, etc.

In this section, facilitator asked the participants about the suitable place for Field Hospitals. The real (but hidden) question is like that; "Once one open space designated for filed hospital, this space will not be able to use for other purposes. RATNA PARK, THUNDIKHEL and National Stadium are very good open spaces for any purpose. The real problem is the contradiction of the functions. Who allocate the functions to each open space? Who manages open spaces? Do they know the importance of allocation of open spaces?"

The answers of participants are...

Question
Where is the most suitable place for Field Hospital(s) including international medical teams?

Answers

Group A
1. Open space nearer existing hospitals

Group B
1. Thundikhel
2. Ratna Park
3. Open space of Army Hospital (Candidate for Open Spaces) Bhugol Park / Dasharath Rangashala / Army Ground Patan / Bhaktapur Thanilchok / Ratna Park / Tundikhel / Birendra hot Hall

Group C
1. Tundikhel
2. Stadiums
3. Government Premises / School Premises / Scout Premises
4. Any other open spaces / play ground

Group D
1. School building or public place (Buildings with Open Spaces)

Group E
1. Tundikhel
2. Convention Hall (Baneshwore)
3. Stadium (Dasrath) Tripureshwore
4. Jawalakhel (in front of zoo) + Lagankhel
5. Sallaghari (Bhaktapur)
6. Sano Gauchar (Gyaneshwore)
7. Tribhuvan University Complex (Kirtipur)

Group F
1. Tundikhel
2. Chhauni
3. Airport area
4. Stadium
5. Sallaghari (Bhaktapur)
6. International conference hall
7. Lagankhel chowk
8. Sanogaucharan (Gyaneshwor)
9. Sanothimi (Madhyapur)
10. Engineering collage Stadium

Analysis and Comment by the facilitator

Without consideration for other purposes or "conflict among roles," Group A's "Open space nearer existing hospitals" is the most proper answer to candidate for Field Hospitals. Four groups among six groups mentioned TUNDIKHEL is the best place for Field Place. Exactly! Tundikhel is

suitable for field hospital. Although, Tundikhel is also suitable for any other purposes!! How can you solve this problem of conflict among functions? Who decide? When he/she will decide? That is the real problem. In this meaning, the answer "TUNDIKHEL" is, partly right but not perfect. We should think and allocate proper function to respective open spaces. It may be correct to say that Tundikhel for field hospital, but it may not be correct.

Regarding the answer of "Open spaces nearer existing hospitals," we should consider more deeply. We have to check the situation of preparation. Concerning field hospitals, we should prepare vacant space but also water supply, electric supply, joint to existing sewerage system, etc. Security of the space is also critical. Once survivors enter that space, it is very difficult to use it for other purpose except temporal shelters.

The situations for other candidates of open spaces are basically same. It means that in order to talk about open spaces, or talk about how to use each open space, we have to check not only locations but also existing facilities. If the functions of respective open spaces are decided previously, and if the funding is available, we should prepare for each designated open spaces (functions).

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Theme 4
On Community Based Disaster Management

Purpose and Background of the Question

In case of large-scale earthquake disaster, who will be rescue provider? People might say, police, fire brigade, Royal Nepal Army, Nepal Red Cross, domestic and international volunteers, UN and other international organizations, foreign governmental aid such as JICA or USOFDA, etc. Exactly! Rotary Club, Lions Club, Chamber of Commerce and Industries, Junior Chamber, and other organization that have international partner will also contribute to the survivors of the earthquake. They will do their best to rescue and save the life of the people in KV.

However, the first responder, or initial responder to rescue and save life of the people in KV, is totally on the people's hands live in KV.

There are several community based organizations in KV, such as Ghuti, Youth Club, domestic and international NGOs, etc. These organizations will contribute to some extent to disaster management. Although, these activities will not be sufficient compare to the scale of earthquake. So that we should empower the capacity of local people in order to cope with the scale of disaster.

The most important element of community based organization is the existence of leader. Who will be leader? Who organize the local people? This is the problem. Outer resources? It may be true. Local NGOs? It may also be true. What is the most suitable answer?

The answers of participants are...

Question
Who should organize In-front Activities?

Answers

Group A

1. Community
2. Volunteer organization (Red Cross)
3. Police and army
4. International team of rescuers

Group B

Groups should be formed under the chairmanship of local ward chairman, with the coordination from local organization like;

1. Health facility
2. School / colleges
3. Local clubs
4. Local ????? ?????
5. Local Red Cross

Group C

1. Local community

2. Ward Level Volunteers / Disaster Management Committee
3. Rescue Team (Army and Police), Fire brigade
4. Red Cross / Scout
5. Foreign Assistance

Group D

1. Local Community
2. Village Development Committee / Ward Committee
3. District Committee
4. Central Committee

Group E

1. Local community + clubs
2. Ward disaster management committee
3. VDC / Municipality disaster management committee
4. Red Cross + Police + Army
5. National + Government (Disaster Management Committee)
6. International organization

Group F

1. Local community people
2. Social organization
3. Army and Police

4A. Chief of district office
4B. Mayor, Municipality
4C. Village development committee

Analysis and Comment by the facilitator

Frankly speaking, answers of each group were disappointed ones for facilitator. It would be the responsibility of facilitator not to explain well about the purpose and/or meaning of the question to the participants. Answers of some groups were "local community" themselves. But this answer is tautology and no meaning. What is the power structure of the community and who has the responsibility? Who is the leader to organize and lead the local community? These are the meanings of question and these are the points we should confirm. Do you really think that local people spontaneously organize themselves against disaster? In my view, it is optimistic. There are needs for some "wake up calls" and some "lead agencies." Sometimes they might be outsiders.

This kind of community based organizations should be formulated before earthquake. In some ward, there are some movements toward establishment of "ward disaster management committee." These efforts should be highly admired. However, these organizations do not have to focus only for disaster. Because unfortunately (for us), disaster management or large scale earthquake were not accepted as the serious problems by local people. They face their day to day problem. That is the reason why the combination of disaster management and sustainable development are requested.

Police, RNA and international team of rescuers may organize some local people temporally to accomplish their rescue activities more efficiently after the disaster. But life and death of the local people is deeply depends on community itself. Even if local people does not have the capability to establish proper organization, life and death of the local people is depend on such organization. This is the reality and importance of community based organizations.

I want to raise one open question. Do Village Development Committees (VDCs) or Ward Committee really have capability to organize local people? If yes, it's fine and no problem. If no, which organization will be the substitute?

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Theme 5
On Distribution of Information

Purpose and Background of the Question

"Law and Order." "Security." "Stability within society." These are most important elements of the governance. There are some ways to protect the sustainability of governance even after the earthquake. People easily think about the needs of low enforcement units such as police, army, etc. Although, in my understanding, the easiest way to maintain the stability within society is "distribution of information." Results of one studies said that more information, less possibility of chaos. Unfortunately in case of large-scale earthquake, more or less, confusion of information is inevitable. However, in order to avoid situations getting worse, somebody have to distribute information, properly. Who has the responsibility? What is their tool?

The answers of participants are…

Question
Who has the responsibility to distribute information to the public? And How?

Answers

Group A
1. Public Radio

Group B

Major responsibility will be of MOHA, via following network;
1. Communication media
2. Police / army forces
3. Local government official
4. etc.

Group C
1. MOHA + Ministry of Communication
2. Radio / FM / TV
3. Telecommunication Authority
4. Newspapers
5. Internet

Group D
1. Spokesman of Government (Central Committee) via Radio, TV, Miking

Group E
1. HMG/N through Ministry of Home Affairs through their wireless system from district Headquarters

Group F
1. Electronic medias (Radio, TV)

Analysis and Comment by the facilitator

The participants said that the responsibility to distribute information is on the hand of MOHA or Central Disaster Relief Committee (also chaired by the Minister of Home Affairs). Concerning tools for distribution of information, all group mentioned radio. These are very reasonable answers, at lease within present legal framework. So, the next question should be rise after these official but unrealistic answers. The real problem is the situation of preparedness within MOHA and radio stations in KV.

For example, in Japanese, the initial information of earthquake will be lunched within 3 minutes from the Metrological Agency itself and at the same time broadcast by NHK (Nippon Hoso Kyokai, quasi national broadcasting company) and also other private broadcast company via TV, radio, FM, etc. If the scale of earthquake is serious one, broadcasting program will be immediately (within 5 minutes or so) change for emergency broadcasting mode. Somebody (must be you!) should check the Standard Operational Procedures (SOPs) within MOHA for emergency broadcasting, especially who has the responsibility to do so. Somebody (also must be you!) should deeply check the broadcasting facilities against earthquake. These are completely on your hands.

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Theme 6
Cremation

Purpose and Background of the Question

Cremations (or other methods of treatment of the victims' remains) are an important rite or ceremony of passage. Proper management of these rite or ceremony will satisfy the families and relatives of the victims and ease their sadness. Especially in religious country like Nepal, preparation for culturally and religiously acceptable method of cremation (or other method) is indispensable.

On the other hand, cremations brings very serious problem especially in case of large-scale earthquake. In our result, there will be about 18,000 deaths just after earthquake. These figures are only for instant death caused by the collapse of building. There must be some delayed death caused by lack or delay of search and rescue activities, or lack or insufficiency of medical service, etc.

For everyone, funeral services for deceased are important ceremony of passage. Even in case of large-scale earthquake, the dignity of the people should be guaranteed. However, the situation is extremely severe. Lack of firewood, lack of cremation site (Ghat), needs of quick cremation to prevent the spread of disease, etc. How can we manage this very difficult but very important task?

The answers of participants are…

Question
How, Where and Who will hold about 18,000 cremations?

Answers

Group A

1. With electrical equipment with alternative power supply (generator and fuel)
2. Mass burials
3. by police and army

Group B

1. Install Incinerators
2. Make big Trenches (for mass grave)
3. Traditional burning
4. (all along existing Ghat)
5. Outer rim of Kathmandu Valley
6. Military and Police Personnel

Group C

As our culture, in many places near Bagmati bank by electrical means with the help of local people and government.

1. Electric Cremation
2. River banks
3. Family members, Relatives, Local Government and NGOs

Group D

1. Local disaster management committee
2. According to cultural practice

Group E

1. How: Mass cremation
2. Where: River banks (Ghats)
3. Who: Local community, scouts, Red-cross, Police/Army

Group F

1. Preparation of electric furnace

Analysis and Comment by the facilitator

Some groups mentioned about electric cremation. Even if this might be one alternative, possibilities will be quite low, especially in case of large-scale earthquake. Because there will not be sufficient number of machineries nor electricity.

If government and/or timber associations would be able to supply sufficient firewood, traditional cremation may be carried out even in case of earthquake. (Even in such cases, there must be huge number of temporal cremation site near Bagmati and other River Banks.) However, these are too optimistic. Supply of firewood is one of the problems of strategic transportation. As we discuss on theme 1, situation is quite serious. Sufficient supply of firewood will be very difficult (almost impossible.).

How about the mass grave? It should be recognized as one possibility. We the people engaged in KV earthquake disaster management should persuade the ordinary people before earthquake that there might be such situation and also about its necessity. One study proposed culturally and religiously acceptable process of mass grave. However, many people, especially

Hindu people may prefer mass cremation than mass grave. In both cases, at least, 3 division by religion, Hindu, Buddhist and Islamic is necessity.

Participants look like more optimistic than facilitator on this theme. Is that correct?

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Theme 7
On Inter-Agency Cooperation and "Kitchen Cabinet"

Purpose and Background of the Question

Inter-agency cooperation, both on site and on rear bases is the essential for successful SAR (search and rescue), relief and rehabilitation activities. Everyone who engaged in disaster management mentioned the necessity of inter-agency cooperation, but the practice of inter-agency cooperation is extremely difficult. Concerning KV earthquake, because of the importance of international relief teams, inter-agency cooperation will include not only domestic agencies but also international donor agencies. So that inter-agency cooperation will become more difficult.

In any cases, designation of location for coordination center and nomination of small coordination team (of practical level) before earthquake will be critical.

The answers of participants are…

Question A
Where should be the coordination center of domestic and international relief activities?

Group A
1. Airport

Group B
1. Patan play ground
2. Bhakutapur Thundikhel
3. Mangal Bazar of Patan
4. All accessible open spaces
5. Local communication center

Group C

1. Airport
2. Bhaikutimandap / Tundikhel / Stadium

Group D
1. Donor coordination committee should be formed under the central disaster relief committee

Group E
1. National disaster management committee charred by the Prime Minister

Group F
1. Domestic: Singha Darbar
2. International: UN Building

Question B:
Who will be the candidate for so to called *kitchen cabinet*?

Group A
1. Central Disaster Management Committee

Group B
International Convention Centre (under, Home Ministry and UNDP)
Kitchen Cabinet:
Home Minister
Health Minister
Nepal Red Cross Society
Chief of Army
Chief of Police
Secretaries of MOHA, MOH, MOF MOFA, etc.
Mayor of Municipalities

Group C to E
No record

Group F
1. Home Ministry
2. Communication Ministry
3. Defense Ministry

4. Foreign Ministry
5. Health Ministry

Analysis and Comments by the facilitator

As for the expression and meaning of "kitchen Cabinet," it looked there would be some misunderstanding. This is the responsibility of facilitator. "Kitchen Cabinet" means, in my understanding, small group of key persons from related agencies. Compare to the real cabinet meeting (political level), they are junior but more capable and more practical (technocrat level). In my view, lieutenant colonel class and equivalent civilian officers will be the candidates. In case of emergencies, they coordinate within their group, decide job allocation, they themselves write down the draft policy within their own agencies, get senior officials' approval and carried out. That is the reason why they called "cabinet."

In Nepalese situation, member of kitchen cabinet will be slightly higher than I first impression. It means that secretary or joint secretary level civilian officer and colonel class military officers will be lead the rescue, relief and rehabilitation activities. Indeed, in present political and legal framework, there is Central Disaster Management Committee. In my view, their status is too high for practical jobs and some important component are not on that list.

At the same time, the important point is that "where is the HQ?" Some member mentioned International Airport and several open spaces. In my view, International Airport, Birendra International Convention Center and some hotels will be candidate for coordination center.

KV earthquake is Nepalese National Crisis. So that Group E mentioned that National Disaster Management Committee chaired by Prime Minister should be established. Present Central Disaster Management Committee is chaired by Ministry of Home. They feel the need to grade up of this kind of implementation body. This is quite reasonable. In case of National Crisis, the leadership (and visibility of leadership) is inevitable. National Disaster Management Committee will be one of our goals.

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Other Comments recorded

Group A

As for discussion and the seminar on disaster management mitigation, we found the following should be done for these purpose, (1) make local body for the disaster management, (2) information and awareness programme. Information can be collected from, (1) Tribhuvan University Department of Geology, (2) H.M.G. Geological Department, (3) ICEMOD, and (4) NSET-Nepal.

Group D

These listed ones should be important for disaster management.

(1) Hospitals, (2) Factories, (3) Government offices (4) Super markets, (5) Well prepared place, (6) Knowledge increase awareness, (7) To help for making future plan, and (8) Updating of critical facilities in lines of disaster or emergency

Summary of each Group

Group A

Earthquake vulnerability and risk assessment of KV is highlighted, once again. In case of Earthquake, preparedness is necessity and discussed about the importance aspects as

*Strategic roads
*Hospital and medical services
*Community is the first who rescue
*Reinforced public buildings (hospital, school, etc.)
*Field hospital
*Open space identification
*Information dissemination
*Community based participation in disaster management
*Mass cremation problem are highlighted and identified?

BE PREPARED & CHEER UP

Group B

*Vulnerability assessment with respect to earthquake disaster
*Preparedness for earthquake disaster
*Locating strategic points / services
*Make people aware of earthquake disaster

Group C

1. Local level disaster management community
2. Information and awareness program from community to government level
3. Earthquake resistant hospital
4. Finding the safer places and sharing between different organizations

Thanks to MOHA + JICA

Group D

Findings

*increased knowledge and awareness
*dissemination of information should be continued
*well prepared plan should be needed to cope the disaster
*updating of critical facilities

Group E

1. Formation of Ward disaster management committee for mitigation and preparedness:
   *Training
   *Resources
   *Awareness
   *School curriculum
2. Building code should be mandatory to protect from Earthquake affect.
3. Support to municipality to implement building code provisions.

Group F

*Successfully sensitized on earthquake disaster management in KV.
*Scientific Date Base created for the first time.
*Participatory and critical exercise is critical.
*More exercise needed for disaster management

Message from Facilitator

These are all of the results of the First DIG in Nepal with some comments on it. I hope that this report gives some positive stimulation for you (especially for your effort toward KV earthquake disaster mitigation.).

Because of the limit of time, we could discuss only seven themes. Within these seven themes, there are a lot of sub themes to be discussed. These themes to be discussed are on your Nepalese's hands.

It is easy to discuss something on disaster management, but it is very difficult to discuss with realities on disaster management. In many cases, general (and vague) discussions are very attractive but they produce nothing concrete. In order to avoid falling down into such situation, DIG uses two materials. One is "The Big Map." Real name, real place and existing realities, these things make discussion realistic. The other one is concrete hazard and damage estimation. Fortunately, concerning KV earthquake disaster, we the JICA team conducted scientific data analysis on possible earthquake that will hit KV in near future. Because of the limit of scientific knowledge, numbers of our results will be different to the real numbers. However, these numbers are sufficiently accurate for milestone for preparation.

The result of JICA study team on KV earthquake disaster mitigation is available in this URL. I deeply recommend you to visit our site.

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

All comments in this report are completely personal ones. I pay for careful attention for the context of this report but there might be some misunderstanding. Further questions, comments and suggestions will be appreciated. Through these comments and discussions, I want to think more deeply for KV earthquake disaster management.

My contact address is,

dmkomura@nifty.com

I appreciate any suggestive comments.

For more safety Kathmandu Valley.

T. K.

Ministry of Home Affairs (MOHA)
HMG of Nepal

JICA Study Team on KV EQ
Disaster Mitigation Planning

For More Safer Kathmandu Valley

Disaster Imagination Game (DIG) Manual for Nepalese People

Takashi KOMURA

JICA Study Team
on Earthquake Disaster Mitigation in KV

February 2002

Preface

This is the First Manual of Disaster Imagination Game (DIG) made for Nepal and Nepalese people. DIG is an easy but cost-effective methodology of Table Top Exercises for Disaster Management. It was invented in 1997 in Japan. DIG is also used for Participatory Awareness Raising Program for disaster management. In this manual, I focus mainly on Earthquake Disaster and Earthquake Disaster Mitigation Program, because this manual itself is a by-product of "The Study on Earthquake Disaster Mitigation in Kathmandu Valley" a project implemented by the Japan International Cooperation Agency (JICA) and Ministry of Home Affairs (MOHA), HMG of Nepal.

Nepal is one of earthquake-prone countries. I think Nepalese people remember two Great Earthquakes. One is the 1934 Great Bihar-Nepal Earthquake that hit Kathmandu. Clock Tower, the Landmark of the Kathmandu fell down, 38,000 buildings were completely or partially collapsed and 4,300 people died. The other one is the Gujarat Earthquake that hit western parts of India in January 2001. Even Reinforced Concrete (RC) buildings destroyed and became just like a *Pancake*. These two earthquakes had almost the same intensity. In internationally recognized Modified Mercalli Intensity (MMI), both earthquakes were reported MMI VIII to IX.

We, the JICA Study Team, conducted surveys in collaboration with MOHA, with the aim to make an earthquake disaster management plan. During our survey, we found out that MMI VIII earthquake, in other word, large-scale earthquake like 1934 Great Earthquake or Gujarat Earthquake will hit Kathmandu Valley again in near future. We call it *Mid Nepal Earthquake*. We cannot say when will it strike, but some said "within the next 50 years." Technological estimation of the JICA Study for damages due to *Mid Nepal Earthquake* will be as follows: number of instant death - about 18,000; severely injured - about 53,000; moderate injured - about 94,000; heavily damaged buildings - about 54,000; partially damaged buildings - about 75,000, etc. What should we do? That is the question!

The list of works "to be done" for earthquake disaster mitigation could be very long, but the first one is always "Awareness Raising." So, I write this manual for Nepal and Nepalese people for awareness raising for preparing against the next large-scale earthquake disaster.

Please confirm hazard of next earthquake and vulnerability of your hometown, by your own hand, and also please make up your own "to be done" list with methodology of DIG. I believe that DIG will help you to bring a lot of creative ideas.

September 2001
Kathmandu, Nepal

Takashi KOMURA

JICA Study Team on Earthquake Disaster Mitigation in KV
(Lecturer, College of Environment and Disaster Research,
Fuji Tokoha University, Shizuoka, JAPAN)

Introduction: What is DIG?

DIG (Disaster Imagination Game) is easy but cost-effective methodology of Table Top Exercises for Disaster Management. It was invented in 1997 in Mie Prefecture, Japan. DIG is, in short, something like that; ***"Let's stand around The Big Map, let's write down our knowledge on map, let's share our writings and let's discuss together about disaster management."*** DIG is the output of a fruitful collaboration of three talents: the first one was the power of local people of Mie, the second one was the creative sense of one public official working in Mie Prefecture Government as director, and the last one was the knowledge and information of one researcher on Disaster Management. This researcher was at that time a civilian officer of Japan Self Defense Forces (JSDF, Japanese Military Organization), and he introduced the know-how of JSDF into the to local people. The methodology of how to use map during DIG basically came from JSDF. However it was modified for easier and more cost-effective ways.

There are some basic materials required for DIG. Map is the board of this game. Usually we use "The Big Map" like 2m x 2 m (sometimes we need enlargement photocopy) in order to stand around the map. Scale of map depends on the scope of discussion. For example, discussion for a community based organization, a 1/1000 or 1/2000 scale map is suitable, and for discussion concerning road transportation, a 1/25,000 or 1/50000 scale map will be suitable. We also need transparent sheet to cover the map, permanent pens for writing on the plastic sheet cover, and benzene with paper or cloth as eraser.

There is another important material necessary for DIG. It is scientific hazard and damage estimations. In order to discuss earthquake mitigation realistically, our discussion should be based on scientific findings (especially based on concrete numbers or orders / scales). Concerning KV earthquake hazard and damages, findings of JICA Study Team are available from our web site (http://www.jica-eqdm-ktm.org.np/). Summary of findings is attached at the end of this manual. At the beginning of DIG, I strongly recommend you to check and share these findings. Unfortunately, these findings are general ones. We should add on some imagination on these findings in order to visualize the real situation of disaster. That is the meaning of I (imagination) of DIG.

After the explanation of hazard and damages, participants are requested to divide into some groups. In my experience, proper number of participants of one DIG is around 20 to 50, and number of groups is 2 to 5, for one facilitator with some assistants. It means that about 10 participants compose one group. Of course, it is only a recommended standard, and should not be understood as fixed numbers.

From now on, participatory activities will begin. At first, participants are requested to identify facilities on map, such as road (motorable or not), water resources, hospitals and clinics, schools, open spaces, public buildings, etc. And also, participants are requested to write down "what will happen to these facilities in case of disaster." To

write down by their own hands is the best way to recognize the situations. In addition, writing down on map means to share information and ideas among participants. By writing down, we will be able to get identify consensus problems / fields for further discussions.

Figure 1

Example of Basic Flow of DIG

(1) Opening Remarks
(10 min)
(2) Explanation of Hazard / Damages / Loss Estimation
(25 min)
(3) Grouping
(5 min)
(4) Identification of Facilities
(20 min)
(5) Imaging of Potential Damages
(20 min)
(6) Discussions with guidance from Facilitator
(30 min)
(7) Free discussions
(30 min)
(8) Presentation from each group
(20 min)
(9) Wrap up comments by Facilitator
(10 min)
(10) Closing Remarks
(10 min)

Total 3 hours

Based on writings on map, we can initiate discuss just such as "which road should be the alternative way, in case of bridge A will be falling down and road B will be closed by collapsed buildings?" What facilitate the discussions are your ideas and your hand- writings!

Facilitator may ask you to write down about your reactions and so on. You can use small paper (memo-pad) to write some ideas and put it on board next to "The BIG MAP." You can also share the idea by looking at such board. At the end of workshop, please make a time for presentation. By presentation you can summarize your findings and you also can learn from other participants' ideas.

These are basic framework and flow of DIG, so that you understand that DIG is very easy. I hope DIG will facilitate the understanding for Disaster Management.

Figure 1 explains one model case of DIG. In this model, the length of the workshop is 3 hours. You can adapt this model to your situation / problems by adding or skipping some items.

1. Planning and Preparing

(1) Purpose of workshop

* What is the purpose of workshop?
* Awareness Raising First, then what?

Knowing Hazard / Knowing Vulnerabilities / Thinking Mitigation / Thinking Response

(2) Role and responsibility of Organizer and Facilitator

Organizer

Needs of "staff meetings" before workshop

Facilitator

Key person of DIG

Just like actor or actress, body action, over action and lauder voice is important talent for facilitator

(3) What should be prepared?

Date and Venue
Time Schedule
Speaker(s) of Opening and Closing Remarks
Facilitator(s) / Staffs
Invitation Letter
Refreshments

(4) Basic Materials

Map
Transparent plastic sheet
Permanent pens (several colors), Benzene and a piece of cloth

OHP and OHP sheets
Large Paper or White Board (or Black Board)
Memo Pad (small piece of papers)
Board (soft or hard)
Pin or tape to put on the board

(1) Purpose of Workshop

Purpose of the workshop should be focused. It is relatively easy to talk about disaster management but it is very difficult to discuss properly and reach to some concrete conclusion. Organizer and facilitator should meet several days before workshop and should decide the scope and focus of discussions. Otherwise, that discussion will easily become "chattering" and nothing will follow.

The first step is "Awareness Raising." We have to set "Wake-up Call" for disaster management. Several years from now on, we should focus on this matter in various areas, such as mayor, deputy mayor and high-level officials of Municipals, staffs of local governments, ward chairperson and word members, leaders of community based organizations, school curriculum, etc. Next step will be "Knowing Hazard," "Knowing Vulnerabilities," "Thinking Mitigation," and "Thinking Response." These are basic framework of disaster management in general. In other work, these are content of "preparedness." DIG is the "entrance gate" for disaster management.

(2) Organizer and Facilitator

Role and responsibility of the organizer is very important. The organizer should have "staff meeting" before workshop. Topics of staff meeting are "who does what?" and "who prepares what?"

The facilitator is the focal point of DIG. Body action, over action and lauder voice are the important talents of Facilitator. Fundamental role and responsibility of the facilitator is to lead the participants, show them what to do, and launch proper questions. This matter will also be mentioned later.

(3) What should be prepared?

There are several things to be arranged for workshop. Some are listed on the left page. Please add anything you need, if necessary. Invitation letter and Refreshment may be very important in Nepal.

(4) Basic Materials

The list shown on the left page spells out the basic materials required for DIG. Concerning Over Head Projector and OHP sheets, this is basically for explanation of next large-scale earthquake. Please visit our web site, select the necessary materials, download the context and print them. You will be able to get teaching materials for earthquake disaster mitigation easily.

With transparent plastic sheet, you can write directly on map. Even in case of permanent pen, you can erase with benzene.

Large paper or white board (black board) is used for explanation by facilitator and presentation from each group. Memo pad, board and pin (or tape) are used to facilitate your discussions. Please do not write down two things on one piece of paper. After writing down, please gather the pieces of paper. Then categorize, prioritize, allocate and put them on board. These prioritized pieces of paper will help you to think about disaster management.

2. Flow of DIG

(1) Explanation of hazard / damages
Use scientific hazard / damages data

Hazard and damage date for KV earthquake disaster management are available from JICA Study Team website.
http://www.jica-eqdm-ktm.org.np/

(2) Identification of Important Facilities for Disaster Management
Identify important facilities on map and show up them visually

Road (motorable or not) / water resources / hospitals and clinics / schools / open spaces / river and bridges / etc.

(3) Imaging of Potential Damages
Think and write down, what would happen if large-scale earthquake strikes

Some bridges will be falling down / many buildings will collapse / by collapsed buildings, many narrow roads will be closed / a large number of people will be trapped / etc.

(4) Discussion with guidance from Facilitator
Think and answer the questions from the Facilitator

(5) Free Discussion
Discuss about disaster management

Based on Facilitator's questions and participants' answers

(6) Presentation from each group
Share the process of discussion and findings of workshop

(7) Wrap up comments by Facilitator
Find out a clues / leads to the next steps

Flow of DIG

These are one example of basic flow of the DIG. Key elements to facilitate discussion are mentioned on the left page. Readers of this manual can easily understand the overall flow of DIG using them. Concerning *(1) Explanation of hazard / damages*, it may be better to invite some expert to explain the hazard and damages. The most important point of this phase is the recognition of the extent of damages.

(2) Identification of Important Facilities for Disaster Management is relatively easier activity within DIG. Participants will be able to identify some facilities on map. There are two important points: one is to make a beautiful map. Beautiful means easy to understand the situation. The other is to check the facilities located outside of the participant's residential area. On the other hand, *(3) Imaging of Potential Damages* is relatively difficult activity during the process of workshop. Most important element of this phase is the "Power of Imagination." Photo of 1934 Great Earthquake or Gujarat Earthquake will help the participants to imagine what will happen in an earthquake disaster.

Concerning *(4) Discussion with guidance from Facilitator*, detail is explained in the next section. Concerning *(5) Free Discussion*, if previous phases are going well, we do not have to worry about this point. Participants will be discussing actively even without any extra suggestions or instructions.

(6) Presentation from each group and *(7) Wrap up comments by Facilitator* constitutes the concluding phase of the workshop. To summarize the process of discussion and findings of workshop will be a good training for the participants. In addition, presenters will feel the strong sense of participation. Wrap up comments by Facilitator should include some clues, leads, hints or advice for the next step.

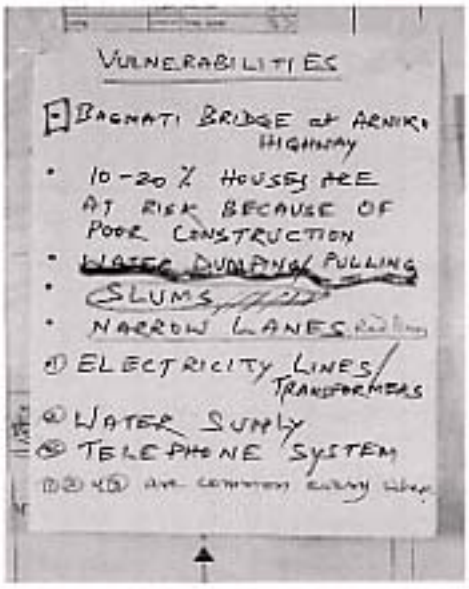
3. Key Questions for Facilitating Discussions

Example 1

1. Which Strategic Road should be repaired first?
2. Which building should be reinforced first?
3. For what purpose, each open space should be used?
4. How the national and local government should support the community-based organization and activities?
5. Who has the responsibility to distribute information to the public?
6. How, where and who will manage of a large number of cremation?
7. Were should be the coordination center for disaster management and who should be the member of inter-agency cooperation board?

Examples 2

1. "What is the biggest problem you face just after the earthquake"
2. "What do you need to solve that problem?"
3. "Find out the way you yourself can solve that difficulty."
4. "Prioritize the list of needs as a matter of your community."
5. "Who has the responsibility to prepare such things?"
6. "As an individual, find out the ways to prepare such things."
7. "How do you disseminate your ideas to other people?



Key Questions for Facilitating Discussions

By using "The Big Map" and your own handwritings, you will be able to grasp the general situation and also reach to the common understanding of damages and vulnerabilities among participants. On the foundation of map-related activities, we should now discuss about planning, especially mitigation and response. In this phase of DIG, we usually use small pieces of paper to sketch and share ideas of the participants.

On discussion phase, the most important element is whether the questions raised by the facilitator are proper or not. If the facilitator asked proper questions, the participants will be able to think and discuss easily and actively. However, if the facilitator failed to ask proper question, discussions will become not so attractive.

I have listed two examples of a series of questions. Example 1 is basically for DIG with government officials and planners. Example 2 is for Ward level community leaders. Unfortunately, these questions are not always proper to the participants. Please mention that these questions are only for references.

There are hidden meaning or hidden message behind each of questions. For example, hidden meaning of the first question of example 2 is "confrontation of the roles." Everyone in society has two or more roles at the same time, such as; husband, father, community leader, local government official, and so on within one personality. This question asks the participants that what is your most important social role among several roles after the earthquake. Organizer, facilitator and staff should meet before workshop and confirm the hidden meaning and proper wording of questions according to the purpose of meeting.

During the discussion, please put each piece of papers on the board. By doing so, we will be able to share these ideas.

4. Presentations, Wrap-up and Next Step

(1) Presentation

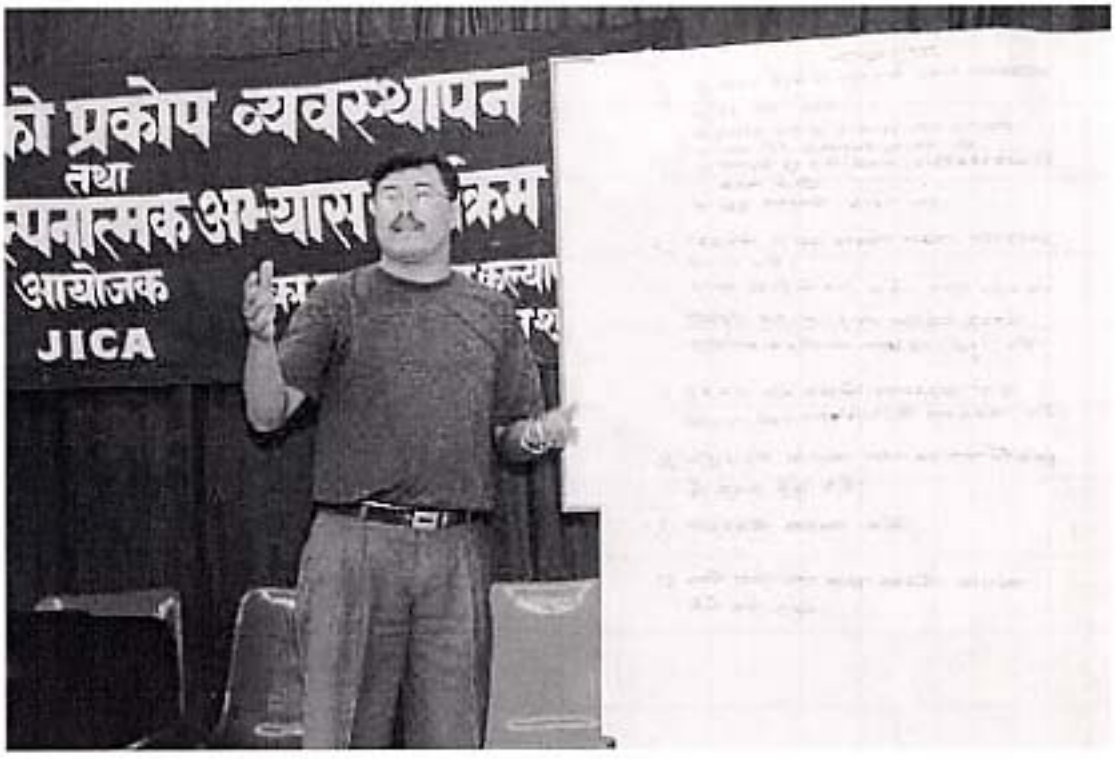
Summarize the process of discussion
Arrive at some (concrete) results
Share the findings of workshop
Process of participatory activities

(2) Wrap-up Comments by Facilitator

Follow up the whole process
Evaluate the whole process
Confirm important results / findings
Identify clues for the next step

(3) Toward the Next Step

DIG as continuous efforts
From awareness to action
From discussion to implementation
From general theory to specified proposal



(1) Presentation

At the end of the workshop, there should be presentation to be made by each group. The meaning of presentation is not only to summarize the process, or not only to share the findings, but also a process of participatory activities. By conducting presentation, participants of the workshop will be able to feel some kind of fulfillness. If there are some positive feedbacks, their feeling of fulfillness will increase.

For presentation, you can use OHP or flip chart. Organizer and facilitator will be able to use this summary sheet as the record of that workshop.

(2) Wrap-up Comments by Facilitator

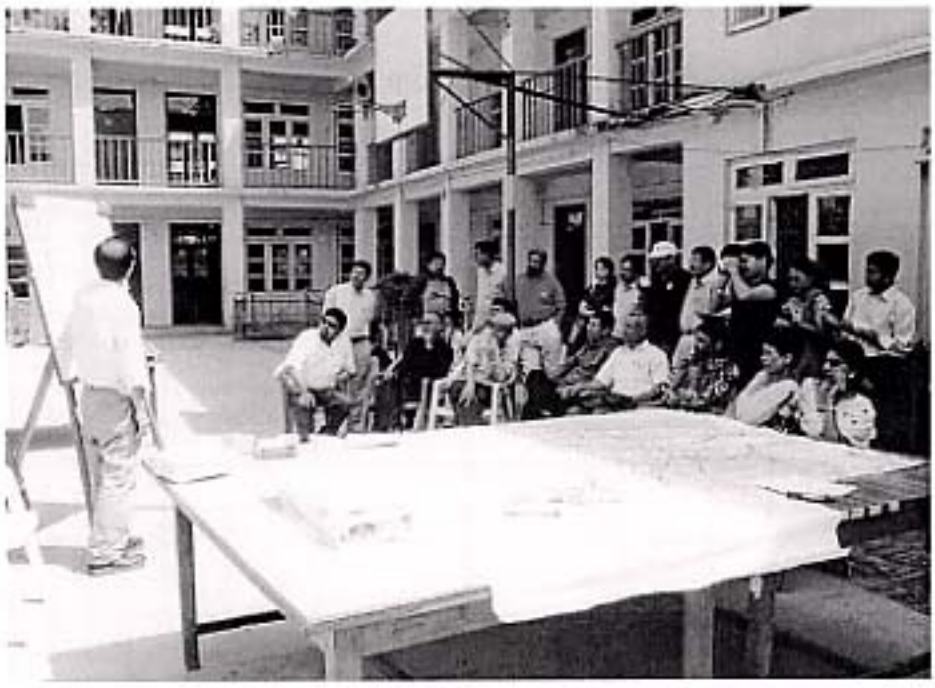
Also at the end of the workshop, the facilitator should make some wrap-up comments. Generally speaking, it should contain follow up and evaluation of the discussion process, identification of important points and some comments for further steps. Only one DIG workshop is not enough for disaster management. DIG should be a continuous process and should be continuous progress. If possible, the facilitator should mention the likely purpose of the next DIG, from the results and findings contained in participants' presentation.

(3) Toward the Next Step

Preparation for Disaster Management takes a long time and requiring large resource input. In this sense, continuation is the most important element of disaster management. DIG is basically a tool for awareness raising. However, sooner or later, we have to go forward beyond awareness raising phase and get into planning, implementation and participation phase.

If you don't mind, please mention at the end of each DIG:

"Let's get together and let's start walking forward."



Conclusion: DIG for What?

What I described above is all of the basic knowledge, know-how and background concepts of DIG. I believe that you will able to facilitate your own DIG after reading this manual, and with some imagination. Although there are some difficult points in DIG, such as launching proper questions, basically the contents and flow of DIG is very easy, and also easy to understand.

DIG has some points similar to the usual Role Playing Game but there is one big difference. In DIG, we usually don't fix participants' role. There are merits and demerits to fix the role. In case of DIG, I ask to all participants to look at the same "Big Map" and think together, from various viewpoints. There must be different ideas, different prioritization, different "something" in disaster management. On "Big Map," please exchange views and try to find out some consensus among the participants.

DIG itself does not have any capability to implement disaster management. However, DIG will be used for awareness raising program. DIG will highlight or underline the problems of disaster management. DIG will be able to prepare the "To Be Done" List within a relatively short period in a participatory ways. That is DIG!

In order to establish the Nepalese version of DIG, we may need more arrangements to adjust the Nepalese context. So, I appreciate your comments and suggestions.

I believe DIG will help you to think about disaster mitigation, not only in Kathmandu Valley Earthquake Disaster, but also all over Nepal and for all types of disaster.

T. K.