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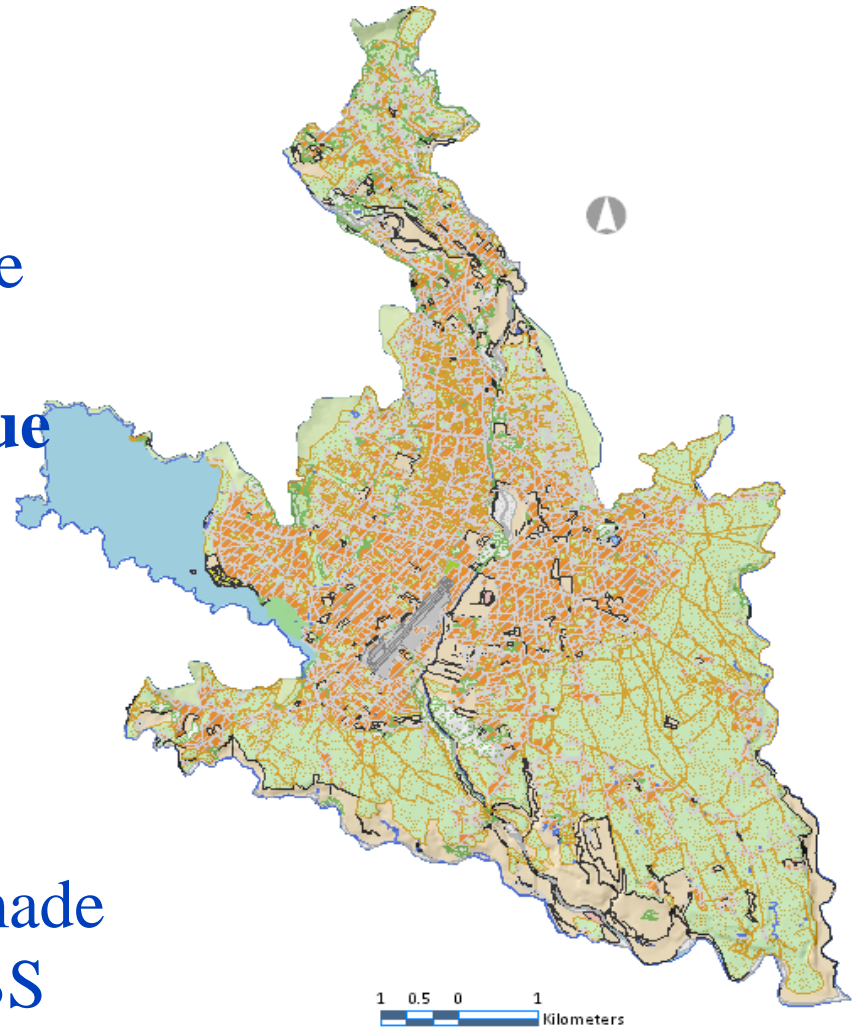
# **Enforcement of National Building Code in Pokhara Sub-Metropolitan City**

**Presented by:**

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Chief and Executive Officer  
Pokhara Sub-Metropolitan City**

# INTRODUCTION

- Pokhara Sub-Metropolitan City is the **Second Largest City** after Kathmandu having more than 60,000 households
- **Around 2600 new buildings** are constructed each year
- Pokhara Valley is **vulnerable due to its geological structure and poor construction trends**
- **Implementation of NBC was urgent**
- Decision for **Enforcement and implementation of NBC** was made by Municipal Council in 2068 BS



# Initiation for NBC Enforcement

- Finalized Action Plan with support from BDRC project
- Formation of **Municipal Level Disaster Management Committee** chaired by Chief Executive Officer (for Policy making on DRR including NBC)
- Formulation of **Technical Committee** (For technical decisions on NBC implementation)
- **Application form of PSMC** has been updated and revised incorporating the updated NBC checklist provided by DUDBC for building code implementation.
- **Exposure visit to Dharan municipality** was organized for Municipal Engineers including CEO of PSMC for learning and experience sharing about the enforcement of Building code in municipality

# Announcement of National Building Code Implementation in Pokhara

- The PSMC decided and announced implementation of National Building Code publicly on 15<sup>th</sup> January, 2013 on the occasion of National Earthquake Safety Day- 2069 BS
- PSMC has started enforcement of NBC in building permit process since 2<sup>nd</sup> Falgun 2069 BS.
- The decision was publicized via local FM stations, miking and pamphlets.



# Outline of Action Plan for NBC Implementation

## UPGRADE SYSTEM, PROCESS & POLICIES

- Formation of Municipal DM Committee
- Formation of Technical Committee
- Upgrade & improve existing permit system, process and implementation policies
- Develop guideline for NBC Implementation
- Introduce License system to trained Masons/Contractors

## TRAINING/ORIENTATION/CAPACITY BUILDING

- Orientation Programs To House Owners
- Training programs for Masons & Contractors
- Training Programs for designers
- Refresher course for Municipal Technicians

## FIELD INSPECTION/MONITORING

- Formulation of Effective field inspection Mechanism
- Counseling service at office and construction site (Mobile Clinic)
- Introduce Inspection Card System

## AWARENESS PROGRAMS AT COMMUNITY LEVEL

- More publications
- Installation of informative Hoarding Boards
- PSAs in FM Stations
- Mass awareness Programs to community
- Awareness programs to school children

# Revised Application Form and General Guideline for Building Permit complying NBC

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 सहरौ विकास तथा सार्वजनिक निर्माण विभाग  
 (घर मक्का शाखा)  
 नयाँ बटक, पोखरा  
 "हाम्रो अभिमान, स्वच्छ सुन्दर पोखरा"

२९/१२/२०१९  
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 ११/१९

पोखरा उप-महानगरपालिका कार्यालय  
 POKHARA SUB-METROPOLITAN CITY OFFICE  
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आपन नं. ८३

( मक्का दरखास्त फारम )

आपन इलाका नाम/सं. : जंगम कुमारी कार्की / भद्रवती भद्रवती

इलाका : .....

मक्का नं. : १६

टोल/नर्स : - पाल्पा/१०१

आपन फोन नं. : ९८४६३२२१५६ / ९८१६१३०६५६

निर्देशको नाम : .....

मिठा नं. : २५५१९

लेखन : ०-३-०-२

आपन घर नं. : .....

आपन पते : .....

"हाम्रो अभिमान, स्वच्छ सुन्दर पोखरा"

उप-महानगरपालिका फोन नं. : ९११५०, ९१०६२ कार्यालय पोखरा, पोखरा नं. : ५०१००  
 ईमेल : pbrnctd@pnct.com.np

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लेखन : ०-३-०-२

आपन नाम र घर : दिपेन्द्र खत्री

फोन नं. : ९८९/१३/१९

"आपन निर्माण शीला अनुदान बुझ्नु भन्नु अघि नयाँ बटक पोखरा नगर निर्माणमा नबन्ने सम्झौता गर्नु ।"

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निर्देशिका  
 २०६९,  
 GENERAL GUIDE LINES  
 (FOR BUILDING PERMIT PROCESS & CONSTRUCTION AS PER NEPAL NATIONAL BUILDING CODE)

"आपन निर्माण शीला अनुदान बुझ्नु भन्नु अघि नयाँ बटक पोखरा नगर निर्माणमा नबन्ने सम्झौता गर्नु ।"

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# Major activities carried for effective implementation of NBC

- **Trainings on Earthquake Resistant Construction of Buildings** have been conducted for masons, petty contractors and contractors of Pokhara.
- So far 417 masons/contractors have been trained.
- **Orientations to House owners** for safer building constructions are going on regularly in municipality.



# Major activities carried for effective implementation of NBC (contd...)

- Two days orientation on NBC and NBC checklist to municipal engineers and designers of Pokhara was conducted.
- Training on structural analysis & designing using SAP 2000 and NBC have been provided to municipal engineers and private designers.
- DUDBC Senior Divisional Engineers/experts provided training/orientations as resource persons





# Permanent full scale models on Earthquake Resistant Construction of Buildings

- Permanent full scale models on earthquake resistant construction of buildings have been installed at 11 public places (in the premises of city hall and ward offices), for demonstration to community people and House Owners
- The models have been constructed as part of practical exercises in the mason trainings





# Regulations set by PSMC for NBC enforcement

- **Guideline for Implementation of NBC** within Municipality has been prepared and approved by municipal board
- **PSMC has introduced compulsory registration and license system for contractors** working in municipality for construction of new buildings.
- Similarly municipality has made mandatory to get training on earthquake resistant construction of buildings for getting building **construction license** from municipality.
- Compulsion of participation **for house owners in orientation** programs on earthquake resistant construction of buildings for getting building permissions

# Institutional Set Up for NBC enforcement

- **Building Permit and Earthquake Safety Section** has been established in PSMC for enforcement of Building Bye Laws/Building Code in municipality.
- **A Technical committee has been formed** consisting of the Division Chief, Urban Development and Public Work Division, Engineers of Building Permit Section of Municipality, Engineers from other organizations including Technical Officer of BDRC.



# Minimum criteria for safer buildings - PSMC

- Minimum 12"x12" sized columns with 4 nos 12 mm and 4 nos 16 mm diameter bars, 8 mm diameter double lateral ties (rings) for MRT Buildings as per NBC
- Recommendation of strap beams and footing tie beams for all buildings
- DPC (plinth) Checking at field became compulsory
- Ductile detailing for RCC framed pillar building
- Construction of sill and lintel bands to tie up infill walls with columns (Pillars)
- Compulsion of structural analysis and design for professional engineered buildings (that have crossed the criteria of MRT) and submission of calculation reports by structural engineers
- Minimum Reinforcement for beams: 4 nos 16 mm diameter at corners with addition extra bars

# Achievements of NBC Implementation

- Confidence level of municipal engineers is quite satisfactory in compliancy checking of building designs as per NBC.
- New buildings are coming up incorporating earthquake resistant technology complying National Building Code.
- House owners are now more conscious on safer building constructions
- Contractors and masons are contributing greatly for construction of new earthquake resistant buildings in municipality.
- Similarly designers and engineers are playing key role for structural designing and technical supervision of building constructions.
- Increased awareness on earthquake safe constructions

# Safer Building Construction Practices after NBC Implementation



# Challenges for NBC enforcement

- Illegal and unsafe addition of stories in existing building
- Public understanding on NBC is low.
- Limited technical manpower for Compliancy checking of each & every construction in fields as per NBC
- Strengthening & Retrofitting of existing unsafe buildings
- Changes in occupancy (functional use) of buildings
- Quality of construction materials and workmanship
- Professionalism & ethics still lagging among designers.



# Lesson Learns from NBC Enforcement in Pokhara

- Capacity Building and Confidence of Municipal Engineers /Designer for NBC is very important
- House Owners are to be orientated and motivated for Safer Building Construction
- Mason Trainings should be conducted in a massive scale to expedite construction of earthquake resistant buildings

# Way forward for NBC enforcement

- Continue support for conducting mason trainings on earthquake resistant construction of buildings
- Awareness raising activities in community and schools on earthquake preparedness
- Dissemination of IEC/ Promotional materials for earthquake safety and safer building constructions
- Broadcasting of earthquake preparedness messages/news in local FM radios and newspapers of Pokhara
- Distribute **Separate house numbering in green colour plate /tag** for buildings complying National Building Code
- Develop & enforce effective field monitoring mechanism

# Conclusion

- Although started very late, NBC implementation has shown quick positive impact in construction trend in PSMC
- NBC Compliance depends on capacity building of masons/contractors, awareness of house owners and community
- Needs staff commitment and increased technical capacity to facilitate the process
- A vibrant control and monitoring mechanism is necessary.



हम्रो अभिभारा-स्वच्छ, सुन्दर पोखरा



Thank you

for your attention