

# Effective Enforcement and Dissemination of Building Code

Proceedings of the Housing Earthquake Safety Initiative (HESI) National Workshop

Lalitpur, Nepal / 2-3 August 2007



**UNCRD**

United Nations Centre for Regional Development  
Disaster Management Planning Hyogo Office



**National Workshop Proceedings**

# **Effective Enforcement and Dissemination of Building Code**

**2-3 August 2007  
Lalitpur, Nepal**



**United Nations Centre for Regional Development  
Disaster Management Planning Hyogo Office**

in collaboration with



**Department of Urban Development and Building Construction  
Ministry of Physical Planning and Works**

**Ministry of Local Development  
Government of Nepal**



**National Society for Earthquake Technology-Nepal**

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## **Preface**

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In 2007, UNCRD Disaster Management Planning Hyogo Office launched a project titled “Housing Earthquake Safety Initiative” targeting four earthquake-prone countries: Algeria, Indonesia, Nepal and Peru. The project aims to improve the safety of houses in these countries through effective implementation of building code.

Nepal is an earthquake-prone country. The last earthquake that struck the country in 1988 killed more than 700 people and damaged tens of thousands of buildings. In Nepal, non-engineered houses, which are built without proper structural safety considerations, account for 80 percent of the total building stock. The National Building Code was established in Nepal in 1994 and was enacted in 2003. However, the implementation is limited to a few municipalities. Some of the problems hindering its effective implementation include lack of capacity of building officials and low levels of awareness within public.

The first national workshop was held in Nepal involving officials from the Department of Urban Development and Building Construction of the Ministry of Physical Planning and Works, Ministry of Local Development, Chief Executive Officers, engineers and urban planners from 20 municipalities, and representatives of international organizations and NGOs. The objectives were to identify the country-context problems, raise awareness among stakeholders of housing safety, and to formulate strategies for the effective enforcement of the Nepal National Building Code. This proceedings is a record of discussions. UNCRD sincerely hopes that experiences and ideas shared during the event will serve as a guide for carrying out concrete actions.

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# OPENING SESSION

**Chair** Purna Kadariya, *Acting Secretary, Ministry of Physical Planning and Works*

## **Welcome Remarks**

Amod Mani Dixit, *Executive Director, National Society for Earthquake Technology-Nepal (NSET)*

## **Opening Remarks**

Shoichi Ando, *Coordinator, UNCRD Disaster Management Planning Hyogo Office*

## **Remarks**

Vijaya Singh, *Assistant Resident Representative, UNDP Nepal*

## **Message from the Hon. Minister Dev Gurung, Ministry of Local Development, Nepal**

Som Lal Subedi, *Joint Secretary, Ministry of Local Development*

## **Remarks by the Chair of the Session**

Purna Kadariya, *Acting Secretary, Ministry of Physical Planning and Works*

## Welcome Remarks

AMOD MANI DIXIT  
Executive Director  
National Soceity for Earthquake Technology-Nepal



Chair of the session and Secretary at the Ministry of Physical Planning and Works, Joint secretaries at the Ministry of Local Development, the coordinator, UNCRD Disaster Management Planning Hyogo Office, senior government officials, representatives from different municipalities, and ladies and gentlemen,

I would like to extend warm welcome to you all for participating in this consultative workshop on Effective Enforcement and Dissemination of Building Code. As stated earlier, this workshop is an outcome of the joint initiative of four agencies. We have representatives from the government of Nepal, the UNCRD Disaster Management Planning Hyogo Office represented by Dr Shoichi Ando and other colleagues and NSET. Primary aim of the workshop is to collectively consult and argue for developing a consensus course of action for enforcing and disseminating the national Building Code of Nepal. We have had the National Building Code in place for several years. This workshop will focus on the dissemination and implementation of the Code. We are not here for pleasure, we are here to work and it is very important. We have to identify the problems and the gaps. What are the methodologies to address them and what is the role of different stakeholders? Let us define collectively the role of the different stakeholders and express commitments. This is the purpose of this workshop.

We have to utilize the Building Code that we have. Actually, it is already quite late for us to start its implementation. We have to enforce it effectively to keep our homes safe from earthquakes and other natural disasters. We did not have this Code a decade ago. Now that we have it we should all try to promote its implementation at all levels and every one has a role, from masons and construction workers right to the top policy makers. Several municipalities in Nepal have been implementing the Code with their own resources, with the resources available in Nepal and with some external support. It has been demonstrated that it is possible to implement the building code in this country. The cases are there. It is perhaps the best opportunity to enforce the Building Code because we already have proper legal and policy environment in Nepal. Whatever is the gap the government is taking very hard course to get those gaps filled. On top of that, we have the international institutions who have consistently expressed their interest and concern to assist us. We have representatives from UNCRD and various other agencies participating in this workshop. So there are many others. Unfortunately, Resident Coordinator of the UN System in Nepal, Mr. Matthew Kahane could not attend this workshop due to his very busy schedule. But the interest is there. Now it's our turn to shoulder the responsibility. We need to discuss and develop consensus. Now we need to identify the problems and ways to address them. I look forward to very exciting moments today and tomorrow. Having said this, I would like to thank you all for sparing your precious time for this workshop. Once again, I would like to welcome you all for coming to attend the workshop. All of you have been extremely busy with your internal plans and workshops.

Despite that you have given your valuable time for the next two days. I welcome you again. Thank you very much.

## Opening Remarks

SHOICHI ANDO

Coordinator

UNCRD Disaster Management Planning Hyogo Office



Good morning, Ladies and Gentlemen. I am Shoichi Ando from UNCRD Disaster Management Planning Hyogo Office in Kobe, Japan. I am very pleased to have this opportunity and I thank Mr. Kadariya, Acting Secretary at the Ministry of Physical Planning and Works, Mr. Som Lal Subedi, Joint Secretary at the Ministry of Local Development, Mr. Kishore Thapa, Joint Secretary at the Ministry of Physical Planning and Works in Nepal, and all distinguished participants from different ministries and municipalities and from institutes and universities from Nepal and Japan.

Firstly, I would like to introduce a brief history of UNCRD. UNCRD was established in 1971 in Nagoya, which hosts the Headquarters of Toyota Motor Company. Nagoya is the third largest city in Japan. In the 1960s, Nagoya was also known for economic and social development in Japan.

The United Nations decided to disseminate the Japanese experience to the Asian countries and the world through regional development experiences. Kobe was affected by an earthquake in 1995 and that experience is also worth disseminating and sharing all over the world. UNCRD Hyogo Office is now implementing disaster management projects. The UN declared the 1990s as the International Decade for Natural Disaster Reduction.

I understand that the Nepalese government established the National Building Code in 1994. Now it is at the stage to disseminate the National Building Code in the municipalities. The UN organized the World Conference on Disaster Reduction in Kobe in the 2005. That conference adopted the Hyogo Framework for Action. UNCRD is implementing Housing Earthquake Safety Initiative (HESI) now as one of the projects of the Hyogo Framework for Action. In the first phase of the project, we are now implementing an Anti-seismic Building Code Dissemination Project, abbreviated as the ABCD Project. We are very pleased to hold this workshop as a first conference after that event. This time, we have invited Prof. Shunsuke Otani, a world famous professor of reinforced concrete structure from Chiba University, former Director of Building Guidance Division of Hyogo Prefecture Government, Mr. Nobuaki Takahasi, and Mr. Masahiko Murata from IRP. Safety of housing and building is key to social and economic development all over the world. This time, I understand, the Ministry of Local Development and Ministry of Physical Planning and Works, and all municipalities are keen to introduce and appropriately implement the building code and building or urban control system in Nepal. I hope Nepal will have a great success. Again I would like to thank you for your participation. Thank you very much.

## **Remarks**

VIJAYA SINGH  
Assistant Resident Representative  
UNDP Nepal



Thank you very much. I was thinking I was going to be late for 10 minutes or so but now I realize that I am quite on time. It is my golden opportunity to make my remarks. Mr. Chair, distinguished guest from UNCRD, distinguished high level government officials, participants from the UN agencies, from other institutions, ladies and gentlemen.

Though this remark was supposed to be given by Mr. Matthew Kahane, UNDP Resident Coordinator, because of his busy schedule, he could not make it and I got the opportunity to say a few words on behalf of my institution.

I think it is a wonderful opportunity that many UN agencies are coming together in this region, particularly. It is giving us some thoughts and some ideas and helping us build our national capacity to respond to the risks of natural disasters. Particularly in this context, the United Nations Centre for Regional Development Disaster Management Planning Hyogo Office, Japan, is proposing to implement three-year HESI project in four countries –Indonesia, Nepal, Peru and Algeria – aiming to develop an effective system of disaster-safe housing, including building code implementation and dissemination. Many of you may have heard that Japan is also involved in supporting a regional program aimed at earthquake risks reduction and public preparedness in five countries – Nepal, India, Bhutan, Pakistan and Bangladesh. All the five countries are participating in this regional initiative. Nepal is also preparing its best to participate in this initiative. I see a lot of synergy between the two initiatives supported by the government of Nepal where the United Nations Bureau of Crisis Prevention, United Nations Centre for Disaster Management, UNDP and IRP are fully engaged with national governments and other national institutions to build the national capacity for disaster risk reduction works.

It is very evident and we all realize that in the developing countries – Nepal is not an exception – structural safety of the building is not sufficient and they are all exposed to the risks of earthquakes if they happen and, of course, they could happen any time. We also realize that unless we have safety measures ensured, we cannot prevent the possibly huge losses and damage of life and property that could happen at any time because of the natural disasters. In this context, it has been very imperative for all of us to strengthen our capacity to look into the gaps in the policy and implementation and the capacity that prevents us to build disasters or earthquakes resistant buildings. We have building codes, we know they are being enforced, but again we need to talk about how much we have been on the ground to reinforce it. We realize that there is a huge gap. We know that very limited municipalities have been partially implementing the building code. I think this workshop would provide wonderful opportunities for all of us to look into the gaps to identify the key areas and how these gaps can be addressed. I think this is the whole purpose of the three-day workshop organized by UNCRD HESI program, and, whatever comes out of that, I think it will help us all formulate the plan of action for the HESI initiative. We also hope that whatever comes

out of this workshop will also help us to build the synergy between another program, which, I just mentioned, Earthquake Risk Reduction and Disaster Preparedness, which is also going to be implemented very soon in the five countries of the region. So this workshop will be able to discuss all the issues because I see the participation not only from the policy level but also of the key persons in the municipalities who are involved in the building code implementation on day to day basis.

It just reminds me that in 2006, through UNDP we supported the Ministry of Local Development to organize some training events for key municipality engineers to aid their understanding of the principles behind the building code implementation and to, at least, give them opportunities to realize this and implement the code as far as possible. There are two main gaps there: first, a one time training is not sufficient and, the second, the whole building code implementation has not been institutionalized within the municipalities as yet. I would like to repeat that just organizing one time training for engineers is not sufficient. A series of training needs to be organized for them. Next, just training the municipality engineers on the techniques is not sufficient. We need to institutionalize the technique within the municipalities. So the whole municipality system has to come together in the task of implementing the building code. I hope these are some practical examples that I picked during the training for the municipality engineers last year. So, not taking most of the time, I hope deliberations in this workshop will be helpful for the country, for all who are involved in earthquake risk reduction or disaster management – the government and the donor agencies, INGO and NGO partners, municipalities etc. I would like to conclude my remarks by welcoming our delegates from UNCRD to Nepal. We are going to take building code implementation seriously and this makes sense to the country and we will integrate it into our programs as far as possible. From now onwards, I hope that the outcomes of the workshop will provide a common platform to work together and I wish a success of the workshop. Thank you.

## **Message from the Honorable Minister Dev Gurung, Ministry of Local Development, Nepal**

SOM LAL SUBEDI  
Joint Secreary  
Ministry of Local Development



Chair of the inaugural session, Dr Ando, the Joint Secretary, the Director General at the DUDBC, Chief Executive Officer at the Kathmandu Metropolitan City (KMC), municipality officials and invitees representing different sectors. We are organizing this two-day workshop on a very timely issue. Since the theme of the workshop is self-explanatory there is no need to explain this further. I feel this speaks of two ways to resolve our problems. How can we implement the building code effectively and what kinds of problems exist. By the end of workshop tomorrow evening, we definitely will be able to find a way out. We often talk about the policy issues. I feel the policy is clear. The problem that we face here is lack of implementation. Local Self-Governance Act (LSGA) has been given the responsibility to facilitate the local bodies, and the Regulation on Work Division requires the Ministry of Physical Planning and Works to facilitate the national policy. Yet, we do confront problems while implementing the Building Code. If we analyze the characteristics of urban development around the world, the municipality seems to exist as the local government or its eldest organ. It occurs to me the political thought process also started from big cities. Neighboring India has established municipal corporations in different places such as Madras, Mumbai and Kolkata. Rural Development Institutions are found to have come into existence nearly 200 years after the municipal corporation came into being. In Nepal also, the municipality was instituted before the village development committees. Despite all this, our orientation is not progressing well. As a result, risks are running parallel to the building construction itself.

Likewise, the local wheel is most important for the implementation of the BC. Local leaders and friends of municipality, I think, should give special attention to this. We have failed to ensure facilitation from the central level. These problems cropped up also because we could not channel human and financial resources down to the municipalities in a package when LSGA was introduced as part of a decentralized system.

Public awareness is also necessary both at the central and local levels. The other important part is development of municipal resources. We have not been able to implement these policies due mainly to the lack of technical know-how and motivation, and of course, we have other burden as well. Two years ago, we had organized two discussions – one in Kathmandu and another in Butwal – on building codes for the technical hands at municipalities. As I recall, some of the participants were completely surprised to know what could happen to their private buildings (apparently because they realized the houses they lived in, structures they built did not follow the BC). We need to develop our own policy and program. We have not been able to implement the policy because we have not been able to adjust the programs that we have at hand.

To put it in short, we had invited representatives from 20 municipalities and I hope they are all here. They need to analyse their own capacity and identify the existing gaps that hinder the implementation of the building code. Once the gaps are identified we need to work on the next steps – formulation of projects. We can no longer escape saying that we have no capacity. Instead, if municipal officials come with the determination that they can implement the building code, the centre can push through implementation in phases.

The most important part is motivating the people and raising public awareness about BC as a solution. Maybe municipalities do not have adequate funds to organize awareness campaigns, but they should at least come with the commitment that they will be able to enforce the building code. Of course, there is a concern that the construction costs may rise, giving the citizens additional financial burden due to the need to get the drawing accepted and additional tariffs. One way of addressing this would be lowering the existing tariff. I feel decreased tariff will certainly motivate the public to translate into practice the building code. If doing this takes a lot of resources away from the municipalities, then we could think of alternative packages to address this problem.

It would really make it easy if we could have a tentative estimate of how much our own resources could contribute and how much the donor resources could do. The other important thing is that we should place this program in periodic and annual plans of the municipalities because Nepal is in danger in terms of code management. Therefore, municipalities should take this right down to the local level. We need to implement the building codes on the basis of the classification of the municipalities. Lately, we have also increased grants to smaller municipalities. Municipalities will be able to implement the program in areas where there are unoccupied lands and where the building codes may be implemented without too many cost implications. In heavily urbanized areas, especially in Kathmandu Valley, we need an integrated package.

Participants and representatives from different municipalities participating in this event are required to discuss ways how we can proceed ahead and how we can implement the code. They also need to analyze strengths and weaknesses of the municipalities. We should discuss as to how these weaknesses can be addressed and what can the local/central levels do and how we can collaborate with the donor community to be able to implement the building code. We should strive to prepare programs by promoting the local autonomy act.

I would like to thank the organizers for giving me this forum to express my views. Also, I would like to thank UNCRD, UNDP, Ministry of Physical Planning and Works and Ministry of Local Development, for their invaluable support to organize this very useful workshop that aims at exploring ways to translate the building code into practice more effectively. I wish this workshop a success. May this workshop be able to help municipalities carry out their work smoothly and identify roles and priorities of different agencies, including the donors, evolve an implementation strategy and who should do what to mobilize assistance or, if we can not do, how and what type of assistance we need to look for. To sum up, we need to develop a comprehensive plan and I hope this workshop will be able to achieve this. Thank you.



## **Remarks by the Chair of the Session**

PURNA KADARIYA  
Acting Secretary  
Ministry of Physical Planning and Works



Good morning and Namaste to all of you. UNCRD representative Dr. Ando, Joint Secretary of Ministry of Local Development Mr. Subedi, Assistant Resident Representative of the UN System in Nepal Mr. Singh, Executive Director of NSET Mr. Dixit, distinguished guests and volunteers who have come here from abroad, joint secretaries at different ministries, Director General at the Department of Urban Development and Building Construction, the Chief Executive Officer of Kathmandu Municipal Corporation, University professors, General Secretaries of municipalities, ministry officials, chiefs of different municipalities, journalists, ladies and gentlemen.

As we all know, our country is vulnerable to earthquakes. There is a high probability of an earthquake measuring 8 on the Richter scale. It has been long since we have not had a major earthquake, which could rattle us at any time and cause huge loss of lives and property. The earthquake (6+ on the Richter scale) that hit the eastern region about two decades back destroyed 65,000 houses and affected some 700,000 people. Floods and landslides have also caused huge losses of life and property, but the state has not been able to respond to these natural disasters effectively. Neither have we been able to pre-plan responses to such disasters. We have not been able to mobilize the means of transportation, nor have we been able to use other means and resources at our disposal, including knowledge and know-how. Disasters may happen any time, anywhere and we can do nothing about it. At the best, we can only pre-plan a response to such disasters. For the past one decade or so we have been organizing discussions, studies, analyses, sharing sessions, seminars and workshops to be able to pre-plan in case of natural disasters, and an earthquake in particular. These activities have had good impact at the national level. I want to thank all who have been working in this area. You have made an important contribution to the country. May our energy and spirit remain, as has always been.

However, we can not rest assured. This can not be a campaign of UNDP or UNCRD or that of the responsible ministry and management of natural disasters, this should be a national campaign. We cannot just think the earthquakes come and go. Quakes will destroy our investments. Therefore, we should not lag behind in implementing the building code. Or else, this will destroy us all. We should play our part responsibly. Let me share with you that the international community is willing to extend assistance in this regard. Their support should not be limited to organizing seminars and workshops. Our municipalities need support to implement the building code. We have already discussed the need to implement the building code, and made necessary preparations to that effect. The need of the hour is to implement these codes on the ground. In this we need to organize ourselves.

We should never lag behind in implementing the building code. We can't shrug off the responsibility to implement it and should mobilize all organs to ensure proper and effective implementation of the code. However, helping us organize seminars alone won't help; we need

support in the municipalities. We must request the UN agencies in helping us implement the building code in the municipalities. We have discussed quite a lot, we have prepared work plans, we have prepared check lists, we have prepared all procedures for implementing the building code, now the time has come to go to the ground and start operations at the ground, at the users' level.

Lastly, I would like to thank the UNCRD for picking Nepal as one of the four priority countries. On behalf of the government of Nepal, I wish to extend thanks to Dr. Ando for his goodwill towards Nepal. This type of support is very crucial to Nepal and we highly appreciate the UN gesture. This program should not be taken as something particular to one ministry or department. I would like to stress here again that this is a program of the government and the Government of Nepal is committed to it, but needs support from all, the municipalities in particular. The civil society, house owners, technical society, all wings of the government, and engineers who design buildings should act responsibly to avert the future crisis by implementing the building code.

I thank you all once again for giving me this opportunity to put across my views. I hope the workshop will be successful in its objective and declare the closure of the inaugural session.



# SESSION I

## POLICY FRAMEWORK FOR BUILDING CODE

Chair Som Lal Subedi, *Joint Secretary, Ministry of Local Development*

### **Building Code as a Tool for Sustainable Habitat**

Kishore Thapa, *Joint Secretary, Ministry of Physical Planning and Works*

### **Millennium Development Goals (MDGs) and HESI for Sustainable Development**

Shoichi Ando, *UNCRD Disaster Management Planning Hyogo Office*

### **Decentralization, Local Governance and Building Code Implementation**

Dinesh Kumar Thapaliya, *Chief Executive Officer, Kathmandu Metropolitan City*

### **Historical Development of Building Code in Japan**

Shunsuke Otani, *Professor, Chiba University, Japan*

### **Session Review**

Bharat Sharma, *Professor, Nepal Engineering College*

### **General Discussion and Response by Presenters**

## **Building Code as a Tool for Sustainable Habitat**

KISHORE THAPA

Joint Secretary

Ministry of Physical Planning and Works



Thank you, Chairman. Distinguished delegates, ladies and gentlemen. I would like to make my presentation in the Nepali language. However, the paper itself is written in English. I want to stress on two words: Building Code and sustainable habitat. In its simplest sense habitat stands for a human settlement in rural or urban settings. By sustainable habitat, I mean, human settlements as per the need of the settlers and that are affordable. Community-managed – not the government-managed – settlements are more sustainable. Settlements that use less energy and where energy may be derived from natural sources are more sustainable because natural sources of energy release less carbon, naturally causing less pollution. Sustainable settlements are safe from natural disasters and can recover faster from the effects of disasters. Japan, for example, recovers relatively faster from disasters, compared to many other countries in the world. Our South Asian neighbor Bangladesh is developing her capacity along the same line, as the country is prone to natural disasters. Bangladeshis are utilizing their earlier knowledge to develop quick recovery systems.

Building Code is not an act by itself. It's a set of standard practice approved by the engineering society. The code provides a guideline to design and build constructions in a particular way. We need an act to enforce the building code. In Nepal, we have an existing legal provision (which came into force before the act on Building Code) that fulfills the legal requirements to enforce the building code. Building Code is also an engineering tool that keeps constructions safe and makes it easy for the users. This is not something, not an act drafted by the lawyers and legal practitioners. The building code is a document developed by and for the engineers themselves. Our municipalities are seemingly confused about the building code and the regulation/by-law on building construction. Some call it code and some call it a set of standards. There's a need to clear this kind of confusion. The code only ensures any building's physical/structural safety and does not deal with, say, the adjacent road size or land size or right of way etc. Structural safety of a building deals with the foundation, pillars, and the slab beams so that they can resist the earthquakes. We need to understand that the code exclusively deals with the 'interior' issues of a building. Hence, it doesn't have anything to do with the city planning or city infrastructure development on the whole. These have to do with by-laws/regulation on building construction. Building code is only concerned with physical, structural safety of a building. Municipalities therefore need to look into the building code as well as by-laws. Building code and by-laws on buildings are different to one another and we should not mix them. When approving a building design, we should ensure that we have considered both. The Building Code 2003 has been passed by the cabinet, and there has already been a regulation in place since 2006. These arrangements require both government and private buildings to follow the building code during construction. The Parliament is looking into the amendment proposals. As soon as the House clears the amendments the building code will come into force. A high level committee has also been set up to monitor implementation of the building code. Secretary of the Ministry of Physical Planning and Works heads the committee that also comprises representatives from the Department of Urban Development and Building Construction,

municipalities, Ministry of Local Development and other stakeholders. This legally mandated committee oversees the implementation of the building code and, if need be, modifies it. The Department of Urban Development and Building Construction sits in the front seat in the entire process. Virtually all (about 90%) of our buildings are non-engineered structures, mainly privately built residences. The 10% engineering structures include big hotels and offices that are in line with the engineering concepts. The private sector tends to think that it can build houses on its own. Also with development have come the high rise buildings, which do not seem to pay particular attention to the structural safety and risks of fire. The varied designs have led to an increase in the number of traditional, asymmetric buildings. Looking at it from seismological point of view, structurally unsafe high rise and asymmetric buildings are important challenges in Nepal, mainly in Kathmandu. Besides, there is maximum use of composite materials in building construction, such as, marble, concrete, glass, woods, and other textures. If these materials are not used properly these could actually make the buildings unsafe. RC buildings look more like a rule. Even in remote areas, people have been building RC structures on the slopes. There's no quality control. RC structures require proper use and mix of construction materials and enough attention should also be given to coding and curing. People tend to think RC construction is all about mixing of construction materials and this is quite serious.

The building code consists of four parts: (a) State of the art buildings (which are either built by foreign agencies or meet the international codes). Not that we Nepalis can not afford state of the art structures. (b) Professionally engineered structures are buildings that measure 4.5 meters in height, have three or more stories and possess more than 1000 sq. feet. (c) Mandatory rule of thumb means areas where sub-inspectors monitor and supervise the construction in the absence of construction engineers. (d) Guidelines for the rural constructions include buildings constructed by local contractors in the absence of engineers and sub-inspectors. Therefore, we implement the code that is applicable in a particular context. The engineering college graduates do not have sufficient knowledge about the building code, which makes it a bit difficult to implement the code itself. Some college teachers and graduates do not even know that there is a building code. This is a serious problem. Even the professional engineers/architects are not trained adequately on ways to implement the code. The training that we are organizing for engineers benefits only those affiliated with the municipalities and we have not been able to reach out to freelance and engineer consultants. To date some 4000 masons have been trained. We do need to review the building code. We in Nepal consider M15 as concrete structural complete, while in India it is M20. Before we take any decision we need to decide whether we stick to M15 or adopt M20. The building act is under the purview of the interim parliament and we hope it will be passed soon. The other important thing is that only Kathmandu Municipal City and Lalitpur Sub-Metropolitan City (LSMC) have committed to implementing the building code. Other municipalities have expressed their interests, but have not yet pronounced their commitment explicitly.

Including the Building Code in the engineering curriculum is the first step toward its implementation. Also, while issuing license to engineers and architects Nepal Engineering Council should adopt a policy that requires the engineers and architects to implement the Building Code. In the municipalities the Building Code should be implemented phase-wise as it may not be practical to enforce the code in all municipalities together. Likewise, the government and municipalities should work on core foundation and standard operating procedure, such as, applications and check list on the Building Code. The Code itself needs to be reviewed periodically. There should also be provisions to scrap the license of engineers and architects who violate the Building Code. Professional societies, such as, NSET, SONA and engineering associations should engage in training and raising awareness among their members and the general public about the Building Code. Publishing the building code and disseminating it is also a big challenge. There also is a need for peer review, which means fellow engineers and architects themselves (and not the government,

lawyers, court and ministries) evaluating whether the BC is followed or not. Before I sum up, I would like to stress that the government strategy should be to enforce the building code through regulations, laws, acts and penalty in case of violation. Government control should play a small role but compliance should play a big role in the implementation of the Code. Designers, building owners and contractors all have an important role to play. Over the time, government control should be on the decline and compliance on the rise, for the government can not control every thing all the time as the government has its own limitations. Therefore, there should be a heavy focus on the compliance part of the Code. Thank you.

## **Millennium Development Goals (MDGs) and Housing Earthquake Safety Initiative (HESI) for Sustainable Development**

SHOICHI ANDO  
Coordinator  
UNCRD Disaster Management Planning Hyogo Office



Thank you. I am Shoichi Ando from the United Nations Centre for Regional Development branch office in Kobe. I am happy to have this opportunity to introduce the broad objectives of the UN MDGs and the Housing Earthquake Safety Initiative for sustainable development and related information on housing safety.

First of all, this is a picture of Kobe immediately after a big earthquake that occurred 12 years ago. Mr. Thapa shared that 90% of houses are not engineered in Nepal. In Japan 70% of the houses are so-called not engineered, meaning wooden structures constructed by carpenters. Most of the city areas were covered by one or two storied wooden houses that easily caused fire. Immediately after earthquake, the water supply stopped. Even if there was a fire fighting team, they could not extinguish the fire. Fortunately, this day of the earthquake in Kobe was 17<sup>th</sup> January, was winter time and early in the morning, there was not much of wind. Therefore, the fire stopped within two days but several areas were damaged by fire by then. This is one of the typical Japanese earthquake disasters. As you can see the slides, this is Kobe, where the residential streets are covered by houses. Most of the houses, as I mentioned, are made by wood.

This is the case of Pakistan Kashmir earthquake in 2005, but I took the pictures in March 2006, about 5 months later. This is the city of Muzaffarabad, where most of the buildings and houses are made of bricks and stones. You can also see the landslides in the mountain and this is also the case of Muzaffarabad city. This is also the case of Bararkot in Pakistan. Even the engineered houses were destroyed by the earthquake. This is the case of Indonesia last year in May 2006. In Indonesia, traditional houses are made of wood but recently they have started constructing brick structures. Especially in the case of Indonesia, the brick houses are not so strong. As a result, many houses were destroyed although it was not a big earthquake.

Through these experiences, UNCRD started several projects. In most of the projects we use some demonstrations or model projects. Through this model project we train experts and help build capacity of the technicians. As reference, we also educate the people. The motivation is one of the keys to proceed not just for the governments but also for the experts. We use model projects for demonstration at both ways.

This is history or series of UNCRD projects. You have some pamphlets with you, the pamphlets include pre-project activities. One is Gender in Community Based Disaster Management (orange paper) and the blue pamphlet is about School Earthquake Safety Initiative and the green

pamphlet is about the Housing Earthquake Safety Initiative. We are now implementing these three projects. Most of the projects are targeting to increase disaster preparedness.

In this preparatory stage, we concentrate on six fields. These are: public awareness, education for technicians, community development, technology development, urban control and building control. These are the fields that we are now managing. About the housing safety, there are many factors and fields that can mainly be divided into three fields – social, economic and environmental/physical policies.

Building code is a part of social policy, but it is not the only instrument that can secure the safety of houses. We not only need the building control policy or building guidance policy but license issuance and urban planning are also critical to building safety, as Mr. Kishore Thapa also mentioned. Also, in some of the cases, in the case of Japan, the national government has prepared housing loan policy but it has already been privatized. In case of public housing loan system we apply the safety standards. It is the minimum same standard for building code, and we put some upgraded standard in the case of the housing loan system. Economic policy such as assurance system also helps to disseminate building code and building safety. This is just an academic analysis. There are several policy tools, such as, regulatory policy tool, economic policy tool, voluntary policy tool, information policy tool and research and development policy tool in terms of government policy. We analyze the code from the viewpoint of effectiveness of safety. Code is compulsory if it is based on the law. Voluntary tools and performance rating are not so strong tools in terms of effectiveness. But economic efficiency such as voluntary tools is high. In case of building code, economic efficiency is high because it does not need so much public funds. The last point is administrative feasibility, and it is important. Actually, in case of the building code, there are some difficulties and challenging issues in terms of administrative ability, as experienced by the 5 countries and Japan. These are the information on the policy and implementation of the Building Code. I think it depends on the culture and socio-economic conditions of the country so there is no universal solution.

As far as I understand, Nepali government has already done a lot and those experiences will be helpful for other countries. Building code is not only about secure and safety of buildings and houses, but now it also extends to the environmental cause, regards the need and concerns of, say, the physically disabled persons and fire safety and so on. Building code is closely related to the planning code or the zoning code. Having only the zoning code is not enough to secure the safety of houses, neither is the building code alone enough. So both – planning/zoning code and the building code – should be combined effectively. This is the experience from Japan and other countries.

This is a reference to what we are proposing to the Indonesian government on how to disseminate the national Building Code to the municipalities. The Indonesian government prepared their draft Building Code way back in 1965 but they established the law in 2002. And, the enforcement began only in 2005 just after the big Sumatra Earthquake. After experiencing multiple earthquakes, they are now trying to implement the Building Code in all municipalities. But only big cities like Jakarta and Bandung are implementing or starting to implement their Building Code. Many other municipalities are waiting. UNCRD and Japan International Cooperation Agency (JICA) are assisting the national government of Indonesia in the dissemination and implementation of the Indonesian building code in the several municipalities. The recent experience in Indonesia is very helpful to introduce the Building Code in the municipalities and the residents are very keen to learn how they can secure the safety of their houses. In this case, we just divide the way – engineered construction and non-engineered construction.



And, lastly, I would like to introduce the MDGs in view of the objectives of the United Nations organizations and institutions. MDGs were adopted in the year 2000, just before the new millennium started and there are eight concrete goals. There are 8 categories. In case of Nepal, poverty has been reduced by 10% in these eight years, while an 8% improvement has been achieved in the case of literacy rate. In the past 15 years, very great improvements have been achieved in Nepal, and, in the health sector, the urban sanitation facilities have also been improved. We do appreciate the efforts of Nepal. HESI program is closely related to the MDGs, particularly to poverty reduction.

In many countries, the poor people are living in vulnerable houses. However, if we put only a little money to improve the structure and safety of the houses the conditions will improve. The improvement in housing will also help improve the state of sanitation – people will live in a healthy and safe environment. So, we are trying to achieve the MDGs through HESI program and the HESI program is aiming to achieve the Hyogo Framework for Action. This is also the process related to the MDGs.

Finally, I would just like to introduce you to this orange book, which you have in the Nepali and the English version. This is just the case of our former project in Nepal, Community Based Disaster Management, and this is a record, for your reference, I believe, to implement the Building Code. One of the tools is community based activities and, as far as I understand, the Nepali government and municipalities, UNDP and also NSET, are experts to implement and educate the people to motivate their communities to secure their own houses because securing the houses means securing safety of our own families. That is the basis of social development. This is my presentation and just after lunch Mr. Takahasi will introduce the video of the Kobe experiences, disaster situation and also the post-earthquake reconstruction process of Kobe. So the video will also help you understand the background and the real situation in an earthquake. Thank you very much.

## **Decentralization, Local Governance and Building Code Implementation**

**DINESH KUMAR THAPALIYA**  
Chief Executive Officer  
Kathmandu Metropolitan City



I am presenting here some of KMC's activities and issues that we faced in the course of implementing the Building Code. My theme is decentralization, local governance and building code implementation. Decentralization and local governance have become so obsessive issues that they may even come in our dreams. Therefore, I do not need to talk more about them and will focus my presentation on the Building Code implementation issues.

The Building Code is something that is supposed to be implemented by the local government. The role of the central government limits to the formulation of policy, rules and regulations, and setting acceptable standards in place. Implementation depends on the local level and that's what the philosophy of decentralization is. The Act on Local Autonomy requires us to exercise freely and independently the rights vested in us. Within the limits of this Act we have to manage resources and implement effectively the policies of the central government, including the Building Code.

Now I would like to talk about the role of the municipalities, not just KMC, in the implementation of the National Building Code. The Act on Local Autonomy grants us some rights. It assigns municipalities the responsibility to approve the design and issue permission for any kind of construction within its territory. We are also required to set building standards and implement them. In Kathmandu we prepare a standard at the central level and implement it at the field level by making some minor changes if need be, but we make sure that we are within the broad guidelines. In case of other municipalities across the country, they can also do the same within the Building Code and the limits set by other acts, rules and regulations. If there are buildings that defy the Building Code we can order its demolition. We also need to monitor if the buildings under construction in different parts of the town are in compliance with the Building Code or not. It is also our responsibility to settle the disputes related to building construction. Legal officer at the municipality plays a leading role in this. I am sure KMC's legal officer will deal with it during his presentation later. Municipalities are also responsible for organizing training, workshops and dissemination activities related to building construction.

Now I would like to talk about what policy KMC is adopting and what activities it is undertaking in the course of implementing the Building Code. KMC's policy is to encourage earthquake resistant building constructions. Our efforts are to create an efficient mechanism to effectively implement the Code. We have already some of these in place, about which I am talking next. It is within our policy to set particular standards to allow particular buildings in particular areas. KMC takes action against those who defy the Code and who do not seek permission while constructing their buildings. KMC does consultations with the stakeholders to implement the Building Code effectively. KMC started right at the beginning implementing certain standards,

which have now been incorporated in the Building Code. For example, when approving the drawings of proposed buildings, we make sure that the building extending over 1000 sq ft of land and going more than three stories must be constructed under structural design. We have been following this since 1995. KMC Board decided to implement the Building Code in 2004, roughly a year after the Code was passed by the government. KMC has a committee, designated to approve the proposed building designs. This committee comprises representatives from the Pulchowk Engineering College, Department of Urban Development and Building Construction, KMC and the Society of Consulting Engineers' Forum. KMC classifies buildings in Category A (institutional buildings) and Category B (buildings that need to be designed by the engineers) on the basis of the Building Code and gives approvals to the submitted designs only at the recommendation of the Building Code Implementation Committee that oversees whether the designs meet the specific conditions. Building designs submitted by overseers will be decided by the municipality on the basis of separate sets of criteria. In case of buildings with rather complicated designs we put the designs before the committee, which takes the decision to approve or not to approve. We approve the designs in two phases. The first phase allows construction up to the DPC level and move to the stage two only after the design engineer confirms completion of the stage one construction. This also provides with a window of opportunity to monitor whether or not the Building Code is being followed during the construction. Land/building tax, 4-feet wide access road (as set by the municipality) and approved design are to be included compulsorily when seeking the construction completion certification. We do not give the certificate if the design is not approved beforehand. We provide training for engineers, junior engineers and masons in collaboration with other agencies, including NSET. Lack of resources, both financial and human, seems to hamper the monitoring of Building Code implementation.

The level of public awareness about Building Code is extremely low. The public at large is also misled by the perception that following the Building Code would involve extra costs. While the Code is intended for the house owners, the owners, sadly, do not feel the need to adhere to it. There has not been any significant increase in the number of building construction in KMC, as compared to the construction in the previous year. We feel that people are increasingly moving out of the KMC to the adjoining Village Development Committees (VDCs). One of the factors motivating the people to shift away from KMC, to me, is that there is absolutely no hassle in the VDC – one need not follow the Building Code or do they need to get their designs approved before starting the construction. That's why we can observe a variety of buildings in the VDCs. Within KMC also, I have to admit shamefully that about 50-60% houses are built without any regard to the Code. We have a plan to counter the tendency to build constructions that defy the Code, but have not been able to translate it into action. We also do not find ourselves in situations where the construction goes right in order of the design. Or else, how would we have buildings completely defying the Code and in some extent the design itself. There are also cases that buildings built in one place are based on the design approved for another place. This kind of situation occurs when we fail to monitor properly. We have not been able to do the technical supervision of the building and there is a shortage of workers and masons trained on building construction. We need additional resources to monitor the construction and I feel we should go jointly. We should also bring about necessary legal reforms so that we can penalize those who violate the Code and legal provisions. There's a need to forge better coordination between the local bodies so as to monitor proper implementation of the Code. We should also provide adequate training to designers, construction workers and masons and we have already started this. We need to ensure that only trained construction workers are employed during the construction and there is also a need to raise public awareness about the Building Code. KMC feels that there is also a need to make the designers accountable that they should see whether the construction is strictly in line with their designs, which are approved by the municipality.

We have to be clear in no uncertain terms as to who is actually responsible for approving the proposed building designs? Is it something that needs to be tackled politically or is it an administrative issue or is it a purely technical, engineering issue? I personally feel this is completely a technical issue and should therefore be left completely to the technicians and engineers. This should not be something to be done by the elected representatives of the people. Unless the experts themselves are made responsible we cannot implement it fully. Periphery and surroundings around all municipalities, not just KMC, are rapidly urbanizing. These VDCs will gradually be integrated into the municipalities. Kathmandu is a highly vulnerable seismic zone and we have repeatedly communicated this to the public at large. Suppose, massive earthquake strikes Kathmandu – will it only concentrate in areas where buildings are constructed according to the Building Code, skipping the adjoining VDCs where constructions are not required to follow the Code? If these VDCs will also be affected by the earthquake, aren't they also to follow the Code? Is it that we need to keep the people in KMC safe from earthquakes and we don't necessarily care about the rest? If we do not want to see the losses of human lives then we should implement the Building Code in the adjoining VDCs as well, not just in KMC. Or else, we will always find ourselves talking about the problems without really bothering about the solutions.

Also we need to make the designers, the municipality engineers, contractors/builders and the house owners accountable in the whole exercise, clearly specifying who is responsible for what. If designers and builders are not to be held responsible for their work, then they will just get away with doing the way they please. Also, we need to monitor building transfer through sales and purchases. As is the practice, one designs and builds the building, but somebody else ends up purchasing it. When buildings go through change of ownership why don't we get the engineer concerned to give the guarantee that the building is up to the mark. And, what do we do in case of the houses built before these rules and regulations came into force? We need to understand that the earthquake will not skip the buildings because they were built before the act came into force. How do we tackle this issue? What should precisely be the role of the respective municipalities? Will it serve the entire purpose if we issue the demolition orders? And, what is the legal status of this Building Code? In our country people tend to relate violation of laws with the powerful that they hold in society. In other words, one who does not follow the rule is essentially a powerful person. In such a case, how can we imagine that the powerful will respect the Building Code? I am afraid the Building Code may be treated like the overhead bridges that we have built around Kathmandu – that they are there, but nobody uses it. If we can not come up with binding provisions it will be extremely difficult for us to enforce the Code. We need to be sure as to who should approve the design and who should do the monitoring. If this is something to be done by the technocrats, I am not sure if junior employees at the municipalities (most of who are not even students of engineering) will be able to check the engineering facts. Designs passed by engineers should be monitored by equally qualified engineers, unlike what the practice is today. The Department of Urban Development and Building Construction and municipalities should sit together to determine as to who should be made responsible for the monitoring. If we have clear answers to these, only then can we implement the Building Code in letter and spirit.

## **Historical Development of Building Code in Japan**

SHUNSUKE OTANI  
Professor  
Chiba University



Thank you, Chairman. I am delighted to be here to talk about our experience.

Most of you may think that Japan is a very advanced and rich country, but that was not so a hundred years ago. We needed long time to achieve this current status. From 1603 to 1867, Tokugawa Shogunate Government ruled Japan and, due to the ban on Christianity, the country of Japan closed all trade in 1639 until an American ship came and forced us to open the harbor. During this period we had developed very nice Japanese culture, such as tea ceremony, flower arrangements, Kabuki play, kimonos and many nice things. But unfortunately, we could not enjoy western science and technology during this period. We could not import these items.

When the revolution occurred in 1867, the new Meiji government wanted to develop military independence from the invading western imperialism. Also, we wanted to enrich our country and improve the people's life. For this purpose, the Ministry of Industry established a technical training college in 1873. Minister Ito consulted professor Rankine of Glasgow University, Scotland, and asked him to recommend some young professors to come to Japan to take care of this technical training college. As a result, Mr. Henry Dyer (1848–1918) came to Japan in 1873 at the age of 25, to start technical education in our country.

The curriculum was fashioned in three phases, each of two years: preparatory training, professional education and practical training. He thought civil engineering, mechanical engineering and house building (that is architecture), telegraphy, practical chemistry, mining and metallurgy were very important subjects to be taught in Japan. He also invited 8 young British engineers to come along with him. These professors were very young. John Perry was 23 years old, William E Ayrton was 26. Very young British engineers came to Japan to teach young Japanese trainees. The emphasis here was practical training rather than scientific education. Once they were enrolled in this technical college, the Japanese students had to do some practical engineering works and that was a major purpose.

In 1877, Tokyo University was founded with faculties of medicine, law and literature, but no engineering. But this technical college was moved to the Tokyo University system and the training college became the faculty of engineering in the imperial university that is actually Tokyo University. The invited professors were gradually replaced by Japanese professors trained in Tokyo University which was renamed as Imperial University. It took us about 15-20 years to replace all foreign professors.

Then, we had one huge earthquake in 1891, measuring 7.9 on the Richter magnitude scale. This was probably the largest possible earthquake that could ever have occurred in all of Japan. The quake caused significant damage to then modern brick, western-style structures. In the following year, the government established the Imperial Earthquake Disaster Investigation Council to study

the prospects of improving the construction to resist earthquakes. All the members were to be assigned by the Emperor and structural engineering became an important subject taught in the Department of Architecture at Imperial University. Architecture was first taught by a British architect who came to Japan at the age of 26. He was a licensed architect from Britain and he introduced British kind of education in architecture, which did not teach structural engineering. However, because of the huge earthquake and also associated damage, gradually, the Department of Architecture started to teach structural engineering. Soon, Structural Engineering became a very strong component in the Department of Architecture.

In 1919 we issued the first law related to buildings, that is, the Urban Building Law. The law enforcement regulations included general principles of structural designs. The enforcement regulations prescribed requirements for various structural materials and design procedures; for instance, structural design specifications, allowable stresses of construction materials. But there was no seismic design requirement at this point.

In 1923, that is 3 years after the issuance of Urban Building Law, there was a huge earthquake in and around Tokyo. Many modern buildings collapsed. A reinforced concrete building was about to be completed by a US company, but the building collapsed during the earthquake. There were no seismic design requirements in Japan at the time of this Kanto Earthquake. When we look at the statistics of the damage, however, it is surprisingly low. For example, there were about 551 reinforced concrete buildings in Tokyo area and only seven buildings collapsed, while 11 buildings suffered severe damage, 4 suffered major damage, 69 suffered minor damage, and the rest survived with very light damage. So, the statistics said, large damage occurred only in 4% of the existing reinforced concrete buildings, 96% survived with very light damage. This means that the ground motion in Tokyo was not so strong. The epicenter was fairly far from Tokyo. That was why we didn't have much damage.

Seismic design was introduced in the law enforcement regulation in 1924, immediately after the Kanto Earthquake. The intensity of seismic design force was determined in the following manner. At the University of Tokyo, the maximum ground acceleration rate was estimated to be about 30% of the gravity acceleration. The building was assumed to vibrate at the same rate as the ground; that meant acceleration acting on the structure was the same as the maximum acceleration of the ground that was 0.3 G. At that time they used allowable stress design procedure. The safety factor was the strength of the materials used divided by the allowable stress and that was around 3. So they divided this estimated maximum acceleration of 0.3 G by the safety factor of 3 to come up with the seismic force of 10% of the weight of the structure. The seismic design was enforced in our country in 1924.

Unfortunately, at that time in 1924, there were no practical structural analysis methods available for engineers. Castigliano's theorem was developed in 1875 and the slope deflection method developed in 1918, but they were very tedious methods. You had to solve many simultaneous equations. At that time we didn't have computers. It was not possible to use such structural analysis methods until Dr. H. Cross proposed practical moment distribution method in 1930. Dr. Muto proposed D-value method for structural analysis in 1933, which was a very simple method but very accurate using calculation charts and tables. Now, the people could analyze complicated structures. Earlier, it was not possible for structure engineers to analyze such structures.

I think it is important to implement seismic design requirements. At the same time the regular structural engineer should be able to use or apply such regulations. In this case, when a seismic design requirement was introduced but no one could analyze the structure under the required

seismic forces. They had to solve hundreds of simultaneous equations, but that was not possible at the time.

Let me talk about the situation in Japan immediately after the World Wars II. The land was devastated when we lost the war. No structure survived in big cities and we had to reconstruct the country from this situation. We were not rich at that time but we reconstructed the country to the current stage over 50 years. For the purpose of rapid reconstruction of the country, we needed to construct infrastructures but satisfying minimum standard for quality. It was essential to force everyone to satisfy minimum standard for safety, health and usage. For the protection of properties, the building needed to be built strong and durable. Proper construction was very important meeting the legal requirements and minimum standard. The legal requirements should be understood and practiced by structural engineers or the construction people. The law cannot require too much, it should set minimum requirements. People have the right and freedom guaranteed by the constitution, and law should not be a barrier to such freedom of the people. So, legal requirements had to be minimal.

The building standard law was established in 1950. There were minimum requirements to protect life, health and property of the people. Large seismic design force requirement could make the structures safe, but very expensive. No one afford such expensive buildings. It should be minimum requirement. The Architect Law specified the quality of good engineers, responsible for the technology. The Construction Trade Law required reliable construction people. If construction people remove some steel in construction, then the building is not going to be safe at all. In Japan, we have Building Standard Law, law enforcement order, notifications from the Ministry of Construction and ordinances of municipal governments in the building code system. Each local government can establish special requirements necessary for the district. We have many publications from academic institutions, but they are not treated as the legal requirements. They are reference materials. For example, the Architecture Institute of Japan has standards, guidelines and specifications, but they are treated as technical references.

In 1968, there was Tokachi-oki Earthquake. A reinforced concrete university building collapsed, but fortunately after 5 hours of the earthquake. There was enough time for students and staff to evacuate as the building began to collapse and no one was killed. This was the first time in Japan that reinforced concrete buildings suffered earthquake damage. Therefore, the government, industries and academics began to study the cause of such failure. In the revision of Building Standard Law, close spacing of ties was to be used. In order to prevent brittle shear failure of reinforced concrete columns, we should wrap the column by lateral reinforcement so that the column could not expand outward by shear failure.

At the same time, we realized that we should develop a method to assess the seismic safety of existing construction. We should be able to assess vulnerability of the existing construction. The existing buildings, designed and constructed using old codes, might suffer similar damage in the future earthquakes. Vulnerability assessment is very important. If we found some structures to be vulnerable to earthquakes, we should be able to strengthen such buildings. If an earthquake occurs and causes damage we should evaluate the intensity of damage and we should judge if the structure could be used without repair work or how much repair work we needed.

We have to develop technology to protect the society from earthquakes – new constructions as well as existing constructions. If we develop a new technology or a new code, then all the existing buildings do not satisfy the new building requirement. Say, after 20 years or so, if we look at the building stock, probably only about 20-30% of buildings may satisfy the new requirement

introduced this year. But 60-70% of the remaining buildings would not satisfy this new requirement. These existing buildings must be protected as well as new buildings from future earthquakes.

In 1981 there was a significant change in Building Standard Law, reflecting the recent development in earthquake engineering. Previously we required that 10% of the weight of the structure should be applied, but here we introduced the effect of the period of the structure. Rather than assigning the horizontal forces at floor levels, seismic design force was determined in terms of story shear. For life safety, we have to check the minimum lateral resistance at collapse and minimum deformation capacity. For this, we apply monotonically increasing horizontal force to a structure in the nonlinear structural analysis and find out the resistance at the formation of a collapse mechanism. In other words, we gradually apply horizontal force to a structure until the structure cannot take any additional lateral force, which is a collapse mechanism. We also examine failure modes of structural members in the analysis if the structure fails before the formation of a collapse mechanism.

The irregularity of the stiffness along building height or eccentricity between the centers of mass and stiffness affects the seismic behavior of a structure. For example, if a structure is supported by columns in the first story, while there are many walls in the upper stories, the major damage tends to concentrate in the weak first story because structural walls are very strong against seismic loading, but columns are flexible and weak. If there are any weak spots in the structure, all the damage would concentrate in that location. Many examples of weak and flexible first story collapse can be found after earthquake disasters in the world. For example, in many apartment buildings, there are structure walls in the second story and above, but the first story is typically used as a garage, where structural walls are eliminated. So the first story became very weak and the whole story collapsed in the first story.

In many buildings, stiff and strong structural walls are not placed in symmetry in the floor plan. If structural walls are placed on one end of the floor plan, and no wall on the other end, under the ground motion, stiff structure walls do not deform much at one end, the flexible other end will deform large amount, causing quite large deformation at the flexible end.

Architectural elements, commonly called nonstructural elements, such as partition walls, windows, doors, staircases, which are not intended to resist gravity loads nor earthquake forces, are important elements for the use of a building. Such architectural elements should be protected during more frequent earthquakes by limiting lateral deformation under seismic design forces. In Japan, the inter-story deformation calculated under design earthquake forces should be less than 1% of story height. Cost to repair non-structural elements is as expensive as the cost to repair structure elements. Until the architectural elements are repaired after an earthquake, the building can not be occupied for the intended use. The protection of non-structural elements is quite important.

The damage statistics of buildings were collected after the 1995 Kobe earthquake disaster, Japan, by the Architectural Institute of Japan. About 4,500 reinforced concrete buildings were surveyed in the most severely-affected areas. The 1971 revision of the Building Standard Law required additional close ties in reinforced concrete columns. Important and major revision of the Building Standard Law, with respect to earthquake resistant design, was introduced in 1981. Buildings with minor or light damage could be used without any repair work. Approximately 20% of the buildings built before 1971 suffered severe damage, but 80% survived the Kobe earthquake even in the worst-hit areas. However, about 93% of those buildings built after the 1981 revision of Building Standard Law survived that earthquake needing no or light repair work. Only 6-7% of the buildings suffered severe damage. With the improvement in the design code, the performance of buildings was significantly improved.



In 1998, there was another change in the Building Standard Law. The background was that there was a very strong demand from foreign countries to open up the Japanese construction market. Japanese design system was very complicated, consisting of Building Standard Law, law enforcement cabinet order, ministry notifications and municipal government ordinances. The system was difficult to be understood by foreign engineers. There was a trend in the world to shift the design regulations from specification format to performance-based format. The structure should be designed to develop prescribed performance under given loading. In the Japanese code, the structure should have such and such column width with so much reinforcement without proper explanation, and that could not be understood by foreign engineers. This code revised in performance-based format was introduced in 1998 in Building Standard Law. The Building Standard Law requires that the design documents must be reviewed and verified by the building officials as per those documents to satisfy all the regulations. If the design requirements are outlined in performance-based format, it is not easy for the building officials to verify unless the building officials have sufficient knowledge in structural engineering. The design verification procedure must be revised to meet the performance-based design format.

Last year, there was another revision of the Building Standard Law. Currently, in Japan, we normally use computer programs in structural calculation and design. When we submit these structural design documents to the local government for verification, the building officers have to check all the qualifications. If the design calculation is to be done by computers, then building officers would have difficult time checking if the calculation is right or wrong. So for the purpose of the verification by building officers, the government decided to allow the use of computer programs if they are approved by the Ministry of Construction. Many construction companies have developed computer programs. They are automated computer programs and you input the configuration and dimensions of a building, and the computer can handle the rest automatically satisfying code requirements. The computer can even do the structural drawings automatically. Then a problem occurred. Inexperienced structural engineers can manipulate the data and then run the computer programs. If the program says that the given structural cannot satisfy the code requirements, then he would change the input data and rerun the program until the program says OK. And it doesn't require any technical knowledge of a design engineer as everyone knows how to input data to the computer.

One structural engineer changed the computer output and used the other computer input and edited the two documents together and then submitted to the local government. Local government building officers did not know that forgery and buildings were constructed. Those buildings had only 40-50% of the required seismic design strength. This forgery caused chaos to the building owners, especially the owners of the residential buildings. They were not allowed to occupy such buildings as they were quite dangerous. The local government ordered to tear down or strengthen the buildings. Therefore, the Japanese government revised the Building Standard Law last year to avoid such problems in the future. Structural design documents of large buildings must be peer reviewed by experienced structural engineers. Strict interim inspection during the construction and detailed structural modeling method was specified in Building Standard Law enforcement order. The application of architect's or structural engineer's engineering judgment was limited by the law. But if the law specifies all the ways from structural modeling to structural detailing, what is the role of the structural engineers? I think if the law specifies too much details then the structural engineers will lose his/her ingenuity to develop original design and we have gone too far in Japan. Thank you.

## Session Review

BHARAT SHARMA  
Professor  
Nepal Engineering College



Thank you, Mr. Chairman. It is quite Herculean a task for me to review. Rather than calling it a review, I would like to call it my observation. There were four presentations in this session, and I have only 10 minutes, meaning hardly couple of minutes for each presentation. The time set for each paper does not do justice to the presenters. I would therefore like to request for 15 minutes of time for my comments. I hope I will be able to wrap it all up in the next quarter of an hour. And, I would like to call it observation rather than review. These are what I have observed: the presentations were bilingual and mostly in English.

I think the theme was excellent, building code tied up with sustainable development and habitat. He has his own definition but I remember the definition is not away from your definition of sustainable development in any sector; that you take care of the present generation without really impacting the future generation. That is what makes it sustainable. That is the standard of your definition, whether you apply in any aspect of life. His definition comes pretty close to that so I don't have any problem. He also gets into the human settlement aspect which is an extremely pertinent area and we have to give it a very serious thought. While coming to that, he gets into energy aspect, which I think, is an excellent point. In our context, the energy is a major issue and our people become more conserving in eating habits. Energy consumption habit in the western parts of the universe is affecting minimum energy intake for the people living in the developing countries, including Nepal. So, in a very sensitive way, he asked that this disparity has to be addressed. That is the future part of the building code and building part they come in complimentarily. Each of them has its distinct needs and we simply cannot mix one with the other so distinction has to be really cleared out.

On construction practices, the engineers and non engineers should cooperate and this is a very sensitive issue. For me it doesn't matter. We engineers, let's do some soul searching also. We engineers, quite a few of us very often, do ritual parts in our engineering practices. I think we have to improve our practices as, in the days to come, we are heading towards a situation in which we will have to be accountable for our actions. There, we have to be very careful following our norms, following our ethics that engineered structures have to be really done in a very imaginative and a very constructive way. We cannot go scotfree with whatever type of engineering designs we prescribe. We better forget we can get away with any kind of prescriptions or engineering designs. I think we should notice the writing on the wall and on the newspapers that the public is taking the issue of accountability seriously and even engineers and the doctors also abide by it. I think being accountable to our actions only do good to us personally and also improve our engineering practices. Then he went on to define the Building Code and I don't want to go into the depth. On the whole, what I see is that, he concluded with peer review, which calls for soul searching by ourselves. Let's do that. It would do good to our individual personality and do good to our professional society. I appreciate, that is an excellent point.

Dr Ando's presentation was really highly enlightening – very technical, but not hard engineering, and very thought provoking. I could understand architecture and urban planning, and I could see your points well covered and well done in the paper.

Having said that, he started from Kobe and went into some countries in the region – Indonesia and Pakistan. He explained the objectives of UNCRD, which, I think are very, very good. If we could get into these objectives, if we could achieve them I think it would do us a lot of good. He went on to recall the projects and then talked about disaster management, community development and focused on community situations. He talked about two communities – our professional community and the wider community of the people at large, where there is a symbiotic relationship. Very often we behave indifferently, forgetting that we are very much part of the community in which we live and we start prescribing things which may not necessarily be congenial to the community. We engineers have to be mindful that it is not the academic degree that we hold; it is the good that we do to the society through our practices.

Our Chief Executive Officer of KMC presented in a very emotional way. When we talk about seismic aspects let's not just talk about bridges as they are very paramount structures but whether they are built. Look at the status of the Kathmandu Valley, the beautiful open spaces, the beautiful courtyards that we have in the valley, they are all fast disappearing. People are buying houses in the congested localities. When talking about the earthquake it is not only what happens to the structural part, how do you breathe in during the earthquake and what happens after the earthquake? These open spaces normally serve as lawns to breathe in oxygen normally we do, it is not just the structural strengthening of the individual houses. Let's give it a serious thought when you get permission to build such kind of structure. Location around the stadium, the big marketing complex that has come here. And think of the vulnerability of our area. It is unthinkable. Is it that we are just thinking about safeguarding the structural safety only? Or, are we also caring about very vital aspects? I think we are just ignoring the latter. As you touched upon, the cultural aspects are very vital also. In our parts also social and cultural aspects have tremendous impacts. We are a fatalist society and we believe in adventures. Earthquake never comes walking on feet. Even the cultural taboos that we have inherited are not something static, but dynamic for the welfare of the society. You touched all the MDGs, which are also significant for Nepal. Quite often we readily sign the international proposals and then forget about the implementation part. We prepare some document and the document stays somewhere in the shelf. By 2015 we will not be able to meet the MDGs, so we have to do a lot of homework.

On the whole, I agree with the ownership transfer issue raised by Mr. Thapaliya and even the status of building code. I think this is a legal issue. The problem – as Mr. Dixit also advised – is our inability to push through the institutionalization process even as the building code was initiated in 1994 in good partnership with the Department. Setting up an institution does not necessarily mean institutionalization. Institutionalization begins when the institution begins to function in a credible way, the signboard makes no sense. The main problem lies in the institutionalization process of the whole exercise. In Japan, they really refined the whole thing in the year 2006. Think of the situation how they started – they started in a rather miserable way. How the technical inspiration was started in a very humble way and how they got it to, you know, the G7 countries' situation. It didn't come just easy like that. There are lots of commitments on the part of the Japanese people, people at large in Japan. Despite being devastated by the atomic bombs they have been able to come to this stage, whereas we did not have to cope with such worst situation but still we are really fumbling in the dark.

I appreciate Professor Otani for his technical presentation in very friendly, simple way, and the presentation was very helpful. You covered scenario in a very humble way. As you rightly stated change is a result of thought, action and dedication. It is high time that we made the technocrats responsible. I think Mr. Thapaliya is very right. The earthquake strikes indiscriminately and does not skip one particular area because it happens to a VDC, which is not required to follow the Building Code.

I think I love your social culture, Professor Otani. It was tremendous and we can very profusely learn what culture and social aspects have to do with earthquakes, very often we think in a very superficial way but it has tremendous impact on socio-cultural dimensions. Kind of with an engagement with our social and cultural kind of dimension which, you highlighted in a very nice way, excellent. You went into, you covered various phases in a very systematic way, right from out of nowhere to your speed work and ought to do this in the twenty-first century - tremendous kind of achievement that Japan has been able to do. What did we learn? I think it is a dynamic process. We also say in conclusion that what you said that forgery you touched but what you are saying that you touched from phobia and all though you are giving instances that you are giving. You are trying to communicate the idea that awful happening doesn't matter in geographical locations, where he is located, but all of us are homosapiens. Nobody can be out of any religions, we are homosapiens. And, the earthquake doesn't exclude. So if it is a challenge to us human beings, it is something to be thought with the lesson we learned from Japan and other parts of the world. And towards the end, role of professional society again comes that to the source of power of us engineers and technocrats, professor you concluded with a real sense. What should be the role of professional society or what should be the role of individual engineers and all in the context of really alleviating the situation. Please bear with me whatever way that I could really jumped up, tight up with my feelings that my so called academic feelings and my remarks, all the good spirit. Thank you very much.

## **General Discussion and Response by Presenters**

**Question:** I would like to ask Mr. Thapaliya. Kathmandu and earthquake are said to stand face to face and anything could happen anytime. If an earthquake measuring 6 or more on the Richter scale strikes Kathmandu, then an estimated 100,000 people will die, mainly in and around the crammed areas of Asan and Indrachowk. What is the Metropolitan City planning to cope with such a tragedy if it occurs?

**Question:** In 2003, the government of Nepal passed the Building Code, giving it a legal status. Since 1998 itself Nepal has an act in place to enforce the Code. The Department of Urban Development and Building Construction and the Ministry of Justice have identified 58 municipalities, where the Building Code is to be implemented. Building Code is applicable in a total of 117 places, not all over the country. Yes, the Code needs to have legal validity. Amendments have been proposed in the Building Act and it's now under the preview of the Parliament. This Act gives a lot of power to the municipalities, including the authority to penalize if anyone defies the Code. The Ministry of Local Development is also making efforts in this regard. Mr. Thapaliya also stated that KMC sends junior employees to monitor the implementation of the Code. May I ask why KMC sends them and not qualified engineers?

**Comment:** We had sent circulars to the municipalities, 18 of which have given us the feedback – all of them from outside of Kathmandu Valley. The municipalities have stressed on these: provision of trained technicians, need to train the local consultants, public awareness, and sensitization of the political parties, among others. We seem to have given the responsibility to the municipalities without assessing their capacity, resources and motivation. If this workshop could direct us on the ways forward, we would discuss at the ministry.

**Comment:** There is a provision that allows us to fine up to 100,000 rupees if somebody is found in unlawful acts while approving the building drawing. Likewise, if one is found building a house against the set standard then the building can be razed or demolished. However, as Mr. Thapaliya has explained, demolition is extremely difficult. And, it is easier to penalize the owner than to demolish the building itself. The fine, ranging from 2000 to 5000 rupees, only increases the tendency of non-compliance. Even if we follow everything and every process according to the Building, the construction workers and masons can still jeopardize the construction if they do not know how to mix the material properly. May be we should adopt the provision that untrained masons can not be used for construction purposes – this alone could raise the quality of construction. Unskilled workers learn practical skills for a couple of years while working in the construction sites and then even without basic training they graduate to become skilled workers and begin to supervise others. May be we need to address these practices as well.

**Comment:** Students passing out of different engineering colleges are not aware of the Building Code. What is the thinking of the Ministry of Physical Planning and Works, the DUDBC, the Ministry of Local Development and the municipality regarding the need to make students aware about these issues? I think we need to focus on creating expert manpower, as developed countries do.

**Comment:** While giving approval to the building designs, we do not care about the provisions for the physically disabled people. May be we should have some provisions for them as well. Are we working on the concept of high rise buildings in Kathmandu? As per our Building Code, we need to have an elevator/lift for buildings that are more than 15-meter tall. Surprisingly, it does not talk about other safety issues. In Lalitpur, the local residents have challenged a permission allowing

construction of a 14-story building and the case is pending at the court. Also, how about conducting technical audit of the houses and private buildings? Regarding training, each of our department trains up to 30 people a year, thus producing some 400-450 trained hands annually. The training is of three days and the participants of training are given certificate at the end of it. You may also keep in touch with our department and make use of the trained and skill hands as construction workers. I too agree that we seem more concerned about the municipalities but not about the VDCs. We have prepared a building code directive, and we want it to reach every person willing to build a house. We are closely with the municipalities to ensure this. If you need it we make also make it available to you.

**Chairperson:** There are several queries, but I think presenters have to respond to the questions and queries regarding policy and implementation aspects. Therefore, I would like to request Mr. Kishore Thapa for his response.

**Thapa:** Giving municipalities the responsibilities without necessary resources and capacity will not mean anything. As I stated in my presentation earlier, our policy should be implementing the Building Code phase-wise after classifying the municipalities and assessing their capacities. Or else, it will be difficult to work. We can not place Birgunj Municipality and Khandbari Municipality in one basket. Even the Town Development Fund extends loans on the basis of classification. We should follow a similar pattern when it comes to building construction committee also. That way it makes trickle down effect. The engineering committee should be most serious about the building code as it engineers who design the map. Masons and construction workers are no less important. Both may be involved in the construction of thousands of houses. Training one mason means keeping thousands of houses safe, but training a house owner means limiting the knowledge to only person as society on the whole does not benefit. We may engage in activities aimed at raising the public awareness, but the training per se should be targeted at masons/construction workers and engineers. That's why the ministry is also designing programs keeping them in mind. We have also moved into the education sector through the Tribhuvan University. We are going to have the Building Code included in the syllabi of other universities as well. Including the Building Code in the university syllabus is a process-oriented activity and it takes relatively long time. Therefore, we are starting off with introductory classes in the university to sensitize the engineering students. After finishing their education when they start working they will think positively about the code.

**Thapaliya:** We know the risks of high magnitude earthquakes in Kathmandu. Therefore, we are working with an international agency and NSET to develop a master plan to reduce the risks. We are currently in the last phase and this plan will address several issues. KMC does not want any single person to die in earthquake. And, the master plan does not only limit itself to KMC, it covers the Kathmandu Valley. I will also suggest incorporating your suggestions in this. But we can not invest scarce resources in building electric crematorium because in case of large scale earthquake tens of thousands will perish. We want to invest the money in ways that can save human lives. I am not really concerned about whether or not the Building Code is implemented. Are we sure that implementation of the Building Code will ensure all constructions of the same standard? Certainly not. We all need to have one view on the need to implement the Building Code for the entire valley. People tend to think building a house in a VDC is easy and hassle free as they do not need to follow any process and we need to change such attitudes.

Yes, we need to be sensitive about the concerns of the physically disabled while constructing new buildings. When we are setting standards we are including provisions that the constructions are disabled-friendly. We should be more sensitive when constructing large and public buildings in particular.

Our policy is that we should now go for high rise buildings because there's no land left in Kathmandu. We don't even have open spaces. When we go abroad, we get to see that thousands of people live in one house. If we can adopt appropriate technology we can go for high rise structures. We already decided to this effect. Our thinking is that we can implement this immediately and we should modify it in some ways.

Within a week, we are going to make an office building available. This building will serve as contact point for trained masons. These trained masons do understand the Building Code and I am sure they will apply the newly learnt skills while working on new houses/projects.

We are going to print about 5000 copies of the directive. Irrespective of what the Directive comprises what's important is whether or not the implementing agency is capable to execute it.

**Chairperson:** Thank you for the presentation and clarification. When we were talking about the Building Code we forgot to make a mention of the function fund. That's partly why the problem exists today. In the whole process coordination seems to be lacking. Now one cannot get away by blaming the other. The DUDBC cannot point a finger at municipality and vice versa. If we indulge in the blame game what would others think of us? We should therefore work in tandem now. And, I declare that this session has come to its end. Thank you.







## SESSION II

# PANEL DISCUSSION ON ROLE OF STAKEHOLDERS

Moderator: Bishnu Pandey, *Researcher, UNCRD Disaster Management Planning Hyogo Office*

Rapporteur: Nisha Shrestha, *Communications Officer, NSET*

### Panellists:

- Som Lal Subedi, *Ministry of Local Development*
- Surya Bhakta Sangachhe, *Director-General, DUDBC*
- Prem Raj Joshi, *Bharatpur Municipality*
- Badan Lal Nyachhyon, *Society of Consulting Architectural and Engineering Firms (SCAEF)*
- Bishnu Subedi, *Vice Principal, Nepal Engineering College*
- Ram Chandra Kandel, *NSET*

**S. Subedi:** While talking about stakeholder, I think, it should be categorized into two. Municipality should lead the local level. In case of village development, we have to enhance its capacity. In village development area; v.d.c. itself should lead it. In these two areas, if District Building Office should look after the public land or government's infrastructure, I think it would be effective. And it is under its mandate too.

When it comes under the municipality, there should be technical leadership. Restructuring the mapping department is the main point because it is the first section where people come. Therefore, mapping section should explain about its technicalities or it should have such behavioral oriented behavior to tell the people why it can't be passed. It should make clear to the people that technically it includes this and that and about its result too. I think Building Office should have to create modality of low cost housing system district by district because our geo-physical structure is different from district to district. There is climate diversity too in every district. RURP had made a building in Gorkha District, which had a window in opposite direction. It was improper. I think it was the boiling of forestry dept. I mean if we contently generalize, it might cause difficulty. Then after, if we can create a wing between branch manager and the politician, it would be easier to deal, who could provide policy guidelines. They should have to make land use planning including building code implementation policy guidelines and facilitation. And next important part is political party in local level. If we can sensitize the representatives from eight political parties and impress them about its function, it will be very much comfortable to implement. It can facilitate to improve the revenue of municipality too. Then all the party leaders can play the role for publicity and facilitation. We should not neglect them even though they are from small party. If he constructed his home alone perfectly, it could contribute to the programs of municipality in some extent. And the next thing: what is the role of District Development Committee?

Probably it might be changed while restructuring the state in coming days. It is possible too. But even, till the DDC is adjusting, there will be any type of body to function such agency. It doesn't matter whether the building office will be in district development committee or in other location. But we have to enforce the building code from the proposed municipality; even it is free of cost. Now municipalities are getting 10 lakhs rupees from government budget. It is not difficult if we divide this budget.

What we are practicing now is, we make municipality just it turns to the jungle of concrete. We don't make it municipality when it is unused land. For example, if we include Gongabu in Metropolitan city it is to import Pandora Box. It has a path of 8 feet and the buildings of 8 floors.

Therefore, district development committee should support and facilitate the village development committee for land use planning, at the very beginning stage. I will come to this point again. Center Dolidar and District development office should have certain roles. Building office should focus within municipality and public building construction such as school, hospital etc. They would be facilitated by building office.

But if municipality itself runs the hospital, it should be under its jurisdiction. Though it will take time to implement it, they may not understand – we should make them understand. But we have to tell it right now. Because, the trend is that: there were only 10 municipalities in 1952. Now we have 58 of them. In 1952 urban population was less than 10 %. Now it is 15%. It will be 23-24% before 2011 as projection.

If fact, if we count IDVs and mobile population it might be as it now. We have prepared 41 more new municipalities. It will be around 150 municipalities within 10 yrs. It means around 200 municipalities is will be there. So if we can inject the culture of municipalities to the potential

VDCs right now, it will be easier to manage. Otherwise they will be mismanaged. Then it will be out of control.

In case of publicity, role should be given to NGOs and other civil society actors including media. We have so many FM stations. If municipality provides joint PSAs to those FM stations in case of building construction, it will be fruitful. FM stations might think, they are achieving adv., but virtually that is the task of municipality. Once I had suggested to NSET. We had sent the proposals to Pokhara and Dhanam municipalities to make a model stone home including disaster risk reduction seed, as per message. But it could not be implemented. Probably we should have to launch such model, considering from the center level.

Likewise, definitely it is the responsibility of the Ministry of Physical Planning and Works and DUDBC to make the national policy, national norms and to standardize it. In case of globalization trend and in urbanization process, what is being there and what should be here? In my opinion, there is so much manpower that has been supported by the state. They are urban planners and architects and are abroad. There was a discussion in earlier session, in Rana rule, 5 Nepalese had gone to Japan to study. I mean, people financially supported by central level are abroad.

That's why it will be easier while building department assists in technology design, innovation and transfer. And the role of MLD is to facilitate the municipality. And another role is to co-ordinate with the building department, Ministry of Physical Planning and Works. While it reflects in national account, it is the role of MLD to compile the activities of municipalities and submit it to the parliamentary committee and other governmental institutions. We should not forget the role of UDTC to strengthen capacity.

In the absence of urban development training center and other private sector like MLD holds it. Definitely DOLIDAR is constructing the big roads, it has big projects here. If we can include the buildings made by DOLIDAR in this modality, it would be better.

**Joshi:** Actually, while talking about the role of stakeholders, municipality is the main responsible body to implement the building code. I want to talk about some issues concerning municipalities before talking about implementing agencies. Mainly, we have to test our capacity. Municipalities out of Kathmandu Valley have such type of working nature that they have only one engineer. He has to make drainage, drinking water design estimate including other works. And how effective it would be, when that single engineer has to guide the building code too?

So, it is very much necessary to enhance the capacity of municipalities. It is the most challenging task to implement the building code. It is necessary to change the whole structure by enhancing the capacity of single body. In my opinion, every municipality should have earthquake resistance section or disaster management section to build up the structural unit, which we don't have in our municipalities at present.

We have such a communal structure that generally, we make laws, but we violate them ourselves. While talking about the building code, we have made the laws and told to follow it. But most of the houses don't apply –follow it. Earlier, representative from Kathmandu said, there are around 60% homes, which don't meet the code. But I am sure; it is more, outside the valley. 70-80% houses are made without the permission from municipalities. How can we bring such trends under the rule? I think, it is a great challenge. We should have special task for it.

The third point is that, as I felt while working in Lalitpur Sub-Metropolitan City, family structure is also a type of challenging phenomena to implement the building code. As my experience, there are

buildings, which are constructed within the area having less than 2 daam or 2 paisas. There is only one ladder and only one room and if he has 5-6 family members, he has to make the home having at least 7 floors. That is why it is difficult to apply the building code. So such a family structure where the members can't stay under the single roof, it is a bit challenging job to implement building code. Likewise, the jobholders in our mapping section sometime have soft corners to pass it because they themselves design the building map. Though that map doesn't fulfill the requirement, they precede it. As the result, it hampers to implement the building code. There is yet another tendency. People who are going to construct buildings generally bypass the authority. Particularly, first they make home and they try to get it approved. Or if any one has committed mistake, people consider it to be a case law that they should be allowed to construct their buildings accordingly.

When we talk about the Kathmandu Valley comparing to the other parts of the country; for example, as a requirement, building can't be made within 20 m from the bank of a river. In Kathmandu, we take this measure for Vishnumati and Manohara River. But in case of other rivers we don't have make any measures. What we are facing is that the map indicates that the building is 200m far from the river but in fact it is attached to the river. What is the fact? Suppose, a citizen made his home on a river bank. Next man claims to make his home as the previous citizen. I think there is an administrative pressure to create such a situation. Because of the pressure by our ministry, department or other powerful people, it is difficult for us to implement the building code. It is the factual situation we and municipal officers are facing.

Likewise, we are practicing the traditional methods to make the homes. We make a type of map; then we keep it at one corner and construct the home on our own manner by contracting the labor. It is another difficulty to implement the building code. Some times tussle between the local people and new homemaker create problems to implement it.

If we talk about Lalitpur Su-Metropolitan City, probably the tallest building could not be built because of the protest by the local people. They didn't let the construction of that building reasoning that they would die if an earthquake occurs. We could not convince them that it was structurally fit. Though that building was structurally sound, it could not be built. They could expect in another sense too. They could have benefited from that building and its owner. We have such a tradition that big houses create a problem, block the sun and pass so many people. We ease 10% to those building which are already made. It also creates the problem on implementing code. These are the challenges I faced in work field.

We have to work harder to avoid these challenges. In fact, municipality is the main stakeholder to deal with it. In local level, municipality is the main holder and in central level the Ministry of Physical Planning and Works has the main role. To implement the building code, non-governmental organizations like NSET are playing great role for the public awareness. They have their role in the central level, and in case of local level, municipality and designers, workers, municipal technicians and executive officers have the main role. So to tackle such challenges and to implementat the building code, institutional development is required. To solve that problem we have to study the overall organizational structure, available manpower and structure and restructure it again.

Likewise we have to inform the people about the merits and demerits of the earthquake resistance building applying the building code. It is practiced in Kathmandu but not other parts. In Lalitpur, we went to ward to ward for public awareness in cooperation with UNICEF. In Lalitpur, women groups, schools, local organizations are very much positive. In Latitpur every building has 12/12-pillar system. Therefore public awareness is a must. Likewise there should be availability of skilled manpower. eg. We can't talk about structural designer in Khandbari Municipality. So, organizations like SONA should think about such areas. Likewise, political willpower is also required. At the

present situation, we have to work jointly with the all-party alliance at the local level. We can't implement these measures if they are not agreeing because political parties have main role, to make the people understand it. Therefore political willpower is a must.

Likewise, planners or designers should have commitment to apply the measures while designing. We had had some workshops including some listed designers and engineers from sub-metropolitan city. Such workshop is necessary even today. If it is not possible in every municipality, we should hold such training regionally. We have to follow the current rules and regulations.

Likewise, the body which is authorized to implement the code should have the power to demolish those building which are not built according to the code or to bring them under the criteria. Only the city police can't demolish those building, which are not under the criteria. Local administration, political parties and all the citizens of municipalities should support to implement. If we do so, no body can make the building in violation of the code. Thanks.

**Sangachhe:** First of all I want to talk about the stakeholder. Now we are talking to identify the stakeholder. I think from people who handle building materials and those who get involved till the completion of construction all are stakeholders. Buildings are regularly made. Only the matter is whether they are following the building code or not.

When we implement the building code, we design it in computer using the software as the building code. But if the essential material is not standardized, building code engineering design is meaningless. We should be conscious from the material. I prefer inter- stakeholder role in it. eg lets talk about rod. We calculate its capacity while designing. By using stat pro design, we calculate and suggest the proper spacing for the rods. But the calculation is useless if it is not standardized.

Talking about the stakeholder, building materials, machines, designer etc. from bottom, it is important to know how it is designed. To design, we go to municipality to pass the map. It will be checked by the municipality, whether it is fit with the building code or not. Afterwards, construction process begins. Construction process begins from the machine. But if we are not aware to tie the rod by machine, building code cannot be implemented, even though we talk in high level. That's why from bottom to top all are stakeholders. It is definitely the main policy from the Ministry of Physical Planning and Works and Department of Urban Development and Building Construction.

There are 23 volumes about it. It is published in gazette in 2063 Falgun 1<sup>st</sup> where it is mentioned to implement building code in 117 areas. Now we have our division offices in 25 districts. They are conducting training for masons every year. While talking about the municipality, if some areas have to be helped, there are committees in Kathmandu and Lalitpur. Engineers are available and they are helping to implement the building code. In case of interlinking, there are DUDBC, municipality, VDC; all are to implement the building code.

Talking about the inter linkage, I think, there is inter linkage among DUDBC, municipality and VDC etc. to implement the building code. It is the matter of community too, how to maintain the inter linkage. If there is demand in municipality to inform the community, we go there and organize/ hold the training. We are producing the pamphlets. For dissemination hoarding boards are being made. For instance, if some steel companies are interested to make the hoarding boards for the publicity of building code criteria, we are allowing them. That's all from my side. Thanks.

**Nyachhyon:** I am privileged to participate in this very important workshop. Myself, my organization, Society of Consulting Architectural and Engineering Firms, we were involved in the process of making building code since 1992. It was not like that, at first. When we drafted we worked very hard to bring this code at this level. After the code was finalized in 1993 in the form of

statute, it was waiting for the parliamentary approval and enforcement by the government. There was a lot of trouble when parliament wanted to have the building code translated into Nepali because they approved only documents that are written in Nepali. They would not adopt documents written in English or in any other foreign language, so translating the building code into Nepali was virtually impossible and time consuming, possibly because it was not given the kind of attention it would require. By now, we have a proper parliament. We have been waiting for many years since 1993 for the building code to be passed by the parliament and applied. If we had moved quickly, we could have gone a long way in the implementation of the building code. However, the engineering professionals came out with a view that at least members of this Society take initiative and apply the building code. So all our members compulsorily apply the code at present. On one hand, we were struggling to have the building code passed by the Parliament. On the other, designs that complied with the building code, which we presented to the municipalities for approval, got stuck because the persons in charge in the municipalities lacked the capacity, knowledge and experience to clear the designs. Also, we have had to struggle in another front. As we all know, the municipalities employ licensed designers, not all of whom are members of this Society. We could also feel a subtle tussle among licensed designers/professional groups themselves – Society members Vs non-members (many employed by the municipalities). There is a huge disparity between them. The number of licensed designers attached with our Society is rather small, as compared to the non-member designers. It all means that elements of professional identity, code of ethics, attitude and standards are missing in many non-member licensed designers. This has resulted in the non-application of the building standards. That (LSMC) is the only municipality, where you can have very easy access, but unfortunately, the Chief Executive Officer departed only last week from us. We have had to knock on the doors of the municipality twice daily – in the morning and the evening – for the last three years. Four years ago, it was decided that the building code would be applicable, as the then Deputy Prime Minister declared, from 16 January 2003. The building code of Nepal would be applicable within the jurisdiction of the municipalities, and our trouble to implement it started with it. Now, we proudly say that we have made at least over four thousand designs compliant to the building code of Nepal. I am very much thankful to our Society and our friends and earthquake section of municipalities and the Chief Executive Officer. We are trying to address the gap between municipalities, the building code and the community. We are playing a key role in bringing together these three together – the nation, communities and municipalities – so our buildings become safer. We are taking facilities. The role of bringing together policy, implementation strategy, and actual practice could be very well dealt by key the players, namely, professionals, designers, contractors and construction specialists. I think that is very much important. That should be the focal point. The earthquake can not be predicted and it could happen anytime, anywhere – in the districts, in the villages. Mr. Khemraj Nepal, the Secretary, instructed that all DDCs, VDCs and municipalities apply the building code but that stopped at that level. The ministry issued necessary instruction, but how could it trickle down to the VDCs and the DDCs. We have to work out that part. I would say, Last year we played a very important role because key contribution was made by the professionals, the young engineers who underwent a 40 hour training on how they can help implement the building code. You can get additional information on our website: [www.esi.com.np](http://www.esi.com.np). The website is a digital platform where we can share our knowledge and experiences. If there are any questions Prakash will answer to them. Thank you.

**Pandey:** Now we have Dr Jishnu Subedi from Nepal Engineering College to do a presentation on the CBR sector, which plays very key role in building code dissemination as well as technology development placement.

**J. Subedi:** Thank you. Engineers are first and foremost responsible for the safety of the building. If houses collapse due to the earthquake then the people will come to you and beat you up. After that they will go to the university and get hold of the professors teaching there. I very much appreciate

the support made by UNCRD and the Government of Nepal in sensitizing and making people aware. The picture that we are trying to draw from the morning is gloomy, certainly, but the best part, I feel, is that several activities have been done by ordinary people and the policy makers. Therefore, we do not need to worry about the gloomy picture since we are drawing the attention of sufficient audience around here and this is definitely a positive aspect. Mr. Bishnu Ojha said that we were not talking about stakeholders. But I do represent the stakeholders, both in my capacity as a structural engineer and a house owner living in the community and I am also a teacher. I represent college and we teach there. In the morning, Kishore Thapa pointed out the need to introduce these courses along with others curriculum. I will come to that point later, but as a structural engineer, what I feel is, I am aware of this.

Once I was supervising my office building on which almost 60 workers were working. I told them to work on and that I would comment “You should do like this”. Then, the workers said they would not work. This is the situation – even though you have capacity and you are aware, still the whole system is not working the way it is supposed to and you alone can not do it. We should focus on the capacity building of house owners, engineers, masons and workers, who build hundreds of houses. We should first focus on it. To raise the awareness level we should go to the grassroots level. It’s a very encouraging point to note here that there is sufficient awareness and that is a positive point. A house is being built opposite to mine. I have to go through that very often so house is load bearing type, not that old but is load bearing type of structure. Now in the entire building there is one more floor and their house is load bearing type of structure. And to my surprise, there is no back door/gate at all, except for the straightwall back slab. Unlike in Japan, the earlier design structures were carried out by civil engineers and their major role was to oversee the hard engineering aspects. Now they are also aware about the aesthetic aspects of the building and want to give the buildings a better look aesthetically so that they do not look artificial. Unfortunately, in the course design, the structural part is very limited. In our institute, there is one such course, which is in the final year. The course is very much open. They want to learn but the core course is so limited.

From the very beginning, we are not ordinary but at the end we are giving structural earthquake engineering course and what I feel is now I am very confident. After discussing with engineers in the lunch time today what I realize is in addition to hard core engineering, capacity building is needed too. How do you implement your agenda, how do you push your agenda, you have building code and you want to implement it but how much do the public and community share that notion? How do we bridge that gap between community and the engineers, engineers and the policy makers and engineers and the politicians? What course is lacking in our institute? And, another issue before we close is shifting the risk. I am willing to talk about this. The insurance can play major role, I think, in Japan. It’s the risk in a sense. We can bring the insurance company into the mainstream and we can bring the stakeholders. Our capacity is limited to a certain extent that we lack confidence in building high-rise buildings. We are not up to date with the design hierarchy. If most of our buildings are low rise (2.5 stories) in the coming 50 years most of the buildings will be high rise. We are talking about the implementation of the building code because we teach the software. That means we have software for Indian code and for the British code. Capacity building of engineers is one part of software development. Tools for effective implementation of the code details are another part. Another issue, as Professor said in the morning about the Japanese code is that it is very specific. My recommendation for the UN is not to rely on the Japanese experiences. In fact, we can simply pick the mistakes from the Japanese experience. Because capacity of our engineers and technicians is limited if we want to develop and extend our code beyond municipalities and engineers we have to make specific guidelines. Then only can we go for high kind of design to start sometime. Thank you.

**Pandey:** I would like to call upon Mr. Ramchandra Kandel from NSET to express his views.

**Kandel:** Thank you, my topic is “Role of stakeholders”. I see I can not count the stakeholders because there are so many of them. If we start to talk from the national level, even the role of Ministry of Finance is to control banks and insurance companies. They are just feeding the policy guidelines if buildings are constructed according to National Building Code. Loans are nothing. They can also influence a lot of construction work. Likewise, the Ministry of Information and Communication also has a role. All of us have heard on radio the advertisements promoting toothpastes. These give details on how to use it. We should also run similar advertisements to promote cement by educating the consumers on how to use, deadline and the ratio. There is a role of the Ministry of Information and Communications. The ministry can guide advertisers, in this case the cement manufacturers, on the details that they need to give to the public while promoting their products. Such specific information coming from the company itself through radio and television can also ensure a better construction quality. And, of course there is a big role of the Ministry of Local Development on policy guidance. The ministry can also support by putting implementation mechanisms in place at the local level, municipality level and even in the VDCs. I don’t think we cannot implement the building code in VDCs. How many types of buildings are constructed in our villages? If we go beyond Kathmandu Valley we see all the constructions which are being constructed in the VDCs that are covered in our guideline. We need to disseminate to the public at large. We can make the policy, we can make the guidance and we can support the local agencies. There also comes the role of professional societies, organizations like SCAEF or like the Engineering Association. There are guardians’ associations in schools in many districts. We can provide them with some resources and seek their cooperation in extending the information. Therefore, there also is a role of the Ministry of Education. We are stressing here that curriculum should be included in the engineering institutes to teach the building code. When giving permission to newly opening engineering colleges/institutes we can include the provision that in their engineering course they must teach the building code. Then, everyone has to teach. Otherwise they do not get the permission from the government.

What is a building code? It is a part of development process. So I see there are so many stakeholders, media and institutions such as Municipalities’ Association of Nepal (MUAN) and different political parties. Even they can support in raising the quality aspect because building code is not only about the earthquake resistant buildings; it is about the building quality, the millennium development goals, and sustainable development. So everything is linked together. And, of course the government seems to be neglecting technical training to the people who work in the village. I studied in Russia, where if people cannot study further, they pass test and join technical training centers for vocational training. We do have technical training centers as well. I know one is in Balaju and another in Janakpur. But these technical centers should be replicated in every VDC, where we could train the masons on how to construct buildings. At the moment, we are employing masons coming from outside especially. The people in the policy making level do not seem to have any planning. If we come up with policies that require construction workers to have masonry training, then there won’t be a big problem. But every stake holder should work in a coordinated way and everyone can find their role in proper building code – in implementation, enforcement and in dissemination. So, I see everybody is a part of the building code dissemination. This is my opinion.

**Pandey:** Thank you, Sir. We don't have time. Actually I have one more round of questions to each panelist but we are constrained by the time limit. I now open the floor for general discussion. Maybe we can take 4 or 5 questions at maximum and then I think it would be better to have some



teams to draft what we discussed here as representatives from the different stakeholders. Now the floor is open.

**Comment:** Thank you, panelists for your discussion on the Role of Stakeholders. My suggestion or question is related to the DUDBC and municipalities because they are the policy makers and the implementers. DUDBC or the Government of Nepal makes legal framework. They already have something at hand, which need some amendment and feedback from time to time. The municipalities may have a role in creating a conducive environment for the implementation of the building code. Academic institutions, universities, consultants and other organizations can facilitate by arranging curriculum and guide, by giving some information to raise the technical know-how of the public. I have already mentioned municipalities are very prominent stakeholders to implement this Act. Dr. Jishnu Subedi has mentioned that engineers of the municipalities are main/key stakeholders. I accept his idea because if they are careful in implementing building code so that we can implement it properly. Another thing is public motivation, which we can achieve through increased awareness. Professional civil society can motivate the public in this regard. If we can not motivate the public we can not implement the code of conduct. The Building Code is a kind of code of conduct and we have already discussed this. So, the community based organizations can play the main role in raising awareness through campaigns. Just like in the municipalities and community based organizations, there are duty officers, engineers from municipalities, who can play a key role. Coordinating community can play a key role in all of this while the donor community, NGOs and INGOs can provide technical and financial support.

**Comment:** Dharan municipality is going to implement the Building Code from August and we have already made necessary preparations for this. Town Development Committees have been formed in the municipalities in the Terai. Questions are being raised in the role of these committees. Anyways, if we could make these committees little more responsible and mobilize them for the monitoring and technical audit purposes it could solve the problem to a large extent and it will not be very difficult to implement the Building Code. Besides, the public perception of the Building Code is that it is intended to harass them and it requires them to incline towards structural designs. Therefore, they become cautious. When talking about the BC we should also consider if we need to think of alternatives or not. Social and non-profit organizations do not want to seek approval of their drawings from the municipality when constructing new buildings. We need to create a situation where we can take action against them if they are found dodging the municipality. Having got to attend this workshop I now understand that BC has wide-ranging stakeholders – society, campus, school etc. When schools are built they do not bother to get approval of the buildings and we can not take action against them because it is a social institution. In practical terms these schools are out of access and we cannot come anywhere close to them to see if they are respecting code and meeting other criteria.

**Pandey:** Thank you.

**Question:** My question is to Mr. Joshi. As you stated, there is a real shortage of technical manpower. We tried to work in coordination with other offices but it did not work out. I have been stationed in the districts for the last 25-26 years, and I observe that these two offices – District Development and Municipality – take each other as a step organization. Now we have created dolidar under the ministry, but do we still hesitate to vest power to it? It's very difficult to convince the public to go for earthquake resistant technology and build houses according to the building code because they tend to think that we are clandestinely working with the business community to promote their business. I'd see a risk of the public awareness campaign also. As engineers we are aware, but can we or our students make the public aware about the Building Code and will they readily go for it? For me, it's a bit difficult.

**Pandey:** Thank you. Mr. Joshi, would please briefly respond to the question raised?

**Joshi:** I agree with mutual understanding to assist one another. But let us frankly admit how feasible, practical is it? Well, issuing a public notice calling for and offering assistance is not a problem. In Khandbari municipality, there certainly is one engineer. What I want to state here is that District Development Committee and Department of Building Construction do not have any engineer. If they have we will happily accept them. Whatever, the municipality is willing to extend cooperation in every way possible. If it helps I am willing to get a public notice issued in Bharatpur municipality within the next seven days or so.

**Pandey:** We have colleagues from different ministries and departments, such as, mines and geology, physical planning and works, and academics and representatives of civil society organizations participating in this workshop. We wanted to extract concrete commitment from them, but we are running out of time. Let us therefore make a small team which will work in and around the breaks to discuss the role of all stakeholders and relationship among them. The team comprised Mr. Narayan Bahadur Thapa from the MoLD, Mr. Dwarika from DUDBC, Mr. Indraman Suwal from KMC, Bidur Mainali from MUAN, Mr. Kishore Thapa from MPPW and Mr. Surya Narayan Shrestha from NSET. The team will analyze the role of the stakeholders and do a presentation at the end. Participants here will then give their feedback/inputs to make necessary changes if need be. This way we will have a consensus document in the end on the role of stakeholders. May I please request you all to clap if you agree to my proposal?



**SESSION III**  
**ROUND TABLE DISCUSSION ON**  
**BUILDING CODE POLICY**

*Moderator* Amod Mani Dixit, *NSET*

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**Dixit:** Now I am requesting Mr. Surya Narayan Shrestha to make a presentation on what we had come of it. After that, I request, other team members and the entire floor here to add anything they would like to incorporate, including experience sharing.

**Shrestha:** I would like to thank participants and the team to which I represent. Now I present here the summary of findings of the group work. First of all, time was very short so we could not complete the task that was given to us but at least we have tried to generate some guiding principles and strategy and we have tried to put these suggestions in the matrix.

As we all feel, there is no clarity about stakeholders' role and we have tried to give it some perspective. Let me admit that it is not complete; even then I would like to present it. I have noted down the discussions and points raised by the team members and have incorporated the other issues raised by other participants. I tried to make a gist of the discussion on the role of the different stakeholders. The panel tried to define the role of different stakeholders. We have made an attempt to include some important issues that were not picked up during the legal discussions. For example, the role of Home Ministry, we suggest that we work in close coordination with this ministry because it is a focal ministry for natural disaster related programs. This ministry has policy guidance and we have to work under it. We may also take guidance from the Home Ministry on awareness raising activities and ministry itself should take the responsibility. We need the police force to take action against those who violate the building code. Therefore, we need support of the home ministry. When we are determined to take action against violators of the code we will have to resort to the use of police, which is controlled by the Home Ministry.

The other important ministries in this regard are Ministry of Education and Ministry of Physical Planning and Work. MPPW should formulate policies, revise and amend them. Likewise, Ministry of Local Development should also engage in initial policy formulation and implementation through the municipalities. This ministry is mainly responsible for creating an enabling atmosphere (as desired by the municipalities) for the implementation of the building code. The policy should support and it does so. MoLD also has a role in resource allocation, and planning and should coordinate between policy making and its implementation. Another important thing is that the MoLD could play a facilitator between policy formulation and implementation.

DUDBC is another key stakeholder, which could play a vital role in making all government buildings respect the building code and this should be priority number one. This Department should also keep a tab on the several innovations around the world in the building construction technologies. Such technologies should be replicated and localized in our context. This Department should also engage in revising and amending the Building Code, which was originally drafted in 1994. It should develop a check list for the implementation of the Building Code and also extend cooperation to municipalities when approving of institutional buildings. In addition, this department should involve in developing training curricular and skills enhancement activities, including developing the system of training, and trainers. Other important donors are the donor agencies, unions and bilateral agencies. What they can all do facilitate the import of good building technology from other countries. They can also provide with necessary financial assistance to raise public awareness about the Building Code.

Bilateral agencies could also be used in advocacy activities in support of the Building Code. Municipality is the single most important institution that can enforce the building code. We need to discuss ways as to how we can make municipalities strong enough to be able to enforce the code. The Municipalities' Association of Nepal could engage advocacy, lobbying and maintain an effective coordination in the implementation of the Building Code. MUAN can provide assistance to smaller municipalities in implementing the Code. Academia and institutions of learning also have

a crucial role – educating students of engineering on the building code. Currently, our universities do not have the Building Code in their curriculum. May be they can develop courses on the Code. Universities can also provide important inputs to the DUDBC while upgrading, modifying the Building Code. Universities can develop academic research technologies and play the role of advisors. We have also identified several roles the different NGOs, professional and civil society organizations play in the implementation of the Building Code, including public awareness, capacity building and training. The masons and construction workers have no less import role and they need to be trained. We should also have provisions that require contractors and builders to employ trained manpower.

In order to effectively implement the building code we need to have the guiding principles, policy and strategy in place as well. We have also listed some strategic activities that could address the problems related with building code implementation. Building Code aims at providing safety to life and property. First, we need to clearly define the role, responsibility and authority of the stakeholders. Then we have to put in place the strategy, line of activities and guiding principles.

The Building Permit Process needs to be amended by classifying municipalities in terms of geographic and natural features, shape and size. Amendment itself is an important activity and we should incorporate provisions for the implementation. We also need to bring all rural and urban sectors into the net of the Building Code. The existing efforts make an approach towards that direction. We also need to make an appropriate framework to ensure that all government, non-governmental and community schools build structures as per the Building Code. Municipalities so far seem to concentrate on the residential houses, but the focus should now shift to other structures as well – such as public schools, NGOs, bridges and other public buildings. We should create a situation in which only trained workers get to involve in construction activities.

**Thapaliya:** We need to include these types of programs in your future proposals. If there are good proposals we can rope the donors in. I am sure representatives from the civil and professional societies were also involved in the training activities. Maybe the civil society should express explicit commitment to abide by the Building Code.

**Dixit:** As I understand, by the evening tomorrow we must come up with multi-phased commitments. I am not talking here as a facilitator, but as a survey official. In the short term, we need strong policing to implement the Building Code. In the longer term, hearts and mind campaign will work.

In terms of looking at the building code as a technical problem, I would like to see it as two sides of supply and demand. There also are issues related with technicality, maintenance, rules and regulations and policy. What I would like to state is that until the house owner internalizes what he/she wants do, it will never work out, no matter what and how we try. To make them pro-active we should concentrate on raising awareness and we need to prepare a check list. We have to make the demand side more active.

I would now like to turn to the Director General for the explanation. What is the current thinking? Who is authorized to approve the map and who will certify?

**Sangachhe:** Now that we have the Building Act in place we all have to abide by it. It's not a matter of who wants and who doesn't. Bringing Acts alone will not work and we have to take it to the public through awareness campaigns. We have to make the people understand that the Act is intended to ensure public safety. The engineering community on the whole should also play an active role to promote and implement the Building Code. If they don't as per their Code of Ethics, their Interior Council license could be canceled. Another good aspect of the Building Code is that

whoever builds a house defying the Code, his/property may be put on hold by the government. The municipality may keep it from all facilities and entitlements. No body can do anything without clearance from the municipality at present. We can deny the person all entitlements unless he/she rectifies the mistakes, as in the case of tax payment. We have double responsibility: informing the people about the Act and why it is important for them and making sure that they comply with it, by all means. If needed, we have to take stringent actions.

**Dixit:** Who certifies compliance, what new provisions are coming and what are we doing with the buildings inside the central secretariat at Singh Durbar? It has been clearly stated in Code that municipality should approve of all building maps. But the irony is that no body really cares about it – the municipality itself, the government, religious institutions, and police. Those who are responsible to enforce the rules and regulations themselves violate them. This is the saddest part. What I have learnt is that palace, army, police and civil servants in position of power make up the front line of violators. The second line consists of municipality employees themselves, followed by the general public. We have badly failed to take action against these high profile violators. From now onwards, we should use the media/press wherever, whenever we can not enforce the rules and regulations.

Compliance certification should be the responsibility of those who approve of the drawings and designs. Those who spend 2-3 million rupees to build a house should also be asked to spend another 5,000 to 10,000 rupees so that the municipality can involve the structural engineers registered with the Engineering Council to check and certify the compliance. In the developed countries it is the responsibility of the consultants. He who signs will be responsible if something happens later on. In Nepal also we need to hold the engineer responsible if he/she issues compliance certificate because the engineer has been paid and has certified compliance. The responsibility may be given to the engineers registered with the Engineering Council and the municipality holds the final say because it is involved in all stages. Also, we need to go to the village development committees because development works are actually taking place in these areas. The ministry should shoulder the responsibilities related with rules and regulations. We should launch sustained campaign to make the people aware and that they will face action if they are not found complying with the codes and standards set by the authorities. This should be a continued process. Bringing about rules and regulations and doing nothing after that does not mean much unless they are implemented. The civil society may step in to provide technical support to the municipalities and local bodies in the course of implementation. Professional organizations, such as, the Engineering Council NSET, and Engineers' Associations should also play their role. In addition, it is the responsibility of the government to activate the academia and universities to include the building code in the text books. When young students pass out of engineering colleges they should understand that they should build the house according to the building code. We also have many professional engineers who do not have knowledge about the building code. We have to enforce if even if we do not have an act.



# SESSION IV

## PROBLEMS AND OPPORTUNITIES IN BUILDING PERMIT PROCESS

Chair **Bidur Mainali**, *General Secretary, Municipal Association of Nepal (MUAN)*

**Japanese Experience of Building Control by Prefecture Government**  
*Nobuaki Takahashi, Hyogo Prefecture Government, Japan*

**LSMC Experience of Building Code Implementation**  
*Niyam Maharjan, Chief, Earthquake Safety Section, Lalitpur Sub-Metropolitan City*

**Challenges and Opportunities to Initiate Building Code Implementation**  
*Suraj Shrestha, Engineer, Dharan Municipality*

**Legal and Regulatory Issues of Building Control**  
*Basant Acharya, Legal Officer, Kathmandu Metropolitan City*

## Japanese Experience of Building Control by Prefecture Government

NOBUAKI TAKAHASHI  
Hyogo Prefecture Government, Japan



Thank you Chairman. I want to speak on Execution of Building Administration in Hyogo Prefecture. Hyogo Prefecture is located in the middle of Japan. According to the recent data, population is about 5.6 million. The Hyogo Prefecture government is in Kobe city.

My speech consists of 4 sections

1. Beginning of building control
2. Building control in 1950's
3. Examination of structure in building administration
4. Exercise after the Great Hanshin-Awaji Earthquake of 1995.

At first, I will talk about the beginning of building control. In Hyogo, building control system started to function in 1912. Hyogo consists of 6 regions. In 1912, they didn't apply the building control in entire Hyogo Prefecture but only in the centre of Kobe City. The structural code encoded building chain and fire prevention but not anti-seismic one. The other building rule in 1920 didn't include the anti-seismic code either, first. At that time most of the building structure relied on the skills of master carpenters. Unfortunately a large number of buildings were damaged during the Great Kanto Earthquake in 1923. So the anti-seismic codes were brought in. In this period the building administration was provincial. The public officials controlled buildings in violation by policing.

Now, I will talk about building control in the 1950s. The Building Standard Law of Japan was established in 1950. I would like to share some experiences with you:

1. The building manager guided the field manager on the construction fields. At that time there were about 50 persons in architecture. They went around many construction fields and guided to confirm the occupation of buildings.
2. The building officers guided to put up a notice of the work plan sheet on the wall of several buildings. If there were no notice on the construction field, the labor would inform the building officer.
3. Building officers checked the bar arrangement of reinforced concrete structures.

Now moving onto Housing Loan Law, this law has been useful to include structural techniques. This law defined the inspection of the construction field and the standard of structural techniques. Most of the people used the housing loan and built wooden houses in this period. The building officers usually checked the standard with building confirmation and the officer executed the entire inspection. In fact, this structural standard was very useful to the method of wooden houses. As you know, Japanese buildings are being made of wood. The skill of master carpenters



was very high; therefore in order to keep the level of carpenter skill the specification of wooden building were defined. As for the reinforced concrete structure, there were not many private buildings in the past. Public sector built many houses and schools and building officers hired field managers to level up the construction according to their experiences, which were very useful and very important. Especially the interim inspection was very useful to keep the capacity of the building. When I speak of structural capacity of buildings, I must mention the Great Hanshin Awaji Earthquake disaster in 1995. I will show the damage of housing and building. The number of deaths in the disaster was 6,434 according to the recent data. The number of deaths just after earthquake was about 5,500. There were several causes of death. The main cause is the collapse of houses and its ratio is about 88%. The cause of fire is due to collapsed houses and almost all persons were killed by their houses.

Next, I will speak about Anti-seismic system. We started a training course specialist of Anti-seismic check-up in 1996. Also, we have been supporting the building owners to check seismic vulnerability since the same year. We supported house owners but houses have not been improved to our expectation. Then, we have started supporting housing owners to include earthquake resistance in 2002. It is difficult and very expensive for the owners to improve all houses. So, we held a competition to develop reasonable methods of improvement into all four regions. I will present the result of checking of earthquake resistance of houses between 2000 and 2002. We checked all wooden houses that were built before the anti-seismic standards were introduced in 1981. Over 80% of them were concluded to be at risk of damage or collapse.

Information to the residents is very important. The effect of anti-seismic systems is very easy to understand the residents of all houses. There is a company that does experimentation on the behavior of wooden houses during application of ground motion. Two wooden houses were built before the adaptation of the seismic code in 1981. One of the houses was greatly enforced to resist seismic forces and the other wasn't added any change. In the experiment, the unreinforced building collapses if the earthquake simulated motion is applied.

We make pamphlets every year and deliver to residents through cities and towns. We use effective photos for the cover of our pamphlets. We announce residents to protect their families from earthquake disasters and call for their attention to enhance the seismic resistance of their houses.

At the end of my speech, I want to speak about the strong modified updates. Private sectors and some building officers found mistakes in building constructions. It became a social issue and the laws were revised in 2006. In the process of building confirmation, it was to introduce to verify structure and design. The new system started in June 2007. The Japanese building administration is not always updated. As public officers, we must respond to social demands.

## **LSMC Experience of Building Code Implementation**

**NIYAM MAHARJAN**  
Chief, Earthquake Safety Section  
Lalitpur Sub-Metropolitan City



In this presentation, I want to share some of the experiences of Lalitpur Sub-Metropolitan City regarding implementation of the National Building Code. I shall explain how we started the implementation, what direction we are heading towards, what challenges we are facing and what strategies we have in place for continued implementation of the Building Code.

I will start with some backgrounds. LSMC has been implementing the National Building Code since 16 July 2003. LSMC is first among the municipalities in Nepal to implement the National Building Code. In the beginning there was no separate section at the LSMC to check the designs and drawings as per the National Building Code. The existing Building Permit Section was also not capable of handling such work either. So we established a technical cell comprising municipal engineers, and engineers and professionals from DUDBC, NSET and Earthquake Safety Forum. This technical cell worked for 6 months. During that period we learned much more regarding the building code itself and how to check the designs and drawings. After that, on November 17, 2003 Earthquake Safety Section was established and the technical cell was dissolved. From the beginning of its establishment, the Building Permit and Earthquake Safety sections are working together for effective implementation of the National Building Code.

Our past organizational structure went like this: the Municipal Board was on the top, followed by many committees. Earthquake Safety Committee was established for making policies regarding the National Building Code. Under that committee was established Engineering sub-committee which is a technical body to make technical decisions as well as to review or verify structural designs of complicated multi complex institutional & commercial buildings. That committee sits for meeting once or twice a month or as per requirement. And, under the Engineering Sub-Committee there was a technical cell to carry out the daily checking of structural designs and drawings as per the National Building Code. The Building Permit Section, after checking the architectural drawings as per building byelaws, forwards application file for building permission with the drawings and designs to the technical cell. Then, the technical cell scrutinizes the structural designs and drawings. If the drawings and designs comply with the National Building Code, it gives no objection and the application file is then sent back to the Building Permit Section for further processing. Our present organizational structure is like this: On the top sits the Municipal Board and Earthquake Safety Committee and now we have three divisions in our municipality – Urban Development Division, Public Work Division and the Administration Division. Under the Urban Development Division, there are many sections, among them, are Earthquake Safety Section and Building Permit Section. Earthquake Safety Section is the one that checks the structural design and drawings and compliance with the national building code.

Making new systems, processes and policies is good. But in our experience, we have learned that making rules and regulations or making standard formats of drawings and check lists and

checking structural designs as per the National Building Code is not sufficient. There should be other components also – training and orientation should go in parallel, awareness program at the community level is very important and there should be effective monitoring mechanism as well for having effective and better implementation of building code.

Now I want to mention some activities of the Earthquake Safety Section. We are checking the designs and drawings as per the National Building Code. We are also doing regular field monitoring and giving house owners suggestions regarding earthquake safe construction technologies. We are also engaged in raising awareness at the community level. One of the major activities of the Earthquake Safety Section is to organize technical trainings jointly with supportive organizations and donor agencies such as DUDBC and NSET. We are also playing a coordination role for ward level disaster management committees and municipality level disaster management committees. After the first training on Earthquake resistant construction of buildings to the local masons working in Lalitpur in December 2004, the trained masons established a group named **Lalitpur Earthquake Resistant Constructors' Group**. The group is working hand in hands with the Earthquake Safety Section for effective implementation of building code. The Earthquake safety section is working at the municipal level whereas the trained masons are working in the construction fields to promote the earthquake safe constructions. This is a very good organization. We have so far organized six events of training. Compared to any other municipality across Nepal, Lalitpur has the largest number of trained masons (180) working in the sub-metropolitan. There has been a positive impact of the trainings that the trained masons have started to make buildings with earthquake-resistant elements.

With the support of the European Commission through UNICEF we have initiated a series of awareness programs targeting women, mothers and school children. Oxfam-GB-Nepal has also supported through NSET for the Community based disaster management programs at ward level. During CBDMP we have learnt that the community people can be made responsible for effective implementation of the building code. If the community accepts, then it's a lot easier to enforce the national building code. If the community is not convinced and if the municipalities try to go and impose the code on them, then the people would react. So the best way would be to work with and through the community. We are also sharing our experiences of implementation of NBC with other municipalities of Nepal. We had shared our experience during technical training on NBC to Municipal Engineers organized by UN-Habitat jointly with NSET in Nagarkot and another one with DUDBC in Pokhara.

The National Building Code is in English version and structural design and drawings are also in English. Most of the house owners and local masons they hardly understand technical details in English. So we have published the general guidelines for Earthquake safe construction of Buildings in Nepali targeting the house owners and masons. The standard application forms and application guide lines have been prepared by the Earthquake Safety Section. We also issue building permit certificate and no objection certificate for compliance of building code. Some other publication like " Earthquake Risk in Nepal and Need of Preparedness in Nepal" and Earthquake preparedness Planning at family" have been also published by EQ section. Under DIPECHO program with the support of EC through UNICEF, we have developed a new logo for EQ section: 'Bhukampako purba tayari, hami sabai ko jimmawari' – earthquake preparedness is the responsibility of us all. Some information, education and information (IEC) materials have prepared for mass awareness campaign on Earthquake preparedness such as poster with 5 basic earthquake preparedness tips, radio jingle and spot, TV documentary, installation of hoarding boards regarding earthquake preparedness so as to aware and prepare city dwellers for the next earthquake disaster.

The permit process which we follow at present,

1. The application files from the Building Permit Section check and forward to Earthquake Safety Section which checks according to the National Building Code. Finally registered and house owners pay taxes according to floor area and the temporary permit up to plinth level is issued.
2. Field monitoring stage: after the house owners completed construction up to plinth level, they apply for permanent certificate for super structure; both technicians from Building Permit Section and Earthquake Safety Section jointly go to field and check the building as compliance with building bye laws & the National Building Code. If OK, then issue permanent building permit certificate. The plinth level checking process has been stopped temporarily in our municipality due to some public pressure.

Some achievements of implementation of building code include significant increase in awareness of people towards earthquake preparedness than before. They learned about earthquake safe construction technologies. Quality in constructions is improving. Also, designers are more conscious in building designs. And finally, we are getting more support from both national and international organizations working in Disaster Management.

**Some challenges we are facing:**

- Designers still lack professionalism and ethics
- Majority designs were done not by competent designers but by less qualified technicians so i.e. less accountable
- Local masons, contractors still lack the knowledge about proper construction
- Low cost raw materials lead to low quality of constructed buildings
- Retrofitting and strengthening of existing unsafe buildings constructed before NBC application and several old wall system houses.

**We need to:**

- Build efficient and effective monitoring systems
- Introduce new policies
- Provide technical input for Building Code update
- Organize training and orientations for house owners, masons, designers, technicians etc.
- Have more IEC materials for dissemination of information on Earthquake preparedness and awareness rising.

## **Challenges and Opportunities to Initiate Building Code Implementation**

SURAJ SHRESTHA  
Engineer  
Dharan Municipality



The world famous mountains pose us challenges as well as opportunities for us. Likewise, implementation of building code brings us challenges as well as opportunities.

- Various factors have a role to play in quality construction.
- To build a nice house the building owner should also be aware
- Technicians should also be obedient
- Material suppliers should also be obedient
- Masons should be trained
- Relatives and neighbors should be aware
- Contractors should possess knowledge
- More than anything, there should an institution/municipality willing to enforce the rules and regulations

In my presentation, I would like to speak on challenges and opportunities around the above mentioned issues:

### **Challenges:**

- To appease the house owners (in Dharan) there's a tendency to go for construction that take concentrated load
- Houses built by masons have vertical joints
- Lack of competent manpower
- 120 masons were given training
- Giving orientation to house owners on the safety of the house that they live in (Occupants attach more value to ornaments than building safety because they lack awareness)
- The regulation treats Building code as a secondary issue
- Building code and design approval are taken as an excuse to harass people
- Lack of sufficient expertise
- The month long period that the municipalities take to pass/approve the building map
- The process gets to protract if house are to be built as per the building code
- Construction costs tend increase and house owners take it negatively as they want to keep the costs low
- Universities lack specific curriculum, available courses are donor driven

- Masons come from across the border (India) for seasonal employment
- Employing trained and skilled hands/artisans would take the costs up
- Municipalities that have enforced the Building code check the map but are not as strict in monitoring and evaluation
- Material suppliers lack business ethics and supply low quality materials
- Ministry and departments focuses more in and around Kathmandu Valley. There's disproportionate distribution of programs
- Difficult to acquire a new land for a new house and people either add floors or build annexes to expand the house. The code of conduct does not address this complexity clearly.

**Opportunities:**

- Government need to reverse its focus and invest more in producing technicians (trained and skilled construction workers) rather than going all out to produce technocrats (engineers),
- Hiring services of competent engineers, and consultant designers while building houses
- Government should collect revenues from the building construction
- Dissemination of positive message about public compliance of the building code – i.e., how adhering to the building codes saves lives and property in case of disasters
- Making available opportunities in the neighboring countries to prepare the building code

## **Legal and Regulatory Issues of Building Control**

BASANT ACHARYA  
Legal Officer  
Kathmandu Metropolitan City



Legal and regulatory issues related with the building code will be dealt in four steps:

1. What kind of acts we need and how these are to be valued
2. Insight into construction related acts and the existing provisions
3. Pros and cons of these acts and legal provisions
4. The future steps

It is our first and foremost responsibility to implement the acts that we formulate. Who are the rules and regulations formulated for? He who makes rules for others should also learn to follow them. Unless the lawmakers change their ways it will not make sense no matter how often we amend acts or codes or standards, for that matter. Lawmakers should start seeking approval for their own buildings, comply with the standards set, and opt for safe buildings. If we look at the houses they live in and the government buildings then we have a different picture. They should stop patronizing the corrupt and those involved in irregularities. So, things should start from Singh Durbar, down to the implementation level. When adopting laws the lawmakers intend that maximum possible people implement them, that violation of the laws is difficult and that the people respect it by and large. Laws are not implemented in their spirit either when they do not correspond to the contemporary society or when the makers themselves do not translate them into practice. The standards have been reviewed again, but do the changes address Kathmandu or not? More than 90% buildings in Kathmandu defy the building code in one way or the other, but the act in place does not seem to address it either. Now, either the state should scrap the laws or use bulldozers to raze the constructions to the ground. We need to be pragmatic when formulating rules and regulations. Is it practical to have laws that bar construction of buildings with more than 5 stories in Kathmandu? The laws should be useful and practical in every respect possible. Those drafting the laws should keep the changing times in mind and respond to the popular wishes. It's best if the people get to participate in the laws making process.

We have three laws related with construction: Act on Local Autonomy, Town Development Act and the Building Act (1998), which came into force from 2005. These acts clash with and contradict each other. How can they be implemented? These acts transfer power and one overlaps the other. Who would be willing to implement? Who takes the responsibility? Our mentality is to concentrate authority in one place and delegate the responsibility because that way we can shrug off our own responsibility if something goes wrong. There are some ambiguous details in the acts and regulations that discourage people from adhering to these legal frameworks. Proper permission should be obtained from the authority while raising a compound wall around the house no matter the building is government, semi-government or privately owned. There are some instances, where the Town Development has approved of the building map – something that should never have happened because the municipality reserves the right to that effect.

Obtaining map approval: Giving approval of the building map is linked with revenues. This tendency keeps the government buildings from seeking approval from the municipality because the government buildings are not required to pay tax, unlike others. We need to re-orient all stakeholders and they should understand that approval is intended to ensure safety of the building and that it is not a source of revenues. Besides, when the government agencies themselves violate the rules, why should the commoners follow them?

- Therefore, let's start with requiring the ministries to obtain proper approval before constructing the building;
- Clause 146 provides for the discretionary power to waive charges; and
- Only municipalities should be allowed to give approval to the building map, as stated in the laws.





# SESSION V

## DEVELOPMENT OF MUNICIPAL BUILDING PERMIT PROCESS

Chair Narayan Bahadur Thapa, *Under-Secretary, Ministry of Local Development*

**Salient Features of Nepal National Building Code**

Amritman Tuladhar, *Engineer, DUDBC*

**Provision of Resources for the Building Permit Process**

Reshmi Raj Pandey, *Under Secretary, Ministry of Local Development*

**Engagement and Counseling Service by City Government: Experiences of Banepa Municipality**

Suresh Shrestha, *Engineer, Banepa Municipality*

**Role of Civil Society in Building Code Implementation**

Bibhuti Man Singh, *Chairman, Disaster Management Committee KMC Ward-17/  
Representative of Thamel Rotary Club*

## Salient Features of Nepal National Building Code

AMITMAN TULADHAR

Engineer

Department of Urban Development and

Building Construction

Ministry of Physical Planning and Works



I am going to present salient features of Nepal National Building Code and its enforcement by the municipalities and relevant agencies so far. The objective of my presentation is to describe the status, approaches, implementation and dissemination of the Nepal National Building Code in the current context. I will present my paper as follows: formulation and development of the National Building Code, various workshops and training programs organized by our departments, achievements after implementation of the Code, activities of DUDBC regarding National Building Code and earthquake reduction strategy policy of DUDBC.

As you know, we organize interaction programs every year with municipal chiefs in our department. This year on 14-15 June also, we organized an interaction. I have been informed that this ABCD project has municipality chiefs and some of you already know this. Similarly, last year we organized a similar interaction with the municipal chiefs but not all of you were there in the workshop. At that time, I had informed about our National Building Code, its categorization, the cabinet decisions and the checklist and something about the Building Act (1998).

Coming to the salient features of the National Building Code, we are looking at the dissemination part, which we have done thus far. I would like to talk about the formulation of National Building Code, which was developed after 1988 earthquake. After that we had a project, supported by the UNDP and HABITAT, for policy and technical support. We formulated the National Building Code in my department and the project would produce 20 National Building Codes, all of them related with the structural safety only. We needed another code, dealing with the sectoral building. So we developed another 3 codes: electrical code, architectural code and sanitary code. Now we had altogether 23 building codes right now. This was not enough for us and we were working hard to extend, expand and revise the codes. This building code has already been approved by the government in 2003. We have another plan in place in our department.

We have an awareness program for the next three years. This is a long term program for revising, updating and extending the Building Code. Coming to the dissemination part, we have done a lot of work for the dissemination of the National Building Code. First, in March 1993 when the building code was being formulated, we informed the municipal chiefs that a Building Code was being developed and it would be enforced in the municipalities. We had a big seminar on the Building Code, organized jointly by the government and municipalities in April 1993 in Pokhara. Some of you might know about this. We have been conducting training programs for the engineers on Building Code since 1993. In 2003, the cabinet approved the Building Code. In 2003 November, several municipal chiefs committed themselves to implement the Building Code. Even if these decisions and commitments were made by the municipalities themselves, we are still lagging behind in respect of implementing the Building Code.

Lalitpur Sub-Metropolitan City is the first to implement the Building Code in 2003. We also organized various training programs in September 2003. We are trying to educate engineers on the Building Code. Some of the engineers are from my department and others from municipalities. Similarly, we have also trained sub-engineers (overseers or draft persons) on how to use the Building Code. We organized another program in Hetauda on earthquake resistant design using computer software. Similarly, we conducted training in Pokhara on earthquake resistant design of buildings and National Building Code organized by one of the consulting firms in Pokhara. At that time, DUDBC and NSET jointly trained the participants. In 2006, we had another training program for central level municipality engineers organized by UNDP. We have also implemented training for eastern region municipalities on National Building Code. We had another workshop on the Building Code implementation and enforcement in Kathmandu in 2006. This workshop was done with the help of NSET and EMI.

**Achievements after National Building Code:**

- Awareness on earthquake safety has increased significantly
- Structural drawing are more important than reform in some municipalities but not in all
- Designers are found more consistent in structure designs than before
- Owners are found aware in planning, structure design and drawings while constructing the buildings

**Activities of DUDBC regarding the earthquake safety measures so far:**

- DUDBC is disseminating National Building Code nation-wide, different training programs organized for engineers, sub-engineers, overseers and draft technicians
- DUDBC has translated the Building Code in Nepali and trained more than 3,000 masons all over the country
- Working to strengthen the legal framework of National Building Code (enactment of the Building Act 1998)
- Enhancing earthquake safety building construction in the country

**Strategy and policy of the municipalities, what we have to do:**

- Our department is working as a facilitator and government policy maker in earthquake resistant building construction and implementation of NBC
- Coordinating the curriculum branch of university education to endorse NBC in the engineering degree courses
- Trying to operate different Earthquake Safety exhibitions in different regions of the country
- Retrofitting of existing vulnerable government buildings

In 2002, JICA carried out a study on earthquake disaster mitigation in Kathmandu Valley. That study recommended the establishment of a mechanism for seismic improvement and implementation of safe construction practices. The study also suggested a project for building improvement including analysis for revising the building code.

Regarding the awareness and activities of DUDBC, there are some photographs that I want to show you which we received from NSET and Ministry of Home Affairs. We have done exhibition and small model exhibition. This year in January 2007 we again celebrated earthquake safety day and I want to show you some of the photographs. We had a small model for the demonstration to make aware the people on how to make safer buildings. This year also we have also a demonstration program but it was RCC building in order to demonstrate how it will collapse and this was done in Hanuman Dhoka Durbar Square. This is very useful tools to disseminate the

earthquake safety reductions to the local people. Without the tools it was not possible for the demonstration. Therefore, we are thankful to the NSET for providing us such tools.

We make different posters and hoarding boards for the implementation of the National Building Code. If your house complies with the Building Code, it protects and keeps you safe, if you defy the Building Code and build the house the way you please, then it won't protect you.

We have collected data from 42 municipalities on what problems we have. From the data analyzed we found that there is no information regarding the National Building Code. There is lack of information about earthquake safety and lack of personnel or staffs and training about the National Building Code. I think, after this workshop we will find some concrete solutions on what to do with these municipalities. We are covering 20 municipalities. The above points I mentioned are the main problems for them.

Lastly, let's implement the National Building Code all throughout the country. You can find the information on the National Building Code on our website. You can also purchase CDs on Building Code in all our offices in the country. Thank you.

## **Provision of Resources for the Building Permit Process**

RESHMI RAJ PANDY  
Under Secretary  
Ministry of Local Development



My subject of presentation is provision of resources for the building permit process. I work with the Ministry of Local Development in Planning and Foreign Aid Coordination Section. The main responsibility of my section is to provide shared support to the local bodies. I am given such a subject where the government has invested very little, in fact an insignificant amount, and I have to present before you. Please forgive me for this difficult situation.

I will show you the real picture of the governmental financial system, then only we can discuss on how we should proceed ahead:

MOLD has 43 programs for this fiscal year. Basically we have four types of program:

1. Some programs are concentrated on decentralized governance, especially capacity building and institutional support of the local bodies
2. For the support of the local infrastructures development, including the roads, bridges, water supply and sanitation, suspension bridges and other housing areas
3. Social mobilization: we found out that social mobilization is the tool to change the mindset of the poor and vulnerable people. If we organize the poor in groups, they start saving and credit schemes. Then they will start to discuss all the social and economic issues in their groups and they will be provided technical skills, which in turn will help them to have access to public services and they can fight against the illiteracy and other things. These are the social mobilizing things and more than 50% of the villages have been covered by this social mobilization program.
4. Before we generate social inclusion aspects as a government focusing on the vulnerable groups – very poor socio-economically, socially disadvantaged and the national indigenous communities, the Madhesi communities and dalits. Women are also discriminated against in Nepal so we help empower them.

The total budget allocation under the MOLD is 13 billion rupees for this fiscal year and, out of this, we spend 3.17 billion for the current expenditure and 9.91 billion rupees for capital expenditures.

Funding source of the budget: out of 13 billion rupees, the government of Nepal bears from its internal revenue 7.17 billion rupees and the foreign grant is 2.91 billion and foreign loan is 2.99 billion rupees.

Programs and budgets provided to the municipalities:

- Municipal grants for the last year were about 176 million rupees and this year it has significantly increased to 300 million rupees.

- Local development fee: It is charged of the cost of entry points for any imported goods and from that the government allocates as local development fee. Last year and this year it is 987 million rupees. This time the government sector has allocated special budget of 200 million rupees for the municipality for the construction of municipal roads. This budget has been distributed only on the basis of weighted index i.e. 50% for the population and 50% for geographical area and the other programs and budget have also been provided. There is reserve fund within the MOLD and there are many budget items from Ministry of Physical Planning and Works, including urban improvements and other programs. Maybe other ministries might also be able to provide some support to the municipalities. Within the municipal grant, this year we provided 300 million rupees. Out of it current expenditure is 55 million and the capital expenditure is 244 million rupees.

Now, this slide shows whether there has been separate budget for building permit process or not. Look at the current expenditure items. We have provided administrative grant, very vital grant and grant provided even for guest houses but there is no grant for building permit process. Another is capital expenditure grant. We have provided development grant, town development fund, matching fund, rural-urban partnership, program support and human resource development. These are the breakdown of the capital expenditure.

I would like to discuss the other support to municipalities that we have extended so far. The government has sent circulars to the municipalities to implement the National Building Code. The ministry is coordinating with and facilitating the municipalities to raise awareness programs, especially for building permit and earthquake risk reduction. Some municipalities have also initiated to allocate budget for awareness raising and we are providing some sort of support to these municipalities to initiate allocation of budget to create awareness raising and human resource development as per the guidelines provided by the government of Nepal. Now local bodies are also preparing their periodic plans, and within the framework of these periodic plans they have to prepare their annual plan. Under this periodic plan this provision of building code is also a part and parcel of that periodic plan. Now, some of the municipalities are preparing this periodic plan with the support of Department of Urban Development and Building Construction.

The government occasionally provides other supports that are irregular in nature that may be in the event wise situation. We are also providing some sort of human resource development support. For example, providing opportunities of training, workshop, exposure visits and sharing of best practices. We encourage the municipalities that if any one municipality has its good practices, then other municipalities are also encouraged to apply. We also provide equipment support. Sometimes the government of Japan and India provide some sort of equipment and machineries. These equipment and machineries are provided to the municipalities. The government has issued many guidelines and instructions. Sometimes, based on the demand of the local bodies, we also try and facilitate for the technical back stopping. Now our ministry has also focused on better monitoring. However, our monitoring system is very weak. In case of the municipalities, even in the conflict days also, we had some sort of monitoring and other facilitation as per their needs.

Let's share about the problems and issues:

- Municipalities and local bodies lack adequate number of technical and professional manpower. Even if they have technical and professional manpower, they lack the quality manpower. Even if they have quality manpower, they lack proper training. Even if their employers are very sharp at the time of hiring, if you don't provide different trainings and exposures and other opportunities, their sharpness might decline.

- The grants to municipalities are very small in comparison with the population in the urban areas. Urban area now has about 20% of the population and it generates about 60% of the GDP but the investment in the urban area is very low. The grant is very small and I must confess that we have not actually supported the local bodies, especially municipalities for this building permit process.
- Regarding disaster risk including the earthquake risk reduction, our grant is either very small or no grant at all. The urban issues have low priorities as I already mentioned and there are weakness in monitoring also.

Let's talk about the interventions for effective implementation of the National Building Code. At the central level we must mainstream this National Building Code into policy. Though we have a policy, unless it is really implemented, it will only remain as a well written document. So far it is like 20% policy and 80% document. So we must convert it from a document to a good functioning policy. At the central level, all the developmental ministries should realize that implementation of the National Building Code should be integrated in their policies and the different ministries have to support in this regard. They should accept, especially the development ministries must accept, the Building Code as a sub-cross cutting issue. We have provided this building construction permit guidelines and updating of this guidelines is necessary considering the situation and the reality of the municipalities. We must allocate adequate budget for the building permit process and we must provide separate budget for disaster risk reduction for the municipalities. Let's hope that the government will provide conditional grants for the next fiscal year. These areas must be included.

For the promotion of human resources in the municipalities we must issue human resource development guidelines, so that municipalities must allocate some budget for human resource development as this is the most neglected part in the local bodies. Awareness raising, if necessary, helps us to think, brainstorm and realize that we are sitting on the time of earthquake as the JICA report in 2002 mentioned. Kathmandu Valley will not be able to work as capital city of Nepal once the earthquake equivalent to the magnitude of 1934 occurs again. Once there is a bigger earthquake in Kathmandu there will be no roads from the airports to the urban cities. The bridges will collapse and other things such as water supply and other facilities will collapse, as well. If we conduct awareness raising activities to all the policy makers, I think the situation can be changed. In the past couple of years there were some improvements but still they were inadequate. So we must proceed ahead with awareness raising activities. MoLD has a monitoring check list while we go for monitoring of the local bodies. If we follow the building permit in the monitoring check list that will create conducive environment in the local bodies. Strong monitoring is needed and support is also needed for the replication of best practices. Some municipalities already have good results like LSMC and Kathmandu have some sort of building permit process in implementation and there is also some sort of disaster risk reduction efforts and that must be replicated in other municipalities. Such mission should be brought into practice in all the municipalities. At the local level we must encourage local bodies to ensure the budget provision in periodic and annual planning. Once you have sufficient technical manpower and once you have sufficient provision of budget, I think, it will help in effective implementation. We must mobilize civil societies including tole/lanes organizations. There are more than 30 municipalities who have these types of organizations. If we are able to create awareness within them Building Code implementation can be a part and parcel of everyday life in the urban area. I am concluding my presentation with this information. Thank you.

## **Engagement and Counseling Service by City Government: Experience of Banepa Municipality**

SURESH SHRESTHA  
Engineer  
Banepa Municipality



In my presentation I would like to share with you my municipality's struggle towards implementing the Building Code and achievements.

Banepa Municipality tried unsuccessfully to become the first municipality to implement the Building Code even before the Government of Nepal enforced it in 2003. The municipality felt any acts or regulations could be implemented successfully only if one is capable of doing so. Otherwise, any inherent weakness would put the entire system in jeopardy. That's why we refrained from implementing the Building Code. Even as we delayed the implementation of the Building Code, we are thankful to the ministry and the DUDBC for their support. Banepa Municipality had tried to enforce the Code in 2001, but it was not possible to do so all at once. Therefore, we decided to bring into force the building standards first. Earlier, building standards dealt mainly with two key provisions – area of land to be left for the road/lane and minimum space for the windows. Policy and laws were very weak and not clear. Banepa Municipality realized the need to go for the building code after a powerful earthquake rocked Nepal in 1988. In 2001, the building by-laws were prepared with these provisions: each stair not more than 30 meters, main gate/door opening outward, ways to keep safe from fire, maximum stories allowed, and necessary conditions to protect public buildings from lightning and thunders. To successfully implement the Building Code in Banepa, with support from NSET we launched a year-long program, Banepa Environment Mapping Program (BEMP), during 2002-03. Under this program, we collected data/information on Banepa Municipality's physical structures and sources. As soon as the program began, we implemented Banepa Earthquake Risk Management Program (BERMP) with technical assistance provided by NSET. Both BEMP and BERMP were steps, ultimately leading to the implementation of the Building Code. Then, we made the public aware about the risks of earthquake by imagining earthquake scenarios. We organized training for engineers, overseers, sub-overseers and masons. For the public we implemented an awareness-raising campaign. After collecting information on the earthquake scenario, we used a tool called radius to do a study on the extent of damage, caused by earthquakes of varying magnitudes and prepared risks mapping based on them. After that we launched a series of campaigns on to make the public aware about the extent of losses of life and property if an earthquake of this or that magnitude would rock Banepa during the day or at night. The means used to make the public aware were FM radios, local newspapers, street drams, training in hospitals and schools. Likewise, we organized training for the technicians involved in building construction – engineers, overseers, sub-overseers and masons. Also, we implemented earthquake safety programs in schools, and capacity building activities.

After BEMP the people in Banepa began to feel that they need to get their building designs passed by the municipality authorities. Today, the public at large stands in favor of the



implementation of the Building Code. In Banepa, the masons have created a committee with their chairman and vice-chairman democratically elected. Before, the masons feared having to come in front of the engineers even for/during training and lacked self-confidence. The training has raised their self-confidence and, as a result, they have been able to upgrade their skills and capacity.

We organized training, seminars and workshops around these themes on several occasions. We supported street dramas aimed at raising public awareness. The Municipality has taken a decision to accept building maps and designs submitted by the trained technicians only. We have adopted the policy to give building permit only if the building is going to be constructed under the supervision of trained technicians and only if the construction workers/masons are trained properly. As in Lalitpur Sub-Metropolitan City, we are making efforts to form sub-committees to carry out structural analysis of the proposed buildings. However, we have still not been able to fully implement the Building Code in Banepa Municipality due to the lack of monitoring and supervision.

Now, I would like to talk about the challenges that we faced in the course of enforcing the Building Code. Let me start with the coordination with the ministry first. When the government decided to enforce the Building Code in 2003, the DUDBC and Ministry of Local Development sent around circulars instructing various municipalities to implement the Code, but these circulars did not provide information/instruction on ways how to do it. Some months later though, the ministry sent another circular asking municipalities to give feedback as to what the ministry could do to enforce the Building Code. In response, we wrote them a two page letter, but have not heard back from the ministry on it as yet.

The administrative chiefs and people's representatives also seemed to lack initiative or motivation to learn what the building code was all about and how it could be implemented. Due to the lack of skilled technicians, we have not been able to monitor the implementation at the field level. We have proposed amendments to the Building Code and these are yet to be passed. This also puts us in a difficult situation to implement the Code – in fact, how can we push for it when there's such confusion? I would like to advise that DUDBC, Ministry of Physical Planning and Works and the Ministry of Local Development improve upon the existing level of coordination among them and with one another.

Let me respond to the public perception that building drafts prepared by the technicians working with the municipalities are passed sooner than the ones done by the outsiders. Such perception is negative because the reality suggests otherwise. It is crucial that the technicians also act responsibly and make sure their drafts are in line with the minimum requirements set by the municipalities. As far as possible and practicable, the Building Code database should be computerized so as to make it efficient. Let's all work towards this direction.

As I recall, at the end of the training on the Building Code in Nagarkot, it had been agreed that DUDBC, municipalities and the Ministry of Local Development would make joint efforts to develop a standard format, which would be turned into an act and the municipalities would enforce it. We can implement the Building Code successfully and effectively only then, or else we will only have some success. Also, the Building Code should be addressed in the schools and the university colleges. When it is included in the text book, we will be able to implement it successfully. Thank you.

## **Role of Civil Society in Building Code Implementation**

**BIBHUTI MAN SINGH**

Chairman

Disaster Management Committee KMC Ward-17

Representative of Thamel Rotary Club



From the disaster perspective we have been working from two parallel but mutually contradictory assumptions mainly: that as far as earthquakes are concerned, one assumption is, we have more than twenty years before another earthquake occurs or other assumption is that we don't even have one year so it has to be on the emergency basis.

First assumption starts with the very hopeful and optimistic scenario. Let's talk about the basic principles; Building Code, Public Private Partnership (PPP), Inclusivity and Regular interactions. We have to work on the basic principles of preparation for emergencies assuming that we have plenty of time and make people aware from top to bottom. But there is also another assumption that we have, at the local level, to follow and we do not have time to prepare for seminars, trainings etc. What the people at the local level need to understand is that if a major earthquake occurs, then the central level people will not be able to be there to extend assistance and support at least for two weeks. So we have to be self reliant at the local level. We have been working through the Rotary Club of Thamel. We have motivated and mobilized 3 major wards (17, 29 and 30) in Thamel area to act on the assumptions that maybe an earthquake will occur next month. Therefore, we have prepared a volunteering force trained on the first aid and search and rescue methods. These volunteers can respond immediately to an earthquake. We have been trying to create a voluntary force of about 200 in ward no 17 (which has a population of 20,000) assuming that 1 volunteer should be able to take care of 100 people but I have heard that in Japan they have 1 trained volunteer per every 20 people. We are acting similarly in other wards also.

Resmi Raj Pandey and Suresh Shrestha pointed out that monitoring is very weak in Building Code implementation. As far as SONA and SCAEF are concerned we could play a very meaningful role in bringing out the municipalities and central level bodies in monitoring in checking construction drawings for nominal fees. We have put the proposal forward to the municipalities but we have not received a positive response as yet. This could be a very good example of PPP which could help the central level bodies and municipalities in monitoring. As far as SONA is concerned, we have put forward our suggestions also to the central government to get the positive response and I would request foreign friends to continue to support at the local level. I believe that UNCRD is also aware of our concerns at the local level. That's all I have to say. Thank you very much.



# SESSION VI

## BREAK OUT SESSION: MUNICIPAL SYSTEM FOR BUILDING CODE IMPLEMENTATION

Chair Purusottam Dangol, *Deputy Director General, DUDBC*

**Preliminary Result of Survey Questionnaire (summary of responses of all municipalities)**

Ramesh Guragain, *Director, Earthquake Engineering and Training, NSET*

**Global Survey on Building Code and Code Enforcement**

Naoko Mishima, *Research Assistant, UNCRD Disaster Management Planning Hyogo Office*

**Explanation of problem issues to be discussed in breakout session**

Bishnu Hari Pandey, *UNCRD Disaster Management Planning Hyogo Office*

**Presentation of group report**

G1: Capacity building of municipal governments and communities

G2: Administrative structure for sustainable building control and counseling

G3: Ensuring adequate human and financial resources for BC implementation

## **Preliminary Result of Survey Questionnaire**

**RAMESH GURAGAIN**

Director, Earthquake Engineering and Training,  
NSET



We received numerous sets of questionnaire rather late yesterday evening and have received some just now (which we are not including in our analysis). We have analyzed whatever questionnaire we received in time and have put the points in the format. We have derived some good results from them.

The questionnaire contains the following:

Questionnaire for municipalities: How many municipalities have Building Permit System and how many of them include the building code inside the permit process?

Another question was about the most difficult issues regarding the implementation of the Building Code and what we need in the municipalities for improvement (so that the results can be utilized in the future).

We received 25 sets of responses and we could include only 21. Among 21, all the cities have building permit process and the building permit system in the municipalities. 100% said 'yes'. Among them, Building Code is part of the process and about 50% said they have some part of the building code in the building permit process.

The success ratio of the implementation of the Building Permit Process System (wherever it is applied) as 50-70% in the municipalities. About 40% respondents have stated that 70-90% of the construction follow the by-laws. Some 5-25% stated that only 30-50% of the building construction/year follow the BPPS. These are the responses from different municipalities. It shows that at least 50-60% of the 70% of building construction follows the by-laws. We have quite good results.

On another question on how many municipalities provide some sort of counseling to the people, designers and other professionals, about one third of the municipalities stated they would provide such type of services.

On another question, related with large buildings, public buildings (entertained by the committees or any sort of committee that work for such type of important buildings. 20% of the respondents didn't respond and about 14% answered in the affirmative. Most of them said they didn't have such type of committees in the municipalities to look for important types of buildings.

We had 3 more questionnaires and we have quite an interesting result. One of them has to do with the root cause of vulnerability in building constructions – why we are not actually able to implement the earthquake safety and other safety measures in the buildings. The answer is lack of motivation on part of the house owners. Again, there is the answer – the lack of access to the

techniques by house owners, which again, is related to the awareness of the people. If we combine these two 34% and 24% it is about 58% of respondents mentioning that lack of motivation and lack of access to the techniques are the root causes behind our vulnerable constructions.

Some other issues are lack of enforcement, economic conditions (14%) and lack of technical know-how among professionals (14%). The important issue is lack of motivation on part of the house owners. We have got similar responses in other questions as well. The most difficult issue is in effective Building Code enforcement. Some 45% respondents have cited unwillingness/reluctance on part of the general public to abide by the Code as a reason. Others also stated a low level of professional skills of engineers in the cities as the reason. First priority therefore is public awareness and second priority is capacity enhancement of the municipality staff and professionals. Interestingly, the lack of financial resources for implementation and a small number of building control staff have got received a low value – 15% and 10%, respectively. In this case, my opinion is that, may be, we are not implementing the Building Code in our cities. We said that the number of staff are abundant but in this case, if we started, may be the number of professional staff is insufficient. But the statistical analysis showed insufficient number of staff in the municipalities and inadequate financial resources as not significant problems. However, these are the two critical problems: lack of awareness/motivation and capacity building.

Priority needs of the city governments to build capacity to address building safety problems. In this case also, an interface, coordination and communication between the city governments, engineers and house owners seem to be missing. And proper development of building permit system got the second place. If we devise some mechanisms for raising awareness, and maintaining coordination and communication for proper building permit system, we can address the problems.

This is my part of presentation and now there is also a presentation by Ms. Mishima.

## Global Survey on Building Code and Code Enforcement

NAOKO MISHIMA  
Research Assistant  
UNCRD Disaster Management Planning Hyogo Office



I will briefly talk about the UNCRD Housing Earthquake Safety Initiatives. Then I will talk about the results of the survey conducted last year as part of the project. There are four target countries – Algeria, Indonesia, Nepal and Peru and the duration is from January 2007 to March 2009 and the project is funded by the Ministry of Land, Infrastructure and Transport (MLIT), Government of Japan. HESI has four major activities:

- 1) System evaluation – Send HESI questionnaire and evaluate responses
- 2) Awareness raising (among national and local government officials and of the technicians and house owners) on the Building Code
- 3) Policy development: development of policy recommendations on improvement of housing safety, including the safety of traditional houses
- 4) Capacity development of national local governments to implement to Building Code effectively.

We conducted a survey between October and December 2006 by sending a questionnaire to building control officials and experts in seismic countries around the world. We received a total of 26 responses – 13 from national governments and 13 from local jurisdictions. We received the replies from the national government of Nepal as well as the LSMC. There are seven major elements in the questionnaire. They are – history of disaster experience, overview of building code, implementation of building code, aseismic component of building code, related information, problems of dissemination/enforcement and other problems related to building code and disaster management issues in general.

I would also like to mention here some salient facts:

- All respondent national and local governments have a building code in place except Gaza. Djibouti has a draft code at the moment.
- History varies widely, ranging from a well-established code with long history (Japan since 1920) to the one enacted very recently (Bangladesh since 2006)

The interesting figure about non-engineered buildings - a comparison across countries. As mentioned, 80% of all the buildings in Nepal are non-engineered, 97% of all buildings in India are non-engineered.

The next graph shows the ratio of owner self-built ratio of non-engineered houses. Nepal is also very high as 40% of all non-engineered houses here are built by the owners. When this graph is applied to the previous one, you could conclude that 33% of all buildings in Nepal are built by the owners. It (owners building non-engineered houses on their own) is very dangerous because most likely, house owners do not possess knowledge on the safety aspects of housing construction. They might prove vulnerable when a powerful earthquake strikes.

This table shows the average construction cost per square meter. The actual cost doesn't matter much. I would like you to pay attention to the general trend of costs. You can see, in all countries, engineered construction cost more. In Nepal engineered building costs twice as much as the cost of constructing a non-engineered building. Certainly, engineered buildings are safer. I would like you to think why people would want to pay the difference to live in a house safer from an earthquake, which is so uncertain when to occur. And how can we encourage people to build safer houses? Who should be responsible for encouraging people to build engineered houses? I think it is the government's role to encourage people to build safer houses. For example, the Governments can offer some educational programs to house owners.

Problems in effective enforcement of Building Code in Nepal:

- Lack of awareness on the seismic safety within public
- Shortage of trained technicians who are capable of implementing the code, and
- Lack of government policies related to disaster management in general

For the building regulations to work there has to be not only suppliers of Building Code: trained, skilled officials and professionals, but also demanders for building code implementation: house owners and building occupants.

For regulations to work there has to be a system of sanctions in case a violation occurs. And for the penal system to work there has to be a policing body, which would act against non-compliance and correct any misconduct. And house owners can be part of the policing body. I think there are two tasks in Nepal:

1. Training of suppliers of Building Code
2. Education for consumers or demanders for successful building code implementation

This is the end of my presentation. Thank you very much for your attention.

**Guragain:** I need to make you clear about some of the information. One of them is to find the flow chart for building permit system in municipalities we try to divide the participating municipalities into 3 categories.

- 1) metropolitan and sub metropolitan cities
- 2) municipalities with 100,000 population
- 3) municipalities with less than that population

In metropolitan and sub metropolitan cities, the system is a bit rigorous. We've printed and will be distributing this flow chart to you during the group exercise so that we can suggest and identify a better system.

- 1) submission of necessary documents and building drawings
- 2) check for building drawings and necessary documents each year and it focuses on the registration and process for the building permit and tax clearance
- 3) It goes to the ward level administration for the legal notice, field check etc. and comes back again and site technical report
- 4) Re-application after completion of 1<sup>st</sup> phase of the process, if ok, goes to next step and if not ok, suggest for corrections
- 5) Next step is, they provide permission, check again and correct as per the by-law and allow for super structure construction

This is the general building permit process that we did in a short period of time. We will try to do more in the group exercise. In short, the system in larger cities seems more rigorous and other cities seem a little bit simple. That is the summary. Thank you.

**Dangol:** While Mr. Guragain dealt with the Building Code and Building Permit Process System in the different municipalities in Nepal, Ms Mishima in her presentation talked about the international situation and the engineered and non-engineered buildings in Nepal. We have split the participants in three groups; each has its own mandate:

Group 1 (27 members): Capacity building of municipal governments and communities

Group 2 (22 members): Administrative structure for sustainable building control and counseling

Group 3 (25 members): Ensuring adequate human and financial resources for BC implementation

**Pandey:** I would like to present an outline of the subject matter to be discussed within the group:

**For enhancing the capacity of municipalities:**

1. How can the DUDBC assist? What procedures may be followed to avail of such assistance? Is it enough that the municipality writes a request letter or should there be a system? And, who is to arrange the fund for the capacity building activities/training?
2. Who actually will provide training for the municipal employees – DUDBC alone or should there be others as well? What are the training needs?
3. How to manage the additional employees that we need to implement the Building Code? What facilities may be offered to the municipalities and what are their needs? Can we think of doing something to motivate employees to enforce the Building Code?
4. Developing a list of specific municipalities
5. How to raise community awareness about the Building Code? How can such programs be integrated into the municipal system?

**For Administrative structure:**



1. Is there a need for creating a section within the municipality to issue Building Permit, as LSMC did? Or, can we hand the responsibility to one of the existing sections or appoint a focal person?
2. Who will delegate authority necessary for issuing the Building Permit?
3. Should we create thematic sections, as well – fore example, basic earthquake safety, structural safety and monitoring and evaluation?
4. Should there be a responsible department in place to provide training for counselors and masons and to verify the engineers or does giving the responsibility any one person help?
5. Should there be a new department, say, to coordinate with DUDBC and the police (to raze houses constructed defying the Code) and to enforce the Building Code itself? Or, should we and have provision to punish those who do not comply and who should take the responsibility for such actions?

**For ensuring adequate human and financial resources:**

1. What is the size of human resources that we need and how to manage them? Let's also discuss the needs of different municipalities.
2. Can we make the tariff we charge (while issuing permits) a sustainable source of income/finance? If we cannot implement it immediately, how about seeking assistance from the ministry for a short period?
3. How to request the ministry for grants? What could be the basis for conditional grants? Likewise, how can we seek support from other donor countries?

**Clarification by the representative from the Local Development Ministry:** Currently, we are not in position as to how the resource allocation scenario is going to be during the next fiscal year. All grants that come to the ministry are channeled to the Ministry of Finance. What we can do at the most is that we can recommend that the Finance Ministry allocate certain amount for the human resource development in the municipalities, provided that certain conditions are met.

I spoke in favor of conditional grants because, to me, that could help the municipalities advance. But it all depends on the conclusion that we may arrive at in the end.

**Dangol:** We have an hour for the group work and each group is expected to appoint a coordinator. The groups shall then have 15 minutes each for the presentation.

## **Group Presentation**

### **Group I:**

The theme for this group was capacity development of municipalities. I am going to do the presentation on behalf of my group. If anything is left out, I request other group members to join in to explain further.

#### **Technical Assistance made available by DUDBC:**

Our conclusion is that the DUDBC should extend technical assistance in case of requests coming from the municipalities. The Building Code has four levels. We feel Level 3 and 4 can be managed by the existing human resources in the municipalities. We do not have sufficient or trained manpower for Level 1 and 2. That is why we would like to request the DUDBC for providing trained manpower under technical assistance. When we receive drawings for buildings to be constructed under Level 1 and 2, we would like to forward these specifications to the divisional offices of the particular districts. There is a simple procedure to forward the request – writing a letter to the DUDBC, which in turn will provide the necessary technical assistance. Because this is all about technical assistance, the cost involved does not really matter.

#### **Training for municipal employees:**

Municipalities should conduct a need assessment for the training before hand. We don't think the municipalities need support in this regard. The municipalities should demand necessary means and resources for capacity building. When identifying the training needs we should also keep in mind the need for training on the Building Code. DUDBC and NSET may work jointly in this regard.

We seem to have forgotten to state the necessary resourced due to the time constraint. DUDBC has its own training programs and these could be done funded by the Department itself. DUDBC and municipalities can sit across the table to finalize training costs and their share in case of the training requests by the municipalities.

#### **Additional manpower for the Building Code:**

We also discussed the need for additional resources in the municipalities for the implementation of the Building Code. We need to understand that whoever joins the municipality finds it difficult to exit. Also, there are numerous problems because of the municipal employees themselves. We therefore suggest that it is better to hire professionals on contract rather than taking them in as regular employees. The costs may be recovered b charging the house owners up to 100-200 rupees per drawing. However, any increase should be accompanied by training and orientation as raising the charge without such programs may send a negative message to the people.

#### **Facilities to encourage the Building Code implementation:**

It would be possible to encourage the Building Code implementation by (a) explaining the process to the people (b) increasing budget (given by the Ministry of Local Development or any other ministry, for that matter) for the municipalities that have effectively/successfully implemented the Building Code, and (c) giving house owners who build house in line with the Code a discount on the tax amount. We can also offer tax discounts to contractors or issue them letters of commendation for doing the good work. The state can offer insurance schemes or discounts on the income tax. May the banks and lending agencies should issue loan on reduced interests for the buildings that comply with the Code. This may also be pegged with the monitoring system as banks issue the pledged loan in several installments. The Department can prepare a list of the main municipalities for each level of Building Code. Level 1 may not be applicable in our context, but we may prepare separate lists for Level 2 and rural buildings. According to our group, it is appropriate

to make a list according to the buildings than making separate lists for separate municipalities. It is advisable that technicians at the District Development Committees pass or take care of the drawings that need to be passed by the Village Development Committees.

**Dissemination of the Building Code:**

DUDBC should play the lead role in disseminating the directive prepared by the Department and raising public awareness about the Building Code. Let us stress here that the MRD (Level 3) is the principal act. The Code should be translated into Nepali and dispatched to village development committees and ward offices in the municipality and DUDBC and NSET work together in this. Likewise, NGOs can play their role in taking the message through out the country by radio. There should be at least one trained overseer in each village development committee. Maybe schools can start talking about earthquake safety right from Class One. NSET has been handling this part till date and maybe it should continue in the days ahead as well. Class 10 students should also be taught the Building Code and earthquake safety. We should look for necessary funds to prepare and disseminate IEC materials, including telefilms and documentaries for radio and television. Maybe DUDBC, NSET and municipalities can co-finance these initiatives. Last but not the least, what is the role of HESI itself – is it only to support and organize training. We feel HESI needs to do the following:

- Conduct training and information dissemination
- Observation/exposure visits for the municipal employees

**Dangol:** I would like to thank Group I for their presentation, also highlighting the role of municipalities. Now I would like Group II to make their presentation on the administrative structures.

**Group II:**

This group had a relatively difficult task because we also had to discuss the role of municipalities and designers and ways to improve upon the existing arrangements.

In Nepal, we have three types of municipalities: Kathmandu is a municipal city, Lalitpur is Sub-Metropolitan City and the rest are municipalities. KMC, LSMC and some other municipalities are capable in terms of resources and mechanisms. They have sections such as building permit sections and these are quite efficient and robust. There are some municipalities, which have these sections but they are not as efficient and robust. We feel that the Building Permit Process should be institutionalized gradually and should be capable of implementing the Building Code. We have to start their capacity development right from now.

- The Building Permit Section should be strengthened in such a way that the Code is perfectly implemented
- Capable municipalities should immediately go department-wise in its structure.

There should be at least one engineering code in any municipality that should be decided in consensus manner. The municipalities that have been categorized as weak or with very less resources must also recruit at least one engineer, and if possible, more than one. Unless they have technical manpower, the municipalities won't be able to implement the Building Code. In case of higher class buildings, the municipalities should take help from DUDBC and professional societies available in the local market. If competent manpower is not available in the local market, they could be hired from outside the local market. Those who would like to build sophisticated buildings will certainly have no problem spending little extra for the safety of their building.

We think authority of approval of the building map should lie with the elected mayor because he is elected by the people. But there should be a provision to delegate the approval authority to, say, the senior most technicians working in the section. This is a great area because people have frequently been expressing grievances over the process and time that approval of buildings takes. In order to avoid the public grievance, what is thought, is those who are able to submit evidence and no-objection letter from their immediate/adjoining neighbors, the landlord should be granted permission there and then, without any further delay. Those who are unable to produce evidences from their neighbors adjoining their landlords should be given time as provided in the law. Field inspection and monitoring should be made compulsory by engineers. The political mechanism should also be in place. They should be provided with the role of monitoring. There was also a hot discussion regarding who should monitor regularly and we came up with two ideas: The majority of group members were in favor of the designers being given this responsibility but I was opposed to it because if the designer is made responsible for the monitoring, then the client has to pay. This provision should be adopted in the law and there should be certain indicators about it. A lot of whatever has been adopted has not been grasped by the society members. The same situation would appear in the above mentioned case, as well. Instead of giving the responsibility of monitoring to particular designers, the capacity of the municipal people attached with the building permit section should be strengthened and these technical persons should frequently visit the site and recommend whether the construction complies with the Code or not. In case, constructions are found non-complying, they should be taken necessary action. Regarding verification there were arguments that the field verification process is too long. There should be provision to reduce this field verification in terms of time consumption. Thank you very much for your kind attention.

**Dangol:** Thank you for the presentation. We can discuss different issues after the completion of all presentations. Now I would like to request Group 3 to make their presentation on human and financial resources.

### **Group III:**

We agree that all municipalities should implement the Building Code, as per the circulation. As we all know, lack of resources – both human and financial – hampers the prospects of disseminating the Code and implementing it in all municipalities. We have tried to identify the problems, recommend solutions and identify as to who is responsible for what. We have categorized municipalities in three groups on the basis of population, households and ongoing constructions. They are: Metropolitan City and Sub-Metropolitan City, Municipalities and adjoining VDCs, District Headquarters and the VDCs that are on their way to be municipalities. We feel the concerned ministries – Ministry of Local Development and Ministry of Physical Planning and Works – should work together to allocate resources on the basis of categorization. It will be easier this way to set aside resources for the municipalities and to decide as to who is responsible for what. Municipalities may differ in their scope of work and capacity. First, we need to determine the size of work force that each municipality needs, after that we have to manage the identified human resources. In the first category, we have placed metropolitan city and sub-metropolitan city, where it is crucial to have a section designated to implement to the Building Code. For the second category municipalities and adjoining VDCs, we may need to arrange for units or sections depending upon their capacity. For the third category, we need to ensure that there is trained manpower to implement the building code. As our group sees it, all three categories of municipalities themselves should be made responsible for the human resources that they need and units or sections that they need to set up. District headquarters and village development committees that fall in the fourth category should seek support from the central government.

We think the municipalities should be given a two year time frame for them to provide their designers with training on verification, license issuance and awareness raising/dissemination. Only at the end of the gestation phase should the municipalities reject maps and drawings done by untrained designers. Training should be provided to the contractors/builders, masons and employees at the municipality. DUDBC and the MoLD should be made responsible for the training and capacity building. Municipalities have not been able to do effective monitoring due mainly to the lack of resources and the DUDBC also has not been able to provide support and assistance in this regard. May be the MoLD, UN and I/NGOs should join in to manage employees, training and awareness-raising campaigns. But the requests should come from the municipalities. When municipalities work out their annual budget, they should set aside certain amount of fund for the implementation of the Building Code, starting this year only. The Building Code should correspond with the classification of municipalities. Municipalities should fix varying tariff structures in line with their classification. While designing Class A and Class B buildings the designers need more skills and have to devote more time and energy, therefore the building owners should pay increased service charge/permit tariff and the additional amount thus collected should be used for the purpose of the enforcing the building code. The building permit tariff should be raised by the municipal boards.

**Dangol:** Now, the floor is open for the discussion on the presentations. Please specify which groups the questions are intended for.

**Question:** Please explain what is meant by the building permit tariff? Does this mean the charge for the approval of the map or what? If there is double taxation, may be it will cause additional burden on the public.

**Answer:** The Building Code stresses on Class A and Class B type buildings, which naturally need special designs and analysis. Such buildings should also be monitored and the building permit tariff currently charged by the municipalities may be increased by some percentage. The difference amount may be used for monitoring purpose or for conducting awareness-raising campaigns.

**Comment:** We need to have clear administrative structures in place to enforce the building code. But this was not stated in the group presentation.

There should be four classifications altogether. Municipalities should be divided into A, B, and C category in terms of resources, VDCs, VDCs that surround/adjoin the municipalities, and the district headquarters that are likely to be urbanized. We have learnt that circulars have been sent to 132 places so far. Therefore, Group II should base its points either on three classifications or the classifications that our group has suggested.

What we have been telling since yesterday is that if the municipality takes onto itself the authority to pass the maps, then it will be difficult in the future – when it needs to issue orders to demolish the buildings. How can it issue orders against the building construction cleared by itself? Building maps have been passed provisionally – that the buildings will be demolished if they are found to be constructed against the set standards. How are we going to implement it all? And, there are contradictions: the elected mayors have the authority to pass the map and they will themselves decide on the cases filed against maps defying the set standards. We have a number of such cases, pending since 1996. Let us therefore have more discussion on this authority issue.

**Answer:** Let me clear on this authority issue. Yes, I agree that the authority should be delegated. We also need to delegate authority in areas where there is tremendous work pressure. That's why we have all gathered here, to discuss the modalities. Municipal City and other municipalities should

not be put in one basket. I feel mayors in metropolitan city and sub-metropolitan city should be seen a bit differently if we are to create organization structures.



**SESSION VII**  
**ROUND TABLE DISCUSSION ON**  
**BUILDING CODE**  
**IMPLEMENTATION IN**  
**CITY GOVERNMENTS**

**Chair** Krishna Prasad Devkota, *Chief and Executive Officer*  
*Lalitpur Sub-Metropolitan City*

**Facilitator:** Surya Narayan Shrestha, *Deputy Executive Director, NSET*

**MC:** Let's move onto the next session. I would like to request Mr. Krishna Prasad Devkota, Chief Executive Officer, LSMC, to come to the Dais and chair the session. Similarly, I would like to request Mr. Surya Narayan Shrestha, Deputy Executive Director, NSET, to facilitate the session.

**Devkota:** We are close to the end of this session. I would request Mr. Shrestha to facilitate this part of the session.

**Shrestha:** This part of the session will try to consolidate the recommendations submitted by the three groups. Group coordinators and NSET representatives are requested to present the consolidated versions of the recommendations for the discussion. At the end, I hope, we will be able to have one final consensus documentation on recommendations.

Let me go back to the presentations and recount the differences, as observed. Group I was responsible to recommend ways to strengthen municipalities through capacity building. This group had recommended that DUDBC oversee implementation of the Building Code (Level I and Level II buildings) and municipalities themselves oversee the Level III and Level IV of the Building Code. Group II made slightly different suggestion to it: that not just DUDBC but other professional groups and committees can also oversee the Building Code (Level I and Level II).

Next, there are diverse opinions from different groups on these issues:

- Classification of municipalities – should it be three or four types?
- Should there be sections, departments or divisions within the municipalities to implement the Building Code? Group III has stressed on an immediate need to create section while Group II has advised a gradual process to develop/create them. Likewise, Group II has suggested that there be at least one engineer in all municipalities and others have also supported this.
- On monitoring issue, there are diverse opinions. Some have said engineers and designers should be made responsible while others are in favor of the municipalities themselves monitoring and supervising the construction on little extra charge. Another key concern is delegation of authority. Should there be a provision mandatorily requiring the municipal chief to delegate authority or should there be a loose provision under which he/she can delegate authority (voluntarily).

Let us all discuss these concerns one by one.

I don't think the classification of municipalities is too serious an issue. One group classified municipalities into three categories and another group made it four by including the village development committees as well. I don't think it sparks a serious debate on the classification.

**Floor:** The local bodies should be divided into four. Some 44 adjoining VDCs are also required to respect the standard and it should be seen that they follow it.

**Shrestha:** Municipalities should be divided into three: (a) Municipal/Sub-municipal city, (b) municipalities with more than 100 thousand population/households and (c) smaller municipalities. And, how about clustering the village development committees in two groups – VDCs included/covered by Building Act and VDCs that are not covered by this Act?

Based on the discussion, it has been concluded that there should be five groups: four types of municipalities, and the fifth type including VDCs.



We all agree that there should be sections, departments and divisions to implement the Building Code and we should gradually create these.

**Floor:** However, creating sections/departments is not as easy as it sounds to be. It takes time to add people in municipalities. So, how about going by the project, as in the case of the RUPP project, which was later integrated with the municipality? Going by the project would make sense because projects have resources, but the municipality does not always have. In such a case, how can we create sections?

When talking about the creation of sections, departments and divisions we should also look at the job descriptions. We have a culture of hierarchy and we can remove them right away. We also need to look into legal provisions, directives, facilities, and means and resources available at hand. How about creating a department only for the Building Code implementation and creating a whole range of departments? We should try to avoid difficulties that may arise in the future. More than internalization of the work/labor division, we should promote internalization of the need to work in the employees.

**Ando:** As per the Japanese experience, there are two points about the building guidance division. The first issue, in the case of Kathmandu city, There are lots of building construction activities going on so the resources for the building control sections may come from the building permission fees. The one key point to establish the system is: how much fees can the government impose on the owners? Of course, the revenue is just the municipality's revenue so it does not mean that the revenue directly support the building section or the financial section of the local government or municipalities. The amount of fee is important. In big cities it is necessary to establish a permanent building control section. The second point: even if we set up the permanent section of building control it is very difficult to train the building officers, but if the same municipality of the same local government has the section managing the construction site, (such as, school construction site) there is also an engineer who knows the cost of such construction very well. So such type of exchange of personnel within the ministry and between the sections is important issue also for the resources for capacity building training within the municipality of the local government. And the last point, it is very difficult to keep even one engineer for small municipalities or remote area local government. In Japan, the national government sends engineers to municipalities. Sometimes the municipality employs an engineer, who is sent to the national government for capacity building. Such kind of personnel exchange between the national and local governments is effective. In the Japanese case, we have the municipality, the national government and prefecture government organizations. The Prefecture government sends their engineers to the towns, very small cities and to the remote areas, and they exchange and share technology among themselves. This practice is still in place.

**Shrestha:** Thank you, Sir. He mentioned 3 or 4 things: that we should have the section, money for monitoring and supervision should be generated from the current process itself and the central government should send engineers as having engineers in municipalities, especially remote ones, is difficult.

**Floor:** The government should extend cooperation to C and D category of municipalities for some time. Municipalities categorized as A and B class should create sections and units, if not they should gradually roll back to the VDCs.

Kathmandu Metropolitan City and Lalitpur Sub-Metropolitan City should create such sections within a year because, in addition to examining and approving the drawing, there is no other department or section for monitoring and supervision. If the current practices do not change even

after implementing the Building Code, then the Code may not be enforced effectively. As a result, the Code will be limited to the papers only.

**Shrestha:** All municipalities should enforce the Building Code. Municipalities that are capable and old enough should create sections while DUDBC and other stakeholders should extend support to relatively small (in terms of resources and capacity) and newly named municipalities. KMC and LSMC should have these sections in place within a year, as the floor recommends.

**Floor:** The government should introduce it as projects in municipalities that have little and scarce resources. “Projects” will make municipalities feel the need in the long run and the employees will also be able to learn the ropes in the mean time.

First, that C and D class municipalities should gradually recruit engineers also means that these municipalities should learn on their own about the Building Code and should be aware that in the future they will be implementing the Building Code. Secondly, the available manpower will also be able to carry out the task and even if the government fails to provide technicians as per the demand, there will be no problem. Projects will take some time. We intend to implement the Building Code from the third week of September in Dharan municipality. Will the DUDBC be able to provide us with one engineer if we request them? We need to be clear about these issues as well.

When there are no projects, the Division must support. In any case, the Division must go to the site when governmental buildings are under construction. We have allocated budget for monitoring whether the building under construction complies with the Code or not. Colleagues from our Division must visit the smaller municipalities as well. If, in the past, there were fewer visits, we now have to increase such visits. We have to see to it that we set aside budget to monitor whether or not the smaller municipalities are implementing the Building Code.

In the first year, we need to conduct an analysis of the municipalities and categorize them in terms of their capacity. Then, we have to have a work plan with targets set for the first year, second year and third year and so on. I don't think it helps if we go by the numbers only.

**Shrestha:** We mean that the five or six municipalities, including KMC and LSMC, should implement it within a year from now. Then, we need to identify the municipalities that have a population of more than 100,000 and give them a time line as to when they can implement it. Category C municipalities should implement it with support from DUDBC and the ministry. KMC and LSMC should start immediately and effectively. Shall we decide on the provision that each municipality should have at least one engineer?

**Floor:** When the Centre or the Division sends engineers, they should follow the action plan. It should be known beforehand who is going where and when. When they go on deputation, it should be clear for how long. While sending engineers on deputation there should be proper coordination among the municipality, Department, Ministry and other stakeholders.

I have heard that DUDBC engineers charge 2-5 percent of the projects while they go for monitoring and supervision. Is it true, and should that be so?

**Answer:** We prepare an MOU while designing any governmental building, clearly specifying the resources that we need. As per the economic regulation, we can set aside up to 5% of the project costs for supervision – 2.5% for the recruitment of site engineers and 2.5% for contingency. The Department sets aside budget for the monitoring of the Building Code. If there are requests coming from the municipalities we should also go there for monitoring. We will not go if there is no request.

We do however motivate the municipalities to come up with requests and we have created a conducive atmosphere for the requests to come in. From this year onwards, we will also be going to the municipalities for monitoring.

**Shrestha:** DUDBC goes for monitoring not only when there is a request coming in from the municipality, but on its own as well. There are a number of arrangements and provisions. Only recently have you all expressed commitment to make necessary amendments, if need be, to provide support. If we implement the spirit, I think, it will be easier for the municipalities. But have we finalized as to how we are going to which municipality?

**Floor:** Yes, yes, and we have to even if we haven't yet.

**Shrestha:** There also was this question raised: who is actually responsible for monitoring and supervisions? Municipality or the designer?

**Floor:** May be the designer should be made responsible for monitoring and supervision of the construction. If the municipality takes over the responsibility, then they will have to recruit more technicians and this is going to create problems. Monitoring should be done by the designer, but let's also be clear about monitoring of what? Is it that we are talking about monitoring technically whether the Building Code is implemented during construction or shall we also look at other aspects – multidimensional monitoring? I personally feel the monitoring by designers should be multidimensional and it needs multidimensional monitoring capacity on part of the designers.

First, we have to look at it in two levels – Building and city. The designers themselves should be made responsible for monitoring of the particular construction. In the case of city-wide monitoring, however, we need to turn to municipal engineers, other technical teams and independent professional groups. The teams assigned to monitor constructions in cities and municipalities may go for random sampling to figure out the level of compliance with the Building Code.

As I observe, actions defy intentions. In reality, designers who draw the building maps do never go to the construction site for monitoring. And, we never know if the designer is a civil engineer, or an architect or a structural engineer. We tend to look for the designer only when we need the certificate, towards the final stage. This has caused supervisory problems. I myself have experienced this. The designer has to be trained and the municipality must not only look for the code numbers that it has issued to the designers.

It is not that the designer must be responsible for the monitoring and supervision; it's just an alternative that we are looking at. Should designers be responsible for the monitoring and supervision, I am concerned that it will invite some practical problem in the future. Besides, the municipality will still have to monitor the designer and this means an extra burden/responsibility on part of the municipality.

I don't think that whatever we have decided here are all very simple issues and we should be more serious about it. Each municipality has to have one structural engineer and we also need to have them in the VDCs that are fast turning into municipalities. If we look at the current situation, the DUDBC itself has one engineer for three or four districts. If these engineers are to be allotted three municipalities in these districts, how can they do justice to monitoring and supervision?

That the designers should be made responsible was also an issue raised while developing the Building Code. Frankly, the municipal technicians can not look at each house and scrutinize each design. The municipality should only work to facilitate the implementation of the Building Code.

This means the designers are themselves responsible for the design and the structure being raised. On the other hand, house owners are not in position to pay engineers for the monitoring and supervision, except for a handful few. Even if we conclude here that the designer should monitor and supervise the construction, for me, it will be extremely difficult to translate the decision into practice at the field level.

If we look at the KMC, the A class buildings are all monitored and supervised by trained technicians. In the case of the B class buildings, monitoring and supervision depends largely on the financial status of the owner and many B class buildings are being monitored and supervised. May be we have a completely different scenario in areas outside of Kathmandu. We have slightly raised the building permit tariff so as to be able to enforce the Building Code. Let's be clear that the raise is not intended to pass the responsibility to the municipal employees and designers and counselors/consultants may also be given the responsibility to monitor and supervise the construction. May be the municipalities should think of using independent designers for the monitoring and supervision and paying them for the services that they render.

Let me also clarify here that the amount that has been set aside for the designer to monitor and supervise the construction is too little and the designer will not find it motivating enough. If the municipalities charge extra, then they should also be conducting the monitoring and supervision part by employing mobile teams.

**Shrestha:** Let's all agree that there is a need to make the designer accountable. However, it involves costs leaving the supervision completely to the designers. Therefore, municipalities need as well to do monitoring at different intervals. Municipalities need to set aside budget for this purpose. Monitoring should be guided by the desire to make municipalities stronger than just doing regular supervision.

**Floor:** It doesn't become effective that way. This is mainly the responsibility of the municipality and we do charge the residents for it. I therefore suggest slightly raising the fee structures and utilizing the money in monitoring and supervision. The municipality should make necessary arrangements in the budget so that independent designers monitor and supervise the buildings and this should be certified.

Municipalities should be made to understand that monitoring is their responsibility and private designers should as well be utilized while monitoring. Whoever may do the monitoring at the beginning, but it is the municipality that has to certify in the end. Therefore monitoring by municipality and independent designers must not be proposed as an alternative, but as part of the process. In any case, it is the municipality that rejects the right to accept the ultimate right to accept or reject the design.

**Shrestha:** I agree that the designer should be responsible, but irrespective of whether the designer does it or not it is municipality that is ultimately responsible for the citizens' safety. Therefore, the municipality should be involved in monitoring and supervision activities. The municipality should itself arrange for the resources that it needs for this purpose.

**Floor:** Let's be clear that the municipality may not be able to take the responsibility completely. We also need to make elected representatives accountable as well – they should also bar people doing things the way they please in their constituencies.

One single person should not be made responsible for the supervision. There are the municipalities, designers and other stakeholders. The key responsibility lies with the house owners, who are most

responsible for the safety and quality of the house. If the house owner does not allow designers and others to work independently, then none can do anything about it. Only after that comes the issue of safety certification. Others may visit the site periodically just to be sure that the construction complies with the Code, but the house owner has most important role – somehow we seem to have forgotten to bring this up. The designer may say whether or not the construction process is in line with the standards set. Municipalities will certify that the process adopted by the designer matches their own standards. No matter what we do if the contractor does not act responsibly then it all goes waste. Therefore, we need to issue a directive that specifically deals with the responsibility issue. Unless we have quality raw materials quality and safety cannot be guaranteed.

**Shrestha:** We have already decided on some directive principles to implement the Building Code. This also takes into consideration the issues that we have raised just now. What we are discussing at the moment is how we can include the concerns related with the building permit process system. These are legitimate issues: that designer is responsible for the supervision, which the municipality should ensure proper supervision and that it involves additional costs.

**Floor:** The municipality can not take the responsibility for the recommendation of the entire city and it should never go for this.

The municipality should charge for the number of visits that its supervisors make to the construction site and the amount charged should be spent strictly to pay for the supervisor. All other responsibilities should be given to the house owners themselves.

What I had stated is the building quality should a part of the package deal, now we are only talking about the iron rods. It's only the raw materials that determine the quality of the construction. The way these materials are mixed and whole range of other issues have a bearing on the quality of the building under construction.

**Shrestha:** We have discussed a lot on this and let's waster more time on it. As we all understand it is a multidimensional issue. We should agree that the municipality should go to the site for monitoring construction on the spot.

The next issue has to do with who can have the final say on the drawing – the mayor alone or engineers also?

**Floor:** We need to go for an act that delegates responsibilities. We can not always keep under cover the issues that we can do nothing about it.

Our intention is that it should be given to the technical team. We tried to operate the entire municipalities under one single act – that's where all the problems lie. We were talking about KMC and LSMC, but the arguments were stretched to cover all municipalities. When delegating responsibility we should be municipality-specific. One does not fit all. While amending the act, we should also see to it that the authority is delegated to the municipal engineers as well.

Authority has to do with good governance and the mayor should personally take charge of this. The mayor however needs support and assistance from the technical teams.

The municipality can formulate an advisory committee, but its effectiveness always comes under question. The problem here is that we do have provisions but the system never seems to work.

**Shrestha:** We have not been able to arrive at a consensus on this issue; therefore I propose we leave it at that. I would like to conclude this session with these remarks. The suggestions and recommendations put forward by the three groups should be merged into one comprehensive draft. There were some unclear issues, but they have all been resolved by now. Suggestions coming from these groups may be regarded as directives related with the Building Code process, mechanisms, capacity building and administrative and financial resources. I would now like to request Dr Ando to explain what HESI does and can do, as the floor seeks to know about it.

**Ando:** HESI program is coordinated with UNDP program for 2-3 years. The UN fund originated from the Japanese government, but HESI fund is concentrated in the national level, and we cooperate and will support national level coordination, like this meeting. The UNDP program is also funded by the Japanese government and will support local government program through national government. Training, dissemination, observation tour, actual activities in the field by municipalities are all UNDP's part. On its part HESI will coordinate the committee if necessary and support the national level activity of the committee. I will commit a fund although not enough but for international conferences in poor countries, including these four countries, around 20,000 dollars for 3 yrs support for DUDBC activities in coordination with UNDP program.

**Floor:** It is not possible for a two day workshop to develop a system for building permit process. Therefore, we need to create a committee within the framework of the directive principles. Let's propose this: we appoint a committee and the UNCRD extends necessary support to develop into a national level body/system.

**Ando:** During the discussion, only the government can secure safety. The Government just secures minimum safety level. Even in the case of Japan, it is confusing. The government system cannot secure all types of requirement. Inspection is to just check the minimum level. The inspection from the government side should be implemented to check only the minimum safety level. To secure small details of the engineering issues, engineer himself should learn to check and supervise. The law of the architecture or of building engineers should regulate. Building control system and building engineers both should be responsible for the safety.

**Shrestha:** UNCRD or HESI project has commitment to support for system development and exchange sharing. For this, we have principally agreed but we need to sit down again and detail out the things later. May be we can sit down immediately after this workshop. I must to leave now, but before leaving the floor, I want to present the summary of the group presentation.

All these institutions have made a commitment in this – municipalities, ministry, department, HESI and UNCRD. NSET always remains committed to it. I feel the workshop is heading towards the right direction. I would like to sum up the conclusions of the two day workshop.

They are as follows:

1. We have received some 12-15 suggestions in the form of directive principles, strategy and activities to implement the Building Code. Also, we have already passed the strategic and directive principles.
2. We have also analyzed the stakeholders and identified and analyzed their roles in detail
3. Through group works we have also given some suggestions regarding capacity building, administrative restructuring, allocation and management of financial and technical resources

Let us all clap in support of these conclusions, which will be submitted to the UNCRD. Thank you... the resolutions have been passed. Now I would like to thank you all for contributing to my facilitation.

**Devkota:** I would like to thank you all for your active participation. Let me assure you that the modified documents will be sent to the municipalities. I also declare the end to this session.







# SESSION VIII

## WAY FORWARD AND CLOSING

*Chair: Surya Bhakta Sangachhe, Director General, DUDBC*

### **Short oral presentations**

- *Dinesh Thapaliya, Chief and Executive Officer, KMC*
- *Amod Mani Dixit, NSET*

### **Earthquake Risk Reduction and Recovery Preparedness Programme for South Asian Region**

*Masahiko Murata, Senior Researcher, International Recovery Platform (IRP)*  
*Rahul Sen Gupta, Disaster Management Expert, UNDP Nepal*

### **Closing remarks by the Chairperson**

*Surya Bhakta Sangachhe, Director-General, DUDBC*

**MC:** Thank you, Chairperson and the facilitator. At the end of the day, we came to a certain consensus on Building Code enforcement and implementation. We have actually committed to prepare certain guidelines through this workshop. So now moving onto our next session, actually the last session of the workshop – way forward and closing, I would like to request Mr. Surya Bhakta Sangachhe, Director General, DUDBC to chair the session. Similarly, I would like to call upon the presenters of the session. The presenters of the session are: Mr. Dinesh Thapaliya - Chief Executive Officer of KMC, Mr. Amod Mani Dixit - Executive Director of NSET, Mr. Masahiko Murata - Senior Researcher at IRP, Mr. Kishore Thapa - Joint Secretary at Ministry of Physical Planning and Works, Mr. Som Lal Subedi - Joint Secretary at Ministry of Local Development, and Dr. Shoichi Ando – Coordinator of Disaster Management Planning Hyogo Office, UNCRD, and Mr. Rahul Sen Gupta - Disaster Management Expert of UNDP, to come to the Dais.

**Sangachhe:** Good afternoon to everybody. This is the closing session of the two-day workshop. In this program we have a short presentation by the city government, Mr. Dinesh Thapaliya, chief executive officer, KMC. I would like to request him to make his presentation.

**Thapaliya:** The municipality is chiefly responsible for the implementation of the Building Code in any given municipality. Chief Executive Officers and engineers representing different municipalities and others present here are concerned, directly or indirectly, with the implementation of the building code. We all comprehend the responsibility and I feel some additional responsibilities have been added on. We are moving forward, cutting through the problems, confusions and complexities that lay on the way. I understand that it is a complex issue and we have no option other than implementing it. On the contrary, we all do not find ourselves in the situation in which we can implement every decision.

Building a small house for shelter is one of the several desires of the human beings. At this point we are apprehensive whether the house we have built invites us trouble or death, and this, I believe, will be instrumental in enforcing the Building Code. If we take the message to the people that they are not building a house, but a grave yard this will contribute to a positive result.

Some questions have arisen here. We have also seen that unsafe buildings have been constructed here. We can implement the Building Code by going to the individual house owners with the message that using inferior raw materials will mean building a low quality, unsafe building, which itself could be the cause of death. If we succeed in driving this message properly, then the house owners will be forced to abide by the Code. We need to raise awareness to be able to create a system.

Building Code is extremely important and no one can implement it alone. We have analyzed our roles and responsibilities in the past two days. If we all play our role properly will be able to observe notable difference in the implementation of the building code within a year or so. Let us all implement our commitments without fail. I am sure many of us here are building houses. If we all follow the Building Code then it already makes some contribution in this regard. We can then play the role of a catalyst – by telling our close friends and relatives about the need to implement the building code. That's how the message spreads to the community by word of mouth. Let us realize that charity begins at home and we have to start with ourselves. The municipalities should start with whatever they can do to implement the building code instead of looking up to the centre for the budget and provision of engineers. Taking the first step by the municipality makes an important contribution to the implementation of the building code. Let's look for the assistance only when and where there is difficulty.

There are three things: house owners, government and the local government and our policy framework, rules and regulations – in this case, the Building Code. All three belong to the different time frames. While the house owners belong to the 19<sup>th</sup> century, the implementers (government/local government) belong to 20<sup>th</sup> century while the Code belongs to the later half of 21<sup>st</sup> century! Let us look at the gaps that exist between these three sides. If we can identify the gaps, it will not be very difficult to implement the code. I feel this is very important.

The issue of compliance depends heavily on the honesty of the people enforcing it. Let us therefore be sincere to implement the policy in place – then only can we make the implementation mandatory. There also is a need to raise policy level coordination. Ministry of Physical Planning and Works should support the DDC. In our case, one ministry takes the lead role in drafting policy and another ministry happens to be the focal ministry. If policy making and focal ministry were to be one, then it would be much easier to implement the policy, in this case, the Building Code. I propose formation of a committee to enforce the Building Code. That committee will also monitor the work in progress in different municipalities and facilitate implementation of the Building Code. The committee shall also coordinate with different authorities and make basic documents for the areas where the Building Code has not been implemented. As we all understand, the implementation of Building Code is in a poor stage. We do know that there are houses that defy the building code, we also talk loud that these constructions should be demolished but in the end we can do nothing about it. We therefore need to follow and implement the Building Code as much as possible.

Before I conclude, let us not just talk about the role and responsibilities; let us agree that we have to compulsorily fulfill our role and responsibilities. If we all put our acts together, we shall definitely be able to implement the Building Code in its spirit.

**Sangachhe:** Thank you Mr. Thapaliya. Now I would like to request Mr. Amod Mani Dixit to present his remarks.

**Dixit:** Mr. Chair, distinguished guests and the participants. This is the first time in my memory that such a gathering is here, and for 2 days we discussed the issues of Building Code implementation. And we have representatives from 20 largest municipalities of this country along with the very honorable government officers, Director General, mayor and the international agency representatives. This is a wonderful and significant event. I don't know if such events had taken place in other countries and regions. We have reached a broad consensus which is the main thing. Now there is no doubt, what everybody is talking about and all the participants are talking about, we have the Building Code and it's a necessary documents and we need to implement it. As everybody realizes, there are problems and it is not an easy task to implement the Code. Despite the problems we can implement it and we have to continue implementing it.

We have collectively expressed the need and commitment to implement the Building Code right after the opening ceremony yesterday morning. We still need to work out the details related to the role of stakeholders, policy, enforcement of the entire building permit process, necessary improvements for the Building Code implementation, the administrative system, the mechanism and capacity building and the resources required for that. The entire discussion was marked with a very, very positive approach. Everybody was trying to find out more positive space towards this which is absolutely the major thing. I think we have categorized our commitments in three broad categories and let's take them as our guiding principles. With these we can really achieve though we might still have some problems and difficulties along the way, including political instability. We have outlined these 3 fields of actions, which we can do and that is the strong message to our international partners. I would like to request to our international partners to take specific note regarding these Building Code implementation. Having said that, I would like to also make a

commitment on behalf of NSET, which was established with the only objective of assisting the government to implement the Building Code. If we are not working anybody has the right to ask us the question. We are committed in almost every sector but you have to decide where we best fit. If you don't see our role that is also fine. Lastly, I would like to thank UNCRD and the program HESI, ministries and the rest of the group who have worked very hard to make this workshop a success. Thank also goes to all those authorities who helped to organize this. Thank you!

## **Earthquake Risk Reduction and Recovery Preparedness Programme for South Asian Region**

MASAHIKO MURATA  
Senior Researcher  
International Recovery Platform



RAHUL SEN GUPTA  
Disaster Management Specialist  
UNDP Nepal



**Murata:** I'm representing International Recovery Platform, or IRP. IRP was established following the World Conference on Disaster Reduction in Kobe, Japan in 2005. Now I want to introduce the newly launched Earthquake Risk Reduction and Recovery Preparedness program for the South Asian region. This is the first regional project supported by the Government of Japan through the UN system or UNDP. It has a close relationship to the HESI project. The IRP has a coordinating role between the government of Japan and UNDP, which is the leading agency in initiating a program with funding of US\$4.83 million. This is funded by the Government of Japan and the program was proposed for the fulfillment of the Hyogo Framework for Action for the duration of 2 years. This is along the Hyogo Framework for Action and this is about preparing residence, communities and the nations for disasters. The program aims to strengthen the institutional and community capacity to plan and implement earthquake risk reduction strategies integrating disasters preparedness and post disaster recovery in 5 South Asian countries namely Bhutan, Bangladesh, India, Nepal and Pakistan. The program has been built on two tier approach. First one is country level project to support the national level management framework and the second is regional projects for sharing of experiences among the regions and technical assistance for regional and country level projects. A country project has been developed by the UNDP country offices for each national government. The country proposal of Nepal which may have good synergetic effect and effective coordination with HESI was produced by UNDP Nepal. I would like to briefly introduce the regional projects. The regional project operates regional cooperation and coordination in sharing of experiences and that is in practice among the region and documentation of experiences and practices. Within the South Asian region, the disasters are unique and there are varieties in construction firms, socio economy and cultures and appropriate and cost effective technologies in the countries. The program utilizes appropriate technical assistance for regional and country level projects, using regional and international specialized agencies, NGOs and networks; and what we intend to do in Nepal will be good practices for other target poor countries. International technical

assistance will be ensured in the Asian Disaster Reduction Center in Kobe. It is expected that Japan's knowledge and experiences on earthquake resistant building strategies will be well incorporated in the program. Thank you. Now Rahul from UNDP will introduce the details of the project.

**Gupta:** I would like to thank all of you from the UNDP side for allowing us to be part of this particular program. What I want to mention here is the counterpart of South Asian Regional Program that IRP and UNDP has support from the Ministry of Foreign Affairs, Government of Japan. As you can see here what would the other components of this program looks like. The geographical area will be at the national level and the municipal level. While talking about the municipal level, we are trying to identify, in conjugation with the Ministry of Local Development and Ministry of Physical Planning and Works, 5 key municipalities are based on very technical terms: topography, the density of population, to some extent, the capacity of the municipalities as per the analysis of the Ministry of Local Development or the land use pattern or the building stock itself. Based on these very technical criteria, 5 municipalities will be identified in the next 10 days or so by our project appraisal committee. There will be a national component and there will be municipal level components as well. The national components will be very closely working with the HESI project of UNCRD. The period will be from August till July 2009. The budget is US\$760,000 directly coming for programming for the program support activities at the country level. This also does not include the regional support that we will be getting from highly technical institutions from Japan. That component will be hovering above this, and will be coming directly from the regional components. Thus US\$760,000 is readily available for programming and program support at the country level in Nepal.

The partners in Nepal: the lead agency as per the guidelines under which the UNDP works is mostly the national execution level. That means the government entities will take the lead and support before but will get the execution and implementation responsibility and credit for outputs. So the Ministry of Physical Planning and Works will be the implementing agency along with the Ministry of Local Development and municipalities. The Ministry of Physical Planning and Works will be responsible at the national level and municipalities will be coordinated by and Ministry of Local Development. For general disaster management in Nepal, the Ministry of Home Affairs acts as the inter-ministerial coordinating body and will be member of this partnership. This will be done with the coordination with the UNCRD program. The intended output of at the country level is assessment of earthquake risks, vulnerability and the capacity of municipalities to undertake earthquake risk reduction. The 5 listed countries will not be in the same level whenever we are talking about the South Asia program. That doesn't mean that each of the country is at the same level of maturity when it comes to earthquake risk reduction. Nepal comes to be one of the pioneers and one much forward in this particular area of assessment. You have the NSET, JICA, earthquake monitoring assessment of Kathmandu, you have the European Commission mapping project with Kathmandu Municipal Corporation, so there have been extremely highly technical programming being done in this particular area. Hence, it is very important to make it clear that we will do whatever we do we will build on the work of NSET, JICA and all other partners. Second one is about capacity development, which UNDP strongly engages in across the 166 countries. Capacity of government institutions and communities on adaptations for the earthquake preparedness and planning is the simplest process. Third one is capacity enhancement in disaster recovering planning. This is a very new area and most of these planning, processing has been done in post-Tsunami and post earthquake context. But in Nepal it should get a lot of credit for initiating this pre-disaster framework. It is required at the municipalities for the urban framework should be available where recovery preparedness can be planned beforehand so that the critical infrastructure – the housing, schools, and hospital buildings can be brought back better. The fourth one, is as far as the country level is concerned, the enhancement of the capacity of the government with very specifically locally

appropriate solutions about what Nepal feels is required to support the capacity building processes that are there. About assessment there are 3 key areas that we are looking at, they are:

- Assessment of seismic vulnerability of the building stock (public constructions like schools, hospitals, etc and private housing)
- Review of the impact of settlement pattern, land use practice and options in high risk areas and review of livelihood and socioeconomic conditions in relation to earthquake hazards.
- Review of the existing governmental and municipal policies on earthquake preparedness and response.

The responsible party for planning is DUDBC in coordination with UNCRD as lots of national level areas are covered in this one. Second one is capacity building of the municipalities and other ministries on earthquake risk reduction to be very clear and precise. Basically, we are trying to assume whom we are going to make responsible and what we are really looking at is that there is a chain of construction. When a house is being constructed it goes to the overseer, the engineer and contractors etc. Now this particular chain is being supervised or monitored by the municipal engineers. We have to see whether this particular process is done in a correct manner or not. Hence, each of these stakeholders in the construction process requires the particular technical inputs. Hence, starting with the house owner we would like to make awareness raising of house owners, technical training for the private and municipal engineers. Policy levels can sensitize for policy makers in the municipalities and ministries and all the related owners of factory, hospitals, schools, shopping complex etc. They are equally at risk and we have to sensitize them. Again the DUDBC, MPPW and MOLD are taking this forward. Output 3 is simple, it is about recovery planning in 2 areas, one carrying out the lessons learnt and this will be exchanged with the help from IRP - exchange of knowledge from different countries where we've seen recent disasters from earthquake. The second one is about incorporation of this recovery preparedness planning into the development planning of Nepal. Thank you.

## **Closing Remarks**

**SURYA BHAKTA SANGACHHE**  
Director General  
DUDBC



I would like to thank you all for patiently sitting and participating throughout this program and what we learnt till now is that the work is to be done by ourselves.

We have made several commitments. We need resources, but are not quite sure whether we can avail of them or not. Anyway, let's start with whatever we can do. We hope HESI and UNDP's ERRP programs will guide us which direction to go. It's us who have to work and we have laid the foundation so far. We have also created teams and we have the Building Code in place. We also have institutions willing and ready to step in wherever, whenever necessary. We now have an environment for us all to work. Let us all start to work in line with our own commitments. This, I believe, is the main outcome of the workshop. We do pledge to work with you in the future. Please do not take Urban Development, DUDBC and municipalities as separate entities – they are all one. Let us work together to take the process forward. HESI and ERRP have also pledged their support in this. Let's work building coalition.

At the same time, I would like to thank Dr Ando, Dr Murata and Professor Otani as I am very happy at your presence in our country for your inspiration and guidance to continue working in the implementation of the building code in order to make our houses, public buildings, schools, and hospitals safe. We have already committed to work with the municipalities and your support in this context will be highly appreciable. We look forward to receiving assistance from you in the future. Now I would like to declare that the session has come to an end. Thank you very much.

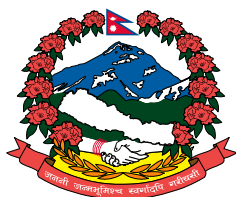




# Appendix

Aide memoire

List of participants



## Workshop Program:

### **“Effective Enforcement and Dissemination of Building Code”**

**2<sup>nd</sup> – 3<sup>rd</sup> August 2007**

Godavari Village Resort, Lalitpur, Nepal

Building codes are key instruments for improving the resilience of the built environment to earthquakes and other natural hazards. It is recognized that though many developing countries have established the building control system aiming to prevent casualty and other losses due to natural hazards like earthquake, cyclone etc, it is yet to see the effective enforcement of such regulation in practice in those countries. Lack of understanding of proper building control mechanism among policy makers, inability of local governments to put system in place and other socio-economic factors are, in part, the major factors for such shortfalls in code enforcement.

In order to identify the common problems that hinder the effective enforcement of codes, the United Nations Centre for Regional Development (UNCRD) held an expert meeting in Kobe in January 2007 under the Housing Earthquake Safety Initiative (HESI). The meeting attended by several international and Japanese building officials and experts pointed out the lack of capacity of national government and local governments to comprehend the necessary requirements and tools for code application as one of the major hindrances in this path. In this context, UNCRD plans to support national and local governments in recognizing the problem areas, identify the appropriate chain of building permit system, planning for human and financial resources for code enforcement through certification and inspection.

In course of HESI implementation, a national consultative workshop is planned for 2 – 3 August 2007 in Nepal where UNCRD will co organize the meeting with Ministry of Local Development (MOLD), Department of Urban Development and Building Construction (DUDBC)/ Ministry of Physical Planning and Works, and National Society for Earthquake Technology -Nepal (NSET).

The objectives of the workshop are:

1. Identify the country context problems in relation to supply and demands of building construction in urban areas.
2. Make the case that building control is a policy problem and requires policy intervention from the decision makers
3. Support development of generic framework for effective building code enforcement by city governments in Nepal.
4. Identify the scope and areas of necessary support to build capacity of local governments for effective Building Code (BC) enforcement.

The workshop will deal with the topics in following themes:

1. Building code as policy issue
2. Development of BC enforcement and dissemination system for local governments
3. Capacity building of local governments
4. Way forward for sustainable and effective BC enforcement and dissemination

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## **Workshop “Effective Enforcement and Dissemination of Building Code”**

*A two-day consultative workshop for shaping the future course of action*

### *DAY I – THURSDAY 2 AUGUST 2007*

**08:00-08:30**                      **Participants Registration**

**08:45 - 09:20**                      **OPENING SESSION**

**Chair**                      **Mr. Purna Kadariya, *Acting Secretary, Ministry of Physical Planning and Works***

Welcome Remarks

Mr. Amod Mani Dixit, *Executive Director, National Society for Earthquake Technology- Nepal (NSET)*

Opening Remarks

Dr. Shoichi Ando, *Coordinator, Disaster Management Planning Hyogo Office, UNCRD*

Remarks

Mr. Vijaya Singh, *Assistant Resident Representative, UNDP Nepal*

Message from the Hon. Minister Dev Gurung, *Ministry of Local Development, Nepal*

by Mr. Som Lal Subedi, *Joint Secretary, Ministry of Local Development*

Remarks by the Chair of the Session- Mr. Purna Kadariya, *Acting Secretary, Ministry of Physical Planning and Works*

**09:20-09:30**                      **Group photo**

**09:30- 10:00**                      **Tea/Coffee Break**

### **SESSION I:    POLICY FRAMEWORK FOR BUILDING CODE**

**Chair**                      **Mr. Som Lal Subedi, *Joint Secretary, Ministry of Local Development***

- 10:00-10:20      **Building code as a tool for sustainable habitat**  
*Mr. Kishore Thapa, Joint Secretary, Ministry of Physical Planning and Works*
- 10:20-10:40      **Millennium Development Goals (MDGs) and HESI for sustainable development**  
*Dr. Shoichi Ando, UNCRD, Japan*
- 10:40-11:00      **Decentralization, local governance and building code implementation**  
*Mr. Dinesh Kumar Thapaliya, Chief Executive Officer, Kathmandu Metropolitan City*
- 11:00-11:30      **Historical Development of Building Code of Japan**  
*Prof. S. Otani, Chiba University, Japan*
- 11:30-11:40      **Session Review**  
*Prof. Bharat Sharma, Nepal Engineering College*
- 11:40-12:00      **General Discussion and Response by Presenters**

## **SESSION II: PANEL DISCUSSION ON ROLE OF STAKEHOLDERS**

- 12:00- 13:00      *Moderator: Mr. Bishnu Pandey, UNCRD*  
*Rapporteur: Ms. Nisha Shrestha, NSET*
- Panellists:*
- *Mr. Som Lal Subedi, Ministry of Local Development*
  - *Mr. Surya Bhakta Sangachhe, Director General, DUDBC*
  - *Mr. Prem Raj Joshi, Bharatpur Municipality*
  - *Badan Lal Nyachhyon, Society of Consulting Architectural and Engineering Firms (SCAEF)*
  - *Dr. Jishnu Subedi, Nepal Engineering college*
  - *Mr. Ram Chandra Kandel, NSET*
- 13:00-13:15      **General Discussion and formation of a team for drafting main elements of the policy for enforcement and dissemination of Building Code**
- 13:15-14:30      Lunch Break**
- 14:30- 15:00      Video Screening "An Earthquake Reconstruction of Kobe, Hyogo Prefecture, Kobe, Japan"

## **SESSION III: ROUND TABLE DISCUSSION ON BUILDING CODE POLICY**

- 15:00- 15:30      Moderator: Mr. Amod Dixit, Executive Director, NSET

*Presentation of draft building code enforcement policy by team representative*  
Discussion on draft document  
Finalization of the document

**15:30 -15:50**            **Tea Break**

**SESSION IV:    PROBLEMS AND OPPORTUNITIES IN BUILDING-PERMIT PROCESS**

**Chair**    **Mr. Bidur Mainali, General Secretary, Municipal Association of Nepal (MUAN)**

15:50-16:10            **Japanese experience of building control by Prefecture government**  
*Mr. Nobuaki Takahasi, Hyogo Prefecture Government, Japan*

16:10-16:25            **LSMC experience of building code Implementation**  
*Mr. Niyam Maharjan, Chief, Earthquake Safety Section, Lalitpur Sub-Metropolitan City*

16:25-16:40            **Challenges and opportunities to initiate building code implementation**  
*Mr. Suraj Shrestha, Engineer, Dharan Municipality*

16:40-16:55            **Legal and regulatory issues of building control**  
*Mr. Basant Acharya, Legal Officer, Kathmandu Metropolitan City*

16:55-17:15            **General discussion and note from session chair (omitted)**

17:15- 17:30            **Explanation of questionnaire to be filled by each municipality (input to develop a system of building permit process)**  
*Mr. Bishnu Hari Pandey, UNCRD*

17:30- 18:30            Filling out of questionnaire

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***DAY II- FRIDAY, 3 August 2007***

08:45-09:00            Recap of 1st Day's work by Mr. Bishnu Hari Pandey, Researcher, UNCRD

**SESSION V:    DEVELOPMENT OF MUNICIPAL BUILDING PERMIT PROCESS**

**Chair**    **Mr. Narayan Bahadur Thapa, Under-secretary, MOLD**

09:00-09:20            **Salient features of Nepal National Building Code**  
*Mr. Amritman Tuladhar, Engineer, DUDBC*

09:20-09:40            **Provision of resources for the building permit process**

*Mr. Reshmi Raj Pandey, Under Secretary, MOLD*

09:40- 10:00      **Engagement and counseling service by city government: Experiences of Banepa Municipality**

*Mr. Suresh Shrestha, Engineer, Banepa Municipality*

10:00-10:20      **Role of civil society in building code implementation**

*Mr. Bibhuti Man Singh, Chairman, Disaster Management Committee KMC Ward-17; Representative of Thamel Rotary Club*

10:20-10:40      **General discussion and response by presenters**

**10:40- 11:00      Tea/Coffee Break**

**SESSION VI: BREAK OUT SESSION: MUNICIPAL SYSTEM FOR BUILDING CODE IMPLEMENTATION**

**Chair**    *Mr. Purusottam Dangol, Deputy Director General, DUDBC*

11:00-11:30      **Preliminary Result of Survey Questionnaire (summary of responses of all municipalities)**

*Mr. Ramesh Guragain, Director, Earthquake Engineering and Training, NSET*

**Global Survey on Building Code and Code Enforcement**

*Ms. Naoko Mishima, Research Assistant, UNCRD Disaster Management Planning Hyogo Office*

11:30-11:45      **Explanation of problem issues to be discussed in breakout session**

*Mr. Bishnu Hari Pandey, UNCRD*

11:45-12:00      **Break out of participants into 3 groups**

G1: Capacity building of municipal governments and communities

G2: Administrative structure for sustainable building control and counseling

G3: Ensuring adequate human and financial resources for BC implementation

**12:00-13:00      Working Lunch**

**SESSION VII: BREAK OUT SESSION: MUNICIPAL SYSTEM FOR BUILDING CODE IMPLEMENTATION (continuation of session VI)**

13:00-14:15      Group work

14:15-14:30      Preparation of group report

14:30- 15:15      Group work presentation by group coordinators (15 min each)

15:15- 15:35                    Tea/Coffee Break

**SESSION VIII: ROUND TABLE DISCUSSION ON BUILDING CODE  
IMPLANTATIONS IN CITY GOVERNMENTS**

**Chair**   **Mr. Krishna Prasad Devkota, *Chief and Executive Officer, LSMC***

15:35- 16:15                    Facilitator: Mr. Surya Narayan Shrestha, *Deputy Executive Director, NSET*

Presentation of draft building permit system for municipalities (based on group work presentation)

Roundtable discussion on draft document

**SESSION IX:            WAY FORWARD AND CLOSING**

**Chair**   **Mr. Surya Bhakta Sangachhe, *Director General, DUDBC***

16:15- 16:45                    Short oral presentations by representative of

- City government: *Mr. Dinesh Thapaliya, Chief and Executive Officer, KMC*
- NSET- *Mr. Amod Mani Dixit, Executive Director, NSET*
- IRP – *Masahiko Murata, Senior Researcher*
- UNDP- *Mr. Rahul Sen Gupta, Disaster Management Expert, UNDP*

16:45- 17:00                    Way forward (3 - year action plan )

- MPPW – *Mr. Kishore Thapa, Joint Secretary, Ministry of Physical Planning and Works*
- MOLD- *Mr. Som Lal Subedi, Joint Secretary, Ministry of Local Development*
- UNCRD- *Dr. Shoichi Ando, Coordinator, UNCRD Disaster Management Planning Hyogo Office*

**17:00-                            CLOSING REMARKS BY THE CHAIR**

### List of participants

S/N	Name	Title/Organization
1	Mr. Purna Kadaria	Acting Secretary, Ministry of Physical Planning and Works
2	Mr. Kishore Thapa	Joint Secretary, Ministry of Physical Planning and Works
3	Mr. Surya Bhakta Sangachhe	Director General, Department of Urban Development and Building Construction
4	Mr. Asok Nath Upreti	Deputy Director General, Department of Urban Development and Building Construction
5	Mr. Moti Lal Pandey	Senior divisional engineer, Department of Housing and Building Construction, Ministry of Physical Planning and Works
6	Mr. Dwarika Shrestha	Senior divisional engineer, Department of Housing and Building Construction, Ministry of Physical Planning and Works
7	Mr. Amritman Tuladhar	Building Engineer, Department of Housing and Building Construction
8	Mr. Som Lal Subedi	Joint Secretary, Ministry of Local Development
9	Mr. Babu Ram Gautam	Under Secretary, Ministry of Local Development
10	Mr. Reshmi Raj Pandey	Under Secretary, Ministry of Local Development
11	Mr. Pashupati Pokharel	Section officer, Ministry of Local Development
12	Mr. Dinesh Thapaliya	Executive Officer/ Kathmandu Metropolitan City
13	Mr. Ram Thapa	Engineer/ Kathmandu Metropolitan City
14	Mr. Devendra Dangol	Urban Planner/ Kathmandu Metropolitan City
15	Mr. Krishna Prasad Devkota	Executive Officer/ Lalitpur Sub Municipality
16	Mr. Niyam Maharjan	Engineer/ Lalitpur Sub Municipality
17	Mr. Pradeep Shrestha	Head, Urban Development Division/ Lalitpur Sub Municipality
18	Mr. Indra Prasad Karki	Executive Officer/ Bhaktapur Municipality
19	Mr. Ram Govinda Shrestha	Engineer/Bhaktapur Municipality
20	Mr. Krishna Gopal Prajapati	Arch. Engineer/Bhaktapur Municipality
21	Mr. Saroj Guragain	Executive Officer/Kirtipur
22	Mr. Bal K. Maharjan	Engineer/Kirtipur
23	Mr. Govinda Singh Bhandari	Executive Officer/ Madhyapur Thimi
24	Mr. Satyanarayan Shah	Engineer/ Madhyapur Thimi
25	Mr. Yagya Prasad Bhattarai	Executive Officer/Biratnagar
26	Mr. Dilendra Pradhan	Engineer/Biratnagar
27	Mr. Umesh Prasad Ojha	Engineer /Biratnagar
28	Mr. Uttam Prasad Nagila	Executive Officer/Pokhara Sub-Metropolitan City
29	Mr. Purna B. Gurung	Engineer/Pokhara Sub-Metropolitan City
30	Mr. Sarada Mohan Kafte	Urban Planner/Pokhara Sub-Metropolitan City
31	Mr. Keshav R.Ghimire	Executive Officer/Birgunj Sub-Metropolitan City
32	Mr. Shailendra Shrestha	Engineer/Birgunj Sub-Metropolitan City
33	Mr. Prakash Man Amaty	Chief, Planning /Birgunj Sub - Metropolitan City
34	Mr. Khadga Bahadur Chapagain	Executive Officer/Dharan Municipality
35	Mr. Suraj Shrestha	Engineer/Dharan Municipality
36	Mr. Krishna Prasad Jaisi	Executive Officer/ Banepa Municipality
37	Mr. Jay Manandhar	Engineer/Banepa Municipality
38	Mr. Madan Bhujel	Executive Officer/ Hetauda Municipality
39	Mr. Satya Narayan Sah	Engineer/Hetauda Municipality
40	Mr. Birendra Lal Shrestha	Urban Planner/Hetauda Municipality
41	Mr. Ganesh P. Timilsina	Executive Officer/ Itahari Municipality
42	Mr. Arjun K. Dahal	Engineer/Itahari Municipality
43	Mr. Narendra Baral	Executive Officer/ Butwal Municipality



44	Mr. Surya Mani Poudel	Engineer/Butwal Municipality
45	Mr. Bishnu Prasad Khanal	Legal Officer/Butwal Municipality
46	Mr. Krishna Prasad Aryal	Executive Officer/Nepalgunj Municipality
47	Mr. Ganesh Prasad Pandey	Engineer/Nepalgunj Municipality
48	Mr. Murai Nepal	Executive Officer/ Dhangadhi Municipality
49	Mr. Dej Raj Bhatta	Engineer/Dhangadhi Municipality
50	Mr. Krisna P. Gautam	Executive Officer/Tribuvan Nagar Municipality
51	Mr. Ram Dhan Shrestha	Engineer/Tribuvan Nagar Municipality
52	Mr. Krishna P. Pudasaini	Executive Officer/ Mahendra Nagar Municipality
53	Mr. Himalay Singh Ayar	Engineer/Mahendra Nagar Municipality
54	Mr. Pusp Raj Bhatt	Assistant Planner/Mahendra Nagar Municipality
55	Mr. Tuphan Singh K.C	Executive Officer/ Birendranagar Municipality
56	Mr. Janak B. Shahi	Engineer/ Birendranagar Municipality
57	Mr. Tika Ram Gyawalai	Executive Officer/ Tansen Municipality
58	Mr. Bishnu Paudel	Manager/ Tansen Municipality
59	Mr. Manohar Lal Shakya	Urban Planner/ Tansen Municipality
60	Mr. Lok Nath Poudyal	Executive Officer/ Bharatpur
61	Mr. Prem Raj Joshi	Engineer/ Bharatpur
62	Mr. Birat Ghimire	Engineer, Urban Planner/ Bharatpur
63	Mr. Raju Pokharel	Engineer/Dharan Municipality
64	Mr. Amod Mani Dixit	Execurtive Director, National Society for Earthquake Technology- Nepal (NSET)
65	Mr. Surya Narayan Shrestha	Deputy Executive Director, NSET
66	Mr. Ramesh Guragain	Director, Engineering and Research Division, NSET
67	Ms. Niva Upreti	Communication officer, NSET
68	Dr. Jishnu Subedi	Vice Principal and Associate Professor, Nepal engineering college
69	Mr. Bharat Raj Sharma	Professor, Nepal engineering college
70	Mr. Bibhuti Man Singh	Chairman, Disaster Management Committee, ward 17, KMC
71	Mr. Badan Lal Nyanchhon	Executive Director, Society of Consulting Architectural and Engineering Firms (SCAEF)
72	Mr. Kiran Pokhrel	Reporter, Sagarmatha community Radio





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