



नेपाल सरकार

सङ्घीय मामिला तथा सामान्य प्रशासन मन्त्रालय



स्थानीय विकास प्रशिक्षण प्रतिष्ठान
Local Development Training Academy
(Established under the Local Development Training Academy Act, 2049)

"An Autonomous, Professional, Client-Centred, Gender Responsive National Institute of Education in the area of Local Self Governance."
LDTA>>

प्रशिक्षकका लागि

स्थानीय तहका लागि तयार पारिएको प्रशिक्षण सामग्री

Urban Design (अर्वन डिजाइन)



प्रशिक्षण सामग्रीको बनावट:

- प्रशिक्षण मार्गदर्शन
- प्रशिक्षण योजना
- सत्र योजना (अभ्यास पत्र समेत)
- प्रस्तुति सामग्री (पावरप्प्लाइन्ट स्लाइड)
- सहभागीका लागि अध्ययन सामग्री
- मूल्यांकनका औजारहरू

मोड्युल १८



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स्थानीय विकास प्रशिक्षण प्रतिष्ठान ईमा, २०४५ इंद्रजा वर्षामध्ये
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२०७८ असार

मोड्युल १८

प्रकाशकः

सर्वाधिकारः

प्रकाशनः २०७८ असार

प्रशिक्षण सामाग्री निर्माणमा संलग्न सदस्यहरू

श्री पीतकुमार श्रेष्ठ, स्थानीय विकास प्रशिक्षण प्रतिष्ठान, ललितपुर

श्री जय कृष्ण श्रेष्ठ, स्थानीय विकास प्रशिक्षण प्रतिष्ठान, ललितपुर

श्री योग माया सापकोटा, स्थानीय विकास प्रशिक्षण प्रतिष्ठान, ललितपुर

प्राविधिक सहयोग

डा. बिजय कृष्ण श्रेष्ठ, परामर्शदाता

भाषा सम्पादनः

सम्पर्कका लागि:

विषयसूची

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प्रशिक्षण मार्गदर्शन

प्रशिक्षण सामाग्री वारे

स्थानीय विकासको कार्यसँग सम्बन्धित स्थानीय तहहरूको प्रशासनिक एवं व्यवस्थापन सम्बन्धी दक्षता अभिवृद्धि गर्ने उद्देश्यले त्यस्ता निकायहरूमा संलग्न जनप्रतिनिधिहरू एवं कार्यरत कर्मचारीहरूलाई योजनावद्व तरिकाले उच्चस्तरीय प्रशिक्षणको व्यवस्था गरी स्थानीय स्तरमा ती निकायहरूको संस्थागत विकासमा सघाउ पुर्याउन स्थानीय विकास प्रशिक्षण प्रतिष्ठान ऐन २०४९ अन्तर्गत वि.सं. २०५० सालमा स्थापना भएको यो एक स्वशासित र संगठित संस्थाको रूपमा रहेको छ । प्रतिष्ठानको मुख्य उद्देश्य प्रशिक्षण स्थानीय विकास कार्यसंग सम्बन्धित स्थानीय तहका व्यक्तिहरूको लागि आवश्यक पर्ने प्रशिक्षणको व्यवस्था गर्ने, प्रशिक्षण केन्द्रद्वारा सञ्चालन गरिने प्रशिक्षण कार्यक्रम सम्बन्धी अनुसन्धान गर्ने र प्रशिक्षण केन्द्रद्वारा सञ्चालन गरिने प्रशिक्षण कार्यक्रमलाई बढी उपयोगी तुल्याउन तथा प्रशिक्षण सामग्री तयार गर्नको लागि समस्यामूलक अनुसन्धान, परामर्श सेवा तथा सूचना सेवा सम्बन्धी कार्यक्रमहरू सञ्चालन गर्ने रहेको छ ।

यो प्रशिक्षण सामग्री संघीय मामिला तथा सामान्य प्रशासन मन्त्रालयको निर्देशनमा स्थानीय विकास प्रशिक्षण प्रतिष्ठानले तयार पारिएको हो । यस सात दिने प्रशिक्षण सामग्रीले अर्वन डिजाइन प्रशिक्षणलाई प्रभावकारी बनाउन प्रशिक्षकहरूलाई महत्वपुर्ण मार्गदर्शन हुने अपेक्षा गरिएको छ ।

प्रशिक्षण सामग्रीको उद्देश्य

गाउँपालिका/ नगरपालिकामा हुने विभिन्न प्रकारका वस्ती विकास, पूर्वाधारहरू र भवनहरूको नीजि भवनहरू समेत डिजाइन निर्माण र अनुगमनलाई स्थानीय ठाउँ प्रासंगिक (Local context), दिगो र सुरक्षित बनाउनु हो । साथै उक्त कार्यहरूमा प्रत्यक्ष वा अप्रत्यक्ष रूपमा संकलन हुने सरकारी, गैर सरकारी, नीजि क्षेत्र तथा सर्वसाधारणलाई प्रशिक्षण गरी प्रभावकारी र गुणस्तर कायम गर्नु हो ।

प्रशिक्षण सामग्रीको बनावट

यो प्रशिक्षण सामग्रीलाई चार खण्डमा विभाजन गरिएको छ । पहिलो खण्डमा प्रशिक्षण सामग्री र यसको प्रयोग गर्ने तरीका (Instruction to user) उल्लेख गरिएको छ । दोश्रो खण्डमा प्रशिक्षण योजना, प्रशिक्षण तालिका समावेश गरिएको छ । तेश्रो खण्डमा प्रशिक्षणका प्रत्येक सत्रका विषयवस्तुहरूको पाठ योजना, पावर प्वाइंट स्लाइडहरू र विषयवस्तुसंग संबन्धित अध्ययन सामग्री समेटिएको छ भने अन्तिम खण्डमा प्रशिक्षण मूल्यांकनका औजारहरू समावेश गरिएको छ । यसका विषयवस्तुहरूलाई संक्षिप्तमा तल उल्लेख गरीएको छ ।

१. प्रशिक्षण सामग्रीको प्रयोग गर्ने तरीका (Instruction to User)

यसमा प्रशिक्षण सामग्रीको पृष्ठभूमी, यसको उद्देश्य, प्रशिक्षण सामग्रीमा समावेश गरिएका विषयवस्तुहरू, प्रशिक्षण सामग्री प्रयोग गर्ने तरीका, प्रशिक्षणका विधिहरू र तिनको संचालन प्रक्रिया, अध्ययन सामग्री, प्रशिक्षण मूल्यांकनका औजारहरू, प्रशिक्षणका प्रयोगकर्ता आदि समावेश गरिएको छ । प्रशिक्षणको क्रममा सहभागीहरूले दैनिक जिवनयापनमा देखेका र भोगेका कुराह राख्दा प्रशिक्षकहरूबाट प्रतिक्रिया दिनु जरुरत हुन्छ । कतिपय अवस्थामा यस्ता छलफलका विषयवस्तु सत्रसंग प्रत्यक्ष सम्बन्धित नहुन पनि सक्दछ । तर प्रशिक्षकहरूबाट प्रभावकारी जवाफ र सत्रसंग जोड्ने कार्यको पनि आशा गरेको हुन्छ । सहभागीहरूले उठाएका बुढाँ वा लक्ष्यहरू बढी व्यवहारिक हुने भएकोले प्रशिक्षकहरूबाट सम्बोधन भई प्रशिक्षणको बेला अलि लचिलो (Flexible) हुँदा सिकाई अङ्ग प्रभावकारी र लाभदायक हुने छ ।

२. प्रशिक्षण योजना

प्रशिक्षण योजना प्रशिक्षण संचालनका लागि तयार पारिएको प्रशिक्षणको समग्र खाका हो । यसमा प्रशिक्षणका साधारण र निर्दिष्ट उद्देश्य, प्रशिक्षणका विषयवस्तु, प्रशिक्षण संचालन विधि र प्रशिक्षण सामाग्री उल्लेख गरिएको छ ।

३. प्रशिक्षण दैनिक तालिका

प्रशिक्षण दैनिक तालिकामा हरेक दिनका क्रियाकलाप र विषयवस्तु र तिनका लागि आवश्यक समय उल्लेख गरिएको छ ।

४. पाठ योजना

पाठ योजना हरेक सत्र संचालनकालागि मार्गदर्शन हो । यसमा सत्रका साधारण र निर्दिष्ट उद्देश्य, सत्रका विषयवस्तु, प्रशिक्षण क्रियाकलापको विस्तृत विवरण, प्रशिक्षण विधि, प्रशिक्षण सामाग्री र आवश्यक समय उल्लेख गरिएको छ । यसमा सत्रका निर्दिष्ट उद्देश्य हांसिल भए वा भएन् थाहा पाउनका लागि सत्र मूल्याङ्कन विधि समेत उल्लेख गरिएको छ ।

५. पावरप्वाइन्ट स्लाइड

प्रशिक्षण सत्र संचालनकालागि आवश्यक पावरप्वाइन्ट स्लाइडहरु यस सामाग्रीमा क्रमबद्ध रूपमा समावेश गरिएका छन् । सत्रका साधारण र निर्दिष्ट उद्देश्य, सत्रका विषयवस्तुहरु, समुह कार्य वा अभ्यास र सो अभ्यास संचालनकालागि गर्नुपर्ने क्रियाकलाप पनि पावरप्वाइन्ट स्लाइडमा उल्लेख गरिएको छ ।

६. अध्ययन सामाग्री

प्रशिक्षणका विषयवस्तु र प्रस्तुतिकरणसंग सम्बन्धित सामाग्रीहरुको विस्तृत विवरण अध्ययन सामाग्रीको रूपमा यस सामाग्री भित्र समावेश गरिएको छ । यि सामाग्रीहरुलाई प्रशिक्षण सत्रका आधारमा छुट्ट्याई क्रमबद्ध रूपमा व्यवस्थित गरिएको छ ।

७. प्रशिक्षण मूल्यांकनका औजारहरु

प्रशिक्षणको प्रभावकारीता मापनकालागि निम्न औजारहरु समावेश गरिएको छ ।

(क) प्रशिक्षण पूर्व र प्रशिक्षण पश्चात जानकारी

यस अन्तर्गत प्रशिक्षणका विषयवस्तुहरुमा सहभागिहरुको बुझाइको अवस्था थाहा पाउन प्रशिक्षणका विषयवस्तुहरुसंग सम्बन्धित प्रश्नहरु निर्धारण गरि प्रशिक्षणको सुरुमा पूर्व जानकारी र अन्तमा पश्चात जानकारी लिइन्छ । यसले प्रशिक्षणका कारण सहभागिहरुको ज्ञान र सिपमा आएको परिवर्तन मापन गर्न सहयोग गर्दछ ।

(ख) दैनिक पृष्ठपोषण फाराम

हरेक दिनको अन्तमा दिनभरी भएका छलफलहरुमा सहभागिहरुको सिकाई थाहा पाउन दैनिक पृष्ठपोषण फारामको प्रयोग गरिन्छ । यसबाट सहभागिहरुले सिकेका र सिकेका कुरालाई कहाँ र कसरी प्रयोग गर्ने भन्ने बारेमा र प्रशिक्षणलाई अझ प्रभावकारी सुधार गर्नुपर्ने सुझाव पाउन सकिन्छ ।

(ग) प्रशिक्षण सुधारकालागि प्रश्नावली

यो प्रश्नावली प्रशिक्षणको अन्तमा सहभागिहरूलाई वितरण गरी उनिहरूको प्रतिक्रिया लिन प्रयोग गरिन्छ । यसबाट (१) प्रशिक्षणको समग्र मूल्यांकन (२) सहजकर्ता प्रतिको दृष्टिकोण (३) प्रशिक्षणमा उपलब्ध गराइएका पाठ्य सामाग्रीको प्रभावकारीता (४) प्रशिक्षणका विषयवस्तुको उपयुक्तता र (५) प्रशिक्षणमा प्रयोग भएका प्रशिक्षण विधिहरूको सान्दर्भिकता जाँच गरिन्छ ।

प्रशिक्षण कार्यक्रमको मूल्यांकन

प्रशिक्षण कार्यक्रमको प्रभावकारीतालाई मुख्यतः चारवटा तहमा मूल्यांकन गरिनुपर्दछ । सहभागिहरूको प्रशिक्षण प्रतिको प्रतिक्रिया, उनिहरूको सिकाईको स्तर, प्रशिक्षण कार्यक्रमले सहभागिहरूको दैनिक व्यवहार र उनिहरूको दैनिक कार्य सम्पादनमा ल्याएको परिवर्तन र सो परिवर्तनको परिणाम स्वरूप समग्र संस्थाको कार्य सम्पादनमा आएको परिवर्तनलाई प्रशिक्षण प्रभावकारीता मूल्यांकनका आधार बनाइनु पर्दछ ।

प्रशिक्षण सामाग्रीको प्रयोग विधि

अर्बन डिजाइन प्रशिक्षणको प्रस्तुतीलाई व्यवस्थित र पूर्ण गराउनका लागि पाठ योजनाको अनुशरण गर्नुपर्दछ । यस सामाग्रीमा व्यवस्था गरिएको पाठ योजनालाई अनुशरण गरी सहज तरिकाले सत्र संचालन गर्न क्रियाकलाप शीर्षक अन्तर्गत विषयवस्तुलाई विस्तृत रूपमा प्रस्तुत गरिएको छ । बिषय प्रस्तुती अगाडि बिषयप्रति रुची जगाउने, बिषयको महत्व दर्शाउने जस्ता कार्य प्रशिक्षक आफैले विकास गरी सत्र संचालन गर्न सक्नेछन् । प्रशिक्षकले बिषयवस्तुको अध्ययन सामाग्री राम्रोसँग अध्ययन गरी बिषयको प्रभावकारी प्रस्तुतीकरणका लागि आवश्यक दृष्य सामाग्रीको तयारी/संकलन समेत गर्न सक्नेछन् । यसका साथै प्रशिक्षकले प्रशिक्षण सामाग्रीमा उल्लेख गरिएका पावरप्वाइन्ट स्लाइड र अध्ययन सामाग्रीमा समावेश गरिएका चित्र, चार्ट, ग्राफ आदिलाई आवश्यकता अनुसार तिनको आकार विस्तार गरि प्रस्तुत गर्न सक्नेछन् । सत्रहरूको प्रस्तुतिकरणका लागि सिलसिलेबार रूपमा पावरप्वाइन्ट स्लाइडहरू समावेश गरिएको छ । प्रशिक्षणको प्रभावकारीता र प्रशिक्षण प्रभावकारीताको मापनका लागि प्रशिक्षण मूल्यांकनका औजारहरू समेत सामाग्रीमा समावेश गरिएका छन् । तिनलाई उपयुक्त तरिकाले प्रयोग गरिनु आवश्यक छ ।

अध्ययन सामाग्री

प्रस्तुत सामाग्रीमा समावेश गरिएका अध्ययन सामाग्रीहरू अर्बन डिजाइन प्रशिक्षण सँग संबन्धित विभिन्न निकायहरूका प्रकाशन, प्रशिक्षण सामाग्री, नेपाल सरकारले गरेका नीतिगत व्यवस्थाहरू आदिलाई आधारमानी तयार गरिएको छ । यी अध्ययन सामाग्रीहरू केवल सन्दर्भ सामाग्री मात्र हुन् । यिनलाई समय समयमा अध्यावधिक गराउनु पर्दछ ।

प्रशिक्षण सामाग्रीको प्रयोगकर्ता

यो प्रशिक्षण सामाग्री अर्बन डिजाइन प्रशिक्षणमा रुची राख्ने जो सुकैको लागि उपयोगि हुनेछ । यो विशेष गरि अर्बन डिजाइन प्रशिक्षण सहजकर्ताहरूलाई ध्यानमा राखी तयार पारिएको छ । तर यस सामाग्रीको उपयुक्तताको ठहर गर्ने जोसुकैले पनि यसको प्रयोग गर्न सक्नेछन् । यसका प्रयोगकर्ताले यसमा उल्लेखित विधि, प्रकृया, समय, सामाग्री जस्ता

पक्षहरूलाई हुबहु उतार्नु भन्दा यसमा उल्लेखित मार्ग दर्शन र स्थानीय परिवेश अनुसार यसलाई सहयोगी सामाज्रीको रूपमा बुझेर प्रयोग गर्नु उपयुक्त हुनेछ । स्थानीय परिवेश अनुसार यस निर्देशिकाको मुल मर्मलाई ध्यानमा राखी सहजकर्ता/प्रशिक्षकले अन्य रचनात्मक गतिविधि समेत अङ्गाल्न सक्नेछन् ।

प्रशिक्षण विधि र प्रयोग तरिका

प्रशिक्षकको सहजिकरणलाई व्यवस्थित गर्नकालागि पाठ योजनामा प्रशिक्षण विधिहरु उल्लेख गरिएको छ । प्रशिक्षण कार्यक्रमलाई सहभागीतामूलक र प्रभावकारी बनाउन निम्न विधिहरु प्रयोग गर्न सकिनेछ ।

क) समुह छलफल

सहभागितामूलक प्रक्रियाबाट प्रशिक्षण सञ्चालन गर्नका लागि समुह छलफल एक महत्वपूर्ण विधि हो । समुह छलफलका लागि निम्न प्रक्रिया अपनाउनुपर्ने हुन्छः

- समुह विभाजन गर्दा सकभर सहभागी संख्या बराबर बनाउने, सहभागिको स्तर लाई ध्यान दिने ।
- समुह छलफलका लागि विषयवस्तु किटानी गर्ने ।
- छलफलको विषय अनुसार स्थान र समय निर्धारण गर्ने ।
- सहजकर्ताले छलफल प्रकृया बताउने । जस्तै:
 - समुहमा संयोजक, प्रतिवेदक चयन गर्ने ।
 - समुहमा सवैको भनाई समेटिनु पर्ने ।
 - समुहको निचोण ठूलो कागजमा तयार गर्ने ।
 - संयोजकले समुह कार्य प्रस्तुत गर्ने आदि ।
- समुहमा खुल्ला छलफल चलाउन प्रेरित गर्ने ।
- सहजकर्ताले छलफलको सन्दर्भ र विषयवस्तुलाई आधार मानी आफ्नो निष्कर्ष दिने ।

ख) खेल

खेल विधिले विषयवस्तुलाई सजितै प्रष्ट पार्न सहयोग गर्दछ । खेल विधिबाट सिकेका सिकाईहरु चिरस्थायी हुन्छन् ।

सञ्चालन प्रक्रिया

- खेलको प्रकृति अनुसार सहभागी संख्या छनौट गर्ने । शारीरिक शक्ति प्रयोग गर्नुपर्ने खेल भए शारीरिक रूपमा अशक्त व्यक्तिलाई उसको अनुमतिमा बाहिर राख्ने ।
- लैंड्रिंगिक संवेदनशिलताका पक्षमा ध्यान दिने ।
- समय निर्धारण गर्ने । खेललाई २० मिनेटभन्दा बढी समय दिनु उपयुक्त हुदैन ।
- खेलमा पालना गर्नुपर्ने निति नियम प्रष्ट पार्ने ।

- खेलका लागि आवश्यक सामाग्री तयार गर्ने ।
- खेल सकिएपछि खेलबाट भएका सिकाईहरु छलफल गर्ने ।
- खेलको लागि सबैलाई धन्यवाद दिने ।

ग) प्रश्नोत्तर

कुनै विषयवस्तुबारे सहभागिहरुको बुझाई थाहा पाउनकालागि प्रश्न गर्ने, उत्तर लिने र सो अनुसार सहजकर्ताले विषयवस्तु प्रष्ट पार्ने प्रक्रिया नै प्रश्नोत्तर विधि हो । यसले सहभागीहरुको ध्यान विषयवस्तुप्रति आकर्षित गर्न मद्दत गर्दछ । सहजकर्ताले प्रश्नोत्तर सीपमा विशेष ध्यान पुर्याउनु पर्दछ ।

घ) साना समूह छलफल

यो विधि प्रशिक्षण कार्यका सन्दर्भमा छिडै छलफल गरी तत्कालै विषयवस्तुको निष्कर्षमा पुऱ्याउन उपयोगि हुन्छ । २/३ जना सहभागी बीच बसेकै स्थानमा आमने सामने भई यो विधि मार्फत विषयवस्तुको निचोड निकाल्न सकिन्छ । यो विधिले सिकाईलाई मूर्त रूप दिन मद्दत गर्दछ ।

संचालन प्रक्रिया

- सहजकर्ताले छलफलको विषय र समय निर्धारण गर्ने ।
- नजिकैका २/३ जना सहभागिलाई आमने सामने बस्न भन्ने ।
- छलफल गर्न लगाउने । छलफलका मुख्य कुरा टिपोट गर्न भन्ने ।
- छलफलको निचोडलाई मेटाकार्ड दिई लेख्न लगाउने ।
- छलफल सकिएपछि क्रमिक रूपमा सहभागी समूहलाई आफ्नो निचोड प्रस्तुत गर्न लगाउने, छलफल गर्ने, कार्ड सफ्ट बोर्डमा टास्ने ।
- सहभागीको प्रस्तुती पश्चात सहजर्ताले विषयवस्तुको सन्दर्भ र तात्पर्यता मिलाई निष्कर्ष निकाल्ने ।

ड.) मस्तिष्क मन्थन

सहभागीले आफ्नो विचार मन्थन गरी विषयवस्तुलाई निर्णयमा पुऱ्याउने विधि नै मस्तिष्क मन्थन विधि (Brainstorming) हो ।

संचालन प्रक्रिया

- छलफलको विषय / प्रश्न प्रश्ट रूपमा राख्ने ।
- सोचका लागि समय दिने ।
- सहभागीहरुका विचारलाई संगठित गर्दै टिपोट गर्ने, छलफल चलाउने ।
- भनाईलाई निष्कर्षमा पुर्याउने ।

च) अभ्यास

सहभागीको प्रत्यक्ष संलग्नतामा सिकाई आर्जन गर्न यो विधि महत्वपूर्ण हुन्छ । यो विधि जीवन र जगतसंग सम्बन्धित घटनामा आधारित कुराहरू प्रष्ट पार्ने प्रयोग गरिन्छ ।

संचालन प्रक्रिया

- सहजकर्ताले घटना वा सवाल समुह बीच राख्ने ।
- विषय अनुसार समय निर्धारण गर्ने ।
- सवालका निष्कर्ष निकाल्न लगाउने ।
- अभ्यासबाट निकालिएको निष्कर्षलाई सहजकर्ताले छलफल चलाई अन्तिम निष्कर्ष निकाल्ने ।

ज) लघु प्रवचन

यो प्रशिक्षणको सबैभन्दा महत्वपूर्ण विधि हो । यस मार्फत विषयवस्तुलाई सहभागिहरु समक्ष सहज रूपमा प्रस्तुत गर्न सकिन्छ । नाम अनुसारै यो विधि मार्फत गरिने प्रस्तुतिकरण छोटो र सहभागितामूलक हुनु पर्दछ । प्रशिक्षकले एकोहोरो रूपमा लामो समय सम्म प्रस्तुतिकरण गर्नु हुँदैन । प्रस्तुतिकरणका सिलसिलामा सहभागिहरुलाई पनि संलग्न गराउँदै जानु पर्दछ ।

प्रशिक्षकलाई प्रश्नः

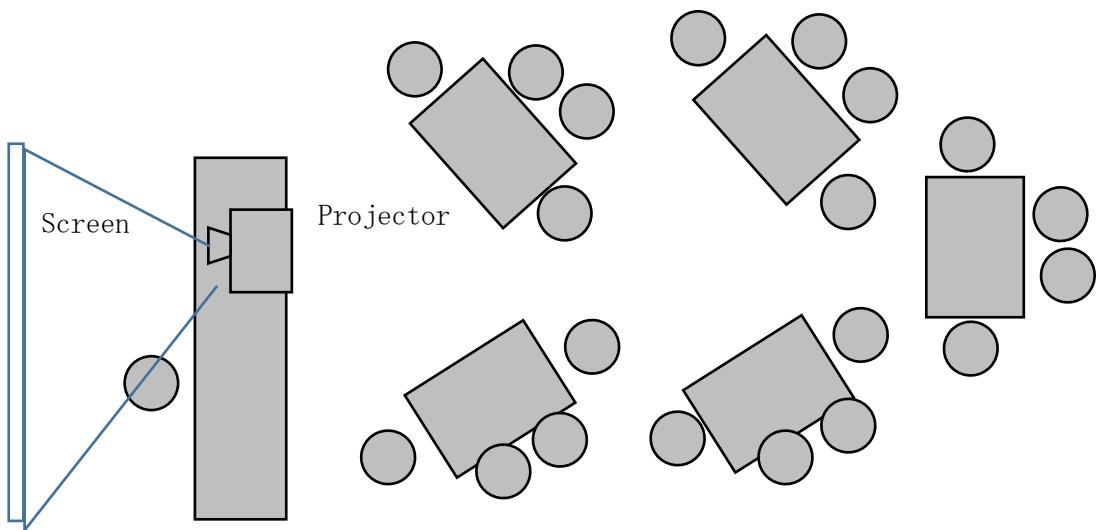
१. सत्रका विषयवस्तुको राप्ररी अध्ययन गर्नु भएको छ ?
२. सत्र सञ्चालनका लागि पाठ योजनाको अध्ययन गर्नु भएको छ ?
३. सहभागीहरुको पृष्ठभूमि तथा स्तरको बारेमा सोच्नु भएको छ ?
४. सत्रका लागि चाहिने आवश्यक प्रशिक्षण सामग्रीहरु जुटाउनु भएको छ ?
५. प्रस्तुतीकरणका बुँदाहरुको राप्ररी अध्ययन गर्नु भएको छ ?
६. प्रस्तुतीकरणमा बढी महत्व दिनुपर्ने बुँदाहरुको निक्रियोल गर्नु भएको छ ?
७. प्रस्तुतीकरणमा विशेष जोड दिनका लागि आवश्यक उदाहरणहरुको चयन गर्नु भएको छ ?
८. प्रशिक्षण सारांशका बुँदाहरु तय गर्नु भएको छ ?
९. सत्रप्रति रुची जगाउन तथा सहभागीता बढाउन आवश्यक पर्ने विधिहरुको चयन गर्नु भएको छ ?
१०. समय भित्र सत्र पूरा गर्न राप्ररी योजना गर्नु भएको छ ?
११. सत्र सञ्चालनका लागी आवश्यक पर्ने भौतिक सामग्रीहरु जस्तै, सेतो पाटी, फ्लिपचार्ट, खैरो कागज, मेटाकार्ड, मार्कर, मास्किङ टेप, कागज, कलम, कैंची, चित्रहरुको व्यवस्था गर्नु भएको छ ?
१२. प्रशिक्षण हल, बसाई व्यवस्थापन, कोठाको तापक्रम, हावा, प्रकाश इत्यादिका बारेमा सोच्नु भएको छ ?

प्रशिक्षण योजना

प्रशिक्षण योजना

मोडुल/विषय	अर्वन डिजाइन Urban Design
मिति	
स्थान	नगरपालिका र गाँउपालिका
सहजकर्ता	
लक्षित सहभागीहरू:	
<ul style="list-style-type: none"> ■ गाउँपालिका/ नगरपालिकाका आर्किटेक्ट, ईंजिनियर, सब ईंजिनियर अन्य संघ संस्थाहरु र नीजि क्षेत्रमा कार्यरत प्राविधिक 	
साधारण उद्देश्य	
<ul style="list-style-type: none"> ■ सहभागीहरूको अर्वन डिजाइन सम्बन्धी ज्ञान र सिपमा अभिवृद्धि भई गाउँ वा नगरपालिकामा हुने निर्माण कार्य र वस्ती विकासलाई दिगो र सुरक्षित बनाउन मदत्त गर्दछ । 	
निर्दिष्ट उद्देश्यहरू: यस प्रशिक्षणको अन्तमा सहभागीहरूले	
<ul style="list-style-type: none"> ■ वस्ती निर्माण र वकास सम्बन्धी विभिन्न सिद्धान्तहरु स्मार्ट सुरक्षित जिवन्त र दिगो बुझ्ने छ । ■ शहरी विकास पूर्वाधार निर्माण र विपद् पछिको पुनर्निर्माणमा राष्ट्रिय तथा अन्तर्राष्ट्रिय असल अभ्यासबाट सिकेका पाठहरु स्थानीय स्तरका विकास निर्माण कार्यमा उपयोग गर्ने छ । ■ स्थानीय तहका दैनिक र बार्षिक कार्यक्रमहरूमा अर्वन डिजाइनको घटक (components) र प्रविधिहरु (techniques) समावेश गरी गुणस्तरीय र प्रभावकारिता बढाउने छ । ■ हाल अवस्थित वस्ती र भविष्यमा बन्ने शहर वा वस्ती विस्तारलाई व्यवस्थित गर्न चाहिने नियम कानूनहरु र संस्थागत व्यवस्था सम्बन्धी जानकारी प्राप्त गर्ने छ । ■ यस प्रशिक्षणबाट गाउँपालिका वा नगरपालिकाका विधमान समस्याहरु समाधान गर्न मदत्त पुग्ने छ । 	
विधि:	
<ul style="list-style-type: none"> ■ मष्टिस्क मन्थन, समुह अभ्यास, लघुप्रवचन, प्रश्नोत्तर आदि । हरेक दिनको अन्तमा दिनभर छलफल भएका विषयवस्तुको संक्षेपीकरण गर्ने । ■ दोस्रो दिन पहिलो दिन संचालन भएका गतिविधिको पुनरावलोकनबाट सत्र शुरुवात गर्ने । ■ व्यवहारिक अभ्यासको लागि आवश्यक फाराम अभ्यास सिटहरु तयार गर्ने । 	
आवश्यक समाग्री, उपकरण र स्रोत साधन:	
<ul style="list-style-type: none"> ■ ल्यापटप, एलसिडी प्रोजेक्टर, हाईट वोर्ड, स्क्रिन, प्वाइन्टर, पिन बोर्ड, क्यामरा, प्रिन्टर, फारामहरु, हाजिरी रजिष्टर 	
आवश्यक प्रशिक्षण सामाग्री:	
<ol style="list-style-type: none"> १. सहभागीहरूको लागि आवश्यक सामाग्री नोटबुक, डटपेन, रेकर्ड फाईल, पेन्सिल, कटर, अध्ययन सामाग्री २. प्रशिक्षणका लागि आवश्यक सामाग्री ब्राउनसिट, न्यूजप्रिन्ट, वोर्ड मार्कर, परमानेन्ट मार्कर, मेटा कार्ड, ग्लू, मास्किङ टेप, कैंची, स्केल, स्टापलर, पुस पिन, पेपर क्लीप, सादा कागज, चकलेट आदि । 	

सहभागीहरुको प्रशिक्षण हलमा वसाइ व्यवस्था (Training Hall Layout) :



कैफियतः

१. प्रभावकारी प्रशिक्षण संचालन गर्नका लागि आवश्यक सूचना संकलन तथा अन्य सम्पूर्ण कामको जिम्मेवारी आवश्यकता अनुसार निर्धारण गर्ने ।
२. प्रशिक्षण हलको उपलब्धता र सहभागी संख्याको आधारमा सहभागीहरुको वसाइ व्यवस्था मिलाउने । समूहकार्य गर्न सहज हुने गरी टेवलको व्यवस्थापन गर्ने ।
३. धेरै जसो प्रस्तुतीकरण सामग्री अंग्रेजीमा हुन्छन् तर नेपाली भाषामा बुझाइन्छ। व्याख्यान दिने र अभ्यास र छलफल सञ्चालन गर्दा सहभागीहरुको पृष्ठभूमि र चासोलाई ध्यान दिइ संचालन गरिनेछ ।

Training on Urban Design Tentative Schedule



नेपाल सरकार
 सङ्घीय मामिला तथा सामान्य प्रशासन मन्त्रालय

Time/ Dates	09:00- 10:30	10.30-11:00	11:00-12.30	12:30-13:30	13.30 -15:00	15.00-15.30	15.30-17.00
Day 1 <i>[Urban design & city planning theories]</i>	<ul style="list-style-type: none"> ▪ Registration ▪ Opening and Introduction, Objectives and Norms, Pre-Test 	Tea Break	Introduction of urban design and its scope	Lunch Break	Livable city/smart city design and its major components (pedestrian friendly neighborhood, mixed use, etc.)	Tea Break	Development control, planning norms & standards and building bylaws
Day 2 <i>[Domestic and international case studies]</i>	Successful urban design projects international case studies	Tea Break	Urban design approach in land pooling	Lunch Break	Municipal sustainable development goals, disaster risk reduction and management and climate change	Tea Break	Post-earthquake housing reconstruction in the urban historic core and rural areas
Day 3 <i>[Municipal planning and urban design implementation technique]</i>	Urban design guidelines and incentive mechanism	Tea Break	Urban design techniques in public infrastructure design and implementation	Lunch Break	Debt financing for municipal infrastructure development	Tea Break	Municipal planning process and urban design approach for selection of projects
Day 4 <i>[Review of municipal works and contextual preparation for group exercise]</i>	Sharing of review of municipal projects & discussion	Tea Break	Sharing of review of municipal projects & discussion	Lunch Break	Discussion on possible sites, issues and detailing of the project for group exercise	Tea Break	Discussion on possible sites, issues and detailing of the project for group exercise
Day 5 <i>[Site visit & discussion over different exercises]</i>	Site visit & discussion	Tea Break	Site visit & discussion	Lunch Break	Group exercise & discussion	Tea Break	Group exercise & discussion
Day 6 <i>[Brain storming on urban design exercise]</i>	Group exercise & discussion	Tea Break	Group exercise & discussion	Lunch Break	Group exercise & discussion	Tea Break	Group exercise & discussion
Day 7 <i>[Presentation & evaluation]</i>	Group presentation & discussion	Tea Break	Group presentation & discussion	Lunch Break	Group presentation & discussion	Tea Break	Evaluation, Post Test and Closing

सत्र योजना

सत्र योजना

मोडुल: अर्वन डिजाइन (Urban Design)

सत्र: १

समय: ९० मिनेट

विषय: शुभारम्भ, परिचय, उद्देश्य, अपेक्षा सङ्कलन, समूह मान्यता, प्रशिक्षण पूर्व जानकारी

साधारण उद्देश्य: यस सत्रको अन्तमा सहभागीहरू प्रशिक्षणको उद्देश्यबारे प्रष्ठहुनेछन्।

निर्दिष्ट उद्देश्य: सत्रको अन्तमा सहभागीहरू

- एक आपसमा परिचित हुनेछन्।
- प्रशिक्षण अवधिमा छलफल गरिने मुख्य विषयवस्तुको वारेमा जानकारी पाउनेछन्।
- विषयवस्तु वारेमा पूर्व जानकारीको अवस्था उपलब्ध हुनेछ।

सत्रका मुख्य विषयवस्तु:

- प्रशिक्षणको शुभारम्भ
- प्रशिक्षणको उद्देश्य
- परिचय
- अपेक्षा सङ्कलन
- प्रशिक्षणका विषयवस्तु, आधारभूत नियम, जिम्मेवारी आदि
- प्रशिक्षण पूर्व जानकारी

प्रशिक्षण – सिकार्ड क्रियाकलाप	अवधि	प्रशिक्षण – सिकार्ड सामग्री	कैफियत
क्रियाकलाप १ शुभारम्भ <ul style="list-style-type: none"> सहभागीहरु र अतिथिहरुको उपस्थितिसंगै राष्ट्रियगानका लागि अनुरोध गर्नुहोस् । स्वागतसहित कार्यक्रमको उद्देश्यबारे प्रकाश पार्नुहोस् । प्रमुख अतिथिबाट व्यानर पढी कार्यक्रमको औपचारिक शुभारम्भ गर्नुहोस् । अतिथिहरुबाट कार्यक्रमको सफलताको शुभकामना मन्तव्यका लागि अनुरोध गर्नुहोस् । कार्यक्रमको अध्यक्षबाट शुभारम्भ मन्तव्यसहित सत्र विसर्जनका लागि अनुरोध गर्नुहोस् । 	२५ मिनेट	मेटाकार्ड, व्यानर,	अतिथिहरु र अतिथिहरुको मन्तव्य व्यवस्थापन अवश्यकता अनुसार गर्नुहोस् ।
क्रियाकलाप २ परिचय <ul style="list-style-type: none"> सबै सहभागी, सहजकर्ता (प्रशिक्षक) र अन्य उपस्थित व्यक्तिहरुलाई आफ्नो नाम, ठेगाना, पद, संक्षिप्त कार्य अनुभवसहित आफ्नो परिचय दिन लगाउनुहोस् । 	१५ मिनेट		
क्रियाकलाप ३ अपेक्षा सङ्कलन <ul style="list-style-type: none"> सहभागीहरुलाई प्रशिक्षणबाट गरिएको अपेक्षालाई मेटाकार्डमा लेख्न लगाउनुहोस् । मेटाकार्डहरुलाई एक एक गरी पढ्दै ब्राउन पेपर वा बोर्डमा टाँस्नुहोस् । आएका अपेक्षालाई एकै किसिमका आसय भएका कार्डलाई एकै ठाँउमा राख्नुहोस् । प्रशिक्षणको विषयवस्तु र सहभागीको अपेक्षा मिलान गर्नुहोस् । सहभागीहरुबाट आएका अपेक्षाहरु के कति हदसम्म यस प्रशिक्षणले सम्बोधन गर्न सक्छ भन्ने प्रष्ट पार्नुहोस् । 	१५ मिनेट	मेटाकार्ड, मार्कर, पुस पिन, खु स्टीक, मास्किङ टेप, ब्राउन पेपर	यदि सहभागीबाट विषयवस्तु भन्दा भिन्न अपेक्षाकार्ड आएमा अलग राख्नुहोस् ।
क्रियाकलाप ४ विषयवस्तुको जानकारी <ul style="list-style-type: none"> सहभागीहरुले ल्याएका अपेक्षाहरुलाई मिलान गर्दै प्रशिक्षणमा छलफल गरिने विषयवस्तुहरु जानकारी गराउनुहोस् । 	५ मिनेट	ब्राउन पेपर, मार्कर, न्यूज़प्रिन्ट पेपर	

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
<p>क्रियाकलाप ५ समुह मान्यता, जिम्मेवारी आदि</p> <ul style="list-style-type: none"> प्रशिक्षण प्रभावकारीताको लागि हरेक दिनको प्रशिक्षण अवधिमा समूह मान्यतालाई सहभागीहरुसंग छलफल गरी न्यूज प्रिन्टमा लेख, डिपालना गर्न लगाउनुहोस् । आवश्यकता परेमा विभिन्न जिम्मेवारी बाँडफाँड (रिपोर्टिङ, समय व्यवस्थापक, मनोरञ्जनकर्ता आदि) गराउनुहोस् । 	५ मिनेट	ब्राउन पेपर, मार्कर, न्यूजप्रिन्ट पेपर, पावरप्वाइन्ट स्लाइड	
<p>क्रियाकलाप ६ प्रशिक्षण पूर्व जानकारी</p> <ul style="list-style-type: none"> सहभागीहरुलाई प्रशिक्षण पूर्व जानकारी फाराम वितरण गर्नुहोस् । उक्त फाराम कसरी भर्ने सबैलाई स्पष्ट पार्नुहोस् । सबै सहभागीहरुबाट फाराम संकलन गरी सकेपछि यसबाट आएको नतिजालाई हामी प्रशिक्षणको अन्तमा गरिने पश्चात जानकारीको नतिजासँग तुलना गर्नेछौं भन्नुहोस् । 	१० मिनेट	प्रशिक्षण पूर्व परीक्षण फाराम	
<p>क्रियाकलाप ७ प्रशिक्षणको साधारण उद्देश्य, निर्दिष्ट उद्देश्यहरु, प्रशिक्षण विधि र प्रशिक्षण तालिका</p> <ul style="list-style-type: none"> प्रशिक्षकले प्रशिक्षणको बारेमा फ्लीप चार्टमा तयार पारेको प्रशिक्षणको साधारण उद्देश्य, निर्दिष्ट उद्देश्यबारे बताउनुहोस् । प्रशिक्षणका विधिहरु जानकारी गराउनुहोस् । प्रशिक्षण तालिकाको जानकारी तथा तालिका वितरण गर्नुहोस् । 	१० मिनेट	ब्राउन पेपर, फ्लीप चार्ट, प्रशिक्षण तालिका	
<p>क्रियाकलाप ८ सत्र संक्षेपीकरण र अग्रसम्बन्ध</p> <ul style="list-style-type: none"> समग्र प्रशिक्षण सहभागितामूलक ढंगबाट अगाडि बढ्ने कुराको अवगत गराउनुहोस् । दोश्रो सत्र सम्बन्धी जानकारी गराउनुहोस् । 	५ मिनेट		

Sessional Plan

Module:

Session subject: Introduction of urban design and its scope

Session: 1-II

Time: 1h30 m

General objectives

The main objectives of this session is twofold:

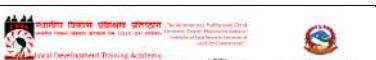
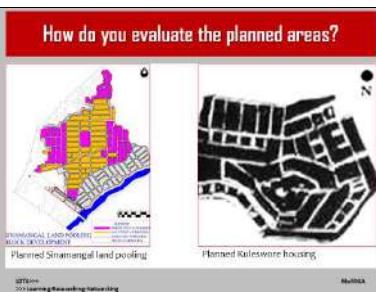
- [a] to make participants aware about new emerging subject of urban design and its scope;
- [b] to make participants understand the roles of urban designers

Specific objectives

At the end of this session, the participants will

- [a] understand the emergence of urban design profession acting as a bridge between architecture and urban planning;
- [b] comprehend the scope of urban design;
- [c] learn various elements of urban design; and
- [d] realize the future prospects of urban design in Nepal

Main contents of the session

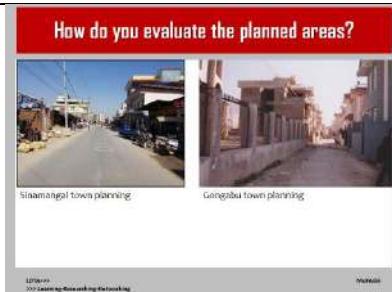
Training/teaching activities	Time duration	Teaching materials	Remarks
Activity 1: Introduction of the topic	1 min	 	Introduction, scope and elements of urban design
Activity 2: Specific objectives and expectation of learning by participants	3 min		At the end of the session, participants will [i] understand the emergence of urban design profession acting as a bridge between architecture and urban planning, [ii] comprehend the scope of urban design, [iii] learn various elements of urban design, and [d] realize the future prospects of urban design in Nepal
Activity 3: Show participants two planned areas [Sinamangal land pooled and Kuleswore housing estate] and ask them to describe	3 min		Discuss with participants views and thinking

the plans and built form

Activity 4: Show participants two other settlements [Historic core area and recently developed

haphazard area] – settlement patterns and townscape – and ask them to describe what they see in the pictures

2 min



Discuss with participants views and thinking

Activity 5: Explain various salient features of historic settlements of Kathmandu valley. Also explain them the integrated water infrastructure developed at that time for the whole town and agriculture land

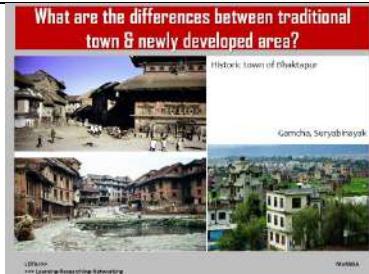
2 min



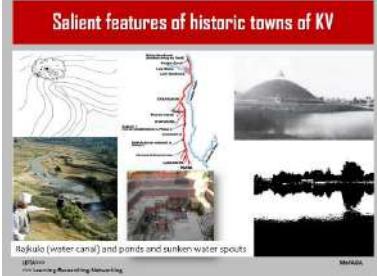
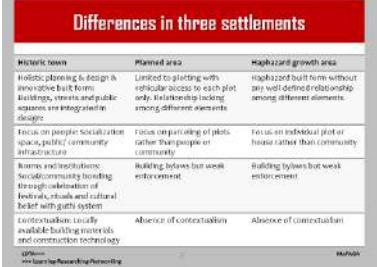
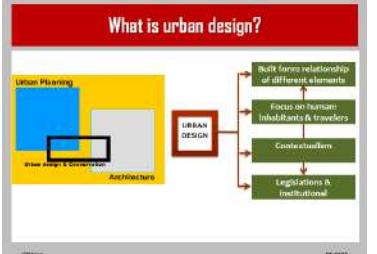
The elaboration includes [i] allocation of housing in the towns, [ii] street network and open space hierarchy, [iii] socialization space and public amenities, and [iv] various festival routes and the way of celebration. The integrated water infrastructure includes water brought from the foothills via Rajkulo, leading to big ponds to acidifiers finally feeding to sunken water spouts, used for multiple purposes

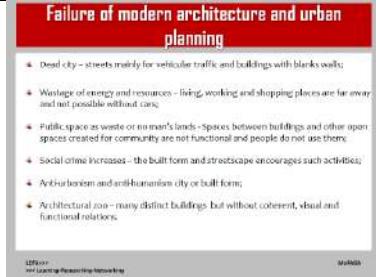
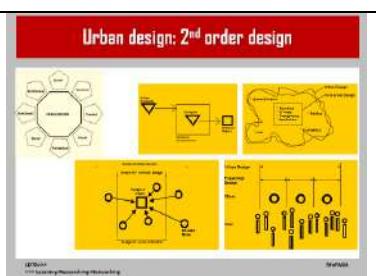
Activity 6: Summarize what participants explain about earlier plans and townscape. Also, differentiate the three different settlements in their qualities

2 min

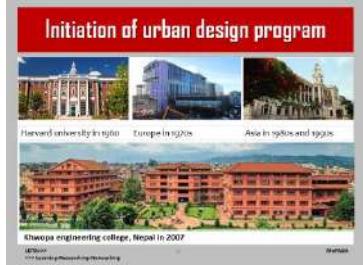


Elaborate the three different settlements [historic town, planned area and haphazard growth area] in terms of built form, community spaces and facilities, norms and institutional framework to manage them and contextualism. In the historic town, different elements such as urban blocks, street network and open space hierarchy including architecture of buildings are well integrated supporting each other. Moreover, they are contextualism – using locally available building materials and construction technology. Planned area is limited to land development with provision of vehicular access to each plot. They are not linked with the buildings and their uses in the plots. Haphazard growth area does not have all these qualities available in the historic towns. Similarly, there was well integrated water infrastructure system used for both agriculture and urban areas. However, in the

		planned and haphazard growth areas, provision of infrastructure is on incremental basis without any planning.
Activity 7: After sensitizing the participants mind, define the urban design and its important features	2 min	 <p>Based on earlier elaboration, it will be easy to define urban design as a profession bridging urban planning and architecture. It focuses on built form (relationship between different elements of the settlements), human components and considers contextualism. It also requires legislation and institutional framework to enforce planning and design rules and regulations by individuals and community.</p>
Activity 8: Show the two slides of modern buildings and town planning as well as parking lots and vehicular movement and ask participants what they understand from the pictures	2 min	 <p>Failure of modern urban planning is due to multiple reasons: segregation of land use, public spaces occupied by vehicular movement and parking thereby increasing crimes in the cities, wastage of petrol and time for long commuting whereas modern architecture has failed due to considering architecture as designers' fantasy without linking to the past, site and surrounding context and above all needs of inhabitants.</p>
Activity 9: link the participants view with multiple reasons of failure of modern architecture and urban planning	2 min	 <p>As a result, the new cities planned as per modern planning and architecture have characteristics of dead city, wastage of energy and resources, public spaces as no man's land, increase in social crime, anti-humanism built form and architectural zoon.</p>
Activity 10: Show the slides with multiple definition of urban design	2 min	 <p>As urban design deals with built form, the product of socio-economic, political and cultural dimensions, it has multiple definition: designing cities without designing buildings, second order design, creating design/ decision framework for other professions [architects, engineers, municipal engineers, etc.]. It focuses on human components and is research and analytical based</p>

Activity 11: Show the slide of initiation of urban design program and its spread in global level	2 min		Urban design program was first started at Harvard university in USA in 1960s and subsequently many universities in Europe started offering the program during 1970s. However, it was only in 1980's and early 1990s' urban design study was started in Asia. In Nepal, this program [urban design and conservation] was started at Khwopa Engineering College from 2007 and the only institute offering this program in Nepal
Activity 12: Show the slide elaborating scope of urban design	2 min		In fact, urban design profession lies in between urban planning and architecture. Planning basically focuses on resource allocation and policy basis whereas urban designers deals with housing, new towns, CBD, urban renewal, conservation, development control, streetscape, signage and so on at building, urban block, neighborhood, community and city levels. It facilitates many designers [creating products] for coordinated overall design framework.
Activity 13: show the slide describing relationship of urban design with architecture and urban planning	2 min		Urban design's domain is mainly public with clients single or multiples, working at local, urban and city levels. It relies on urban design guidelines and incentive mechanism for creating enabling environment for individuals and communities for creating a desirable environment
Activity 14: Show the slides of scale of urban design	2 min		Urban design can be applied at variety of scales: site, block, centre, district, cities, metropolis as well as street, corridor, landscape, signage, etc. It basically operates at three scales: the region [city and town], neighborhood [district and corridor] and the blocks [streets and buildings]
Activity 15: Show the slides describing elements of urban design	2 min		Broadly speaking, urban design deals with three elements: building level, public amenities and infrastructure and town and city design. Its elements also include building, public spaces, streetscape, landscaping and transportation.

Activity 16: Show the slides of urban design projects with variety of scale and elements 2 min



Urban design projects includes new town development along the waterfront on reclaimed land, public space creation along the water's edges and pedestrian friendly district. It also includes renewal by converting highway into greenery parks, development of public park and greenery over the streets extending towards surrounding building complexes, conversion of local areas between the buildings into a public spaces with street furniture

Activity 17: Show the slides indicating future prospects of urban design in Nepal 2 min



Future prospects of urban design in Nepal is enormous. There are 293 municipalities and they need efficient settlements. The future scope is of three types:
Conservation of historic settlements,
provision/improvement of public amenities and infrastructure and new area development through land pooling or other means.

Activity 18: Take home message from the session 2 min

Aspect	Architecture	Urban design	Urban planning
Focus	Individual building/ structure	Public space and community facilities	Land use and transportation
Domain	Private	Public	Public
Client	Single	Single/Multiple	Multiple
Scale	Local site/building specific	Local or urbanicity level	Urban/regional level
Volume	3D	3D	2D
Development control	Building code/ act, bylaws, etc.	Urban design guidelines	Planning laws, zoning, etc.
Implementation	Private sector	Public/private partnership	Public sector

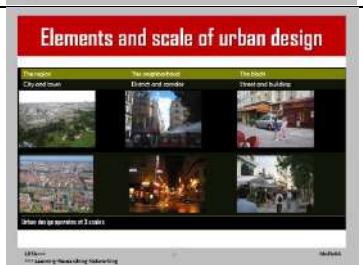
Historic settlements in Nepal are well designed compared to recent planned areas or haphazardly growth areas. It is a new profession emerged to link urban planning and architecture. Its works at various scale ranging from building to the whole city design. Its elements include cities, towns, districts, neighborhoods, streets, public spaces and buildings. The prospects of urban design is very high in Nepal.

2 min



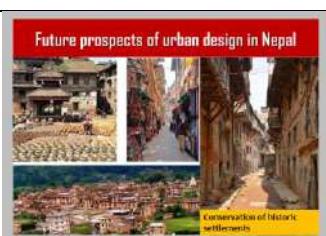
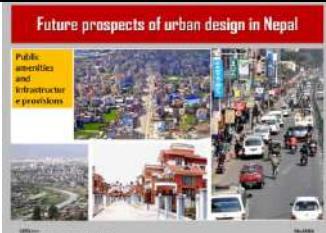
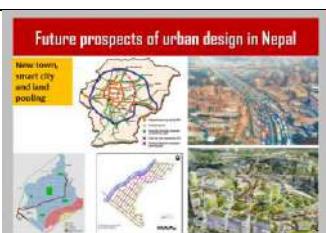
Urban design can be applied at variety of scales. In terms of areas, it can be site, block, centre, district or neighborhood, cities or metropolis. Similarly, in linear systems, it has street, corridor and other natural system.

2 min



Broadly speaking, urban design operates at three different scales: city and town in the region, district and corridor in the neighborhood and streets and buildings in the blocks.

2 min	 <p>Elements of urban design</p> <p>This diagram lists ten elements of urban design, grouped into five main categories. The first five are icons: Building (a house), Transportation (a car), Public space (a person in a park), Landscaping (a tree), and Streetscape (a street lamp). Below these are five labels: PATH, NODE, LANDMARK, EDGE, and DISTRICT, each accompanied by a small icon.</p>	<p>Urban design is basically dealing with building, public spaces, streetscape, transportation, landscaping. According to Kevin Lynch, it has five distinct elements: path, node, landmark, edge and district.</p>
2 min	 <p>Urban design projects</p> <p>The image displays two examples of urban design projects. On the left, a night view of a city skyline with fireworks exploding over it. On the right, a daytime view of a modern city waterfront with a bridge and buildings.</p>	<p>Urban design projects comprise of development of larger area focusing built form, street network and open spaces, skyline and land use activities. Numerous waterfront development projects are urban design activities with creation of amenities and facilities for general public.</p>
2 min	 <p>Urban design projects</p> <p>The image shows two maps. The top map is titled 'PEDESTRIAN FRIENDLY DISTRICT' and features a grid-like urban plan with various buildings and green spaces. The bottom map is titled 'MADRID' and shows a larger-scale map of the city of Madrid with its major roads and landmarks.</p>	<p>Urban design projects always give priority to pedestrian network and walkability and hence create pedestrian friendly activities such as continuous network for walkability, public spaces and accessibility, visual, physical and psychological connection to those spaces and so on.</p>
2 min	 <p>Urban design projects</p> <p>The image provides two aerial perspectives of urban design. The left side shows a highway with a red circular sign, while the right side shows a large green park with modern buildings integrated into its design.</p>	<p>Urban design projects also include improvement of transportation network and creation of public greenery spaces in the existing cities. Many cities in the developed countries have remodeled the earlier transportation network that separates the settlements are now redeveloped by creating underground highway and developing greenery on the highway at grade level. Similarly, huge parks have been developed to link various office and commercial spaces around the major roads by lifting the parks above the highways.</p>

2 min		<p>Similarly, many cities have dedicated their vehicular streets for pedestrian and walkability at least one day in the months (or week) by stopping vehicular movement completely. People do enjoy the streets for socialization, playing and other activities. In other cases, the footpaths have been made pedestrian friendly by adding various amenities.</p>
2 min		<p>Urban design approach is required in conservation of historic settlements in Kathmandu valley as well as outside the valley in Nepal through identification of heritage values to be conserved and modern amenities and facilities required for present day life.</p>
2 min		<p>Public amenities and infrastructure provision in the existing cities or municipalities is possible through urban design techniques by developing guidelines and incentive mechanism. Mobility and traffic jams can be addressed by intervening on land use density and transportation modality including converting urban streets into pedestrian friendly.</p>
2 min		<p>Urban design technique is also essential in development of new towns, smart city and land pooling process in Nepal. For instance, the land pooled area needs to be integrated with surrounding areas in terms of land use, density and connectivity. Formation of urban blocks, street network and location of public spaces should be finalized first before developing the individual plots.</p>
Activity 31: questions answers time	<p>30 min</p> 	<p>Participants can be further educated through discussion over question-answer session, as they might have many queries after listening the lecture.</p>

Sessional Plan

Module:

Session subject: **Livable/smart city design and its major components**

Day-session: 1-III

Time: 1h 30m

General objectives

The main objectives of this session is twofold:

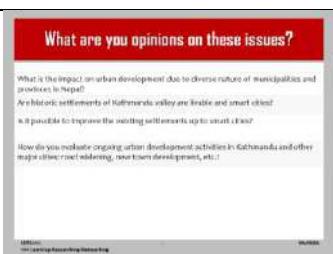
- [a] to learn various features of a smart and livable city; and
- [b] to check if the historic towns of Kathmandu valley qualify for smart and livable city or now.

Specific objectives

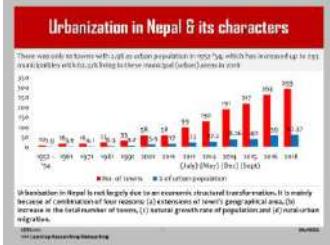
At the end of this session, the participants will

- [a] understand the diverse nature of municipalities (and province) of Nepal;
- [b] learn about various principles of urbanism, livable cities and smart cities including their components and to relate them to the historic towns of Kathmandu valley; and
- [c] know the possibility of converting existing cities, towns and settlements into livable and smart

Main contents of the session

Training/teaching activities	Time duration	Teaching materials	Remarks
Activity 1: Introduction of the topic	2 min	 <p>P: +977 (0)-9503004-5223651 F: +977(1)-9523521 E: lita.org.np@gmail.com W: www.lita.org.nr <small>LITA Local Initiatives for Technical Assistance</small></p>	Elaborate the session topic: livable/smart city design and its major components
Activity 2: Specific objectives and expectation of learning by participants	2 min	 <p>At the end of this session, participants will: [a] understand the diverse nature of municipalities (and province) in Nepal; [b] learn about various principles of urbanism, livable cities and smart cities including their components and relates them to the historic towns of Kathmandu valley; [c] Possibility of converting existing cities, towns and settlements into livable and smart</p>	The specific objectives of this session are to understand the diverse nature of municipalities (and province) in Nepal in terms of area, density and capacity, to learn about various principles of urbanism, livable towns and smart cities including their components and to review the historic towns of Kathmandu valley and to explore possibility of converting existing towns and cities into smart one.
Activity 3: Ask participants at least three different questions	3 min	 <p>What is the impact on urban development due to diverse nature of municipalities and provinces in Nepal? Are historic settlements of Kathmandu valley are livable and smart ones? Is it possible to improve the existing settlements up to smart ones? How do you judge ongoing urban development activities in Kathmandu and other major cities (most widening, new town development, etc.)?</p>	Participants will be asked for their views on some issues: [a] what is the impact on urban development due to diverse nature of municipalities and province in Nepal? [b] are historic settlements of Kathmandu valley livable and smart? [c] is it possible to improve the existing settlements up to smart ones?

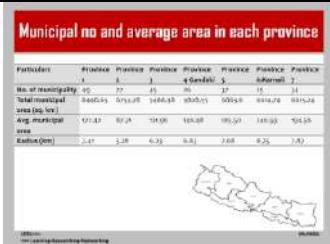
2 min



Urbanization in Nepal is not largely due to an economic structural transformation but mainly because of political decision of increasing number of municipalities by extending town's geographical areas.

There was only 10 towns with 2.9% urban population in 1954 which was increased up to 293 municipalities with 62.37% of total population living in the municipalities by 2018.

2 min



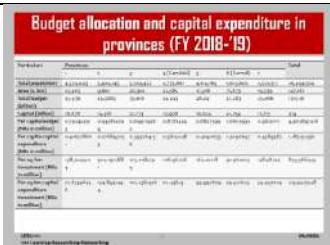
Provinces in Nepal have diverse characters. Province 2 houses 77 number of municipalities whereas Province 6 (Karnali) has only 25 number of municipalities. However, in terms of total municipal areas, this province has 6014.74 sq. km, comparable to that of province 2 with 6753.78 sq. km.

2 min



Also, municipalities even in the same province have great variations in terms of population, area coverage and density. For instance, Biratnagar is the largest city in terms of population (214,663) and density (2787.83 per/sq. km) in province 1 whereas Madi municipality has only 14,470 population and Solo Dudhkunda municipality has just 38.62 persons/sq. km of area in the same province. Similarly, the Thuli Bheri municipality of Province 6 (Karnali) has only 19.86 per/sq. km of area, compared to 975,453 per/sq. km of area in Kathmandu metropolitan city. Such variations will have multiple implications in provision of infrastructure, their cost and utility charges to be paid by citizens.

2 min



Due to diverse nature of population, density and area coverage by municipalities in different provinces, the per capita investment and per sq. km. expenditure have also been found a great variation. For instance, per capita expenditure as per budget allocated in provinces in fiscal year 2018-'19 reveals that Karnali province has NRs. 1.30 million expenditure per capita compared to NRs. 0.27 million in Province 2. Similarly, per sq. km investment of NRs. 37.97 million was the lowest figure and of NRs. 304.19 million in Province 2 was the highest figure.

2 min



The concept of new urbanism and green urbanism has emerged during 1980s and it has focused on past successful model: walkable blocks and streets, mixed use and accessible public spaces, all human scale design. There are at least ten principles of new urbanism: walkability, connectivity, mixed use and diversity, mixed housing, quality architecture and urban design, traditional neighborhood structure, increased density, green transportation, sustainability and quality of life. Similarly, green urbanism can be achieved through consideration of energy and materials, socio-cultural features, water and biodiversity and urban planning and transport.

2 min



During the 1990s the concept of livable city has also emerged with the aspects similar to new and green urbanism. It is based on five fundamental aspects: robust and complete neighborhoods, accessibility and sustainability mobility, a diverse and resilient local economy, vibrant public spaces and affordability. Well designed and compact city is desirable which allows people to walk to school and work, to stores, parks and restaurants along with access to good sanitation, water, clean air, safer and affordable housing and healthy foods.

2 min



Other study shows 5 Es of livable cities: economic competitiveness, environmental sustainability and resilience, equity and inclusiveness, enablers and engagement.

2 min



With development and advancement of science, technology and telecommunication, the concept of smart cities has emerged around 2000s. It has six founding principles: smart economy, smart environment, smart government, smart living, smart mobility and smart people. It is a resilient city too, that is technological enabled, connected and agile to address 21st century environmental, social and economic challenges.

2 min



In addition to six dimension of smart city, there are about 28 characteristics. Smart economy includes economic growth and value creation, innovative economic growth, equitable wealth distribution and entrepreneurship whereas smart living comprises of safety and security, low carbon lifestyle, housing quality, educational quality, health conditions and cultural facilities.

2 min



Smart cities require walkability, connectivity and mixed uses. About 10 min walk is considered acceptable. Street networks should connected different hierarchy of streets: boulevards, streets and alleys. Mixture of residential, retail and office within neighborhood is desirable whereas diversity of people promotes safer neighborhood: mixture of single family and multi family dwelling units.

2 min



Smart transportation system requires intermodal transportation with priority on pedestrians in the city areas. Investment on pedestrian network, cycle lane, public transport and the least priority on private vehicles are expected. And redesign of the existing street network is also required to make them smart.

2 min

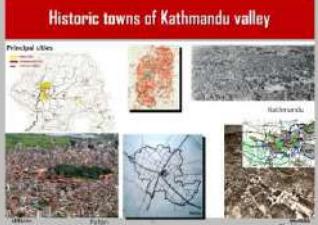


Many cities in developing countries have used dedicated bus lanes as smart mobility, which discourages use of private vehicles. Such practice has been successfully carried out in many cities in Philippines, Indonesia and many south American cities.

2 min



Many existing cities have modified the earlier transportation network and converted the huge space occupied by vehicles into public gardens as the case in Boston, USA. Similarly, encroachment of river system in the recent past for construction of flyover and road network in South Korean has been revived by dismantling the flyover and other structure built over the river and developing river edges with greenery and pedestrian network.

2 min	<p>Urban mobility: dismantling of fly over</p> 	<p>Numerous flyover and huge transportation network built in Seoul during 10th Asian Games in 1986 have created new set of urban problems but failed to contain traffic jams. As a result, many of those flyovers were dismantled by 2002 when the South Korea along with Japan organized the World Cup.</p>
2 min	<p>Conversion of vehicular paths into plazas</p> 	<p>Numerous street junctions and traffic islands including river edges have been converted into greenery, all dedicated to pedestrians in Seoul. Such activities have been possible due to development of mass transit system, improvement of public transport and decentralization of business activities from congested areas into peripheral zones. However, in Nepal we have been widening the road network without improving public transport system, reduction of density and regulation of land use and so on.</p>
2 min	<p>Pedestrianisation and cycling</p> 	<p>Many vehicular streets in various cities in different countries have been converted into pedestrian friendly street through formation of dedicated cycle lane, widening of footpaths, greenery and plantation and so on, which have shown positive results in terms of pollution reduction, local business improvement and above all reduction of crime rates due to increased number of pedestrians outside the buildings.</p>
2 min	<p>Remodeling of streets & transportation mode</p> 	<p>Many cities in Europe and East Asian countries have remodeled their street network and transportation mode emphasizing cycling and use of public transport to maintain social distance during covid pandemic.</p>
2 min	<p>Green public open spaces</p> 	<p>Many cities have developed diverse type of greenery public open spaces to cater various age groups. Such public places have been created along the roadside, between two housing complexes or in the vicinity of commercial and office complexes.</p>
2 min	<p>Historic towns of Kathmandu valley</p> 	<p>Historic towns of Kathmandu valley developed during Lichhavi and malla period have numerous features of today's smart cities. Those towns are of three types: principle cities of Kathmandu, Patan and Bhaktapur, four peripheral towns (that also have listed into the world</p>

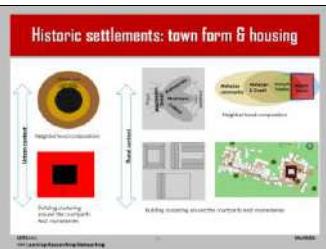
heritage site by UNESCO) that have been enlisted into the world heritage tentative list and the remaining rural ‘newari’ settlements.

2 min



Those towns have smart living. The settlements were placed on elevated land (tar), not useful for agriculture. They have homogenous town with heterogeneous people living in harmony. The centre location is always either palace or major temple, surrounded by high caste people and subsequently living by other caste people. The town growth was limited by keeping ‘astramatrika’ at eight peripheral areas.

2 min



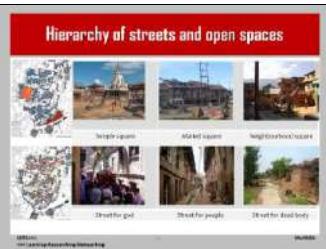
The town form is always compact and housing location is determined by position of palace or major temple. For instance, the settlement of Chovar in Kirtipur was developed around Adinath Temple with Shakyas and Tuladhar living next to the temple, and Maharjan and Goopali community and following them further away from the temple. The courtyard type of housing helps to achieve high density and forms a safe community spaces enclosed by houses.

2 min



As the town economy was based on agriculture in the past, it was essential to have continuous supply of water. For that, they have developed innovative water infrastructure system called ‘rajkulo’, a canal brought from the mountain foothill to the town centre. This system has two functions: irrigating agriculture land in the rural areas and providing continuous water supply through sunken stone spouts, which were supported by aquifers and huge ponds as storage of water.

2 min



The streets and open spaces have three hierarchy as per their locations and functions. Major open spaces are located around palaces known as ‘Durbar square,’ whereas market squares are located along the junction of major streets and ‘residential courtyards’ within neighborhood quarters are the third typology of open space. Similarly, streets have three types: major festival route for gods, other streets for human and streets along the peripheral of the towns basically dedicated for death or funeral procession.

2 min	<p>Historic settlements: way of socialization</p> <p>Sources as a cheap and reliable source of livelihood UMLC UNESCO World Heritage Site Bhaktapur</p>	<p>The public spaces just around the houses were used for socialization: washing cloths, doing carpenters and drying off vegetables and grains. Similarly, streets are not only for movements of goods and people but they are also stage for watching various festivals and rituals, which ultimately bonds communities of different caste (professions) living in different locations.</p>
2 min	<p>Historic settlements: environmental sustainability</p> <p>UMLC UNESCO World Heritage Site Bhaktapur</p>	<p>Those historic towns used to be environmentally sustainable too. Most of the waste produced were of bio-degradable and used in the agriculture field. During festivals, people generally used locally made plates of leaves for eating. The kitchen waste in some houses were collected in a small pit digged just below the stair on the ground floor.</p>
2 min	<p>Historic settlements: agriculture by-products</p> <p>UMLC UNESCO World Heritage Site Bhaktapur</p>	<p>Building materials and utensils used for daily lives were often made from agriculture product. For instance, sun dried brick with mud mortar for walls and woods for flooring and roof covered by thatched all are naturally available. Moreover, they also used utensils for storing foods, water and other daily purposes made from mud and threads, which can be easily managed. Cow dung with straw were prepared in circular shape and dried off in the sun to burn for cooking.</p>
2 min	<p>Historic settlements: architecture</p> <p>Unifying elements: Dominating sloped roof Brick exposed vertical facade Horizontal band separating floors Decorative wooden windows</p> <p>UMLC UNESCO World Heritage Site Bhaktapur</p>	<p>Similar living style and economic base of the town, use of locally available materials and limitation of construction technology all have led to formation of an architecture having unifying elements: dominating sloped roof, brick exposed vertical façade, horizontal band between floors and decorative wooden doors and windows.</p>
2 min	<p>Historic settlements: Maintenance of infrastructure & individual behaviour</p> <p>Traditional practices Community participation Large infrastructures & structures Religious belief & spiritual values</p> <p>Traditional practices Community participation Large infrastructures & structures Religious belief & spiritual values</p> <p>UMLC UNESCO World Heritage Site Bhaktapur</p>	<p>Maintenance of public monuments and infrastructure in the past were maintained and operated through social institute known as ‘guthi system’ and through celebration of festivals. Religious belief and spiritual values also helped to keep infrastructure clean and safe. Many annual festival celebrated through community participation have components of maintenance and operation. For instance, Sithinakha festival is celebrated in the dry season of June-July by cleaning water bodies,</p>

canals and drainages thereby ensuring smooth function of water infrastructure even during hot and dry seasons.

Similarly, ‘Pahacharhe’ festival is also celebrated before the summer by cleaning courtyards and waste dumping sites and those wastes are directly taken to the agriculture field. It has double functions: cleaning the public spaces and environment in the residential neighborhoods and at the same time adding compost fertilizers in the field before cultivation.

2 min



However, rapid urbanization and haphazard urban growth, concentration of business, administrative, political and social and emergency facilities and adaptation of centralized policy by successive governments in the past has resulted in rapid transformation of the traditional towns and society with creation of multiple problems, which are yet to be resolved. Earlier public spaces have been converted into parking lots, rivers systems into sewer lines and traffic congestion thereby creating environmental pollutions has become daily phenomenon.

2 min



Municipalities in Nepal have diverse characters in terms of area, population, density, topography and capacity and hence they present a diverse nature of challenges in urban development. New urbanism, livable settlements and smart cities have many commonalities: All of them are based on the concept of sustainable development, which includes the concept of affordability, diverse housing and job, efficient transportation system and municipal services, environment and ecological conservation. For all people, communities and individuals should also be smart.

25 min



Any question, elaboration and explanation?

Sessional Plan

Module:

Day-session: 1-
IV

Session subject: **Development control, planning norms and building bye-laws**

Time: 1h 30m

General objectives

The main objectives of this session is twofold:

- [a] to learn about overall concept of development control; and
- [b] to understand the prevailing planning norms and standards as well as building bye laws in Nepal and their limitations.

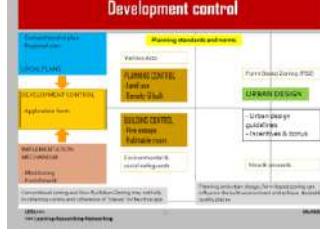
Specific objectives

At the end of this session, the participants will

- [a] understand the overall concept of development control in regulating urban growth of cities;
- [b] learn about planning norms and standards practiced in Nepal; and
- [c] comprehend the prevailing building bye-laws and its various clauses including emerging issues in building construction and planning regulations.

Main contents of the session

Training/teaching activities	Time duration	Teaching materials	Remarks
Activity 1: Introduction of the topic	2 min	 	This session basically deals with development control, planning norms and standards and building bye-laws. It will cover both national cases and international experiences.
Activity 2: Specific objectives and expectation of learning by participants	2 min		At the end of this session, the participants will understand the overall concept of development control in regulating urban growth of cities, learn about planning norms and standards practiced in Nepal and comprehend the prevailing building bye-laws and its various clauses including emerging issues in building construction and planning regulations.
Activity 3: Ask participants at least three different questions	5 min		Ask the participants views on various issues: what type of planning and building regulations are known to them? Municipalities in Nepal have facilities, amenities and infrastructure provisions as per planning norms and standards? Why ordinary people generally do not follow building bye laws especially in big cities? And is there another way to regulate building construction and urban growth in Nepal/

<p>5 min</p>  <p>The diagram illustrates the concept of development control. It defines it as a planned scheme for development of land and buildings and any material change in the use of existing buildings or land. The objectives include regulating the growth and development, character, fabric and personality of a city through regulations and guidelines aiming to achieve public health and safety, convenience, economic growth and provision of efficient amenities and facilities. Components listed are Development plans, Development control, Development regulations, and Development standards.</p>	<p>The concept of development control is to regulate use and form of development as per planned scheme for development of land and buildings and any material change in the use of existing buildings or land. It forms an integral part of the planning practice. It intends to regulate the growth and development, character, fabric and personality of a city through regulations and guidelines aiming to achieve public health and safety, convenience, economic growth and provision of efficient amenities and facilities.</p>
<p>2 min</p>  <p>The diagram illustrates the concept of development control. It defines it as a plan explaining the objectives and how future developments have to be achieved in relation to the major developing areas for various activities and building densities within the city. Components include Master plans, detailed development plans, Land use, usage of buildings, ground coverage, FAR, set backs, open spaces, height, set back, open space, height and number of story, parking requirement etc. for various developments related and other regulations like Town Planning Legislation and the principal building rules are the main instruments by which schemes can be controlled and development control regulations can be enforced.</p>	<p>Development control often comprises of development plans that explains the objectives and how future developments are to be achieved. It also includes a set of planning and building regulations aiming to guide the city in a planned and orderly manner. Development control has basic elements of master plans (zonal plans and detailed development plans), land use and building use, ground coverage, FAR, set back, open space, height and number of story, parking requirement etc. for various developments on land and for various categories of buildings.</p>
<p>2 min</p>  <p>The diagram illustrates the concept of development control. It shows the relationship between Development Control, Planning and Building bye laws, and Urban design. Development Control is influenced by Objectives, Policies, and Applicable Norms, which lead to Master Plan and Monitoring mechanism. This leads to the implementation of PLANNING CONTROL (Land use, Density, Width) and BUILDING CONTROL (Fire safety, Structural strength, Environmental & sustainability). These controls are guided by Form Based Zoning (FBZ) and Urban design guidelines, incentives & Incentives. Finally, Monitoring and enforcement, Training and capacity building, and Research and innovation are the outcomes.</p>	<p>Development controls basically rely on planning regulations and building bye laws, both are legal documents and their various clauses are mandatory for all (individual and institutions). Construction works are monitored and defaulters are punished. Local plans and infrastructure provisions are carried out based on planning standards and norms, besides contextual study of the city. However, these mandatory regulations are static and can not address the dynamic nature of society, city and fast changing of lifestyle and city economy. Hence, instead of relying on those mandatory rules, urban design guidelines are often prepared to address the site context and present day needs. Though they are not mandatory, they are prepared under the consensus of participating stakeholders and in many cases, they are linked with incentive mechanism to encourage individuals to follow design guidelines. For newly developed areas such as waterfront areas, land pooled area or special zoning areas such as world heritage zone, form based zoning is often used on site and context</p>

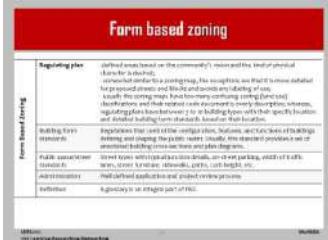
<p>2 min</p> <p>Components of zoning ordinances</p> <p>The diagram illustrates the components of zoning ordinances. It starts with a 'Zoning Map' which defines 'Zoning districts' and 'Boundaries'. This leads to the 'Components of zoning ordinances' table:</p> <table border="1"> <thead> <tr> <th>Section</th> <th>Description</th> <th>Example</th> </tr> </thead> <tbody> <tr> <td>Zoning maps</td> <td>Shows zoning district boundaries on a map.</td> <td>Separate residential or pocket maps.</td> </tr> <tr> <td>Definitions</td> <td>Describes terms used in the zoning ordinance.</td> <td>Building units, urban area, lot, etc.</td> </tr> <tr> <td>General provisions</td> <td>Describes operational rules and procedures applicable to the zoning ordinance.</td> <td>This includes authority, application of zoning ordinance, establishment of zoning districts, name of zoning commission, etc.</td> </tr> <tr> <td>Zoning district regulations</td> <td>All zoning district and overlay district regulations, rules, including those for buildings, structures, trees, etc.</td> <td>Prescribed and conditionally permitted uses in agricultural, residential, commercial, industrial, institutional, and other zones.</td> </tr> <tr> <td>Special development districts</td> <td>Specific development standards applicable to localities and districts.</td> <td>Lighting, advertising signs and structures, noise, landscaping, recycling facilities, food establishments, etc.</td> </tr> <tr> <td>Administrative and enforcement</td> <td>Individual requirements for all administrative and enforcement processes.</td> <td>Site plan review, construction review, zoning permit applications, zoning hearing, illegal occupancy, enforcement, due process, and penalties.</td> </tr> <tr> <td>Penalties</td> <td>Describes the penalties for non-compliance with zoning regulations.</td> <td>Monetary fines, imprisonment, injunctions, etc.</td> </tr> </tbody> </table> <p><small>Source: Land Use Planning Handbook</small></p>	Section	Description	Example	Zoning maps	Shows zoning district boundaries on a map.	Separate residential or pocket maps.	Definitions	Describes terms used in the zoning ordinance.	Building units, urban area, lot, etc.	General provisions	Describes operational rules and procedures applicable to the zoning ordinance.	This includes authority, application of zoning ordinance, establishment of zoning districts, name of zoning commission, etc.	Zoning district regulations	All zoning district and overlay district regulations, rules, including those for buildings, structures, trees, etc.	Prescribed and conditionally permitted uses in agricultural, residential, commercial, industrial, institutional, and other zones.	Special development districts	Specific development standards applicable to localities and districts.	Lighting, advertising signs and structures, noise, landscaping, recycling facilities, food establishments, etc.	Administrative and enforcement	Individual requirements for all administrative and enforcement processes.	Site plan review, construction review, zoning permit applications, zoning hearing, illegal occupancy, enforcement, due process, and penalties.	Penalties	Describes the penalties for non-compliance with zoning regulations.	Monetary fines, imprisonment, injunctions, etc.	<p>basis only. Such techniques will help to achieve the best desirable options, which is not possible through traditional zoning and bye laws.</p> <p>Zoning is the major component of development control. It comprises of zoning maps (with boundary of each zoning), general provisions, development standards and administration and enforcement process including penalties for defaulters.</p>
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<p>2 min</p> <p>Conceptual framework for preparing FBZ</p> <p>The diagram illustrates the conceptual framework for preparing Form Based Zoning (FBZ). It starts with 'Existing condition and inventory', followed by 'Public visioning and characters', and finally 'Basic zoning and overlays'.</p> <p>Existing condition and inventory</p> <ul style="list-style-type: none"> - Land use - Existing use of land - Building conditions, analysis and inventory - Height restrictions, perimeter setbacks, and set back requirements - Public spaces - Infrastructure - Natural resources - Existing zoning and overlays <p>Public visioning and characters</p> <ul style="list-style-type: none"> - Desired form - Desired character - Desired building types - Desired building height - Desired building density - Desired architectural character (clustering or linkage principles, etc.) - Desired open space - Desired site circulation <p>Basic zoning and overlays</p> <ul style="list-style-type: none"> - Determine specific lots for regulation - District, transect, streets or special zones - Overlay zones <p><small>Source: Land Use Planning Handbook</small></p>	<p>Euclidean (traditional) zoning system emphasizes regulation by use, within limited use or single use zoning district and disconnects between land use and urban form and design with one size fits all standards. Such zoning ordinances have proven to be limited in their ability to regulate physical design in the context of socio-economic changes. Zoning ordinances have generally use of residential, commercial, industrial and agriculture; intensity of use, FAR, height restriction, placement of building, actual size and volume of the buildings, set back between buildings, provision of adequate light and air, landscaping and signage, etc.</p> <p>Conceptual framework for form based zoning (FBZ) consists of analysis of existing condition and inventory, public visioning and characters, determining of appropriate spatial basis for regulation (district, transect, streets or special zones) and so on.</p>																								
<p>2 min</p> <p>Non-Euclidean zoning techniques</p> <p>The diagram illustrates four non-Euclidean zoning techniques: Inclusionary zoning, Transfer development right (TDR), Cluster zoning, and Performance zoning.</p> <table border="1"> <thead> <tr> <th>Zoning type</th> <th>Advantages</th> <th>Disadvantages</th> </tr> </thead> <tbody> <tr> <td>Inclusionary zoning</td> <td>Provides certain percentage of affordable housing for low and moderate income groups.</td> <td>Sometimes the housing isn't affordable to buyers.</td> </tr> <tr> <td>TDR</td> <td>Helps in preserving open spaces, historical areas, wetlands, and other environmental sensitive areas while allowing higher density development in other areas.</td> <td>Dividing the areas with prescribed higher density might be difficult.</td> </tr> <tr> <td>Cluster zoning</td> <td>Provides open spaces by concentrating development with high density in certain part of the area.</td> <td>Might create blighting development.</td> </tr> <tr> <td>Performance zoning</td> <td>Allows the impact of development on environment and site performance to determine the density and other characteristics above baseline than on exclusive zoning following development standards.</td> <td>The calculations of performance estimates could be confusing and difficult to comprehend.</td> </tr> </tbody> </table> <p><small>Source: Land Use Planning Handbook</small></p>	Zoning type	Advantages	Disadvantages	Inclusionary zoning	Provides certain percentage of affordable housing for low and moderate income groups.	Sometimes the housing isn't affordable to buyers.	TDR	Helps in preserving open spaces, historical areas, wetlands, and other environmental sensitive areas while allowing higher density development in other areas.	Dividing the areas with prescribed higher density might be difficult.	Cluster zoning	Provides open spaces by concentrating development with high density in certain part of the area.	Might create blighting development.	Performance zoning	Allows the impact of development on environment and site performance to determine the density and other characteristics above baseline than on exclusive zoning following development standards.	The calculations of performance estimates could be confusing and difficult to comprehend.	<p>Non-Euclidean zoning techniques have multiple advantages over traditional zoning. It has inclusionary zoning with provision of certain percentage of affordable housing for low and moderate income groups. It helps preservation of open space, historical areas, wetlands and environmental sensitive areas through TDR (transfer development right), besides provisions of clusters zoning and performance zoning.</p>									
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2 min



Form based zoning is an emerging concept. It regulates the form of the built environment, creates a predictable through city/country regulations. It uses simple and clear graphic prescriptions and parameters for height, sitting and building elements. It is used to create a more compact, pedestrian oriented and mixed-use style of development with a range of housing options.

2 min



Form based zoning also comprises of regulation plan, building form standards, public space or street standards, administration and definition of various terminology.

2 min



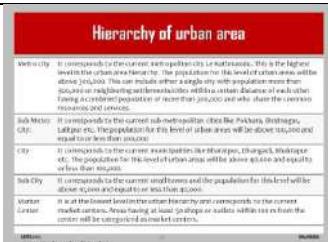
In traditional zoning system, the municipality is divided into various zoning areas and each area will have various clauses of building bye laws. Hence, it is rigid and those building regulations can not address the site context and special needs. Unlike in Euclidean zoning, non-Euclidean zoning has flexibility in pattern of development even in a same zone and relies on various bonus/incentive zoning, planned development unit (PDU), transfer of development rights (TDR) and so on. The traditional zoning basically focuses on land use, setbacks, density and building height whereas the non-Euclidean zoning also emphasizes on architecture and built environment, streetscape, building foot prints and so on.

2 min



Form based zoning intends to regulate building envelope in order to get natural light and ventilation in the streets and open spaces, to regulate streetscape and town character. This is not the case in Euclidean zoning system primarily focusing on land use, FAR, density and building height.

2 min



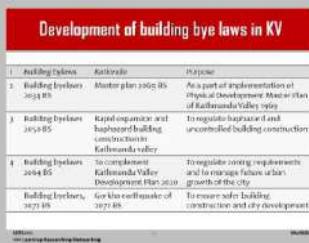
Urban areas in Nepal has been grouped into five different category: metro city, sub-metro city, city/municipality, sub-city and market entre.

2 min



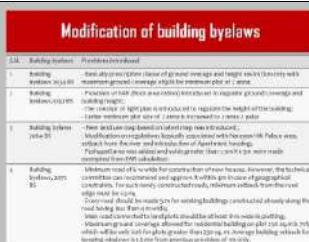
For infrastructure norms and standards for Market Centre (above 50 shops), the road will be collector street and local streets with ROW 14m and 10m respectively. At least 1m setback is required and the footpath can be of 2m wide, if possible can have 1.5m wide cycle track in collector road. Such norms and standards have also been given for other infrastructures: physical, social and economic.

2 min



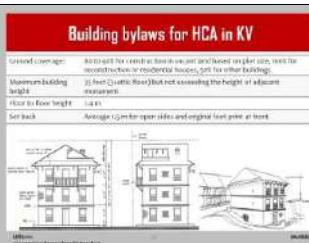
Building bye laws in the Kathmandu valley were formulated around 2034BS as a part of implementation of Physical Development Master Plan of Kathmandu Valley 1969. It was revised in 2050 aiming to regulate rapid urbanization and haphazard urban growth. Again, KVDA prepared building byelaws for municipalities and emerging towns within Kathmandu valley in 2064BS and many municipalities of the valley at present have refined this regulation to prepare each municipal's own. After the earthquake I 2015, the Ministry of Urban Development came up with a general building regulations in 2072 BS especially for those newly established municipalities.

2 min

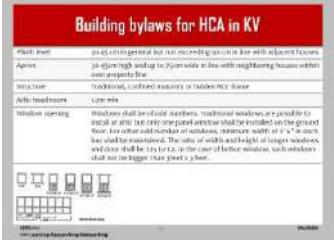
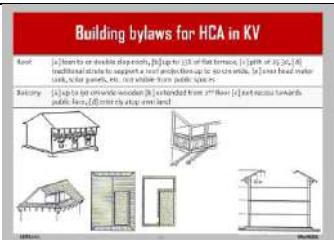
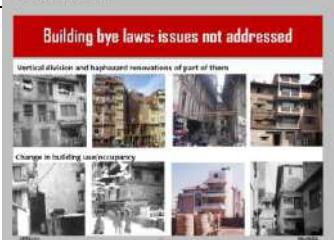
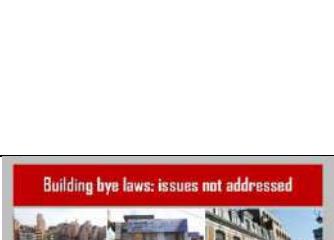


The building bye laws of 2034 basically had prescriptive clauses of ground coverage and building height restriction with maximum ground coverage of 90% for minimum plot of 2 anna. However, provision of FAR along with the concept of light plan was introduced in 2050 BS bye laws. The 2064 BS bye laws added areas like Pashupati area, Narayan Hiti palace area by restriction construction around these settlements. The building bye laws of 2072 BS has minimum road width of 6m with setback of 1.5m and other provision targeting earthquake safety of the buildings.

2 min



In the revision of this bye laws in 2073, additional clauses under 14 have added targeting historic settlements of the Kathmandu valley. It has minimum conditions required for declaring any settlements as heritage settlements. As per this regulation, the allowed floor to floor height is 2.4m and maximum height of 35 feet including roof coverage.

2 min	 <p>Building bylaws for HCA in KV</p> <p>Roof: [x] Roofs to be sloped steeply, [x] 25% or [x] flat terrace, [x] 10' pitch or [x] 20' rise. Traditional struts to support a roof projection up to 90 cm wide. [x] no fixed water tank, solar panels, etc., must be visible from public spaces.</p> <p>Balcony: [x] up to 60 cm wide; window [x] extended from 2nd floor [x] part recess towards street. [x] no cluttered clutter.</p> <p>Anti-headroom: [x] 2' 6".</p> <p>Window opening: Windows shall be of odd numbers, traditional windows are allowed to install at all, but only one panel window shall be installed on the ground floor. For other windows of residential structures width of 2' 6" or more, the height of the window shall be 3' 0" to 3' 6" in the case of lattice window, and closer shall be 3' 0" to 3' 6" in the case of lattice window such windows shall not be bigger than 3' X 3'.</p>	<p>This regulation requires 30-45cm height of plinth level with minimum attic head room of 1.2m. The structure can be either traditional, confined masonry or hidden RCC frame structure. Windows shall be of odd numbers and shall have minimum width of 2' 6". In case of lattice window, it can not be bigger than 3' X 3'.</p>
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4 min	 <p>Building bye laws: issues not addressed</p> <p>Vertical division and haphazard renovations of part of them:</p> <p>Change in building use/occupancy:</p>	<p>There are numerous urban activities going and the prevailing building bye laws simply fail to address them. For instance, haphazard vertical division of traditional houses and then renovation of part of them by creating new door and window openings by dismantling part of load bearing walls, addition of RCC floor on load bearing brick in mud mortar masonry walls, etc, are a common phenomenon. They are responsible for increasing earthquake vulnerability, but the prevailing regulations cannot address such issues. In addition to these, the ordinary residential houses are being converted into schools, nursing homes and training institutes (mass gathering activities) without assessing their structural capabilities.</p>
4 min	 <p>Building bye laws: issues not addressed</p> <p>Vertical division and haphazard renovations of part of them:</p> <p>Change in building use/occupancy:</p>	<p>Important cultural spaces (bahal and bahis) have been converted into parking lot and local club buildings are built on the bahal space, all carried out by local club and the concerned municipalities. In other cases, commercial sign boards have almost covered the front façade of houses. The municipality is mainly concerned in collecting taxes rather than regulating such signage.</p>
4 min	 <p>Weak enforcement of building bylaws</p>	<p>The weak enforcement of building regulations is clearly seen from construction of high rise structures even in the historic core areas. It is believed that more than 90% of the buildings in urban Kathmandu do not follow the prevailing building regulations. Such transformation is seen not only in increased building floors (and hence density) but has also been found in use</p>

also from residential use to mixed used with commercial activities in the lower flowers and residential in the upper part of the buildings.

2 min

Weaknesses of the building bylaws	
Planning regulations:	Building bylaws:
Lack of master development plan	What to achieve is not known
Planning and building norms are combined into a building bylaw	Building code controls change in building use
	No control over vertical addition and high-speed renovations and reconstruction
Not clear what sort of urban form/density to achieve	No control over urban signage control
UDI is missing	Missing guidelines on building materials, construction technology and colouring
The concept of LBU is far away	

Weaknesses on planning regulations include lack of master plan, not following planning norms and standards while extending infrastructure. The prevailing building regulations have inadequate clauses to regulate change in building occupancy, urban signage and haphazard vertical division and renovation and reconstruction of them. The concept of urban design and form based zoning is missing in the development control of Nepal. It is not clear what sort of built form is intended from the prevailing building bye laws.

30 min

- Take home message
 - Development control prepared in legal as well as it is not related with master plan and intended built form
 - Population requirement is different to become a municipality is different for towns, mountain and hilly regions but the planning standards and norms have sense for all these regions
 - The concept of form-based zoning and urban and architectural design guidelines are advised
 - The prevailing building byelaws have numerous weaknesses and general people have violated many clauses whereas these concerned rules and regulations have been found weak in administrative control and punishing the defaulters

Development control prepared in Nepal is weak as it is not related to master plan and intended built form. Planning norms and standards shall be different for Tarai, Mountain and Hilly region municipalities. The concept of rom based zoning and urban and architectural design guidelines are missing in Nepal. These tools can better address the emerging numerous activities that the prevailing building bye laws simply fail to deal with.

2 min

Any Questions?					
Direktor	Cafe	Banks No.	Tourism Reich	Auto	Zoozoo
buchstabe	abzählen	steuer	Diktatoren	geordnet-mitglied	agiert
neurotische	anwärter	steuer	ausrichten	ausrichten	Thema pr.
Reich	arbeiten	steuer	ausrichten	ausrichten	tack si ayekat
Obrigada	merktigたとう	ausrichten	ausrichten	ausrichten	fahrlässigkeit
Shukrly	mange takt	ausrichten	ausrichten	ausrichten	ausrichten
takk	Onzie	ausrichten	ausrichten	ausrichten	ausrichten
Ergonomie	diky	ausrichten	ausrichten	ausrichten	ausrichten
arren	Musiker-prinzip	ausrichten	ausrichten	ausrichten	ausrichten

Any question, comment and suggestion?

Sessional Plan

Module:

Session subject: **Successful urban design projects: international case studies**

Day-session: 2-I

Time: 1h 30m

General objectives

The main objectives of this session is twofold:

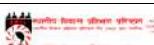
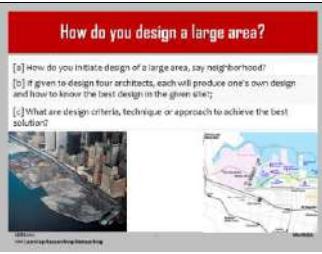
- [a] to learn urban design approach adopted in waterfront development especially in preparation of master layout plan, development control and implementation technique; and
- [b] to check the applicability of lessons learned from international best practices to Nepalese context in urban development at municipal level.

Specific objectives

At the end of this session, the participants will

- [a] understand the changing role and value of water body in urban planning and design;
- [b] learn about urban design approach, technique and strategy in waterfront development particularly in preparing master layout plan, development control and implementation; and
- [c] comprehend lessons learned from international best practices in the context of Nepal.

Main contents of the session

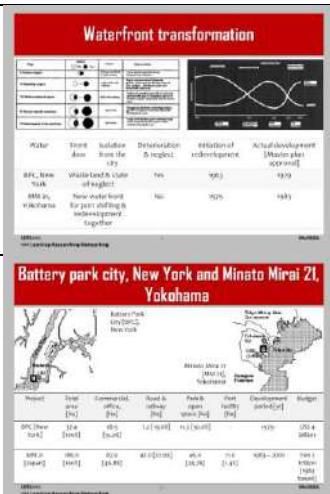
Training/teaching activities	Time duration	Teaching materials	Remarks
Activity 1: Introduction of the topic	1 min	 Successful urban design projects international case studies Session 2-1 <small>If >>> +977 (1) - 9522004 - 9522051 F >>> +977 (1) - 9521521 E >>> luta.org.np@gmail.com Www >>> www.luta.org.np</small>	This session basically deals with successful urban design projects implemented in abroad, at least taking two cases.
Activity 2: Specific objectives and expectation of learning by participants	1 min		At the end of this session, the participants will understand the value of water body in the present context, will learn about urban design approach, technique and strategy in planning and designing waterfront areas, and will check the possibility of applying various lessons learned in the context of Nepal.
Activity 3: Ask participants at least three different questions	3 min		Participants will be asked to share their views on the following specific issues: (a) How do you initiate design of a large area, say residential neighborhoods? (b) how to find out the best design among various design option for the same site and same requirement? and (c) what are design approach, criteria, technique to achieve the best solution?

2 min



Waterfront has been transformed due to multiple reasons. Waterfront redevelopment in many countries were delayed due to political debate over controlling waterfront development. With globalization of economy and labor, corporatization of cities, foreign direct invest provision all have transformed many industrial areas into a vibrant and lively areas. The earlier role and value of water body limited to transportation use has also been transformed. At present, waterfront has visual and aesthetic value, emotional and psychological values and real estate and recreation values, all used for public enjoyment, identity and economic development.

2 min



Two international case studies of waterfront development namely Battery Park City (BPC) in New York and Minato Mirai 21 (MM 21) in Yokohama, initiated in 1963 and in 1979 respectively.

2 min



2 min



2 min



2 min



In the case of MM21 too, there were also broad planning and design principles: a 24 house international cultural city, a 21st century information city and a humanistic city rich in water, greenery and historic relics.

1 min



It intended to create a lively town through development of superior urban infrastructure, urban activities, advance technology and so son, besides developing a network of water and greenery, open spaces and pedestrian ways.

3 min



Multiple master plans were prepared for BPC by different agencies to control over the land. Each architect prepared the master layout plan, which was different from each other in terms of land use activities, street network and open spaces locations including layout of buildings. None of them had acknowledge the site context, existence of water body and surrounding existing areas. The master layout plan on the right side was approved in 1969. It proposed three office towers at the lower end of the site and they were connected through sky bridges at different levels. All the proposed seven pods were internally connected through climate controlled system with horizontal and vertical internal circulation system. Such utopian design was very much appreciated at that time and was also published in numerous architectural journals. In the case of MM21, the earlier layout plan was revised with increased land area and the shorelines were designed considering the whole Tokyo Bay Area.

2 min



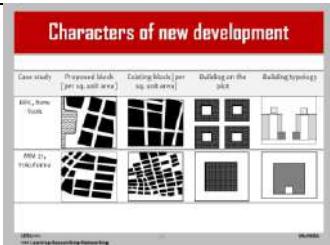
The proposed site in both cases were developed through land reclamation. These two coastal cities have long history of land reclamactions. Their patterns were different: extension of road network and hence the urban block by filling up the water body between different finger piers in New York and continuation of water canal and development of island for industrial uses. The urban blocks are different in the reclaimed land due to different land use.

2 min



Only one apartment building was built as per 1969 master plan at BPC. Even after 10 years of approval of master plan, none of the real estate company had shown interest in participating the construction as per 1969 master plan due to multiple reasons: global oil crisis of 1976, rigid nature of master plan requiring construction of whole seven pods, new typology of development, New York was not familiar, and no developers took risk, conflict between mayor and governor of New York. Later, a team of urban designers were hired to prepare another master plan. The team adopted urban design approach by emphasizing contextual study of the site, history of development of New York and focusing human rather than buildings. Urban blocks at BPC were formed by extending the significant road network of adjacent areas into the waterfront, with many of them ending as a cul-de-sac towards the water's edge. In the case of MM 21, two major road network linking the surrounding areas were significant. However, the internal road network especially pedestrian paths were planned to lead them towards the water's edges, all dedicated for public uses, greenery parks and promenades. As the newly developed areas mainly comprises of office and institutional uses, the proposed urban blocks are much greater than the surrounding residential fabrics.

2 min



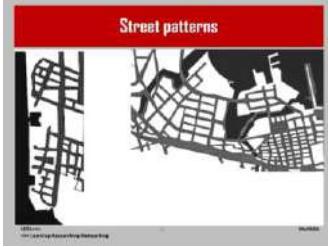
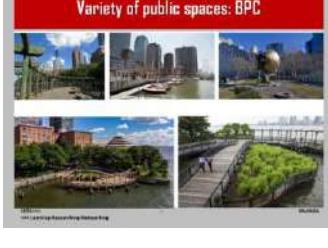
An analysis of proposed urban block with blocks of the existing surround areas reveals that urban blocks at BPC have similar characters in terms of size and shape. However, in the case of MM 21, the proposed blocks are much bigger than the surrounding ones. Also, apartment buildings are placed around the courtyard with alignment of building lines with the streets at BPC whereas most of the building are kept at the centre with sufficient setback around the buildings at MM 21.

2 min

A table comparing the new development with adjacent areas for BPC and MM 21. It includes columns for Item, BPC [New York], and MM 21 [Yokohama]. The table highlights significant differences in land area, number of blocks, and street junctions.

Item	BPC [New York]	MM 21 [Yokohama]
Site area [ha]	37.4	186
No. of urban blocks	27	39
Building on the plot [Area ratio, Min. Max.]	8.7% - 100%	100%
No. of urban block (proposed/existing) per sq. unit area	72 [proposed] 3 [existing/containing areas]	81 [proposed] 59 [existing/containing areas]
No. of building on a block (proposed/existing)	279 117%	117%
No. of block with direct water view	61	53
No. of street junctions	45	47
No. of existing courtyard	0	4
No. of non-contiguous street	2	3

Comparision of BPC and MM21 reveals many things. In terms of area, BPC has 37.4 ha of land compared to 186 ha of land of MM 21. There is only 27 blocks and 40 street junctions at BPC against 39 urban blocks and 47 street junctions of MM 21. Eight existing streets have been continued

		to the newly developed area at BPC against only four street continuation at MM 21.
2 min		Street network at BPC has numerous characters: mostly continued from the existing areas and leading towards the water's edge with cul-de-sac formation. To encourage pedestrian movement, street network at MM 21 has also emphasized straight pedestrian paths leading to water's edges. The major vehicular road near the water's edge has been kept underground to avoid pedestrian and vehicular traffic conflict.
1 min		The placement of buildings on the plots has defined the street character and streetscape. Building facades on both sides of the street is clearly visible at BPC whereas the wider footpath with continuous plantation with building façade at the background is the case at MM 21.
1 min		Numerous streets at MM21 are designed for pedestrian friendly with plantation, non-slippery stone pavement and street furniture.
1 min		Both BPC and MM21 have diverse type of public open spaces. Those public open spaces comprises of waterfront promenades, greenery parks, hard landscape areas and so on.
1 min		BPC has created diverse type of public spaces along its water's edge: hard landscape in front of office complexes, greenery park in front of northern residential neighborhood and public spaces with stones, wooden bridges extended to water and trees at the southern neighborhood.
1 min		Similar types of combination of plazas and greenery parks including waterfront promenades are planned at MM 21 too. Public plazas are created around the vicinity of commercial and office complexes whereas greenery parks and promenades along the water's edges.

1 min		Such public spaces have also been equipped with various facilities such as fun park, museum and industrial era red houses conserved for public usage.
1 min		Greenery of BPC is not limited within the parks and promenades, but they have also been extended along the street network linking various activities.
1 min		One can find extensive usages of such public open spaces by various age groups at different time period during working days as well as in holidays.
1 min		Similar type of huge open spaces with greenery and pavement can also be found at MM 21 and are being used for multiple activities by diverse age group as well as visitors.
1 min		Waterfront promenades at BPC are designed and detailed out connecting spaces at various levels so that people using those spaces do not disturb each other especially the visual aesthetic of water body. Those public spaces along the water's edges are also well connected with public spaces and greenery placed at various locations including the street network.
1 min		One can see variety of spaces even along the waterfront promenades: some covered by trees and others open to sky. These spaces have also been equipped with street furniture and street lamps for using them at night.
1 min		Compared to BPC, waterfront promenades at MM 21 are less equipped with street furniture, as the local regulation prohibit use of furniture or any other obstruction along the pathway of pedestrians.

1 min	<p>Public art and sculpture: BPC</p> 	<p>Public spaces at BPC are decorated with different public arts, all of them designed by famous local artists. Many of such arts can also be used by visitors such as covered and open pavilions, iron stairways and so on. This was a new dimension of planning during late 1970's and early 1980s.</p>																																								
1 min	<p>Public art and sculpture: MM 21</p> 	<p>Public art and sculpture can also be seen at MM 21, adding value of public spaces. These public arts have reinforced the history and tradition of the place and Yokohama city as a whole.</p>																																								
1 min	<p>Battery park city: skyline</p> 	<p>Office complexes were kept adjacent to the World Trade Centre so that the infrastructure could be shared. Also, building along the water's edge was kept low rise with gradual increasing the building height once proceeds away from the water's edge.</p>																																								
1 min	<p>MM 21: skyline</p> 	<p>In case of MM 21 too, low rise office building was kept at the water's edge with gradual increasing the building height, away from the water's edge. The roof of the three office buildings symbolizes the water's wave. The hotel at the water's edge is of boat shape whereas the Landmark building is a multiplex, the tallest building in Japan.</p>																																								
1 min	<p>MM 21: night lighting</p> 	<p>Lighting has also been designed for major buildings and public spaces so that the beauty of the place is not diminished even at night.</p>																																								
2 min	<p>Master plan approval</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; padding-bottom: 5px;">Project</th> <th style="text-align: left; padding-bottom: 5px;">Initiation</th> <th style="text-align: left; padding-bottom: 5px;">Approval</th> <th style="text-align: left; padding-bottom: 5px;">Timeline</th> <th style="text-align: left; padding-bottom: 5px;">No. of approvals issued</th> </tr> </thead> <tbody> <tr> <td style="text-align: left; padding-bottom: 5px;">BPC, New York</td> <td style="text-align: left; padding-bottom: 5px;">Public sector working on development plan</td> <td style="text-align: left; padding-bottom: 5px;">competition among competing authorities</td> <td style="text-align: left; padding-bottom: 5px;">1 yr</td> <td style="text-align: left; padding-bottom: 5px;">1 (Held by P.C.)</td> </tr> <tr> <td style="text-align: left; padding-bottom: 5px;">MM 21, Yokohama and Shenzhen, Hong Kong</td> <td style="text-align: left; padding-bottom: 5px;">Comprehensive feasibility studies</td> <td style="text-align: left; padding-bottom: 5px;">political and financial support from different countries</td> <td style="text-align: left; padding-bottom: 5px;">1 yr</td> <td style="text-align: left; padding-bottom: 5px;">1 (Held by P.C.)</td> </tr> <tr> <td colspan="5" style="text-align: center; padding-top: 5px;">Comparative study of Master Plan Approval - Time taken & Agency involved</td> </tr> <tr> <td style="text-align: left; padding-bottom: 5px;">Project</td> <td style="text-align: left; padding-bottom: 5px;">Initiation</td> <td style="text-align: left; padding-bottom: 5px;">Approval</td> <td style="text-align: left; padding-bottom: 5px;">Timeline</td> <td style="text-align: left; padding-bottom: 5px;">No. of approvals issued</td> </tr> <tr> <td style="text-align: left; padding-bottom: 5px;">MM 21, Yokohama and Shenzhen, Hong Kong</td> <td style="text-align: left; padding-bottom: 5px;">Public sector working on development plan</td> <td style="text-align: left; padding-bottom: 5px;">competition among competing authorities</td> <td style="text-align: left; padding-bottom: 5px;">1 yr</td> <td style="text-align: left; padding-bottom: 5px;">1 (Held by P.C.)</td> </tr> <tr> <td style="text-align: left; padding-bottom: 5px;">MM 21, Yokohama and Shenzhen, Hong Kong</td> <td style="text-align: left; padding-bottom: 5px;">Public sector working on development plan</td> <td style="text-align: left; padding-bottom: 5px;">political and financial support from different countries</td> <td style="text-align: left; padding-bottom: 5px;">1 yr</td> <td style="text-align: left; padding-bottom: 5px;">1 (Held by P.C.)</td> </tr> <tr> <td style="text-align: left; padding-bottom: 5px;">MM 21, Yokohama and Shenzhen, Hong Kong</td> <td style="text-align: left; padding-bottom: 5px;">Public sector working on development plan</td> <td style="text-align: left; padding-bottom: 5px;">political and financial support from different countries</td> <td style="text-align: left; padding-bottom: 5px;">1 yr</td> <td style="text-align: left; padding-bottom: 5px;">1 (Held by P.C.)</td> </tr> </tbody> </table>	Project	Initiation	Approval	Timeline	No. of approvals issued	BPC, New York	Public sector working on development plan	competition among competing authorities	1 yr	1 (Held by P.C.)	MM 21, Yokohama and Shenzhen, Hong Kong	Comprehensive feasibility studies	political and financial support from different countries	1 yr	1 (Held by P.C.)	Comparative study of Master Plan Approval - Time taken & Agency involved					Project	Initiation	Approval	Timeline	No. of approvals issued	MM 21, Yokohama and Shenzhen, Hong Kong	Public sector working on development plan	competition among competing authorities	1 yr	1 (Held by P.C.)	MM 21, Yokohama and Shenzhen, Hong Kong	Public sector working on development plan	political and financial support from different countries	1 yr	1 (Held by P.C.)	MM 21, Yokohama and Shenzhen, Hong Kong	Public sector working on development plan	political and financial support from different countries	1 yr	1 (Held by P.C.)	<p>Another important aspect of urban design is the time taken for approval of master plans. It took 6.5 years for master plan approval of BPC 1969 plan, but took only 1.5 yr for approval of 1979 master layout plan. In the case of MM 21, it took only 4 year to get master plan approval. The waterfront site in New York went through various phases of controversy and confusion, whereas the waterfront development in Yokohama was supported by various previous studies.</p>
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2 min



In order to make implementation smooth at BPC, the authority and urban design team worked in collaboration with private developers by issuing RFP (request for proposal) at convenient time, based on real estate market and vacancy rate. When there was recession, the public agency used to invest in infrastructure development such as road network and drainage construction, park building and so on.

2 min



In conclusion, water is a special type of land use and it has multiple values including real estate value on waterfront development. Waterfront areas need to be integrated with water body as well as existing surrounding areas in terms of land use, road network and open spaces. New development should be based on certain planning and design principles rather than designers' personal whim. The public realm: waterfront promenades, greenery, public spaces and parks are the most important elements along with street network to be designed and regulated through formulation of urban design guidelines. Public agencies should work with private sectors and urban designers as per market condition for win-win situation.

30 min



Any question, suggestion or comment?

Sessional Plan

Module:	Day-session: 2-II
Session subject: Urban design approach in land pooling	Time: 1h30 m

General objectives

The main objectives of this session is twofold:

- [a] to make participants aware about land pooling and housing pooling;
- [b] to make participants understand their practices, strengths and weaknesses.

Specific objectives

At the end of this session, the participants will

- [a] understand the present trend of land pooling and prospects of house pooling in Nepal;
- [b] identify strengths and weaknesses in the present practices of land pooling; and
- [c] acknowledge the need of urban design approach in land pooling projects.

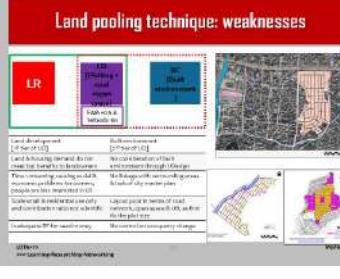
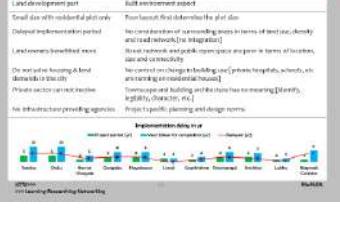
Main contents of the session

<i>Training/teaching activities</i>	<i>Time duration</i>	<i>Teaching materials</i>	<i>Remarks</i>
Activity 1: Introduction of the topic	1 min	  	Introduce the session topic and elaborate it.
Activity 2: Specific objectives and expectation of learning by participants	2 min	  	The specific objectives of land pooling is threefold: of understanding the present trend of land pooling in different parts of Nepal, of identifying strengths and weaknesses in the present practices and of acknowledging the need of urban design approach in land pooling projects.
Activity 3: Ask participants different questions on evaluation of development in the land pooled area to sensitize their brains	3 min	  	Participants are engaged into at least three different issues/questions: how land pooled areas are different from other haphazardly growth neighborhoods?, is it convenient and comfortable to live in the land pooled area and is land pooled area different from other parts of the city except in terms of vehicular access to each plot?

3 min	<p>Contextual background for land pooling</p> <ul style="list-style-type: none"> Contribution of different sectors in GDP of Nepal Urbanization trends: 2001-2011, New development: Post-earthquake reconstruction, Urban regeneration (Loktak, Kathmandu valley) Land Pooling Policy: Land pooling is a technique for public participation plus for technicalities plus for economic viability, National Urban Development Strategy 2015, National Shelter Policy, Land pooling, international development, infrastructure, planning, etc. Land Pooling: Learning Researching Networking 	<p>Land pooling practice is essential due to combination of reasons. First, the economic base of Nepal is shifting from agriculture to trade and services. Second, there is a rapid growth of major cities like Kathmandu valley in the past few decades. Third, huge mega projects like smart cities, outer ring road, international stadium construction, etc. are to be implemented through land pooling practices. Finally, this techniques can be applied into new development, post-earthquake housing reconstruction and regeneration of slums and squatter settlements.</p>																								
3 min	<p>Features of land pooling process</p> <ul style="list-style-type: none"> Land Pooling (LP) is a two tier of urban development tool: <ul style="list-style-type: none"> Land rendering Land reform Land readjustment Land regeneration Land consolidation Self financing land development technique Win-win situation for land owners and government New way of public participation and land owner friendly development model No displacement of land owners or permitting Planning tool for more efficient, cost effective and equitable land development Balance participation and sharing of land or contribution for public amenities 	<p>Land pooling popularly known as land reordering, land reform, land readjustment, land regroupment or land consolidation has multiple features. It is a two tier urban development tool with win-win situation for land owners and government. It's a new way of public participation and land owner friendly development model, as there exists no displacement or gentrification.</p>																								
3 min	<p>Land pooling technique</p> <pre> graph LR A[Planning tool for more efficient, cost effective and equitable land development] --> B[Land Pooling] B --> C[Land rendering, Land reform, Land readjustment, Land regeneration, Land consolidation] C --> D[Self financing land development technique] D --> E[Win-win situation for land owners and government] E --> F[New way of public participation and land owner friendly development model] F --> G[No displacement of land owners or permitting] G --> H[Planning tool for more efficient, cost effective and equitable land development] H --> I[Balance participation and sharing of land or contribution for public amenities] </pre>	<p>All the lands are unified into a single one for planning purposes by developing road network and open spaces along with provision of service plots for sell to recover the cost of development. After deduction of land from each land owners, the serviced plots are returned to the original land owners. Though each of them receive plot area with deduction of land (based on contribution parameters), nonetheless, their land values will be much higher than the pre-land pooling time.</p>																								
3 min	<p>Land pooling process</p> <p>A 100 acre = 100 plots Before LP: Owner A, Owner B, Owner C, Owner D, Owner E, Owner F, Owner G, Owner H, Owner I After LP: 100 plots Diagram: A map showing a 100-acre land divided into 100 plots, labeled 'Before LP' and 'After LP'. To the right is a grid plan labeled 'Land Pooling'.</p>	<p>The developed land plot will have regular shape of land along with vehicular access to each plot. Moreover, the neighborhoods will have open spaces and other amenities</p>																								
3 min	<p>Historical development of land pooling process</p> <table border="1"> <thead> <tr> <th>Phase</th> <th>Timeline</th> <th>Key Milestones</th> </tr> </thead> <tbody> <tr> <td>Learning phase (1975-1990)</td> <td>1975-1990</td> <td>Learning from other like Lumbini project, G.D., etc.</td> </tr> <tr> <td>Towns Development Act 1988</td> <td>1988</td> <td>UR projects in Kathmandu Valley and related projects (Bhaktapur, Lalitpur, etc.)</td> </tr> <tr> <td>Munimandali also started implementing L.R. projects</td> <td>1990-1991</td> <td>Munimandali also started implementing L.R. projects</td> </tr> <tr> <td>Consolidation & proliferation (1991-2002)</td> <td>1991-2002</td> <td>Detail out of implementation process</td> </tr> <tr> <td>Assessment of L.P. Act in 2002</td> <td>2002</td> <td>To reduce L.P. Act in 2002, its revised L.P. Act in 2002, new L.P. Act in 2002, new L.P. Act in 2002</td> </tr> <tr> <td>Towns Development Directorate (TDD) 2000s</td> <td>2000s</td> <td>Infrastructure provisions such as Outer Ring Road (73km), Bhairabgaon River Road (16km) & Tribhuvan Highway (10km)</td> </tr> <tr> <td>DUDC also engaged in L.P. projects</td> <td>2000s</td> <td>DUDC also engaged in L.P. projects</td> </tr> </tbody> </table>	Phase	Timeline	Key Milestones	Learning phase (1975-1990)	1975-1990	Learning from other like Lumbini project, G.D., etc.	Towns Development Act 1988	1988	UR projects in Kathmandu Valley and related projects (Bhaktapur, Lalitpur, etc.)	Munimandali also started implementing L.R. projects	1990-1991	Munimandali also started implementing L.R. projects	Consolidation & proliferation (1991-2002)	1991-2002	Detail out of implementation process	Assessment of L.P. Act in 2002	2002	To reduce L.P. Act in 2002, its revised L.P. Act in 2002, new L.P. Act in 2002, new L.P. Act in 2002	Towns Development Directorate (TDD) 2000s	2000s	Infrastructure provisions such as Outer Ring Road (73km), Bhairabgaon River Road (16km) & Tribhuvan Highway (10km)	DUDC also engaged in L.P. projects	2000s	DUDC also engaged in L.P. projects	<p>Land pooling process in Nepal can be grouped into three distinct phases. First phase (1975-1990) is basically a learning period (from site and services and guided land development program) and development of Acts such as Town Development Act 1988. The second phase (1991-2002) is consolidation and proliferation time with detailing out of implementation process as well as</p>
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implementation of number projects. In this period, municipalities have also started implementing land pooling projects. The last phase (2003 to now) is sophistication and upscale phase with amendment of TD Act in 2007 to reduce 51% of landowners' consensus from 71% and need of min. 50 landowners. The town development directives 2005 requires allocation of 10% of service land for urban poor.

<p>3 min</p>	<p>Land pooling at present can be implemented through three different ways. Its being implemented by Kathmandu valley development authority (KVDA) and municipalities. However, outside the Kathmandu valley, it is often implemented by town development committees with support from Department of urban development and building construction (DUDBC). In all cases, project management committee is formed and site office is established. Users committee is also formed.</p>
<p>3 min</p>	<p>There are numerous good aspects of land pooling process practice in Nepal. The project is self-financed with creation of public assets in the form of street and open spaces. It also upgrades the existing cadastral maps and land registration records including increase in government tax. Local people prefer to have plots developed by public agency rather than by private sector. So far about 546.52 km of road (completed and ongoing LP projects) have contributed with total of 6,297 rcp of land (road and open spaces) from LP projects.</p>
<p>3 min</p>	<p>Land pooling technique practice in Nepal has also numerous weaknesses. First, the land pooled area is not well integrated with surrounding existing areas in terms of land use and road network. Second, urban blocks are mainly developed for residential uses only with different sizes and orientation.</p>
<p>3 min</p>	<p>Street networks are developed on grid-iron pattern with street junctions inadequate for vehicular movement. The urban blocks and street patterns have failed to acknowledge the local context and features (riverfront, etc.).</p>

3 min	 <p>Land pooling technique: weaknesses</p>	<p>Land pooling in Nepal is limited to land development only with formation of regular plots with vehicular access to each plot. There is no linkage of land development with building component – use and density. The layout is carried out first by fixing the minimum plot area (2 anna 2 paisa) and width of streets (6,9 or 11m). As a result, the built form is monotonous and not different from other haphazardly growth area.</p>																														
3 min	 <p>Land pooling technique: site specific standards</p>	<p>Critical review of the past completed land pooling projects reveals that the specification – street width and open space allocation – is project specific. Many projects took longer time for completion than the earlier specified time period. As a result, the landowners had to suffer a lot. The project cost also increased unnecessarily. Land pooling implemented by local municipalities were comparatively completed with few years of delay only.</p>																														
3 min	 <p>Land pooling technique: weaknesses</p> <p>Comparison study of area coverage of through land pooling system in different countries</p> <table border="1"> <thead> <tr> <th>Country</th> <th>Area</th> <th>Year</th> <th>Land developed</th> <th>Land developed per km road</th> <th>Street width</th> </tr> </thead> <tbody> <tr> <td>Japan</td> <td>100-200</td> <td>44</td> <td>40,000 plots</td> <td>0.008 ha</td> <td>500 m</td> </tr> <tr> <td>South Korea</td> <td>100-1000</td> <td>62</td> <td>42,000 plots proposed</td> <td>0.01 ha</td> <td>24 x 4</td> </tr> <tr> <td>Nepal</td> <td>100-1000</td> <td>22</td> <td>200,000 plots proposed</td> <td>0.01 ha</td> <td>14</td> </tr> <tr> <td>India</td> <td>100-1000</td> <td>32</td> <td>100,000 plots proposed</td> <td>0.02 ha</td> <td>14</td> </tr> </tbody> </table>	Country	Area	Year	Land developed	Land developed per km road	Street width	Japan	100-200	44	40,000 plots	0.008 ha	500 m	South Korea	100-1000	62	42,000 plots proposed	0.01 ha	24 x 4	Nepal	100-1000	22	200,000 plots proposed	0.01 ha	14	India	100-1000	32	100,000 plots proposed	0.02 ha	14	<p>Compared to urban development through land pooling in other countries like Japan and South Korea, land developed in Nepal is insignificant and it is not able to fulfill the ever increasing housing demand in the cities.</p>
Country	Area	Year	Land developed	Land developed per km road	Street width																											
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3 min	 <p>Land pooling: weaknesses</p> <p>Land development part</p> <ul style="list-style-type: none"> Small size of residential plot only Large size of residential plot only Delayed implementation period Land ownership issues Private sector can not invest No infrastructure providing agencies <p>Build environment aspect</p> <ul style="list-style-type: none"> High density of buildings along the plot line Low density in terms of height, density and road network [no integration] Street network and public open space are poor in terms of location and quality Developments are building uses [private hospitals, schools, etc. are starting to construct residential houses] Transport and building and the same have no measuring [distance, height, width, etc.] Project specific planning and design norms <p>Implementation failing at</p> <ul style="list-style-type: none"> Widening road (left) Widening street (middle) Widening road (right) 	<p>Numerous weaknesses in land pooling practice in Nepal can be grouped into different aspects. Land pooling is carried out in small chunk of land with development of residential plots only. The master layout plan is poor and is guided by plot size and fixed street width. Almost all the implemented projects were delayed by many years. Only land owners were benefitted from the projects. So far, private sector is not allowed to implement the project. Also, due to absence of participation of infrastructure providing agencies, the opportunity of integrated infrastructure development is not realized.</p>																														

Many residential buildings are now being converted into schools and health centers in those planned areas at present.

3 min



3 min



3 min



3 min



30 min



Land were developed by private sector too in the past but limited to plotting only. Land pooled by public agency was much better in terms of increased land value because it had allocation of streets and open spaces. Outside the planned area, the land value is nearly half the price of planned area.

The implication of land pooling is also seen in demographic change. In case of Nayabazar land pooled area, about 64% were migrants, moved to the area from Kathmandu valley and outside. Also, many local farmers have changed their profession from agriculture to retail, workshop and other service sector. In the pooled area, there is lacking of cultural amenities like temples and cultural facilities.

At policy level, infrastructure providing agencies are required to involve in LP process. Private sector is also to be included. Also need to engage central, province and local governments in LP process by ensuring equal sharing of development gain among all participating agencies. In terms of planning and design, urban design approach is required with formation of urban and architectural design guidelines. Finally, scale of the land pooling project should be increased with mixed land use and other public amenities.

Land pooling is an opportunity to build a balanced, inclusive and disaster resilient community, besides solving problems of the surrounding areas. Urban design approach is essential in master layout plan and its scale should be increased with active participations of infrastructure providing agencies, different levels of governments and private sector.

Question answer session

Sessional Plan

Module:

Day-session: 2-

III

Session subject: **Municipal sustainable development goals, disaster risk reduction and climate change**

Time: 1h 30m

General objectives

The main objectives of this session is twofold:

[a] to explore relationship between sustainable development goals, disaster risk reduction and climate change adaptation at municipal level; and

[b] to explore DRR policies and strategic action plans at municipal level in Nepal.

Specific objectives

At the end of this session, the participants will

[a] understand the interrelationship between sustainable development goals (SDGs), disaster risk reduction (DRR) and climate change adaptation (CCA);

[b] learn about impacts of disaster and climate change on various aspects in Nepal; and

[c] comprehend the localizing SDGs, DRR and CCA at municipal level through formulation of strategic action plans, establishment of institutional set up and enacting new legislation.

Main contents of the session

Training/teaching activities	Time duration	Teaching materials	Remarks
Activity 1: Introduction of the topic	1 min	  <p>This slide includes contact information: Phone +977 91-2523004, +977 9651, Email ldtaseng@gmail.com, Website www.ldta.org.np. Logos for LDTA and the Ministry of Federal Affairs and Local Development are also present.</p>	This session basically focuses on municipal sustainable development goals, disaster risk reduction and climate change adaptation.
Activity 2: Specific objectives and expectation of learning by participants	1 min	 <p>This slide includes the following text: At the end of this session, participants will: [a] understand the interrelationship between sustainable development goals (SDGs), disaster risk reduction (DRR) and climate change adaptation (CCA); [b] learn about impacts of disasters and climate change in Nepal; and [c] comprehend the localizing SDGs, DRR and CCA at municipal level through formulation of strategic action plans, establishment of institutional set up and enacting new legislation.</p>	The participants will learn the interrelationship between sustainable development goals (SDGs), disaster risk reduction (DRR) and climate change adaptation (CCA). They will also explore about impacts of disasters ad climate change on various aspects in Nepal before localizing national SDGs, DDR and CCA policies and program at municipal level.
Activity 3: Ask participants at least three different questions	3 min	 <p>This slide includes the following text: What are the interrelationship between sustainable development goals (SDGs), disaster risk reduction (DRR) and climate change adaptation (CCA)? National plans, programs and policies for SDGs, DRR and CCA have been prepared but how do you localise them at provincial and municipal levels? How can municipality effectively play a role in implementing those plans, programs and policies?</p>	Participants will be asked to shed their views on certain issues: (a) what are the interrelationship between sustainable development goals, disaster risk reduction and climate change adaptation? (b) how to localize national plans, program and policies of SDGs, DRR and CCA at province and municipal level? And how can municipality effectively play a role in implementing those plans, programs and policies?

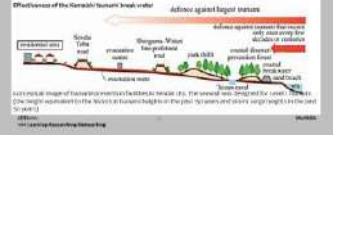
1 min	<p>The Sustainable Development Goals (SDGs) are 17 global goals adopted by the United Nations General Assembly in 2015. They are part of the 2030 Agenda for Sustainable Development. The SDGs are interconnected and aim to end poverty, protect the planet, and ensure prosperity for all.</p>	<p>United nations have developed seventeen interrelated sustainable development goals for the period of 2016-2030. Many of them have set target along with indicator to evaluate the progress and achievement.</p>
1 min	<p>A circular diagram titled "दिगो विकास लक्ष्यक ५ सम्पर्क" (5 pillars of sustainable development). It includes five segments: People, Prosperity, Planet, Partnership, and Peace.</p> <ul style="list-style-type: none"> पुरुषी व्यक्ति को जारी रखने वाला विकास का लक्ष्य है। जीवन की अचूकता वाला विकास का लक्ष्य है। सामुदायिक समर्पण का लक्ष्य है। जीवन के लिए नियमों का लक्ष्य है। भौतिक विकास का लक्ष्य है। 	<p>Sustainable development goals are based on five pillars: people, prosperity, planet, peace and partnership.</p>
2 min	<p>The Sendai Framework for Disaster Risk Reduction (2015-2030) has four priority areas:</p> <ul style="list-style-type: none"> Understand disaster risk: which requires a better understanding of risk to reduce its impacts. Build resilience and capacity for early warning: which requires an integrated and holistic approach to disaster risk reduction. Invest in disaster risk reduction to enhance development resilience: to strengthen at all levels an efficient and accountable system of disaster risk management. Substantially reduce global灾害 risk and losses in lives and livelihoods and in the delivery of basic essential services, especially in vulnerable areas, through integrated policies and actions across sectors. This will allow countries to better manage risks and reduce their exposure to hazards, identifying natural and induced hazards, assessing risks and vulnerability, and developing and applying knowledge, technologies and capacities for preparedness, prevention, mitigation and recovery. 	<p>Sendai framework of disaster risk reduction has multiple features: shifting from managing disasters to managing risk, people centred, introduction of concept of multi hazard and inclusion of natural, man-made and bio hazards. It has given four priority areas for disaster risk reduction. The national policies and strategic action plan 2018-2030 adopted by the government of Nepal has also acknowledged these four priority areas.</p>
2 min	<p>The concept of multi-hazard involves the interaction between various natural and human-made hazards. It considers how different hazards can affect each other and how they can lead to complex disaster situations. The diagram shows how one hazard can trigger another, creating a chain of events that can lead to a major disaster.</p>	<p>Risk has been assessed in multiple ways by different agencies. Risk is often considered as product of hazards, vulnerability and exposures. Climate change also modifying hazard conditions thereby impacting on socio-economic process. At the city level, capacity of individual or institutions is also added as additional dimension for assessing disaster risk. The earlier concept of looking single hazard in isolation does not work. Flooding is possible even in dry season without any rainfall. A huge earthquake can result heavy landslides thereby blocking the river system, which after few hours will burst in the form of flooding.</p>
1 min	<p>The Paris Agreement (COP 21) aims to limit global temperature increase to well below 2.0°C above pre-industrial levels, and to limit the amount of greenhouse gases emitted by human activity to the same levels that trees, soil and oceans can absorb naturally, beginning at some point between 2050 and 2100.</p> <ul style="list-style-type: none"> To keep global temperatures "well below" 2.0°C above pre-industrial times and "endeavor to limit" them even more, to 1.5°C. To limit the amount of greenhouse gases emitted by human activity to the same levels that trees, soil and oceans can absorb naturally, beginning at some point between 2050 and 2100. To reinforce each country's contribution to cutting emissions every five years as they scale up to the challenge. For rich countries to help poor countries by providing climate finance to combat climate change and switch to renewable energy. 	<p>Another important international agreement and commitment carried out during 2015 was 'Paris agreement: cop 21' aiming at keeping global temperature well below 2.0 C above pre-industrial time, aiming to limiting the amount of GHS emission by human activity to the same levels, that trees and oceans can absorb 'naturally,' beginning at some point between 2050 and 2100.</p>

1 min	<p>National development plan</p> <p>The diagram illustrates the structure of the National Development Plan. It starts with the National Development Plan, which includes Strategic Objectives such as well-being and development, sustainable development, social and economic development, and environmental protection. This leads to the Medium-term Development Plan, which includes Strategic Objectives like healthy and balanced environment, good governance, and national unity, security and dignity. The Medium-term Development Plan is further divided into Development Programmes and Development Projects.</p>	<p>The 15th national development plan (2019-2024) prepared by National Planning Commission clearly mentions the need of integration of national development plan to province level and then to municipal level. It has emphasized on well-being and decent life, healthy and balanced environment, good governance and national unity, security and dignity.</p>																														
1 min	<p>Flood & landslide 2017 damages</p> <table border="1"> <thead> <tr> <th>Sector</th> <th>Estimated Total (Rs. millions)</th> <th>Total (M)</th> </tr> </thead> <tbody> <tr> <td>Social sector [35.1%]</td> <td>21,400</td> <td>60,716.6</td> </tr> <tr> <td>Agriculture [58.3%]</td> <td>36,200</td> <td>60,716.6</td> </tr> <tr> <td>Health</td> <td>600</td> <td>60,716.6</td> </tr> <tr> <td>Education</td> <td>3,700</td> <td>60,716.6</td> </tr> <tr> <td>Infrastructure sector [6.6%]</td> <td>4,000</td> <td>60,716.6</td> </tr> <tr> <td>Industry</td> <td>1,000</td> <td>60,716.6</td> </tr> <tr> <td>Transport</td> <td>1,000</td> <td>60,716.6</td> </tr> <tr> <td>Water and sanitation</td> <td>800</td> <td>60,716.6</td> </tr> <tr> <td>Total</td> <td>60,716.6</td> <td>60,716.6</td> </tr> </tbody> </table> <p>Tornado in Bara & Parsha, March 2019</p> <p>In March 2019, there was a severe wind storm in districts of Bajura and Parbat. The storm caused significant damage to houses, trees, and infrastructure. In total, 28 people were killed and over 600 persons were injured. Most of the deaths and injuries were caused by houses being demolished by the high winds, trees falling on at least one bus, cars being blown away and by flying debris.</p>	Sector	Estimated Total (Rs. millions)	Total (M)	Social sector [35.1%]	21,400	60,716.6	Agriculture [58.3%]	36,200	60,716.6	Health	600	60,716.6	Education	3,700	60,716.6	Infrastructure sector [6.6%]	4,000	60,716.6	Industry	1,000	60,716.6	Transport	1,000	60,716.6	Water and sanitation	800	60,716.6	Total	60,716.6	60,716.6	<p>Natural disasters in the past caused extensive damages in Nepal. The flood and landslides in 2017 alone resulted in total damages of NRs 60,716.6 million, impacting on social sector (35.1%), productive sector (58.3%) and infrastructure sector (6.6%).</p>
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2 min	<p>Earthquake hazard of Nepal</p> <p>The report provides a detailed analysis of earthquake hazards in Nepal. It includes maps of the Tibetan Plateau, Indian Plate, and the Himalayan mountain range, showing active faults and seismic zones. A legend indicates the magnitude of historical earthquakes (e.g., 1934, 1950, 1955, 1968, 1985, 1991, 2015). The report also discusses the risk of major earthquakes in the future, with a focus on the central Himalayan region.</p>	<p>Similarly, the Tornado in Bara and Parsha occurred on March 2019 killed 28 people and injured over 600 persons. Most of the deaths and injuries were caused by houses being demolished by the high winds, trees falling on at least one bus, cars being blown away and by flying debris.</p>																														
2 min	<p>Priority ranking of climate change impacts in Nepal</p> <table border="1"> <thead> <tr> <th>Impacts</th> <th>Severity of Impact</th> <th>Impact of Impact</th> <th>Severity of Impact</th> <th>Severity of Impact</th> </tr> </thead> <tbody> <tr> <td>Water resources - High</td> <td>High</td> <td>Medium</td> <td>High</td> <td>High</td> </tr> <tr> <td>Hydropower</td> <td>Medium</td> <td>Low</td> <td>Medium</td> <td>High</td> </tr> <tr> <td>Agriculture</td> <td>Medium - low</td> <td>Medium - low</td> <td>Medium</td> <td>High</td> </tr> <tr> <td>Human health</td> <td>Medium</td> <td>Medium</td> <td>Medium</td> <td>Medium</td> </tr> <tr> <td>Ecosystem/biodiversity - Low</td> <td>Low</td> <td>Medium</td> <td>Medium</td> <td>High</td> </tr> </tbody> </table> <p>Key Findings:</p> <ul style="list-style-type: none"> Greater water scarcity in high mountain regions. Better water quality and availability in the middle mountain. Cause more water related diseases (Diarrhoea, typhoid, cholera). More water related diseases in the Churia/Terai region. 	Impacts	Severity of Impact	Impact of Impact	Severity of Impact	Severity of Impact	Water resources - High	High	Medium	High	High	Hydropower	Medium	Low	Medium	High	Agriculture	Medium - low	Medium - low	Medium	High	Human health	Medium	Medium	Medium	Medium	Ecosystem/biodiversity - Low	Low	Medium	Medium	High	<p>In addition to these, the whole Nepal is vulnerable to earthquake hazard due to Tibetan plate and Indian plate moving across each other. Mapping of the past occurred earthquakes in Himalaya region over the last two centuries clearly reveals that there is a huge gap of earthquake at the centre Himalayan region (west side of Kathmandu) and the scientist have warned of huge earthquake due on this region. The earthquake risk of Kathmandu valley has been further added due to its soft soils (lake in the pre-historic period), fault lines criss crossing the valley floor and numerous earthquake events occurred in the past.</p>
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Province 2 accounts 39% of total affected people in the same period.

1 min	<p>Impact of climate change on water resources</p>	<p>Flooding caused by climate change frequently occurs thereby causing huge damages in property and loss of lives in Nepal. Flooding has also been occurred in the urban centres too in the recent past.</p>
1 min	<p>Impact of climate change: landslide</p>	<p>Mountainous regions are more vulnerable than the corresponding lowlands regarding landslide. More than 60% of the total population of Nepal falls in the moderate to high vulnerability categories. Overall, lack of adaptive capacity is the biggest cause of vulnerability.</p>
1 min	<p>Climate change impact: agriculture, forest & gender</p>	<p>Impacts of climate change on agriculture, forest and gender can be observed through community's experience on shifting of vegetation patterns, reduction in production and supply of timber and non-timber forests products, creating favorable environment for pests, diseases and invasive species to emerge, spread and encroach the agriculture land, forestlands and other pasture land.</p>
1 min	<p>Climate change impact: health</p> <ul style="list-style-type: none"> Growing risk of Malaria, Kalaazar and Japanese Encephalitis outbreaks due to increased tropical and subtropical areas. Increased exposure to floods and vector-borne diseases. 	<p>The impact of climate change has also seen in health sector affecting disease pattern, food and nutrition, water source depletion and natural disaster. There is a growing risk of malaria, kalaazar and Japanese encephalitis outbreak particularly in sub-tropical and warm temperature regions of Nepal.</p>

<p>2 min</p>	<p>Plans, policies and strategies with DRR & CCA</p>	<p>Numerous plans, policies and strategies associated with DRR and CCA have not covered all types of disaster and different aspects or cycles of disaster. For instance, National policy for disaster risk reduction 2018 does not cover climate change impact on agriculture, forest and water resources. Similarly, national adaptation plan 2015 covers does not cover fire and epidemics and various disaster cycles (preparedness, response and rehabilitation).</p>
<p>2 min</p>	<p>Regulatory framework for DRR and CCA</p>	<p>Numerous Acts have been formulated after 2015 as per new construction. Disaster risk reduction and management Act 2017 covers all types of disaster and all disaster cycles covering national, provincial and local governments. National Building Code 1994 covers only earthquake and landslide hazard and fire. Environment Protection Act 2019 does not cover fire and epidemics and basically govern the federal and province governments.</p>
<p>2 min</p>	<p>Institutional framework with DRR and CCA</p>	<p>Numerous institutes have been established at federal, provincial and local levels as per newly enacted Acts. National disaster risk reduction and management authority does not deal with epidemics and does not cover climate change impacts on agriculture, forest and water resources. National council of climate change does not cover disaster associated with fire and epidemics.</p>
<p>1 min</p>	<p>Changing perception of risk & DRR</p>	<p>There is a change in perception of risk. In the past, the intention was disaster management but it is risk reduction at present. SDGs, DRR and CCA should all integrated to reduce risk and enhance resilience. Spending \$1 for prevention saves \$4-\$7 in response.</p>
<p>3 min</p>	<p>Integrating DRR and CCA at municipality</p>	<p>Integration of DRR and CCA at municipal level is essential, which can be achieved by program integration (mainstreaming), collaboration (of expertise and institutions) capacity building (skills and finance) and innovation (research and development).</p>
<p>1 min</p>	<p>Localizing national plans & policies: (SDGs, DRR & CCA)</p>	<p>National level policies and strategic action plan of DRR, SDGs and CCA have already been prepared. Some of these documents have also been scaled down to province and municipal levels. However, integrating all of them at municipal level in preparation of their annual plans and implementation is the most challenging.</p>

1 min		<p>Risk reduction requires intervention not only in construction of houses and infrastructure but it also lies on planning phase and land use allocation. For instance, to prevent from tsumani, residential use can be kept far away from the sea side with construction of evacuation centre, park, coastal disaster prevention forest, coastal break water and sand beach between residential area and the sea.</p>
1 min		<p>Sustainable development is not possible without disaster risk reduction and climate change adaptation. Integration of disaster risk mitigation components and techniques as well as climate change adaptation is essential in urban development process at municipality. National level plans, programs and policies have been prepared for SDGs, DRR and CCA, however, their localization at municipal level is yet to be carried out. Above all, adaptation of those policies and strategic action plans in daily life activities as well as in planning and selecting ward level projects is essential at municipal level.</p>
30 min		<p>Any question, suggestion or comment?</p>

Sessional Plan

Module:

Day-session: 2-
IV

Session subject: **Post-earthquake housing reconstruction in urban historic core area and rural region**

Time: 1h 30m

General objectives

The main objectives of this session is twofold:

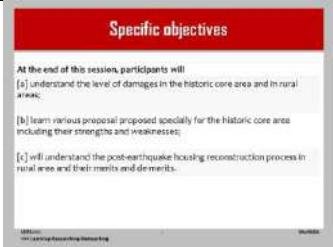
- [a] to learn about post-housing reconstruction model prosed for historic core area and rural region; and
- [b] to understand strengths and weaknesses of those models proposed for core area and rural region of Nepal.

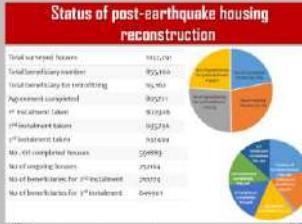
Specific objectives

At the end of this session, the participants will

- [a] understand the level of damages in the historic core area and rural region;
- [b] learn various post-housing proposal proposed specially for the historic core area including their strengths and weaknesses; and
- [c] comprehend the post-earthquake housing reconstruction process in rural area and their merits and demerits.

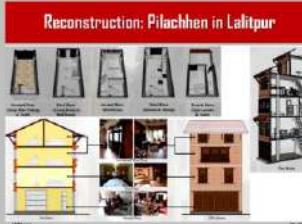
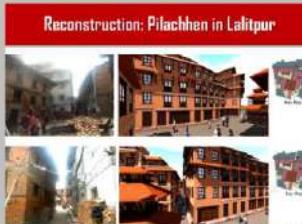
Main contents of the session

Training/teaching activities	Time duration	Teaching materials	Remarks
Activity 1: Introduction of the topic	1 min		This session focuses on post-earthquake housing reconstruction in urban historic core area and rural region of Nepal.
Activity 2: Specific objectives and expectation of learning by participants	1 min		The participants will learn many issues associated with post-earthquake housing construction in Nepal. They will be familiar with level of damages in the historic core and rural region. They also learn on various proposed post-housing construction model for the historic core area as well as in the rural regions. After critically reviewing them, the participants will be clear regarding their multiple strengths as well as weaknesses.
Activity 3: Ask participants at least three different questions	2 min		Ask participants to brainstorm on the issues: what are the important aspects to be considered in post-earthquake housing?

	2 min	<p>How post-earthquake housing differs in historic core area and rural region?</p> 	How post-earthquake housing differs in the historic core area and rural region?										
	1 min	<p>Status of post-earthquake housing reconstruction</p> 	Out of 855,160 beneficiary number (for house reconstruction), agreement was carried out with 8,05,721 persons only. Number of completed houses is 5,91,889 and ongoing houses is 7,52,174. So far, third instalment has taken by 6,32,499 persons only.										
	1 min	<p>Impact of Gorkha earthquake of 2015 in Bhaktapur municipality</p> 	In Bhaktapur municipality, the earthquake of 2105 killed 252 persons and injured another 397 person. About 33.62% housing stock completely collapsed and another 11.82% partially damaged. In terms of monuments, out of 860 monuments, 67 were completely damaged and additional 39 were partially damaged. About NRs 18.86 billion is damaged in the tourist sector.										
	1 min	<p>Study area: Jelna & Byashi – Historic core area</p> 	Jelna (ward no 2) and Byashi (ward no 10) of Bhaktapur municipality was selected for study. The study combines visual survey and structured questionnaire survey with earthquake victims: 66 households at Jelna and 42 households at Byashi. The questions include personal information, socio-economic condition, cultural setting, existing building condition, renovation works, building new houses and type of incentive preferred.										
	1 min	<p>Destruction at Jelna</p> 	The red colour houses were completely destroyed, blue coloured buildings were partially damaged and the green one sustained minor damaged. Majority of the buildings in the study area were completely collapsed.										
	1 min	<p>Destruction of Byashi</p>  <table border="1"> <thead> <tr> <th>Area, ward no. 2</th> <th>Area, ward no. 1</th> </tr> </thead> <tbody> <tr> <td>Complete collapse</td> <td>58%</td> </tr> <tr> <td>Structural damage</td> <td>20%</td> </tr> <tr> <td>Minor damage</td> <td>22%</td> </tr> <tr> <td>No damage</td> <td>2%</td> </tr> </tbody> </table>	Area, ward no. 2	Area, ward no. 1	Complete collapse	58%	Structural damage	20%	Minor damage	22%	No damage	2%	In case of Byashi too, majority of the buildings were completely collapsed. In Jelna, 56% of the study area has structures completely collapsed against 71% in Byashi area. Similarly, 29% houses got structural damage at Jelna against 20% in Byashi.
Area, ward no. 2	Area, ward no. 1												
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1 min	<p>Impacts: livelihood of victims</p> <ul style="list-style-type: none"> Losses - Income from small scale business, craft & jobs including loss of workshop and decrease in no. of visiting tourists Expenses increase for rent and basic services Difficult to switch to new profession 	Impact of earthquake has also been observed on livelihoods of the people. There has been cases of loss or decrease in income from small scale business, rent and job including loss of workshop and decrease in number of visiting tourist. Expenses increase for rent and basic services. Many farming households find it difficult to shift to other professions.						
1 min	<p>Impact: health, education & psychology</p> <table border="1"> <thead> <tr> <th>Health</th> <th>Education</th> <th>Psychology</th> </tr> </thead> <tbody> <tr> <td>Physical activity, unsanitary condition</td> <td>Drop out from school, difficult to study in a single room of temporary shelter</td> <td>Living in the damaged/vulnerable structures, no feeling unsafe Feeling unsafe forneider due to temporary support "tikki" First injury for women at the time of menstruation due to inadequate space and privacy</td> </tr> </tbody> </table>	Health	Education	Psychology	Physical activity, unsanitary condition	Drop out from school, difficult to study in a single room of temporary shelter	Living in the damaged/vulnerable structures, no feeling unsafe Feeling unsafe forneider due to temporary support "tikki" First injury for women at the time of menstruation due to inadequate space and privacy	Impact of earthquake is also seen on health, education and psychology, as the earthquake victims spent many months or year in temporary shelters, covered by CGI sheets.
Health	Education	Psychology						
Physical activity, unsanitary condition	Drop out from school, difficult to study in a single room of temporary shelter	Living in the damaged/vulnerable structures, no feeling unsafe Feeling unsafe forneider due to temporary support "tikki" First injury for women at the time of menstruation due to inadequate space and privacy						
1 min	<p>Issues & problems</p> <ul style="list-style-type: none"> Narrow lanes with inadequate light & ventilation Very elongated plots Multiple ownerships: land and houses Plot width - In front building Plot width - rear building Plot width - side building 	Numerous issues and problems associated with historic core area include narrow lanes with inadequate light and ventilation, tiny elongated plots and multiple ownerships of land and houses. In such a situation, it would be difficult to build a safer and health buildings. There are some plots having frontage less than 8 feet wide.						
2 min	<p>Issues & problems</p> <ul style="list-style-type: none"> Planning & conservation: What are the features/character to be conserved? Planning & design issue: One elongated plot only Multiple ownerships on land & houses Historical issue: Use of traditional materials and part of them supported by GND Permit issue: No rules, changes in building norms for reconstruction Applicable zonal agreement Act for new zone not activated House pooling? (2nd urban regeneration?) possible? How to make safe neighborhood? Safety infrastructural: How to achieve cost effectiveness in reconstruction? Cost of housing: How to incorporate the emerging issues (energy efficient components) and community needs and aspiration Capacity: How to incorporate the emerging issues (energy efficient components) and community needs and aspiration 	Numerous issues emerge for post-earthquake housing reconstruction process. Everybody agrees on need of conservation and townscape of historic core area but no one knows what features or characters of the core area need to be conserved. There is a doubt if fast reconstruction and cost effectiveness can be achieved in the owner driven approach focusing on individual houses construction at piecemeal process. It is not clear how to incorporate energy efficient components and integrated infrastructure development in newly reconstructed neighborhoods.						
2 min	<p>Reconstruction: Pilachhen in Lalitpur</p> <p>Location: Newari core settlement, Lalitpur, Nepal House type: Kt. Mahrjan Card of community: Agro-Ecology, wood & stone carving, Vegetable weaving Traditional architecture: Each individual house separately Traditional systems: Rain water harvesting Water use: Quota: 1000 liters per person = 300 Card or card support = 250 Volunteer support = 250 Bank financing = 300</p>	Right after the earthquake, Maya foundation, a local non-profit organization initiated Pilachhen Reconstruction and Tourism Project. The site comprises of 82 houses inhabited by mainly Maharjan community engaging in agriculture, wood and stone carving and cloth weaving. The proposed plan comprises of individual house construction with lower floor for						

guest and galleries and upper one for owners' residents. The whole construction cost has been divided into four sections: 25% cash payment, 25% cash or kind support, 25% volunteer support and remaining 25% through bank financing.

1 min	 <p>Reconstruction: Pilachhen in Lalitpur</p> <p>Various façade views have been prepared to make owners familiar about the place after reconstruction.</p>	<p>The total number of floors is three and half story with traditional character: brick expose façade with wooden door and window and some part of sloped roof.</p>
1 min	 <p>Reconstruction: Pilachhen in Lalitpur</p> <p>The proposed construction technology was RCC frame structure with proposed estimated cost of NRs 3,200 /sq. ft. of area. It is estimated that for a construction of a house would cost about NRs 50.4 lakh over 1 anna land.</p>	
1 min	 <p>Reconstruction: Pilachhen in Lalitpur</p> <p>So far, many new houses have been built at Pilachhen area of Patan. Though the newly built houses are mainly in the street side and slightly different from the earlier proposed one, nonetheless, they have followed some guidelines such as brick exposed façade, cornices between two floors and wooden door and windows.</p>	
2 min	 <p>Reconstruction: Dumbo chowk, Kilagal</p> <p>The Kathmandu metropolitan city proposed to rebuild the earthquake damaged historic core of Kilagal, Kathmandu through the concept of house pooling. The site comprises of 80 houses mostly inhabited by maharjan, gopals and dongol communities, based on agriculture and animal husbandry. The proposed design is single monolithic structure with lower floors for commercial uses and uppers spaces for owners. It is assumed that rental from lower commercial uses will cover the development cost.</p>	

1 min



The proposed building structure one single monolithic unit with RCC frame structure. It's a five story unit with shops and housing units planned around the inner courtyard. The estimated cost is about NRs. 500 million and each household will bear on an average of NRs6.8 million. It is also proposed to take government's loan of NRs250 million with an interest rate of 2% annually.

2 min



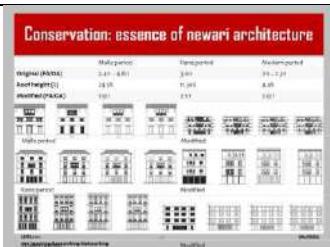
The proposed redevelopment strategy for Jelna and Byashi, two historic core areas of Bhaktapur municipality is “community-based reconstruction” approach. Safer and cost effective housing units in these neighbourhoods in the reconstruction process can be achieved through combining small plots into one single lot for space planning and building design purposes. It has multiple benefits and is a win-win situation for each households. Sharing a common staircase among multiple households result in significant increase in habitable spaces compared to individual house construction on each plot. Such increase in inner space depends on the individual plot size and shape to be combined.

2 min



While combining only two plots at “Jela,” the habitable spaces on ground floor as well as on first (and typical) floor increases by 136% (i.e., 1.36 times). This figure goes up to 171% on ground floor and 211% on each typical floor if four plots are combined into one unit for planning purpose. Similarly, about 5.7 times extra space on ground floor and 34.31% in each typical floor can be achieved at “Byasi” while combining two plots. Upon combining four plots into one unit, as better as 10.80 times on the ground floor and 41.83% extra space can be generated. In addition to these, the circulation will be comfort and convenient and the available rooms will be of better shape and size with improved natural light and ventilation.

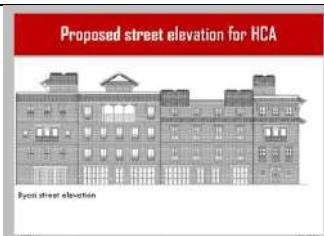
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Study of various houses built in different political periods (Malla, Rana and post Rana period) confirm that they are gradually changes in architectural design yet the unifying elements exist. Original Malla period houses in Bhaktapur have opening in the front façade less compare to

houses building in the Rana and Post-Rana period. While analysing the ratio between façade area and opening area only, it ranges from 2.4:1 to 4.8:1 for Malla period houses, which are gradually decreasing in the subsequent periods: 3:1 in Rana period houses and 2:1 to 2.3:1 in recent houses. Another special feature of houses in Malla period is dominating roof. It covers about one fourth of the total height of the houses, which is significantly decreasing in the subsequent periods. While modifying the original houses in the course of property division and addition or extension of houses, these quantitative features are not given due respect. In the renovation works on houses in Malla and Rana periods, more openings are created for better light and ventilations. Such increase in opening might also be due to division of properties

1 min



Based on these principles, a street façade design for reconstruction of houses at Byashi has also been proposed.

2 min



The proposed financial strategy is to take loan and grant from the central government in a bulk. Soft loan from the government is also to be taken. Partial support from donor agencies is also possible, as the scheme is based on conservation oriented development. It is also proposed to provide different forms of incentive for those house owners willing to build a single house by combining plots and sharing circulation space. It is expected that Bhaktapur municipality prepare urban design guidelines and facilitate the construction and building permit work.

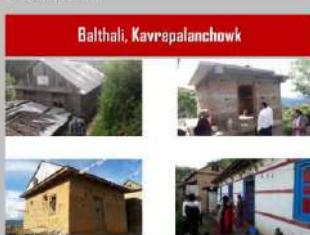
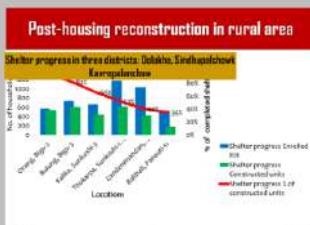
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However, this concept has not been implemented. At present, many new houses are being built in both Jelna and Byashi areas on individual plots. In some cases, the earlier original plots are divided and new houses are built in each divided part. However, one can see the differences in scale proportion, building detailing and texture of the materials between the old existing houses and newly construction along the same street façade.

Caritas Nepal, a non-government organization supported the National

Reconstruction Authority in rebuilding many thousand houses in Dolakha, Sindhupalchowk and Kavrepalanchowk districts of Nepal. This shelter program has other components of livelihood improvement too.

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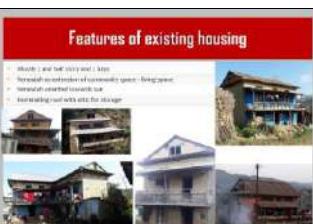
Those newly built houses can be grouped into different categories. Based on construction technology, houses with load bearing walls with either cement mortar in brick or mud mortar in stone have significant number compared to RCC frame structure.

Again, in term of number of rooms, most houses have two room single floor structure but there are few house of single room and single story and some of them are two roomed two story structure with attic floor.

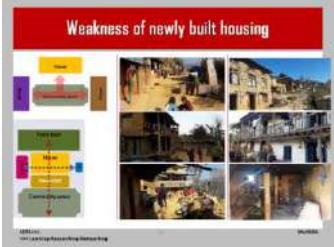
Progress of shelter reconstruction in Dolakha and Sindhupalchowk is high compared to Kavrepalanchowk.

Caritas Nepal team first sensitize the earthquake victims by explaining about the projects and roles to be played by the team and beneficiaries. They also distributed information, educational and communication (IEC) materials by placing signage boards at various locations. Then, the team build capacity of the beneficiaries and masons and carpenters for earthquake resilient construction. Only after building capacity, they are used in reconstruction of demonstration houses, which are given to the most vulnerable beneficiaries, as per community and ward recommendations.

Earlier, it was formed different community organizations: shelter committees, shelter group, community reconstruction committee and advisory committee. In each committee, the earthquake victims (beneficiaries) have been included.

1 min	<p>Masons' training</p> 	<p>Mason trainings are carried out while building demonstration houses so that the participants could get real life experience.</p>
1 min	<p>Technical support and facilitation to victims</p> 	<p>In addition to these, the beneficiaries are also given technical support and facilitation to ensure time submission of paper and receive of grants.</p>
1 min	<p>Transportation support to beneficiaries</p> 	<p>Addition support rendered to them include cash for work program for debris removal and road maintenance, transportation support, water tanks, drinking water system (brining in water for construction as well, tarpaulins, which ultimately helped them to build their houses smoothly with cost effectiveness, quality and timely completion. People are able to build earthquake resistant houses using largely local construction materials and human resources as demonstrated in model houses</p>
1 min	<p>Social institutional formation & mobilization</p> 	<p>To carry out all these activities, Caritas Nepal established its offices in each district as well as in the construction site. They also hired local residents as social mobilizer for better communication. Caritas Nepal's technical team has supported beneficiaries in many ways: helping layout in the site, supervising construction at foundation, DPC and roof levels, besides checking the quality of construction</p>
2 min	<p>Features of existing housing</p> 	<p>Pre-earthquake housing typology in these settlements are clustered around community spaces. Semi-covered veranda is the family gathering place and working area. It is the buffer space between community space and private space inside the house. These community spaces either private ownership or shared ownership connects the housing units around them. In some cases, neighbors living backside use this community space as a passage. The existing houses before the earthquake were generally of two story plus attic space on the top. They used to have two bays and were occupied by joint family. Verandah on the ground floor and balcony on the first</p>

floor were essential elements of building architecture.

1 min	 A screenshot of the 'Design catalogue: DUOBC' website. The header reads 'Design catalogue: DUOBC' and 'Design Catalogue for Disaster Resilient Housing and Technologies'. It features a grid of images showing various house designs and a floor plan.	Most of the built houses are of two room load bearing wall, single structure, selected from Design catalogue, prepared by Government of Nepal. The social mobilizers visit door to door level of beneficiaries to assist them in selection of design typology, calculation of cost estimate and making them aware about NRA's policies and guidelines as well as on earthquake safer construction.
2 min	 A screenshot of a presentation slide titled 'Weakness of newly built housing'. It includes a diagram of a house with labels for 'Front door', 'Living room', 'Kitchen', 'Bedroom', 'Toilet', and 'Animal shed'. Below the diagram are several photographs showing various issues with new buildings, such as poor construction quality and inappropriate design.	However, the reconstruction approach has focused on safer construction of individual house only rather than considering community at settlement scale. Focus on individual house taking reference from readymade design typology has failed to acknowledge numerous salient features of community spaces, socialization patterns and lifestyle of the community in mountain topography. The earlier joint family is being dispersed into two or three families by building separate houses in the farm land or in the front courtyard. Newly built houses mainly of single story with two rooms. While selecting the site for new houses, only flat land is considered. In other cases, earlier damage houses and temporary sheds are being converted into animal shed, storage and kitchen is some cases. All these activities have negative consequences in many ways.
2 min	 A screenshot of a presentation slide titled 'Weakness of newly built housing'. It includes a diagram of a house with labels for 'Front door', 'Living room', 'Kitchen', 'Bedroom', 'Toilet', and 'Animal shed'. Below the diagram are several photographs showing various issues with new buildings, such as poor construction quality and inappropriate design.	Haphazard building new houses and converting earlier units into animal shed and kitchen has disturbed the earlier socialization pattern and linkages of different hierarchy of spaces. It has resulted in close proximity of kitchen, toilet and animal shed thereby impacting on family health and hygiene. There is a loss of farm land reducing family income. The newly built form does not reflect the local culture and identity of pre earthquake period.
2 min	 A screenshot of a presentation slide titled 'Newly built houses vs traditional houses'. It shows a comparison between a modern two-story house and a traditional two-story house, highlighting differences in design and structure.	Individual newly built house may be earthquake safer but in many cases, it does not fulfil their lifestyles, space requirements and future needs. Pre-earthquake houses are of two bays and more than two story. Two bays are generally divided by wooden post thereby making spaces more flexible for different uses in different time period. However, the

newly built house unit mainly of two rooms are rigid and encircled by stone walls. They are small in size and can not be used for multiple activities. As a result, most of the families are forced to carry on household activities in different units: kitchen in temporary shed, and sleeping in the newly built unit. In other cases, the newly built space is also being used for sheltering animals. Most of the newly built houses do not have veranda on the ground and balcony on the first floor, which are necessary for socialization and drying out agriculture product.

2 min

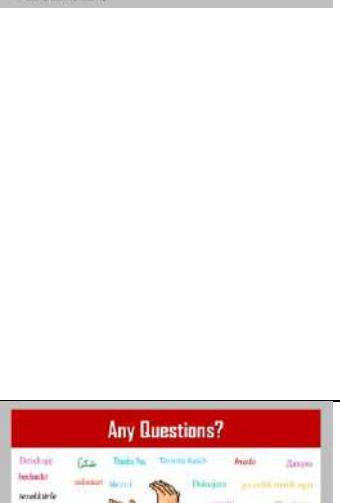


Housing unit along with outdoor toilet and animal shed including a small farm land (front or back side of house) altogether form a complete house in these agriculture based society in pre-earthquake period. Toilet and animal shed including farm land are often at lower land. Such layout of building unit – separation of toilet and animal shed from house (kitchen) – has been found logical from health and hygienic condition. Community spaces clustered around 4-5 houses in different locations are connected to pedestrian network. The veranda is the key working space, also used for socialization with neighbours and at the same time visually controlling toilet and animal shed and the front community space.

1 min



Some of the buildings constructed in Balthali need site analysis due to sloped ground. They are vulnerable to landslide. A two story single room RCC house is under construction in Balthali. Few buildings are also built along the edge of the ridge. There may be chance of addition of storey in these RCC structure in future with increased family members. Some new houses were built adjacent to the existing stone masonry structure. It is not clear how foundation was layout in the new house without hampering the foundation of attached structure. Building two structures of different mass and construction technology by attaching each other is vulnerable to ‘pounding effect’ during earthquake shaking. Some newly built houses have inadequate detailing. For instance, wooden bracing is missing between wooden battens below CGI sheets in the roofs. Similarly, some houses lack

2 min	 <p>Weakness of newly built housing</p> <p>Weaknesses of shelter project: Future issues to be addressed</p> <ul style="list-style-type: none"> • Not suitable to landscape - future condition of houses? Foundation of new street and light & ventilation should be considered. • Not designed for natural disaster - The vulnerability of health & hygiene is an important issue. This should be considered in the design, space & detailing! • Not designed for social interaction - People can't interact with each other if they don't have a common space. 	wooden tie to connect wooden floors with stone masonry. Such cases have been found both in Bulung and Balthali.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
1 min	 <p>Take home message</p> <ul style="list-style-type: none"> • In the historic core area, the reconstruction should be of 'Community driven' with consideration of the historic townscape, socialization space and lifestyle of the inhabitants. Cost effectiveness, solar built form and evidence of vernacular including integration of reconstruction with livelihood improvement and integrated infrastructure provision should be considered. Facilitation through NGOs specifically to technical support and grant disbursement is recommended. • Caritas Nepal's innovative approach in community mobilization, staffs allocation at site and districts, facilitation in grant collection, building construction and material supply along with inclusion of livelihood programs in the shelter construction has yielded a very good results. • However, adaptation of ready-made designs from the catalogue has destroyed earlier townscape, vernacular architecture and lifestyle of the villagers. 	Numerous issues mentioned above: building site, pounding effect, natural light and ventilation, foundation of new structure without disturbing the existing adjacent house need to be considered in future projects. Also, the pre-earthquake period housing typology and built form should be studied.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
30 min	 <p>Any Questions?</p> <table border="1"> <thead> <tr> <th>Dardžil</th> <th>କୁଣ୍ଡଳ</th> <th>Tibetan</th> <th>Burmese</th> <th>India</th> <th>Assam</th> </tr> </thead> <tbody> <tr> <td>bedsheet</td> <td>ବେଦ୍ଜିଲ</td> <td>bedsheet</td> <td>ବେଦ୍ଜିଲ</td> <td>bedsheet</td> <td>ବେଦ୍ଜିଲ</td> </tr> <tr> <td>pillowcase</td> <td>ପିଲୋଫ୍ସେଟ୍</td> <td></td> <td></td> <td>pillowcase</td> <td>ପିଲୋଫ୍ସେଟ୍</td> </tr> <tr> <td>pillow</td> <td>ପିଲୋ</td> <td></td> <td></td> <td>pillow</td> <td>ପିଲୋ</td> </tr> <tr> <td>blanket</td> <td>ବଲ୍କେଟ୍</td> <td></td> <td></td> <td>blanket</td> <td>ବଲ୍କେଟ୍</td> </tr> <tr> <td>quilt</td> <td>କୁଣ୍ଡଳ</td> <td></td> <td></td> <td>quilt</td> <td>କୁଣ୍ଡଳ</td> </tr> <tr> <td>sheet</td> <td>ଶେଟ୍</td> <td></td> <td></td> <td>sheet</td> <td>ଶେଟ୍</td> </tr> <tr> <td>pillow</td> <td>ପିଲୋ</td> <td></td> <td></td> <td>pillow</td> <td>ପିଲୋ</td> </tr> <tr> <td>pillowcase</td> <td>ପିଲୋଫ୍ସେଟ୍</td> <td></td> <td></td> <td>pillowcase</td> <td>ପିଲୋଫ୍ସେଟ୍</td> </tr> <tr> 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<td>quilt</</td></tr></tbody></table>	Dardžil	କୁଣ୍ଡଳ	Tibetan	Burmese	India	Assam	bedsheet	ବେଦ୍ଜିଲ	bedsheet	ବେଦ୍ଜିଲ	bedsheet	ବେଦ୍ଜିଲ	pillowcase	ପିଲୋଫ୍ସେଟ୍			pillowcase	ପିଲୋଫ୍ସେଟ୍	pillow	ପିଲୋ			pillow	ପିଲୋ	blanket	ବଲ୍କେଟ୍			blanket	ବଲ୍କେଟ୍	quilt	କୁଣ୍ଡଳ			quilt	କୁଣ୍ଡଳ	sheet	ଶେଟ୍			sheet	ଶେଟ୍	pillow	ପିଲୋ			pillow	ପିଲୋ	pillowcase	ପିଲୋଫ୍ସେଟ୍			pillowcase	ପିଲୋଫ୍ସେଟ୍	pillow	ପିଲୋ			pillow	ପିଲୋ	blanket	ବଲ୍କେଟ୍			blanket	ବଲ୍କେଟ୍	sheet	ଶେଟ୍			sheet	ଶେଟ୍	quilt	କୁଣ୍ଡଳ			quilt	କୁଣ୍ଡଳ	pillow	ପିଲୋ			pillow	ପିଲୋ	pillowcase	ପିଲୋଫ୍ସେଟ୍			pillowcase	ପିଲୋଫ୍ସେଟ୍	pillow	ପିଲୋ			pillow	ପିଲୋ	blanket	ବଲ୍କେଟ୍			blanket	ବଲ୍କେଟ୍	sheet	ଶେଟ୍			sheet	ଶେଟ୍	quilt	କୁଣ୍ଡଳ			quilt	କୁଣ୍ଡଳ	pillow	ପିଲୋ			pillow	ପିଲୋ	pillowcase	ପିଲୋଫ୍ସେଟ୍			pillowcase	ପିଲୋଫ୍ସେଟ୍	pillow	ପିଲୋ			pillow	ପିଲୋ	blanket	ବଲ୍କେଟ୍			blanket	ବଲ୍କେଟ୍	sheet	ଶେଟ୍			sheet	ଶେଟ୍	quilt	କୁଣ୍ଡଳ			quilt	କୁଣ୍ଡଳ	pillow	ପିଲୋ			pillow	ପିଲୋ	pillowcase	ପିଲୋଫ୍ସେଟ୍			pillowcase	ପିଲୋଫ୍ସେଟ୍	pillow	ପିଲୋ			pillow	ପିଲୋ	blanket	ବଲ୍କେଟ୍			blanket	ବଲ୍କେଟ୍	sheet	ଶେଟ୍			sheet	ଶେଟ୍	quilt	କୁଣ୍ଡଳ			quilt	କୁଣ୍ଡଳ	pillow	ପିଲୋ			pillow	ପିଲୋ	pillowcase	ପିଲୋଫ୍ସେଟ୍			pillowcase	ପିଲୋଫ୍ସେଟ୍	pillow	ପିଲୋ			pillow	ପିଲୋ	blanket	ବଲ୍କେଟ୍			blanket	ବଲ୍କେଟ୍	sheet	ଶେଟ୍			sheet	ଶେଟ୍	quilt	କୁଣ୍ଡଳ			quilt	କୁଣ୍ଡଳ	pillow	ପିଲୋ			pillow	ପିଲୋ	pillowcase	ପିଲୋଫ୍ସେଟ୍			pillowcase	ପିଲୋଫ୍ସେଟ୍	pillow	ପିଲୋ			pillow	ପିଲୋ	blanket	ବଲ୍କେଟ୍			blanket	ବଲ୍କେଟ୍	sheet	ଶେଟ୍			sheet	ଶେଟ୍	quilt	କୁଣ୍ଡଳ			quilt	କୁଣ୍ଡଳ	pillow	ପିଲୋ			pillow	ପିଲୋ	pillowcase	ପିଲୋଫ୍ସେଟ୍			pillowcase	ପିଲୋଫ୍ସେଟ୍	pillow	ପିଲୋ			pillow	ପିଲୋ	blanket	ବଲ୍କେଟ୍			blanket	ବଲ୍କେଟ୍	sheet	ଶେଟ୍			sheet	ଶେଟ୍	quilt	କୁଣ୍ଡଳ			quilt	କୁଣ୍ଡଳ	pillow	ପିଲୋ			pillow	ପିଲୋ	pillowcase	ପିଲୋଫ୍ସେଟ୍			pillowcase	ପିଲୋଫ୍ସେଟ୍	pillow	ପିଲୋ			pillow	ପିଲୋ	blanket	ବଲ୍କେଟ୍			blanket	ବଲ୍କେଟ୍	sheet	ଶେଟ୍			sheet	ଶେଟ୍	quilt	କୁଣ୍ଡଳ			quilt	କୁଣ୍ଡଳ	pillow	ପିଲୋ			pillow	ପିଲୋ	pillowcase	ପିଲୋଫ୍ସେଟ୍			pillowcase	ପିଲୋଫ୍ସେଟ୍	pillow	ପିଲୋ			pillow	ପିଲୋ	blanket	ବଲ୍କେଟ୍			blanket	ବଲ୍କେଟ୍	sheet	ଶେଟ୍			sheet	ଶେଟ୍	quilt	କୁଣ୍ଡଳ			quilt	କୁଣ୍ଡଳ	pillow	ପିଲୋ			pillow	ପିଲୋ	pillowcase	ପିଲୋଫ୍ସେଟ୍			pillowcase	ପିଲୋଫ୍ସେଟ୍	pillow	ପିଲୋ			pillow	ପିଲୋ	blanket	ବଲ୍କେଟ୍			blanket	ବଲ୍କେଟ୍	sheet	ଶେଟ୍			sheet	ଶେଟ୍	quilt	କୁଣ୍ଡଳ			quilt	କୁଣ୍ଡଳ	pillow	ପିଲୋ			pillow	ପିଲୋ	pillowcase	ପିଲୋଫ୍ସେଟ୍			pillowcase	ପିଲୋଫ୍ସେଟ୍	pillow	ପିଲୋ			pillow	ପିଲୋ	blanket	ବଲ୍କେଟ୍			blanket	ବଲ୍କେଟ୍	sheet	ଶେଟ୍			sheet	ଶେଟ୍	quilt	କୁଣ୍ଡଳ			quilt	କୁଣ୍ଡଳ	pillow	ପିଲୋ			pillow	ପିଲୋ	pillowcase	ପିଲୋଫ୍ସେଟ୍			pillowcase	ପିଲୋଫ୍ସେଟ୍	pillow	ପିଲୋ			pillow	ପିଲୋ	blanket	ବଲ୍କେଟ୍			blanket	ବଲ୍କେଟ୍	sheet	ଶେଟ୍			sheet	ଶେଟ୍	quilt	କୁଣ୍ଡଳ			quilt	କୁଣ୍ଡଳ	pillow	ପିଲୋ			pillow	ପିଲୋ	pillowcase	ପିଲୋଫ୍ସେଟ୍			pillowcase	ପିଲୋଫ୍ସେଟ୍	pillow	ପିଲୋ			pillow	ପିଲୋ	blanket	ବଲ୍କେଟ୍			blanket	ବଲ୍କେଟ୍	sheet	ଶେଟ୍			sheet	ଶେଟ୍	quilt	କୁଣ୍ଡଳ			quilt	କୁଣ୍ଡଳ	pillow	ପିଲୋ			pillow	ପିଲୋ	pillowcase	ପିଲୋଫ୍ସେଟ୍			pillowcase	ପିଲୋଫ୍ସେଟ୍	pillow	ପିଲୋ			pillow	ପିଲୋ	blanket	ବଲ୍କେଟ୍			blanket	ବଲ୍କେଟ୍	sheet	ଶେଟ୍			sheet	ଶେଟ୍	quilt	କୁଣ୍ଡଳ			quilt	କୁଣ୍ଡଳ	pillow	ପିଲୋ			pillow	ପିଲୋ	pillowcase	ପିଲୋଫ୍ସେଟ୍			pillowcase	ପିଲୋଫ୍ସେଟ୍	pillow	ପିଲୋ			pillow	ପିଲୋ	blanket	ବଲ୍କେଟ୍			blanket	ବଲ୍କେଟ୍	sheet	ଶେଟ୍			sheet	ଶେଟ୍	quilt	କୁଣ୍ଡଳ			quilt	କୁଣ୍ଡଳ	pillow	ପିଲୋ			pillow	ପିଲୋ	pillowcase	ପିଲୋଫ୍ସେଟ୍			pillowcase	ପିଲୋଫ୍ସେଟ୍	pillow	ପିଲୋ			pillow	ପିଲୋ	blanket	ବଲ୍କେଟ୍			blanket	ବଲ୍କେଟ୍	sheet	ଶେଟ୍			sheet	ଶେଟ୍	quilt	କୁଣ୍ଡଳ			quilt	କୁଣ୍ଡଳ	pillow	ପିଲୋ			pillow	ପିଲୋ	pillowcase	ପିଲୋଫ୍ସେଟ୍			pillowcase	ପିଲୋଫ୍ସେଟ୍	pillow	ପିଲୋ			pillow	ପିଲୋ	blanket	ବଲ୍କେଟ୍			blanket	ବଲ୍କେଟ୍	sheet	ଶେଟ୍			sheet	ଶେଟ୍	quilt	କୁଣ୍ଡଳ			quilt	କୁଣ୍ଡଳ	pillow	ପିଲୋ			pillow	ପିଲୋ	pillowcase	ପିଲୋଫ୍ସେଟ୍			pillowcase	ପିଲୋଫ୍ସେଟ୍	pillow	ପିଲୋ			pillow	ପିଲୋ	blanket	ବଲ୍କେଟ୍			blanket	ବଲ୍କେଟ୍	sheet	ଶେଟ୍			sheet	ଶେଟ୍	quilt	କୁଣ୍ଡଳ			quilt	କୁଣ୍ଡଳ	pillow	ପିଲୋ			pillow	ପିଲୋ	pillowcase	ପିଲୋଫ୍ସେଟ୍			pillowcase	ପିଲୋଫ୍ସେଟ୍	pillow	ପିଲୋ			pillow	ପିଲୋ	blanket	ବଲ୍କେଟ୍			blanket	ବଲ୍କେଟ୍	sheet	ଶେଟ୍			sheet	ଶେଟ୍	quilt	କୁଣ୍ଡଳ			quilt	କୁଣ୍ଡଳ	pillow	ପିଲୋ			pillow	ପିଲୋ	pillowcase	ପିଲୋଫ୍ସେଟ୍			pillowcase	ପିଲୋଫ୍ସେଟ୍	pillow	ପିଲୋ			pillow	ପିଲୋ	blanket	ବଲ୍କେଟ୍			blanket	ବଲ୍କେଟ୍	sheet	ଶେଟ୍			sheet	ଶେଟ୍	quilt	କୁଣ୍ଡଳ			quilt	କୁଣ୍ଡଳ	pillow	ପିଲୋ			pillow	ପିଲୋ	pillowcase	ପିଲୋଫ୍ସେଟ୍			pillowcase	ପିଲୋଫ୍ସେଟ୍	pillow	ପିଲୋ			pillow	ପିଲୋ	blanket	ବଲ୍କେଟ୍			blanket	ବଲ୍କେଟ୍	sheet	ଶେଟ୍			sheet	ଶେଟ୍	quilt	କୁଣ୍ଡଳ			quilt	କୁଣ୍ଡଳ	pillow	ପିଲୋ			pillow	ପିଲୋ	pillowcase	ପିଲୋଫ୍ସେଟ୍			pillowcase	ପିଲୋଫ୍ସେଟ୍	pillow	ପିଲୋ			pillow	ପିଲୋ	blanket	ବଲ୍କେଟ୍			blanket	ବଲ୍କେଟ୍	sheet	ଶେଟ୍			sheet	ଶେଟ୍	quilt	କୁଣ୍ଡଳ			quilt	କୁଣ୍ଡଳ	pillow	ପିଲୋ			pillow	ପିଲୋ	pillowcase	ପିଲୋଫ୍ସେଟ୍			pillowcase	ପିଲୋଫ୍ସେଟ୍	pillow	ପିଲୋ			pillow	ପିଲୋ	blanket	ବଲ୍କେଟ୍			blanket	ବଲ୍କେଟ୍	sheet	ଶେଟ୍			sheet	ଶେଟ୍	quilt	କୁଣ୍ଡଳ			quilt	କୁଣ୍ଡଳ	pillow	ପିଲୋ			pillow	ପିଲୋ	pillowcase	ପିଲୋଫ୍ସେଟ୍			pillowcase	ପିଲୋଫ୍ସେଟ୍	pillow	ପିଲୋ			pillow	ପିଲୋ	blanket	ବଲ୍କେଟ୍			blanket	ବଲ୍କେଟ୍	sheet	ଶେଟ୍			sheet	ଶେଟ୍	quilt	କୁଣ୍ଡଳ			quilt	କୁଣ୍ଡଳ	pillow	ପିଲୋ			pillow	ପିଲୋ	pillowcase	ପିଲୋଫ୍ସେଟ୍			pillowcase	ପିଲୋଫ୍ସେଟ୍	pillow	ପିଲୋ			pillow	ପିଲୋ	blanket	ବଲ୍କେଟ୍			blanket	ବଲ୍କେଟ୍	sheet	ଶେଟ୍			sheet	ଶେଟ୍	quilt	କୁଣ୍ଡଳ			quilt	କୁଣ୍ଡଳ	pillow	ପିଲୋ			pillow	ପିଲୋ	pillowcase	ପିଲୋଫ୍ସେଟ୍			pillowcase	ପିଲୋଫ୍ସେଟ୍	pillow	ପିଲୋ			pillow	ପିଲୋ	blanket	ବଲ୍କ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Sessional Plan

Module:

Session subject: **Urban design guidelines and incentive mechanism**

Day-session: 3-I

Time: 1h30 m

General objectives

The main objectives of this session is twofold:

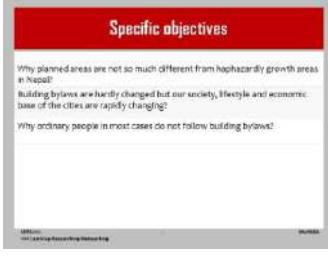
- [a] to make participants aware about urban design guidelines and incentive mechanism;
- [b] to make participants understand on different form of incentive mechanism practices in Nepal.

Specific objectives

At the end of this session, the participants will

- [a] understand the importance of urban and architectural design guidelines in urban development;
- [b] learn about different forms of incentives, practices by different public agencies; and
- [c] know the required design guidelines and incentive mechanism.

Main contents of the session

<i>Training/teaching activities</i>	<i>Time duration</i>	<i>Teaching materials</i>	<i>Remarks</i>
Activity 1: Introduction of the topic	1 min		This session is about urban design guidelines and incentive mechanism, which are interlinked.
Activity 2: Specific objectives and expectation of learning by participants	2 min		The specific objectives of this session is threefold. First, participants will understand the importance of urban and architectural design guidelines in urban development. Second, they will learn about different forms of incentives, practiced by different public agencies and last, they will identify the required urban design guidelines and incentive mechanism.
Activity 3: Ask participants at least three different questions	3 min		Sensitize participants asking few questions: why planned areas are not so much different from haphazardly growth areas?; why building bylaws do not frequently modified with fast changing of lifestyles, economic base and societal needs? And why in most cases, the prevailing building bylaws are not followed?

3 min	<p>Urban design guidelines: skyline, street enclosure and building bulk</p> <p>This diagram shows examples of urban design guidelines focusing on skyline, street enclosure, and building bulk. It includes illustrations of buildings with different facades, streets with trees and buildings, and architectural details like setbacks and rooflines.</p>	<p>Urban design guidelines regulates skyline, street enclosure and building bulk and characters in order to conserve the historic core area, ensure light, ventilation and safety in streets and open spaces and create identity of the city.</p>
3 min	<p>Urban design guidelines</p> <p>This diagram provides a detailed look at the building envelope, showing its various components: facade, roof, windows, doors, and insulation. It also includes a legend for symbols used in the diagram.</p>	<p>Urban design guidelines can be formulated either in newly developed areas or in already built up area. It can be associated with land and building use, building setback or in detailed building envelop, as per necessary conditions.</p>
3 min	<p>Urban design guidelines: streets, walls</p> <p>This diagram illustrates urban design guidelines for streets and walls. It shows different types of walls (e.g., transparent, solid) and how they can be integrated into the urban landscape, along with street scenes and greenery.</p>	<p>Urban design guidelines can be of different forms depending on the requirements of desirable elements or environment. For instance, it can encourage individual house owners especially along some important commercial streets to create enclosed pedestrian footpath in the settlement with hot and humid weather. Similar, boundary wall can be of transparent materials to link the landscape of outdoor public space and private garden of individual houses. It helps to create a harmonious cityscape and street facades.</p>

3 min	 <p>Architectural guidelines: openings & roofs</p> <p>This slide shows architectural guidelines for door and window openings, roof detailing, and plinth design. It includes a photograph of a building, a floor plan, and several small sketches illustrating different design options.</p>	<p>Architectural design guidelines include regulations of door and window openings, roof detailing and plinth design. Such guidelines often provide multiple choices, supported by sketches for designers.</p>
3 min	 <p>Architectural guidelines: building façade, cornice & roof</p> <p>This slide shows architectural guidelines for building facades, cornices, and roofs. It includes a photograph of a building, a floor plan, and several small sketches illustrating different design elements.</p>	<p>Depending on the location and level of control, architectural design guidelines sometimes include detailing of building facade with various elements, cornices and roof detailing. Such level of works is often required in conservation of historic settlements or neighborhoods.</p>
3 min	 <p>Architectural guidelines: windows, cornices & canopies</p> <p>This slide shows architectural guidelines for windows, cornices, and canopies. It includes a photograph of a building, a floor plan, and several small sketches illustrating different design elements.</p>	<p>For instance, if multiple design options regarding door and window openings, cornices (separating two floors) and canopy, all supported with pictures and diagrams are presented, architects and engineers can understand the intent of the guidelines and based on those, they can work out detailing. Such guidelines are also helpful to house owners for taking decision.</p>
3 min	 <p>Architectural design guidelines: signage and shutter of openings</p> <p>This slide shows architectural design guidelines for signage and shutters of openings. It includes a photograph of a building, a floor plan, and several small sketches illustrating different design elements.</p>	<p>Such guidelines are not limited to individual building, but go beyond houses to public realm. Design guidelines are sometimes prepared for signage, lighting, street furniture and public arts too.</p>
3 min	 <p>Forms of incentives</p> <p>This slide illustrates various forms of incentives. It shows a flowchart where 'Incentives' lead to 'Fiscal incentives' (tax rebates, grants, etc.) and 'Urban planning incentives' (zoning, FAR bonus, development rights, utility provision, resettlement, etc.).</p>	<p>Incentives can be of different forms and can be given to institutions, private companies and individual house owners. It can be fiscal incentive: tax rebates or grants, intergovernmental fiscal transfer, conditional cash transfer to municipalities and so on. The second form of incentive is related with urban planning: incentive zoning, floor area ratio (FAR) bonus, transfer of development right, utility provision, resettlement, etc. Again, incentive can also be associated with training and building materials.</p>

3 min



Incentive practice at present in Nepal is limited. Incentive mechanism is yet to be developed for protection of agriculture land and public open spaces, shifting of business activities from the historic core and urban centres to peripheral areas, improvement of infrastructures and amenities and retrofitting of vulnerable houses. Similarly, newly developed area through land pooling, integrated infrastructure provision and new housing construction require incentives to developers and individual house owners to get desirable built environment.

3 min



Nonetheless, numerous mason trainings have been organized in different parts of Nepal especially after the 2015 earthquake. Such trainings have also been given to technical persons for assessing vulnerable structures and their retrofitting.

3 min



There used to be financial incentive given by central government to individual house owners rebuilding or renovating their houses in the preserved monument subzone within world heritage site in Kathmandu valley. Such incentive includes 50% royalty in purchasing woods and 10% of cost incurring for cornices. Some municipalities like Bhaktapur also encourage individual house owners for conservation of historic townscape by providing 100% materials cost used on visible facades and 75% of wooden costs for roof, doors and windows. However, this amount applicable for historic core area only has been reduced to 35% in post-earthquake period. In the past, GTZ/udle used to provide 10%-90% subsidy for construction or renovation of public monuments with commitment of contribution from users group as well as from municipality.

3 min



There is incentive of FAR bonus to real estate companies willing to build planned development in the Kathmandu valley. For instance, there is a FAR of 2 in planned residential subzone for individuals; however, real estate companies willing to develop the planned area will get FAR of 3.

3 min	<p>Incentive: to homeowners after gorkha earthquake</p> <ul style="list-style-type: none"> Waive land revenue tax in 18 earthquake affected districts Provide ownership certificate for earthquake victims 35% waiver in land transfer tax while registering the property on female name 	<p>In the post-earthquake period, both central government and municipalities gave different forms on incentives to earthquake victims. There is a waive of land revenue tax in 18 earthquake affected districts, besides providing 35% waiver in land transfer tax while registering the property on female name. Similarly, many municipalities gave heavy discount on build permit fee for earthquake victims while rebuilding new houses.</p>
3 min	<p>Issues to be considered for incentive mechanism</p> <ul style="list-style-type: none"> No incentive related to land use plan & zoning is available need to work for them Training masons/concrete or even engineers on DRILL has begun but the homeowners often hire their own for construction and renovation activities Incentive becomes ineffective if the benefit is nominal, if the process is lengthy A mechanism to ensure consulting of individual homeowners (real estate companies), engineers, quality & third party (government, trained masons, experts, etc.) 	<p>However, there are still many issues to be considered. No incentive exists to land use plan and zoning, which is essential for earthquake vulnerable cities in Nepal. Many masons and technical persons were trained after the earthquake; however, there has been no mechanism to ensure that they would be hired in post-earthquake reconstruction. Many of them have been migrated into different countries. Incentive becomes ineffective if the benefit is nominal and the formality of receiving the incentive is lengthy.</p>
3 min	<p>Incentive for newly built houses in Bhaktapur</p> <ul style="list-style-type: none"> Building should be less than WTS and Old City Building should be built as Building type I, II, III, IV, V, VI, VII, VIII Building should be constructed with traditional term. Construction Completion Certificate. Filled form should be submitted in Building Permit Section. Forwards to concerned office for ward level committee. An architectural report 10% calculate the amount of used traditional materials like Clay, Sand, Stone, Wood, Bricks, Mortar, etc. Altogether 35% of building facade brick, 10% for door windows, changes tiles for Pataas and Slope Roofs. 	<p>Bhaktapur municipality has been giving financial incentives to individual house owners who follow the prevailing building bylaws in world heritage site and old city core zone. At present, it gives 35% of the cost of building materials exposed to outside (bricks, tiles and woods).</p>
3 min	<p>Incentives for newly built houses in Sankhu</p> <ul style="list-style-type: none"> Free Building Permit, No processing fee for building permit Grant of license (or work done 100% only) for the houses built as per before trade core areas only Special consideration for unique designs of local architecture e.g. see Pata, Gajara Discount in vendor works for 50% from central government Plus incentive of NRs 100,000 for traditional building from Nepal Reconstruction Authority (NRA) 	<p>Shankarpur municipality has also started giving incentives to individual house owners rebuilding their houses in the historic core area. Building permit fee for earthquake victims is made free and a grant amount of NRs 100,000 is given to owners building houses as per prevailing building regulations in the historic core area. National Reconstruction Authority (NRA) also provided additional NRs 50,000 for building houses in a traditional way in the core area.</p>

3 min



The municipality has been emphasizing building materials (exposed brick façade, cornices and wooden door and window) for giving incentives. It is yet to formulate architectural design guidelines that define vernacular architectural characters, scale, proportions and texture.

3 min



Urban design and architectural design guidelines are essential to address the societal needs, site context and multiple design options, besides planning and building regulations. Urban design guidelines should be linked with different forms of incentive mechanism to encourage real estate developers and individuals. They can be effectively applied to newly developed area as well as already built up area.

30 min



Question-answer session

Sessional Plan

Module:

Day-session: 3-

II

Session subject: **Urban design techniques in public infrastructure design and implementation**

Time: 1h30 m

General objectives

The main objectives of this session is twofold:

- [a] to make participants aware about urban design approach in revitalization of traditional pond in Lalitpur metropolitan city;
- [b] to learn how to ensure active participation of local community into planning and implementation process.

Specific objectives

At the end of this session, the participants will

- [a] understand the urban design approach in revitalization of a traditional pond in Lalitpur metropolitan city;
- [b] identify the historical value to be conserved and present day needs to be incorporated into master plan and detailing; and
- [c] learn how to ensure active participation of local community into planning and implementation process.

Main contents of the session

<i>Training/teaching activities</i>	<i>Time duration</i>	<i>Teaching materials</i>	<i>Remarks</i>
	1 min		This session is about urban design techniques in public infrastructure design and implementation.
	1 min		The main objectives of this session are threefold. First, it elaborates urban design approach adopted in revitalization of a traditional pond in LMC. Second, it identifies historical values to be conserved and present-day needs to be incorporate into master plan and detailing. Third and last, it demonstrates engagement of local community into planning and implementation process.



Ask participants on few issues to sensitize them. First, discuss on how to initiate urban design plan for revitalization of traditional ponds. Second, ask them how to convince municipality, ward office and local community on the proposed design whereas two master plans have already exist, prepared by different agencies? Also, discuss with participants regarding how to ensure best design option that is acceptable to all stakeholders.

1 min



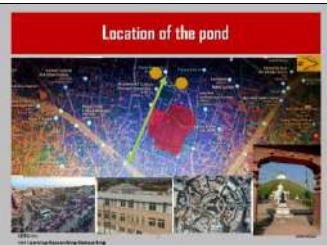
Ponds are significant: part of malla period water infrastructure (heritage), landmark, socio-cultural values, special land use (micro climate effect) & public space, a special land use in the busy city, near Lagankhel bus park (node), community attachment and public sentiment. Similarly, public open is also essential in rapidly urbanizing and haphazardly growth area.

1 min



The study method combines quick literature review and historical background of the pond and surrounding areas, field visit and measurement taken including series of discussion with local communities and municipal staffs. Urban design approach includes study of history of pond and its transformation, contextual study of surrounding areas, consultation with stakeholders, case study of public open space and other ponds in the Kathmandu valley including construction led by users committee.

1 min



Nhu Pukhu (new pokhari) located at Lagankhel Bus Park in ward no. 5 of Lalitpur Metropolitan City (LMC) is believed to be built during Malla period. Centrally located near the present Lagankhel Bus Park, this traditional pond is not easily visible as it has been circled by buildings from three sides.



There has been some master plans for revitalization of Nhu Pukhu prepared by different agencies in the past. Centre for Integrated Urban Development (CIUD) also proposed a master plan for this area in the past. The focus was on a singular use, i.e., ground water recharge. The detailing includes plantation around the pond area and development of multiple wells on east side for effective ground water recharge. Nonetheless, this master plan has missed many issues associated with the historical values of the pond as well as the present day potential of developing responsive

public spaces with diverse usages. The approach adapted focused on the pond area only without looking the complex in the context of immediate surrounding and larger development framework.



Another master plan for Nhu Pukhu was also recently developed by Lalitpur metropolitan city itself. Like the previous one by CIUD, this plan also inadequately addressed the surrounding context, historical development of the pond and sentimental values of the communities. The master plan simply consists of development of brick and stone stepping around the water body using cement mortar. The plan intends to design based on the existing ground situation rather than identifying the original level and position of walls and stepping around the water body.

1 min



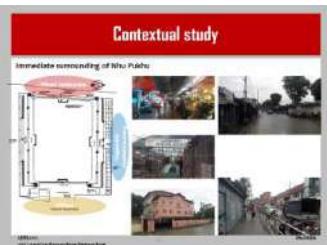
Urban design approach consists of first contextual study, history of the pond and present day needs through consultation with local people, ward officials and municipal staffs. Second, it establishes planning and design principles and based on that a master plan with detailing is prepared.

1 min



Within 500 m of radius, many landmarks structures exist around the pond. Lagankhel Bus Park, the transportation node is about 200 m distance, north-side whereas famous Sapta Patal Pukhu with Ashok stupa is about same distance on east-south direction. Thus, Nhu Pukhu is easily accessible from different parts of the Kathmandu valley. It has huge potential to link with 'Sapta Patal Pukhu' and greenery areas around presently occupied by Nepal Army. Planning and design of the pond needs to consider the surrounding context.

2 min



'Nhu Pukhu' (New Pond) measuring 110.2 m X 84.5 m (approximately) is at present enclosed from three sides with built structure. Only the west side is fronting to the street. Local vegetable market and nursery act as the northern edge whereas there is a brick boundary wall of Nepal Electricity Authority Office on the south side. The eastern edge of the pond is being occupied by shops with ward office (ward no. 5) along the east side and office buildings (such as hospitals and District

Court House) across the road. Immediate land use on the north side of the pond constitutes commercial activities and on the west side is commercial and institutional activities. The water body itself is dirty. Boundary of the pond is not clearly visible and steps around water body are uneven. There is no clear cut boundary of water body and steps around the water body.

2 min



Ponds are not only important and integral part of traditional water network system but they are also the most prominent element of landscape of the Kathmandu valley. The traditional water network system comprises of 'Rajkulo' (royal canal, ponds, acquirers and sunken stone waters spouts and wells in a sequential way.

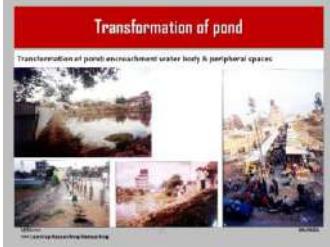
Most of the ponds are not natural but man-made with some specific purpose. Based on their location and use, ponds of the valley can not basically grouped into three types. First, ponds located on the upstream (like 'Nhu pokhari' of Lagankhel) of the settlements collect rain and surface water to recharge the aquifers, to subside flood in the habitat during downpours and to irrigate during dry seasons. Second, some ponds built inside the settlements are relatively smaller in size. They collect storm water to recharge local aquifers. They are used for cleaning and washing purposes, besides for duck farming and animal husbandry. The third typology of ponds are located on downstream of the settlements built primarily for controlling flood and landslide in the downstream of settlement.

2 min



However, with destruction of traditional water network system, the functional role of the pond has gradually becoming less significant. In the past this pond has been under transformation especially in three different ways. First, this pond area was encroached while widening the road on the west side. The debris of the road construction plus any type of household or construction wastes were simply thrown into the pond especially on the west side.

2 min



Transformation of pond

The second phase of transformation is characterized by massive encroachment of the pond's peripheral areas. Storage space was created by using CGI sheets on the top step of the pond on southern edge, adjacent to NEA office. This space was later converted into helping desks (for writing application and typewriting, etc.) for those customers coming to the District Court located across the road on the east side. Peripheral space on the north side was converted into open vegetable market using temporary construction of post and CGI sheets.

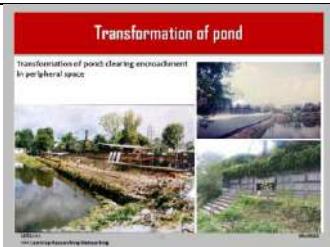
2 min



Transformation of pond

Again, the peripheral space on the west side, after widening of the road was used for parking three wheeler, taxis and buses. The remaining eastern edge was rented for private sector by building a single story structures. Thus the pond's peripheral was enclosed through built structures thereby cutting the physical, visual and psychological access to water body from surrounding areas.

2 min



Transformation of pond

The third phase of transformation is the cleaning of the water body, dismantling of temporary structures and fixing the edges through installing iron bar. Encroachments around the pond periphery has caused pollution of pond water and intensification of dumping of debris. As the pond was full of debris, dozer was used partially to take out some of the debris and to level the dumping on the steps around the pond.

2 min



Transformation of pond

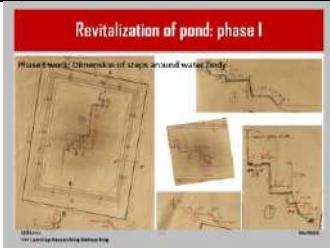
While visiting the site on April 2019, the pond was found full of muddy water with confusing spaces in the form of steps around the water body. All of its three edges have been encroached with buildings on two sides (north and east) and road extension on the west side. The stepping around the water body in four sides were not uniform and they were full of weeds. Construction and household wastes can be seen around the corner covering water in the south-west and south-east corner. One can find weeds around all sides. It was difficult to see even the construction materials used for stepping.

2 min



The ward office hired some workers to clean the debris of the earlier structures as well as removal of weeds. By June 2019, the shape of the water body along with surrounding steps are visible. Users committee with representatives from ward office, local people and business community was formed to regulate construction work as well as supervision work so that the financial transparency and sense of ownership can be achieved.

2 min



The size of the water body and the cross section of each side was measured with horizontal and vertical dimensions of each steps in all directions. As there was no uniformity and height of the steps were not uniform throughout the length and width. This was mainly due to haphazard dumping of debris. Stepping were improved over debris after levelling them and new stone masonry walls were built on west side and part of the east side on ad-hoc basis. Average dimensions of stepping in all sides were measured. There has been provision of rain water harvesting on the west side. A concrete pipe with a storage tank exist on the west side, which is connected through pipes to the nearby 'Sajha building.' While building a new high-rise with provision of basement floor, the local people opposed such construction citing negative implication of natural water flow to and from the pond. A consensus was reached between local people and building owners that the latter party would build a rain water harvesting system to drop all collected rain water from Sajha building to Nhu Pukhu.

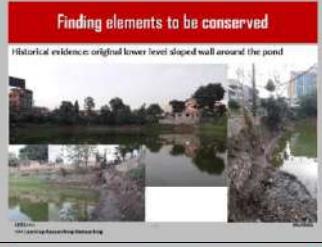
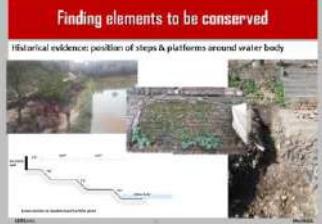
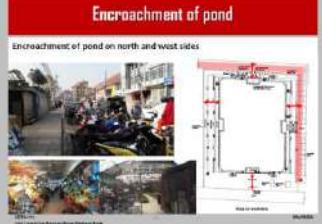
2 min



Based on the measurement of the ground condition of the pond, the phase-I activity was proposed along with architectural design and detailing. This design implementation should not hamper the overall master plan development. As per site condition, it was proposed to clean the pond's water, build 3'6" wide platform around the water's edge at the lowest level, and then construct a sloped wall along with 3'0" platform benefit the water. Its intention was allow visitors stay at the lower platform by putting their legs inside the water. Moreover, the proposed platform also help to protect children falling down into water. All the debris and

litters will be deposit along this space and it would be easy to clean them. Such tasks do not affect in preparation of master plan. The phase – I work activities roughly consume allocated budget of NRs. 5 million by the end of the fiscal year (June-July, 2019). Hence, the following three major activities were proposed. (a) Site clearance on the lower level of the pond by removing water (1m deep) and sludge (0.5m); (b) Putting one layer of brick along with base and earth ramming below the water level to protect children falling down on water body; and (c) Construction of inclined wall around water bound in the lower level using lime mortar and brick work and pavement of flag stone on the platform of the lowest level.

<p>1 min</p>	<div style="background-color: #f0f0f0; padding: 5px;"> <p>Revitalization of pond: phase I</p> <p>First phase work – clearing debris of the lowest level</p>  </div>	<p>While cleaning the deposit inside the water body and clearing the original inclined boundary wall in the lowest level, the situation was found much different than what was assumed in preparation of cost estimate. First, the volume of debris below water even to clear the inclined wall was much more than expected. Second, the water body on the west side was covered by debris more than 2 feet wide. All those garbage were removed to clear the inclined walls encircling water body. Third, the existing levels of different steps were not the original one but created by dumping garbage on ad-hoc basis at different time period. On the south side, the original level of different steps was identified by digging part of the section of the west side stepping. It was found 15 feet wide platform and 8 feet wide (top level) with inclined walls of 7' 6" in difference in each level.</p>
<p>1 min</p>	<div style="background-color: #f0f0f0; padding: 5px;"> <p>Revitalization of pond: phase I</p> <p>First phase work – Repairing the lowest level inclined wall</p>  </div>	<p>The second level of inclined wall on the south side was rebuild with some design modification, maintaining the original elevation and shape. Along the inclined walls, a public space is created at alternative location by recession the inclined wall inside the wall. For better linkages, brick steps were also planned at alternative level. Traditional materials and construction technology were employed for rebuilding the damaged portions of the pond. For instance, a layer of black cotton soil over inclined walls, use of lime surkhi for brick and stone bonding and use of</p>

		<p>bricks and stones (available in the site) further confirm the adaptation of conservation strategy for revitalization of historical pond.</p>
1 min		<p>After contextual study of the site and cleaning of the debris from water and around the peripheral area including series of consultation with various stakeholders, some important urban design principles were established before preparing master plan for revitalisation of the pond. It has basically three principles: Retain historical evidence/reminisces wherever possible; create meaningful/response public spaces with activities/facilities to attract and engage people (value added activities); and cost effective design and detailing and incremental/phase wise construction.</p>
1 min		<p>The original water edge of the pond needs to be retained by removing the covered debris especially on the west side.</p>
1 min		<p>The historical evidence or reminisces available in the pond especially the width and height of the stepping on the south side should be retained wherever possible. Moreover, the original water edge has also to be protected by removing the debris from water body on the west side.</p>
1 min		<p>There has been permanent encroachment of pond areas on the north and east sides which can not be regained. Only on the south and east side, there have been larger spaces around the water body. If the cross sectional width existed at present on south side is drawn around all sides, then half of the streets on west sides should be within the pond and the existing nursery and vegetable markets on the north side were built on the pond's space. Though there exist single story shed and ward office, then can be removed when necessary, as their ownership lies to Lalitpur metropolitan city. Hence, the first position made is to retain the original position and height and width of steps on the south side of the pond only. Thought there are adequate set back of the pond on east side, continuation of stepping of the south side towards east is not possible due to</p>

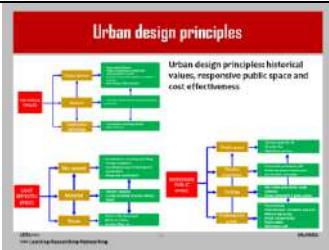
variation in levels on the setback on east side.

1 min



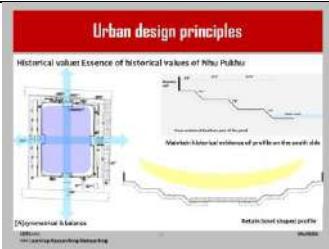
In order to retain the remaining evidence of the historical pond of Nhu Pukhu, the original edges of water body is identified by removing about 2' of debris from water body on the west side. While studying similar size of ponds in other parts of Kathmandu valley, it has been revealed that most of the ponds do have platform in all four directions projected towards the water body from the central point, which was also found at Nhu Pukhu. So, this central platform will be restored in all direction in the master plan. The stepping spaces around the water body in all sides are being filled up with debris dumped in the past. Stone retaining walls were built on the east and west sides without any foundations.

2 min



Historical values can be retained and promoted in three different ways in this project. It can be incorporated into planning and designing of public spaces, in selecting building materials and defining construction technology to be adopted. Responsive public spaces can be achieved through combination of many things. Variety of spaces need to be created for diverse activities associated with public spaces (with free access), disaster management perspective, ecological conservation point of view and contemporary usages. Cost effectiveness can be achieved through balancing cutting and filling materials, use of natural elements as building materials (bricks and stones) and reusing the available materials in the site.

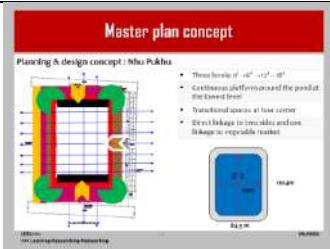
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The inclined sloped walls at different elevations on all sides has functional meaning as it ensures maximum rain water collection. Similar detailing has also been found at Bhajya Pukhu (with similar purpose) in Bhaktapur. Thus, the bowl shaped profile of Nhu Pukhu will be conserved. As mentioned earlier, the water's edges and profile of stepping on south sides will be retained in their original shape and size. As the setback of pond around water body will not be uniform in all four direction, it is decided to maintain the balance of space and activities across

both horizontal and vertical axes through asymmetrical means.

2 min



There are four levels of steps on the setback of the pond on south side. If the platform at the lowest level is considered 0', then there are three levels: +6', +12' and +18'. However, such levels are not available on the three sides due to encroachment and dumping of debris in the past. On the north sides, only two levels are available: +0' and +6'. In the case of east and west sides, the available two levels are of +0' and +12' only. Hence, continuation of platform is possible only on the lowest level (0' level only). Again, the platform on the south side will be comparatively wide against the other three sides. As the visitors movement around the peripheral areas are essential, four corners spaces are designed as 'transitional spaces' so that there would be continuous movement of visitors around all sides of the pond. Again, there would be three well-defined access to the pond: east and west side and the third one is proposed to link directly to the vegetable market on the north side. As vegetable market is essential for the local communities, which is also a means of attraction of visitors, so it was decided not to dismantle the existing vegetable and nursery markets but to redesign them by integrating with pond's spaces.

2 min



Above mentioned various conceptual ideas are further developed to prepare the master plan. Public spaces are created on north and south sides through various means: extra stepping of different heights, recessed spaces and transitional spaces at each four corners to make smooth movement of visitors at different levels. Moreover, these spaces are also equipped with streets furniture and other facilities to engage people longer time within the pond premises. These are the two spaces where the water views can be best obtained with minimum disturbance. Another major activities are planned on the east and west side spaces adjacent to streets. On the west side, the available flat land is minimum and this space has been dedicated for physical fitness activity. There would be provision of few bicycle parking too. Similarly, the spaces on the east side,

comparatively large (after demolition of the existing row of sheds including present ward office) are proposed to develop as ‘flexible spaces’ for multiple activities at different time period. This space comprises of open spaces for emergency situation, storage of emergency kits (at the south-east corner), public toilet (on the north-east corner) and information dispense stand adjacent to public toilet. Bicycle parking has also been planned in this side too.

2 min



Among the four sides, the southern part will be more active, as it has multiple activities proposed. To save the space and budget, the existing boundary wall (brick) of NEA will be screened through greenery cripplers placed on iron and bamboo posts. To break of monotonous, the entire wall are divided into sub spaces with different design for cripplers. On the uppermost platform, there will also be street furniture (semi-covered) of different design for privacy and feeling of personal space. The corner spaces will have well-defined umbrella for socialisation and protection of rain and sun. The middle platform on the south side is planned for not only movement around the water body but also created public spaces in the form of recessed walls and steps of different heights and materials. Those public spaces will be equipped with mobile charging facilities using solar power and dustbin with different pots. To avoid children falling into the water, street lighting has been lined up at lower height thereby creating a sort of barrier between the lowest level platform and water body. Even with increase of water level, these lamps will not be affected.

2 min



The middle platform on the south side is planned for not only movement around the water body but also created public spaces in the form of recessed walls and steps of different heights and materials. Those public spaces will be equipped with mobile charging facilities using solar power and dustbin with different pots. To avoid children falling into the water, street lighting has been lined up at lower height thereby creating a sort of barrier between the lowest level platform and water body. Even with increase of water level, these

lamps will not be affected. Another important activity proposed on the north side is the mini open theatre utilizing the stepping proposed to have direct access to the vegetable market. It is assumed that the existing vegetable market will be dismantle and redesign with more integration towards the pond area with provision of restaurants (terrace level) on the first floor. The central platform extended towards water body can act as a stage with continuous stepping in front will help to carry out small functions.

2 min



On the west side, there would be only two levels connected with a stairway divided into two levels. From the mid-landing, it is connected to the platform at level +6' on the south side. As the available flat space at the upper level is narrow in width, instead of the boundary wall, only soft boundary in the form of short steel post is proposed. Moreover, the floor level is kept as pedestrian footpath level. However, this space will have combination of tiles and greenery and those tiles will be porous for better ground water recharge. Physical fitness equipment is proposed here so that the street users and nearby communities would be benefitted. There are spaces for parking few bicycle. One can see a good panoramic view including water body from this side. The existing trees will be retained and adjusted in design. There will not be a visual prominent or well-defined entry point from this side due to lack of adequate space. It will merge gently with the footpath and street.

In fact, the conceptual master plan was finalised after series of presentation at ward level as well as at the municipality with different stakeholders.

1 min



As this is a multi-year project replying with annual budget allocated by the Lalitpur metropolitan city, the work has to be carried out phase wise. In the first phase, some part of the lower sloped walls and stepping on the lower part on the south side were constructed.

1 min	<p>Construction: natural material & traditional technology</p>	<p>While constructing them, local materials and construction technology is used wherever possible. For instance, to reduce the cost, the stone coming from the site after removing dumping were used partially. Lime surkhi mortar is used for brick masonry walls.</p>																																																																																								
1 min	<p>Implementation: phase wise construction</p>	<p>On the second phase, east side wall of stone masonry was constructed and some of the remaining sloped wall at the lowest level on east and north sides were continued.</p>																																																																																								
1 min	<p>Implementation: phase wise construction</p>	<p>In the third phase, the water of the pond was pumped out and made dry. Outer thin layer of the pond debris was thrown out as a water cleaning process.</p>																																																																																								
2 min	<p>Take home message</p> <ul style="list-style-type: none"> ■ Evidence based master planning is essential to convince all concerned stakeholders and take their confidence. ■ Urban design approach helps to balance conservation of historical evidences and needs of present day lifestyle, besides addressing the local context, considering surrounding development. ■ Engagement of users committee (local people and ward official) is essential not only in planning and design phase but also during construction period. 	<p>Evidence based master planning is essential to convince all concerned stakeholders and to receive their confidence. Urban design approach helps to balance conservation of historical evidences and needs of present day lifestyles, besides addressing the local context, considering surrounding development. Engagement of users committee (local people and ward official) is essential not only in planning and design phase but also during construction period.</p>																																																																																								
30 min	<p>Any Questions?</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Dendrite</td> <td>ଦେଣ୍ଟିଟୀ</td> <td>Buddha</td> <td>ବୁଡ଼ାହା</td> <td>Brick</td> <td>ବ୍ରିକ୍</td> <td>Ziggurat</td> <td>ଜିଗ୍ରାତ</td> </tr> <tr> <td>bentuk</td> <td>ବେନ୍ଟୁକ୍</td> <td>volcano</td> <td>ବୋଲକ୍ଯୁ</td> <td>Domed</td> <td>ଡୋମ୍ଡ୍</td> <td>geological epoch</td> <td>ଜେଗୋଲୋଜିକ୍ ଏପୋକ୍ଷସ୍</td> </tr> <tr> <td>semicircle</td> <td>ସେମିସିର୍�କ୍ଳେର୍</td> <td>lava</td> <td>ଲାଵା</td> <td>soil</td> <td>ସୌଲ୍</td> <td>Thirsty</td> <td>ଥର୍ସି</td> </tr> <tr> <td>sun</td> <td>ସୂର୍ଯ୍ୟ</td> <td>ash</td> <td>ଅଶ</td> <td>stone</td> <td>ସ୍ଟୋନ୍</td> <td>Darke</td> <td>ଡାର୍କେ</td> </tr> <tr> <td>Oriental</td> <td>ଓରିଏନ୍ଟଲ୍</td> <td>mangrove</td> <td>ମଙ୍ଗ୍ରେଫ୍</td> <td>tack</td> <td>ଟାକ୍</td> <td>rocky</td> <td>ରୋକ୍କୀ</td> </tr> <tr> <td>Shrub</td> <td>ଶ୍ରୁବ</td> <td>tree</td> <td>ଟ୍ରୀ</td> <td>fallen</td> <td>ଫଲେନ୍</td> <td>surrounding</td> <td>ସୁର୍ରାନ୍ଡିଂ</td> </tr> <tr> <td>oak</td> <td>ଓକ୍</td> <td>stone</td> <td>ସ୍ଟୋନ୍</td> <td>shrub</td> <td>ଶ୍ରୁବ</td> <td>Coniferous</td> <td>କୋନିଫର୍ୁସ୍</td> </tr> <tr> <td>Ferns</td> <td>ଫର୍ନ୍</td> <td>dome</td> <td>ଡୋମ୍</td> <td>annual</td> <td>ଅନ୍ନାଲ୍</td> <td>leaves</td> <td>ଲେଫ୍ଟ୍ସ</td> </tr> <tr> <td>fern</td> <td>ଫର୍ନ୍</td> <td>domed</td> <td>ଡୋମ୍ଡ୍</td> <td>biannual</td> <td>ବିଅନ୍ନାଲ୍</td> <td>foliage</td> <td>ଫୋଲିଆଜ୍</td> </tr> <tr> <td>fern</td> <td>ଫର୍ନ୍</td> <td>clay</td> <td>କ୍ଲେଇ</td> <td>deciduous</td> <td>ଡେସିଡ୍ୟୁସ୍</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	Dendrite	ଦେଣ୍ଟିଟୀ	Buddha	ବୁଡ଼ାହା	Brick	ବ୍ରିକ୍	Ziggurat	ଜିଗ୍ରାତ	bentuk	ବେନ୍ଟୁକ୍	volcano	ବୋଲକ୍ଯୁ	Domed	ଡୋମ୍ଡ୍	geological epoch	ଜେଗୋଲୋଜିକ୍ ଏପୋକ୍ଷସ୍	semicircle	ସେମିସିର୍�କ୍ଳେର୍	lava	ଲାଵା	soil	ସୌଲ୍	Thirsty	ଥର୍ସି	sun	ସୂର୍ଯ୍ୟ	ash	ଅଶ	stone	ସ୍ଟୋନ୍	Darke	ଡାର୍କେ	Oriental	ଓରିଏନ୍ଟଲ୍	mangrove	ମଙ୍ଗ୍ରେଫ୍	tack	ଟାକ୍	rocky	ରୋକ୍କୀ	Shrub	ଶ୍ରୁବ	tree	ଟ୍ରୀ	fallen	ଫଲେନ୍	surrounding	ସୁର୍ରାନ୍ଡିଂ	oak	ଓକ୍	stone	ସ୍ଟୋନ୍	shrub	ଶ୍ରୁବ	Coniferous	କୋନିଫର୍ୁସ୍	Ferns	ଫର୍ନ୍	dome	ଡୋମ୍	annual	ଅନ୍ନାଲ୍	leaves	ଲେଫ୍ଟ୍ସ	fern	ଫର୍ନ୍	domed	ଡୋମ୍ଡ୍	biannual	ବିଅନ୍ନାଲ୍	foliage	ଫୋଲିଆଜ୍	fern	ଫର୍ନ୍	clay	କ୍ଲେଇ	deciduous	ଡେସିଡ୍ୟୁସ୍											<p>Any question, comment or suggestion?</p>
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Sessional Plan

Module:	Day-session: 3-III
Session subject: Debt financing for municipal infrastructure development	Time: 1h30 m

General objectives

The main objectives of this session is twofold:

- [a] to make participants aware about debt financing and public private partnership method for municipal infrastructure construction;
- [b] to make participants understand on demand and supply of municipal infrastructure in Nepal as well as case of construction of pedestrian overhead bridge construction in Kathmandu valley.

Specific objectives

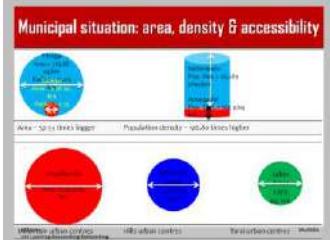
At the end of this session, the participants will

- [a] understand about debt financing and public private partnership (PPP) for municipal infrastructure provision;
- [b] learn about demand and supply on urban infrastructure in Nepal; and
- [c] review the case of pedestrian overhead bridge construction in Kathmandu valley with contractual agreement with private sector.

Main contents of the session

Training/teaching activities	Time duration	Teaching materials	Remarks
	1 min		This session discusses on debt financing and public private partnership (PPP) for municipal infrastructure development in Nepal.
	2 min		At the end of the session, participants will understand debt financing and public private partnership for municipal infrastructure provision in Nepal, learn about demand and supply of urban infrastructure in Nepal and review the case of pedestrian overhead bridge construction in Kathmandu valley.

2 min



Urbanisation in Nepal is not largely due to an economic structural transformation. It is mainly because of combination of four reasons: (a) extensions of town's geographical area, (b) increase in the total number of towns, (c) natural growth rate of population and (d) rural-urban migration. Urban areas have mostly grown haphazardly, expanding over flood-prone areas, and agriculture has remained the main economic activity in most areas. Moreover, urban growth has not adequately transformed potential production sectors in the hinterlands. While considering the old 58 municipality only, one municipality in the mountain region covers about 25,909 sq. km area whereas the corresponding figure is just 1,173 in Tarai region. In hills, one municipality covers about 48 km diameter with area of 2,272 sq. km.

2 min

Municipality	Area (sq. km)	Population Density	Capital Expenditure (Rs. per sq. km)
Kathmandu	10.40	1,986.48	11,65,541
Bhaktapur	11.46	2,975.51	4,68,446
Tribhuwana	11.98	2,189.48	509,368
Dhulikhel	5.56	3,129.77	1,179,704
Lekhnath	5.26	11,025.72	3,070,704
Koteshwar	40.70	1,000.00	44,452,440
Bhalegaon	11.18	12,045.41	4,580,000
Amargadhi	103.38	160.00	304,000
Vidya	319.88	362.21	25,198
Karandhuk	267.90	177.13	65,936
Dhankuta	102.40	363.98	290,971
Dhulikhel	50.75	746.62	13,431
Walsang	117.24	328.17	57,306
Amarpatti	198.95	118.21	27,000

Infrastructure development is the backbone of city planning and design, defining the quality of life of city dwellers. Access to various amenities and facilities by all groups is essential. There are wide variations in terms of population density and per capita investment (as well as per sq. km. area) among the cities in the same ecological belts (and development region) as well as across different ecological and development regions (considering old 58 municipality and their earlier boundary). Banepa municipality has only 5.56 sq. km area whereas Triyuga municipality covers 319.88 sq. km. In terms of population density, Amargadhi having 160.00 person per sq. km is the least dense city against the most dense Kathmandu with 20,289.00 persons per sq. km. Similarly, Triyuga invested just NRs. 251,230.00 per sq. km. of area (the lowest investment) compared to Bhaktapur, invested NRs. 44,452,440.00 (highest) in 2013 according to municipal's total expenditure (including administrative expenses). Such inequality is also observed in terms of per capita investment: Lekhnath spending only NRs. 11,000.00 (minimum) compared to NRs. 29,000.00 in Dhulikhel (maximum).

2 min



At present, per capita urban infrastructure investment in Nepal is about \$13, compared to \$17 in India, \$116 in China, \$127 in South Africa and \$391 in the UK. For low income country like Nepal, 7.5% of its gross domestic product (GDP) needs to be invested in urban services: 4.2% for investment and 3.3% for maintenance and operation. However, Nepal's present investment in urban infrastructure is just 0.8% of its GDP, compared to 5.7% in India and 9.3% in China. It is inadequate even for meeting the required operation and maintenance costs of core urban services, let alone for financing the additional requirements of civic services and other urban infrastructure. India is annually investing at least \$50 per capita (average) for urban infrastructure.

2 min



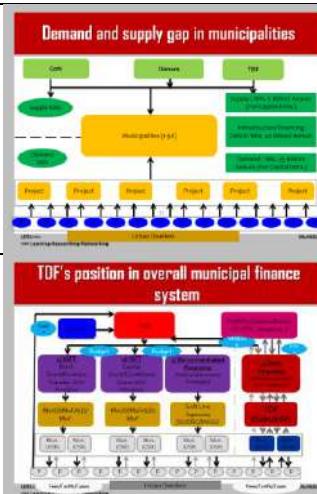
For the same level of investment, Nepal needs to invest \$166.50 million per year for its 4.50 million urban population (considering only 58 municipalities). Another rough estimate calculated by Town Development Fund (TDF) reveals the needs of NRs. 41 billion for urban infrastructure. Nepalese municipalities invested nearly NRs. 1,128,288 million as 'capital investment' in basic services (such as road, drainage and water supply) in the fiscal year 2005-'06. On average, municipalities incurred NRs. 344,380.00 for 'capital investment' in every square kilometre improvement (total municipal area of 3,276.28 sq. km.). Between 1990 and 2003, Nepal's private foreign investment as a percentage of GDP only grew by 0.3% in aggregate. This minor increase in private sector financing was not sufficient to offset the impact of a decline in public infrastructure spending in the last 17 years. The declining levels of capital and recurrent expenditures have also greatly affected key infrastructure development in Nepal. Finally, low levels of investment also had an impact on the overall quality of infrastructure. The global competitiveness report 2008-'09 ranked Nepal among the lowest South Asian countries in overall infrastructure quality.

2 min



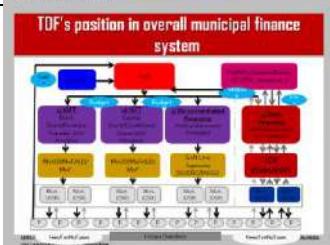
Generally, the municipal sources of funds comprise of taxes (property, license fee and entertainment tax), users charges (water, sewerage and drainage, etc.) and lease income (rental from land, building and market) including grants from the central government. Such conventional financing techniques are often insufficient to meet the funding required for infrastructure development. Even if tax defaults are low and user fees are collected, municipal's own revenues are often not sufficient to fulfil the demand of infrastructure provision and urban services. These local bodies vary substantially in their revenue basis and tax administration capacity, and their service delivery potentials and the scope of services provided are diverse.

2 min



There was about only NRs 5 billion per annum for capital infrastructure investment in Nepal some 10 years back (when there was only 58 municipalities). However, the demand was about NRs 45 billion per year thereby making gap of NRs 40 billion per year.

2 min



To address this gap, the Town Development Fund (TDF) since its inception in 1987 has been providing technical and financial supports through grants, soft loans and loan with the support of the Government of Nepal and various donor agencies. Municipalities in Nepal are still highly depended on grants from central agencies. During fiscal year 2005-'06, about NRs. 2.470 billion have been transferred to municipalities with NRs. 1.9 billion from the then Ministry of Local Development alone. Department of Urban Development and Building Construction contributed NRs. 130.6 million and Road Board Nepal about NRs. 137.9 million. Town Development Fund contributes accounts about NRs.293.8 million. Since the basic services (roads, water supply, health facilities etc.) are provided by the central government, limited room is left for local bodies' initiative to approach TDF, a financial intermediary. The scope of TDF's loan operation in total local government spending is still negligible (11% in 2005, declining to 3.5% in 2009) and does not at all bridge the fiscal gap to meet the development requirements of the

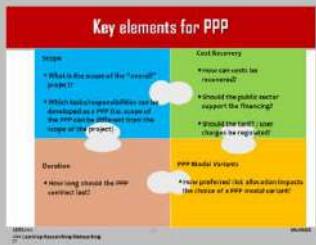
municipalities. All these have caused huge resource gap between supply and demand of urban infrastructure

<p>2 min</p>	 <p>Municipal financing thru' PPP or debt financing</p> <p>BRIDGING THE INVESTMENT GAP: Commitment Required for Underfunding PPPs</p> <ol style="list-style-type: none"> 1. Inadequacy of resources with government (commonest reason) 2. By leveraging on committed government funding it is possible to finance projects of much larger magnitudes 3. In this regard the 11th Finance Commission envisages that 30% of the investment requirements would have to be met through market engagement in the form of PPPs or debt financing <p>Source: UN-Habitat Note: Linking Accounting Database</p>	<p>So, it is very much clear that municipalities need to see alternative method besides the debt financing for infrastructure provision such as public private partnership. It is estimated that about 30% of the investment requirements would have to be met through market engagement in the form of PPPs or debt financing.</p>
<p>2 min</p>	 <p>Future possible financing</p> <p>Assistance Grants - Public Private Partnership - Foreign Direct Investment (FDI)</p> <p>Issue created with grants from higher authority</p> <p>The central government and other organizations involved in the implementation of projects may require municipalities to meet their financial needs according to the guidelines of central governments and other organizations involved in the implementation of projects.</p> <p>Typically, municipalities can also want to perform local revenue activities. In particular, there is a need to have proper arrangements for some specific areas, grants cover a large proportion of capital to the project and allow the municipality to take on a smaller share of the risk, which can encourage people to offer to communities at risk.</p> <p>Grants may also help communities to provide adequate levels of service at reasonable technical and operational costs. Overall, the experience and knowledge of TDF can help municipalities to reduce their costs and enhance the efficiency of their work in the area.</p> <p>A recent study on the role of financing the remote villages, finds grants provided by the central government and other organizations involved in the implementation of projects can help to ensure that the concerned regions benefit from better infrastructure and growth.</p> <p>Generally, investors value accountability. When there is more accountability of government funds the same tends to be accountable problems arise.</p> <p>Source: UN-Habitat Note: Linking Accounting Database</p>	<p>The infrastructure needs are dynamic and therefore changing over time in line with the socio-economic advancement of a nation. TDF shall play a multiple roles to ensure sustainable infrastructure development thereby enhancing quality of life of urban dwellers. It shall expand its funding sources with supports from various donor agencies as well as government of Nepal. Municipalities in Nepal need technical assistance to improve borrowing capacity and management of infrastructure assets. Capacity of both TDF and municipalities need to enhance in project identification, priority, planning & development including implementation and post construction operation and maintenance. In addition to these, provincial and central governments' grants to municipalities should also to be enhanced.</p>
<p>2 min</p>	 <p>What a PPP is & what it is not</p> <ul style="list-style-type: none"> 1. PPP is not privatization or disinvestment 2. PPP is not about borrowing money from the private sector 3. PPP is more about creating a structure <ul style="list-style-type: none"> - in which greater value for money is achieved for services - through private sector innovation and management skills - delivering significant improvements in service delivery and efficiency 4. This means that the private sector <ul style="list-style-type: none"> - no longer builds roads, it purchases lifelines like material and highway - no longer builds prisons, it buys contracted services - no longer operates ports but provides port services through world-class operators - no longer builds power plants but purchases power <p>Source: UN-Habitat Note: Linking Accounting Database</p>	<p>PPP means an arrangement between government or statutory entity or government owned entity on one side and a private sector entity on the other, for the provision of public assets and/or related services for public benefit, through investments being made by and/or management undertaken by the private sector entity for a specified period of time, where there is a substantial risk sharing with the private sector and the private sector receives performance linked payments that conform (or are</p>

benchmarked) to specified, predetermined and measurable performance standards.

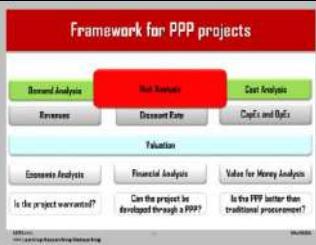
2 min	<p>PPP comes in many sizes and shapes</p> <p>Across many infrastructure sectors...</p> <p>Private Sector can participate through.....</p> <p>In several ways/forms... –</p> <ul style="list-style-type: none"> • Performance/management contracts • Leases • Concessions (BOT, BOOT, BOO, DBFO, etc..) <p>• Designing</p> <ul style="list-style-type: none"> - Building - Financing - Own - Operation - Maintenance - Transfer <p><small>Source: Learning Resource Kit on PPPs</small></p>	<p>PPPs come in many shapes and sizes. It can be successfully used in different sectors: power, transport, urban, education, health and so on. Private sector can participate through several ways: performance/management contracts, leases and concessions (BOT, BOOT, BOO, DBFO, etc.) – designing, building, financing, own, operation, maintenance and transfer)</p>
2 min	<p>PPP option</p> <p>Extent of private sector participation</p> <p>Which of these are PPPs?</p> <p><small>Source: Learning Resource Kit on PPPs</small></p>	<p>PPP has multiple option. It can vary from works and services contracts to full privatization with maintenance and management contract, operation and maintenance concessions and build operate transfer concessions. Involvement of private sector will be low in works and services contracts but will be high in full privatization.</p>
2 min	<p>Types of PPP project</p> <p>FINANCIALLY FREE STANDING PROJECTS</p> <p>Example: Toll Roads, Bridges, Telecoms and Ports projects</p> <p>PROJECTS WHERE GOVERNMENT PAYS FOR SERVICES</p> <p>Example: Roads - shadow tolls, prisons - prison fees, schools - school fees, defense related services - defense fees</p> <p>Hybrid (In both cases, the private sector is fully funded by the private sector)</p> <p>ARTIFICIAL STRUCTURES</p> <p>Example: Roads -影子 tolls, prisons - prison fees, schools - school fees, defense related services - defense fees</p> <p>Financially free-standing nature -影子 tolls</p> <p>Government pays for services</p> <p>Government provides the enabling legislative and policy framework</p> <p>Private sector provides the mobility generated in a mobility project</p> <p><small>Source: Learning Resource Kit on PPPs</small></p>	<p>PPP project can be of different type and nature. They may be financially free standing projects such as Toll Roads, bridges, telecom services, port projects. They may also be projects where government pays for services. For instance, roads built by private sectors but the government pay the shadow tolls against performance. In UK, prisons, education, health services, defense related services belong to this type. Projects sometimes may be of hybrid nature.</p>
2 min	<p>Pre-requisite condition for PPP</p> <p>FOR A PROJECT TO BE UNDERTAKEN ON PPP BASIS</p> <p>The public entity should have the enabling authority to transfer its responsibility - enabling legislative & policy framework OR an administrative order to that effect.</p> <p>Engagement with a Private Partner should bring in value for money</p> <p>The instrument of transfer is the Contract OR Concession Agreement.</p> <p>FOR A PROJECT TO BE CONSIDERED A PPP</p> <ol style="list-style-type: none"> • There should be a significant transfer of responsibility to the private entity - usually including financial investment obligation • Payment to the private entity for services based on achievement of one or the other levels and standards of performance - directly or under a toll/tariff fee or paid by the public entity (annuities for instance) • The nature of the relationship should be long term in order to derive maximum benefits <p><small>Source: Learning Resource Kit on PPPs</small></p>	<p>PPPs have some pre-requisite condition. The public entity should have the enabling authority to transfer its responsibility: enabling legislative and policy framework or an administrative order to that effect. Engagement with a private partners should bring in value for money. The instrument of transfer is the contract or concession agreement.</p>

2 min



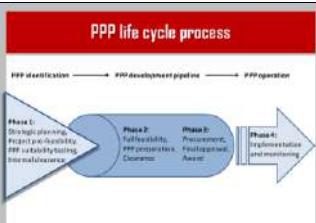
While carrying out PPP projects, key elements like scope, cost recovery, duration and PPP modal variants should be discussed in detail.

2 min



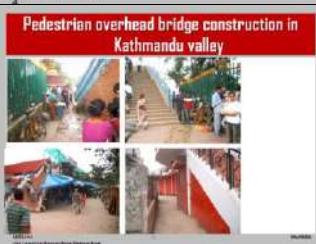
In PPP project, the singular most important element is risk analysis and its valuation. Demand of the services is to be analyzed along with cost of construction and operation and possible revenue generation. Moreover, with economic and financial analysis the value of the money and hence the worthiness of PPP can be determined.

2 min



PPP life cycle process has three distinct stages: identification, development pipeline and operation.

2 min



Acknowledging the miserable traffic condition on Kathmandu's streets, the Asian Development Bank initiated a five year long Municipal Infrastructure Improvement Project (MIIP) aiming to improve the situation. Among the numerous infrastructure projects, construction of overhead pedestrian bridges under the 'public private' partnership between the Kathmandu Metropolitan City (KMC) and Innovative Concept Private Limited (ICPL) is significant from many ways.

2 min



So far six bridges have already been completed along many junctions around Toudikhel route only. According to agreement between KMC and the Innovative Concept Pvt. Ltd, the latter will construct six more such bridges, each worth of NRs. 2 million, cleans and maintains the existing bridges and pays NRs. 120,000 annually with 5% increase of royalty per year to KMC in lieu of allowing commercial display in removable boards and shutters below the bridges.

<p>2 min</p>	<p>Contractual agreement between KMC and private party (Innovative concept)</p>	<p>The contractual agreement further numerous clauses: municipality manage water supply, electricity and telephone lines but maintenance and painting of the bridges and keeping the bridges and surrounding footpath neat and clean should be responsibility of private sector. The agreement also spelt out the need to keep municipal logo and message clearly visible in the overhead bridges.</p>
<p>2 min</p>	<p>Pedestrian overhead bridge construction</p>	<p>So, the duty, responsibility and liability of both public and private parties were clearly mentioned in the agreement paper.</p>
<p>2 min</p>	<p>Sundhara overhead bridge</p>	<p>While surveying the rent of each shop at that time (some 12 yr back), ICPL earned NRs 50,000 per month as rent from three shops below the Sundhara bridge (eastern side of Telecom office).</p>
<p>2 min</p>	<p>Sundhara overhead bridge</p>	<p>Similarly, ICPL received NRs. 60,000 per month from seven shops below the Sundhara overhead bridge (eastern side of Post Office).</p>
<p>1 min</p>	<p>New Road overhead bridge</p>	<p>About NRs. 85,000 per month was collected from seven shops below the New road overhead bridge (in front of NAC building).</p>
<p>1 min</p>	<p>Bir hospital overhead bridge</p>	<p>The nine shops below the Bir hospital bridge (in front of Bir hospital) alone yielded NRs 50,000 per month.</p>
<p>1 min</p>	<p>Jamal overhead bridge</p>	<p>The total rent from all eleven shops at Jamal overhead bridges (near Rastriya nachgar) was about NRs 80,000 per month.</p>

2 min



The eleven shops below Bhotahity overhead bridge (in front of Durbar high school) provided NRs. 80,000 per month for the private sector.

2 min



The KMC has simply failed to conduct detail feasibility study and financial calculation while dealing with ICPL. The latter party earns nearly six million each year: more than NRs. 3,00,000 just from the forty-four shutters and around NRs. 1,50,000 - 2,00,000 from the commercial boards but pays only NRs. 1,20,000 to KMC. On the issue directly related to pedestrian comfort neither the ICPL is interested to keep bridges and the surrounding areas neat and clean without street vendors and beggars nor does the KMC enforce the private party to do so. One can always find bridges full of scattering of paper, cans and bottles and other small pieces of rubbish together with formation of puddles on the stairs during rainy seasons. Moreover, extension of commercial activities from lower part to the upper parts of the bridges including occupying of almost half of the spaces by vendors and beggars have made pedestrian movement inconvenient but promoted commercialisation of public spaces. People have lost the sense of orientation while using the overhead bridges at the Ratna-park junction due to blockages of road view by the commercial boards.

2 min



Though the objectives of the recently constructed overhead pedestrian bridges at different location in central Kathmandu to smoothen vehicular traffic and to ensure safe pedestrian crossing on busy streets are fulfilled in a narrow sense, it has introduced new set of problems of narrowing down the existing street sidewalks (footpaths), making pedestrian movement pattern inconvenient and degrading the unique streetscape scene. It is possible to meet the same objectives through effective traffic management including control of illegal encroachment of sidewalks and integrating transport planning and land use activity in broader context giving pedestrian movement network first priority as pedestrians always

prefer to take visible short route at grade (street) level in their trips.

2 min



Debt financing is necessary for basic infrastructure provision in many municipalities in Nepal. Public private partnership is another technique of building infrastructure for win-win situation on both parties (public and private); Project appraisal and financial calculation should be done effectively for successful implementation of PPP projects, which is not the case for pedestrian overhead bridge construction in Kathmandu valley

26 min



Any question, comment or suggestion?

Sessional Plan

Module:

Day-session: 3-
IV

Session subject: **Municipal planning process and implementation of projects through community participation**

Time: 1h30 m

General objectives

The main objectives of this session is twofold:

- [a] to study municipal annual planning process, and
- [b] to study implementation of projects through community participation

Specific objectives

At the end of this session, the participants will

- [a] understand the annual municipal planning process
- [b] learn about implementation of projects through community participation and its multiple advantages.

Main contents of the session

Training/teaching activities	Time duration	Teaching materials	Remarks
Activity 1: Introduction of the topic	1 min		It is important to understand the municipal annual planning process and implementation of projects through community participation.
Activity 2: Specific objectives and expectation of learning by participants	2 min		The main objectives of this session is twofold: to understand annual planning process in municipality and to apprehend implementation of projects through community participation.
Activity 3: Ask participants at least three different questions	3 min		Participants will be sensitized through discussion over how municipalities prepare their annual programs? And what are the benefits of engaging communities in implementation of projects?
	2 min		After restructuring of the state as per 2015 new constitution, there are seven provinces and 293 municipalities with 753 local units. Based on the size and capacity of the municipality, the organization chart differs from one to another. Nonetheless, there are many sections like administrative,

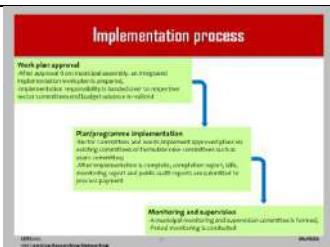
legal, finance, urban development, etc. are common to all types of municipalities.

3 min



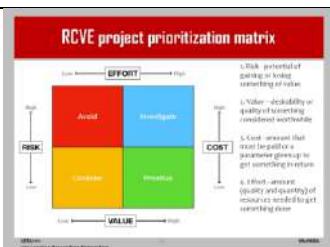
There are seven basic steps to be followed for preparation of annual municipal plan. In the first and second steps, the municipal budget is determined around Dec. – Jan. Ward level meeting and community consultation take place in the third step around Mar-Apr. In step four, each ward priorities plans from the listed/submitted plans and finalize it. In step 5, municipality review all the plans received from different wards and prepare a final list by combining all the plans received and prioritizing them. Municipal sections can also prepare the plans based on their past experiences. In the step six, the municipality presented the plans to municipal assembly for approval during the month of June. Municipal assembly approves the list of plans in step seven around July each year.

2 min



After approval from municipal assembly, an integrated implementation work plan is prepared. Implementation responsibility is handed over to respective sector committees and budget advance is realized. The approved plan or program is implemented through ward and completion report, bills, monitoring report and public audit reports are submitted to process payment. A municipal monitoring and supervision committee is formed for periodic monitoring.

2 min

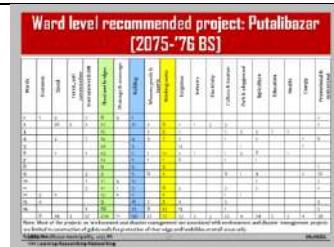
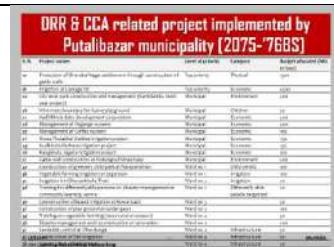
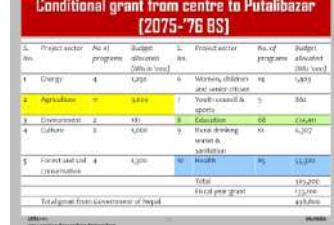
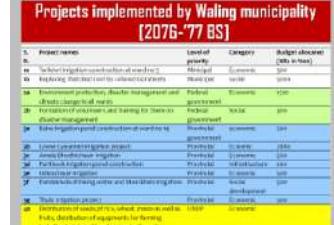


Municipality and wards can use RCVF (risk, cost, value and effort) technique to prioritize projects submitted from communities and wards.

3 min



Municipalities at present can implement development projects in different ways. First, the infrastructure projects approved by municipal council have budget allocation and will have no problem for implementation. Municipalities often receive conditional grants from province and central government for implementation of specific programs. Also, municipalities can sometimes approach to Town Development Fund for debit financing for financially viable project. In addition to these, municipalities

		can also partner with NGOs and donors for implementation of some projects: study, document preparation or construction of physical activities.
2 min		While reviewing the ward level recommended projects at Putalibazar municipality for fiscal year 2065-'76 BS, majority of the projects (274 no) are associated with road and bridge construction followed by building construction (99 no) and drinking water projects (73 no).
2 min		There were only 27 no of projects under environment section and disaster risk reduction and climate change associated projects were also included in this section. Only few projects were implemented related to disaster management and climate change adaptation.
2 min		Putalibazar municipality also received grants from the center government with priority on agriculture, education and health.
2 min		In the case of Waling municipality of Syangja district, infrastructure related projects such as road, bridge and building construction dominated the ward level project (about 117 no of project) followed by drinking water and agriculture related activities.
2 min		Waling municipality have also invested small size of projects related to disaster management and climate change in the fiscal year 2076-'77 BS.
3 min		Under the project entitled “Revitalization of Public Spaces in Kathmandu Valley Traditional Settlements after Nepal Earthquake, Bungamati” planning process of public spaces at Machendra Bahal and De Pukhu area has been carried out using Minecraft game tool with participation of local youths with support from UN Habitat. As the existing public rest house (Ta falcha) was structurally damaged, it was decided to rebuild it again using brick in mud mortar for masonry walls, woods for flooring and tiles in the roof.

2 min



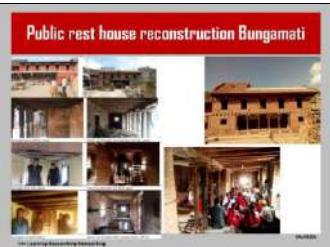
This project was selected by local community and then Karyabinaya municipality. Bungamati Area Reconstruction and Development Council (BARDeC) and neighborhood (tole) committees were formed. Community users' committees were oriented. The damaged structure was dismantled. Another NGO known as Centre for Integrated Urban Development (CIUD) was also involved.

2 min



UN-Habitat and CIUD supervised the dismantling of the 'Ta falcha,' collected the usable materials such as carved wooden post and door or window frames and panels, bricks and stones. The quality of construction work was also checked. Part of the 'Saula' library was used as site office. During the construction work at both sides, the local communities had shown more concern and interest by acquiring more information about design and detailing as well as by suggesting design solutions.

2 min



Minor modifications in design of public rest houses (open wooden colonnades at the corner of the ground floor was shifted to the center by making solid wall at the corner and slight change in alignment of window opening on the ground and first floors) were made to make the structure safer against earthquake.

2 min



It was scheduled to complete the construction work within four months, starting from March 2017. Most activities were completed as per proposed schedule, however, various activities associated with output 2 were delayed by a week due to combination of heavy rains during the months of March and April, local election held on 14th May 2017 and ritual of ground breaking ceremony to be carried out only on auspicious time and day. Searching good quality of wood in the market and traditional type of clay roofing material also consumed almost one week. The frequent raining in the months of May and June also hampered the construction work. All these events delayed the completion work by almost two weeks.

3 min



2 min



2 min



2 min



2 min



Another infrastructure project selected by community was revitalization of 'De pukhu' (main pond) at Kota tole of Bungamati. The design intent was to link water body with surrounding public space and up to the enclosing buildings by creating public spaces (through stepping and removing the earlier brick walls), cleaning water and proposing public related activities on the ground floor of surrounding houses. To engage the people around the ponds, solar lamps and facilities for charging mobiles are also planned to install.

Community users' committee (CUC) was also formed and mobilized the local people for cleaning the water. The top layer of debris were removed using manually and the original shape of the water body was retained by removing the debris and correcting the encroachment.

Stone walls around the pond were constructed gradually by creating stepping of different size and height so that more public spaces are created.

While looking the old picture of the area, there was no wall between the peripheral space and pond boundary but brick wall was built in later period. Instead of the boundary walls, public spaces in the stepping form was constructed which also acts as a 'transitional space' thereby preventing kids directly falling down into water.

These pictures demonstrate the continuous improvement of the pond with multiple activities. The construction work was jointly supervised by UN-Habitat, CIUD, Karyabinayak municipality and local people.

In this case, the planned work schedule was delayed by almost two weeks. The amount of debris below the pond was huge than expected and the boundary wall of southern and part of eastern sides were encroached in the past. Such mistakes were corrected after discussing among CUC, BARDeC and local people. Besides these, frequent rains and local elections also

hampered the construction work. Many workers took leave from the work to plant rice in their field in the months of May and June.

3 min

Cost estimate: community contribution		
(a) Reconstruction of Public Rest House (Pah) at Machchendra Bahal		
Particular	Contribution (%) of total estimated cost	Cost (NRS)
Total estimated cost	100%	2,375,495.12
UN-Habitat's contribution	15%	356,329.28
Community contribution (in kind)	10% (100 = 100)	NRS 237,549.52
(b) Revitalization of De Pukhu at Kota Tole		
Particular	Contribution (%) of total estimated cost	Cost (NRS)
Total estimated cost	100%	2,546,928.00
UN-Habitat's contribution	10%	254,692.80
Community contribution (in kind)	10%	254,692.80
Cost estimate of combined projects		
Particular	Contribution	Cost (NRS)
Total estimated cost	100%	4,922,423.12
UN-Habitat's contribution	10%	492,242.31
Community's contribution	10%	492,242.31
Total estimated cost		
NRS 4,922,423.12		

For the reconstruction of public rest house at Machchendra Bahal, the estimated total cost came out to be **NPR 7,385,885.12**. About 25% (10% by direct community contribution in kind and 15% for reusing the materials of the dismantled structure) of this amount, i.e., **NPR 1,846,471.28** was estimated to be contributed by community's side. The remaining 75% amounting **NPR 5,539,413.84** would be supported by UN-Habitat. The estimated total construction cost for revitalization of De Pukhu at Kota Tole was equivalent to **NPR 2,546,928.00**. In this project, 10% of the total cost was expected through community's contribution in kind. Combining both these two demonstrating projects, the estimated total construction cost came out to **NPR. 9,932,813**, equivalent to **US\$ 91,328**. Out of this total cost, community's contribution would be 21.16% equivalent to **US\$ 19,319** and the remaining 78.84% (equivalent to **US\$ 72,009**) would be contributed by UN-Habitat.

2 min

Advantages of users committees		
Sense of ownership and hence take care of maintenance and operation		
Contribute in cost through labor contribution		
Ensure some financial benefits to local people		
Ensure quality during construction and selection of material		
Strengthen municipal and ward level with community organizations and local institutions		
Source: UN-Habitat Learning Resource Framework		

Engagement of user's committees of local people in planning and implementation of infrastructure project has multiple benefits. As they were engaged from concept to completion, they took the sense of ownership and actively contributed in reconstruction work. The total construction cost has significantly reduce due to their contribution. As local people were engaged in the reconstruction, they also got job at lease for the short term. Quality control was possible. Above all, the local communities built a relationship with ward office and municipal staffs.

3 min

Take home message		
Present municipal planning process allows direct engagement of local people through ward in identifying their needs/desires in the form of projects		
Municipality can select the project based on local needs, balance development and socio-economic benefits of citizens		
Active participation of community organizations and implementation of projects through users committees have multiple benefits		
Source: UN-Habitat Learning Resource Framework		

Numerous lessons can be learnt from this session. Present municipal planning process allows direct engagement of local people through ward in identifying their needs/desires in the form of projects. Municipality can select the projects based on local needs, balance development and socio-economic benefits of citizens. Finally, active community participation in infrastructure development have multiple

benefits and should be encouraged in future too.

30 min



Any question, comment or suggestion?

Day 4 Review of municipal works and preparation of group exercise

Sessional Plan

Module:

Session subject: **Sharing of review of municipal projects and discussion**

Session: 4-I & II

Time: 1h30 m

General objectives

The main objectives of this session is twofold:

- [a] to share planning, designing and implementation of different types of municipal projects;
- [b] to compare those implemented projects with urban design approach and techniques to find out the gaps and improvement possibility.

Specific objectives

At the end of this session, the participants will

- [a] learn different types of municipal projects: planning, designing and implementation including post-construction management;
- [b] share among participants on various issues and problems faced during the development process; and
- [c] observe those already implemented projects from urban design perspective and realize the areas for improvements.

<i>Training/teaching activities</i>	<i>Time duration</i>	<i>Teaching materials</i>	<i>Remarks</i>
Activity 1: Each participant will share experience of municipal project implementation	@5 min	Meta card and fixing in the brown paper	While sharing the experience of municipal project implementation, focus will be on (i) planning, designing and implementation process, (ii) problems faced and issues raised and (iii) agencies involved, budget allocation and related legislation.
Activity 2: Categorization of projects and issues and problems faced	10 min	Grouping of meta cards as per projects and issues	All the meta cards can be grouped as per nature of the project (physical, economic, social, etc.) and the issues/problems faced during development process. Those issues might be associated with weak planning, lack of community participation, failure of individuals to follow building bye laws and National Building Code, cost override, delay in implementation and so on.
Activity 3: think of those identified issues and problems from urban design perspective	25 min	Meta cards grouped and fixed over larger brown sheets	Discuss, brainstorm and facilitate on how those problems and issues raised during the development process could have been addressed through urban design approach, techniques and strategies.

Activity 4: Lessons learned	10 min	Identify the lessons to be learned from the past mistakes and proposed recommendations for the future municipal project design and implementation.
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Day 4 Discussion on possible sites, issues and detailing of the project for group exercise

Sessional Plan

Module:

Session subject: **Discussion on possible sites, issues and detailing of the project for group exercise**

Session: 4: III - IV

Time: 1h30 m (each session)

General objectives

The main objectives of this session is twofold:

- [a] to find out possible project for group exercise; and
- [b] to prepare a check list for each exercise for site visit

Specific objectives

At the end of this session, the participants will

- [a] come us consensus for possible projects for group exercise;
- [b] develop check list for each project; and
- [c] understand the parameters to be observed during site visit

<i>Training/teaching activities</i>	<i>Time duration</i>	<i>Teaching materials</i>	<i>Remarks</i>
Activity 1: Brainstorming and discussion over development of possible projects for group exercise	@20 min	Writing over brown paper	Discuss over possibility of developing a project for group exercise based on the earlier categorization of various municipal activities/projects as per their nature and features.
Activity 2: Group formulation and refinement of discussion towards finalization of projects for group exercise	@10 min	Writing over brown paper	Divide the whole participants into 4-5 groups, each group comprising at least 4-5 participants. Ensure that each group is balanced in terms of gender and educational background (architect, draft person, engineers, overseers, etc.) Develop at least four-five different type of projects for group exercise. Make sure each project for group exercise is relevant to municipality and has activities that resembles to municipal activities.
Activity 3: Finalize the possible projects for group exercise	@30 min	Writing over brown paper	Possible projects for group exercise might be of different natures: [a] Master layout plan preparation of any proposed land pooled area, (b) pedestrianization of mixed use area (existing one) through improvement of footpaths, instalment of street furniture and public amenities (street lighting, dust bins, signage, street marking, etc.), (c) development of public open spaces by

			improving linkages, linking with surrounding buildings (especially ground floor uses), providing public amenities such as drinking water, public toilet, furniture and other activities to engage people of different age groups, and (d) identification of salient features, heritage values of historic districts (neighborhoods) and formulation of urban design guidelines along with incentive mechanism for conservation of townscape.
Activity 4: Assign the group with project of group exercise base on individual interest, educational background and work experience	@30 min	Writing over brown paper	Development of important check list for each project while visiting site in next session (Day 5). For instance, to carry out group exercise on ‘pedestrianization of mixed use area’ check list can be: width of the footpath and its continuous network, available facilities for pedestrian, safety and security condition, possibility of using foot path by blinds and differently able persons, linkage with ground floor use of buildings on both sides of streets, light and ventilation on streets, street characters and so on. Also, ensure the list of drawings, data and other information required for each project.

Day 5 Site visit, observation, mapping and discussion

Sessional Plan

Module:

Session subject: **Site visit, observation, mapping and discussion**

Session: 5-I-II

Time: 1h30 m (each session)

General objectives

The main objectives of this session is twofold:

- [a] to gather information as per check list and to note down site specific situation; and
- [b] to make oneself familiarize of the site context for group exercise

Specific objectives

At the end of this session, the participants will

- [a] gather adequate information of the site for group exercise;
- [b] take note of site specific information and data through different means; and
- [c] understand the site context and major issues and problems.

<i>Training/teaching activities</i>	<i>Time duration</i>	<i>Teaching materials</i>	<i>Remarks</i>
Activity 1: Visit the site along with check list and maps	@30 min	Writing over note paper and plot on the map. Also take pictures	Each group will visit the site along with check list and maps. Each member of the group observe the study area focusing on the aspects mentioned in the check list, take pictures, note in the map and draw other information as necessary.
Activity 2: Note down site specific issues and problems	@20 min	Writing over note paper and plot on the map. Also take pictures	Each member will not only rely on the check list but also take note of site specific issues and problems, talk with local people and visitors for extra information.
Activity 3: Discuss with other members of the group and teacher whenever necessary	@20 min		Discuss with other members of the group and teacher on various issues during site visit in order to get maximum contextual knowledge.
Activity 4: Familiarize with site context and various issues to be addressed	@20 min	Writing over note paper and plot on the map. Also take pictures	Each member of the group makes the site context familiar by collecting sufficient information through different means and noting them.

Day 5 and 6: Group exercise and discussion and preparation for presentation

Sessional Plan

Module: Session: 5/6: III-IV/I-IV
Session subject: Group exercise, discussion and preparation Time: 1h30 m (each for presentation session)

General objectives

The main objectives of this session is twofold:

- [a] to identify the major problems and issues associated with the given site; and
- [b] to propose key solutions and recommendations in the form of master plan, guidelines and policies.

Specific objectives

At the end of this session, the participants will

- [a] understand the major problems and issues associated with site;
- [b] develop a framework for addressing those issues and problems by combining the information of the site and knowledge gained from previous various lectures from Day 1 and
- [c] propose some key solutions along with recommendations.

<i>Training/teaching activities</i>	<i>Time duration</i>	<i>Teaching materials</i>	<i>Remarks</i>
Activity 1: Critically review the information collected from site	@30 min	Meta card and brown paper	Familiarize the site context by mapping and writing various information collected during site visit over maps so that all information are available in a collective way for all participants in the group.
Activity 2: Develop a framework based on site context and knowledge gained from lectures in previous days	@20 min	Meta card and brown paper	Each participant can develop a separate framework based on personal observation and understanding of the site context.
Activity 3: Brainstorming among group member	@20 min	Meta card and brown paper	Each participants can develop a conceptual plan along with solutions for the identified problems and issues. Brainstorm among themselves on each issue and problem.
Activity 4: Finalize the conceptual plan along with other detailing	@20 min	Meta card and brown paper	Finalize the conceptual plan and other detailing by incorporating views by respecting views and ideas of each participants through intensive discussion and consensus building. Also, prepare final presentation materials.

Day 7: Group presentation and discussion

Sessional Plan

Module: Session: 7: I-III

Session subject: Group presentation and discussion

Time: 1h30 m (each session)

General objectives

The main objectives of this session is twofold:

- [a] to carry out group exercise and present their outcome; and
- [b] to share the presentation done by each group and to discuss over their proposals and solutions.

Specific objectives

At the end of this session, the participants will

- [a] able to come out with solutions of various problems and issues identified in the given site;
- [b] develop the capacity of working in a team; and
- [c] able to understand others presentation and commenting on them.

<i>Training/teaching activities</i>	<i>Time duration</i>	<i>Teaching materials</i>	<i>Remarks</i>
Activity 1: Set the regulations for presentation: allocated time, use of media and presentation format, if needed	@50 min	ppt presentation along with using meta card and brown paper	Depending upon the number of group, they can be assigned the presentation time plus discussion time. If time does not allow, it is not necessary to make presentation by all members of the group, as it's a group presentation. A general format can be given to them as they need to focus on understanding of site context, preparation of framework, data analysis and synthesis, problems identification before drawing conclusion and proposing key recommendations. For clarity, they can be allowed to use multiple media: pp presentation along with paper presentation over brown sheets.
Activity 2: Encourage active participation of members of other groups in question-answer session.	@30 min	ppt presentation along with using meta card and brown paper	Facilitate the question-answer session by encouraging some questions from other groups. Also make sure that members of other groups also attend the presentation. For that if necessary, submission can be taken before starting the presentation.
Activity 3: Encourage each group by commenting on their presentation on various issues and problems.	@ 5 min	ppt presentation along with using meta card and brown paper	Facilitate each presentation by quickly commenting on their strengths and weaknesses on various issues during presentation itself so that the participants can develop confidence level.
Activity 4: Make overall comments and review over all presentation	@5 min	ppt presentation along with using	Its always recommended to make overall comments over presentation at the end of all presentations by the facilitators.

meta card
and brown
paper

सत्र योजना

मोडुल: अर्वन डिजाइन (Urban Design)

सत्र: २८

समय १० मिनेट

विषय: कार्य योजना, प्रशिक्षण मूल्यांकन तथा समापन

साधारण उद्देश्य: यस सत्रको अन्तमा सहभागीहरूले सिकेका कुरालाई आफ्नो कार्यक्षेत्रमा कसरी कार्यान्वयन गर्ने बारे कार्ययोजना तयार भएको हुनेछ ।

निर्दिष्ट उद्देश्य: सत्रको अन्तमा सहभागीहरूले

- सिकाई कार्यान्वयन गर्ने बारे कार्ययोजना तय गर्न सक्नेछन् ।
- समग्र प्रशिक्षणको सिकाई उपलब्धि मूल्यांकन गर्न सक्नेछन् ।
- प्रशिक्षण कार्यक्रमको औपचारिक रूपमा समापन हुनेछ ।

सत्रका मुख्य विषयवस्तु:

- कार्य योजना तयार
- प्रशिक्षण अपेक्षा पुनरावलोकन
- प्रशिक्षणको संक्षेपीकरण
- प्रशिक्षण पश्चात जानकारी
- प्रशिक्षण मूल्यांकन
- प्रशिक्षण समापन

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप १ सहभागीहरूको ध्यानाकर्षण <ul style="list-style-type: none">■ सहभागीहरू सबैलाई उठ्न लगाउनुहोस् ।■ सबैलाई ताली वजाउन लगाउनुहोस् र ध्यानाकर्षण गर्नुहोस् ।	५ मिनेट		
क्रियाकलाप २ सत्रको नाम, उद्देश्य र विषयवस्तु <ul style="list-style-type: none">• सत्रको नाम, उद्देश्य, विषयवस्तु र समय अवधि वताउनुहोस् ।	५ मिनेट	स्लाइड प्रस्तुति	पावर प्लाइट स्लाइड

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
क्रियाकलाप ३ विषयवस्तु सम्बन्धी सहभागीहरुको बुझाई <ul style="list-style-type: none"> सहभागीहरुलाई तपाईंहरुले कार्य योजना तयार गर्नुभएको छ कि छैन भनी सोधनुहोस् । कार्य योजनामा के के राख्नुपर्छ भनी सोधनुहोस् । सहभागीहरुबाट आएका कुराहरुलाई मिलान गर्दै विषयवस्तु अगाडि बढाउनुहोस् । 	५मिनेट	प्रश्न उत्तर	
क्रियाकलाप ४ कार्ययोजना तयारी <ul style="list-style-type: none"> सहभागीबाट आएको वुँदालाई समेट्दै अब हामी कार्य योजना बनाउंछौ भनी कार्य योजनाको फाराम प्रस्तुत गर्नुहोस् प्रत्येक सहभागीले आ आफ्नो कार्ययोजना तयार गर्न लगाउने । कार्य योजना बनाउंदा कम्तिमा ६ महिनाको लागि गर्न सकिने योजना बनाउनुहोस भनी भन्नुहोस् । यस कार्य योजनाको अनुगमन हुने छ भनी वताउनुहोस् । 	१५मिनेट	समूह छलफल	न्यूज प्रिन्ट, मार्कर, मासिकड टेप, कार्ययोजना फाराम (अभ्यास पत्र)
क्रियाकलाप ५ कार्ययोजना प्रस्तुतिकरण <ul style="list-style-type: none"> कार्ययोजना प्रस्तुत गर्न लगाउनुहोस् । प्रस्तुतिकरणमा केही थपघट गर्नु पर्ने भए गर्न लगाउनुहोस् । यो योजना लेख्र मात्र नभै कार्यान्वयन गर्नुपर्छ भनी वताउनुहोस् । 	१५मिनेट	लघु प्रवचन	
क्रियाकला ६ सत्र संक्षेपीकरण <ul style="list-style-type: none"> सहभागीहरुको केही जिज्ञासाहरु भए समेट्दै यस सत्रमा गरिएका कार्यहरुलाई समेट्दै संक्षेपीकरण गर्नुहोस् । 	५मिनेट	लघु प्रवचन	
क्रियाकलाप ७ सत्र मूल्यांकन <ul style="list-style-type: none"> यस सत्रमा राखिएका निर्दिष्ट उद्देश्यहरु हासिल भए कि भएनन् भनेर थाहा पाउनको लागि सहभागीहरुलाई निम्न प्रश्नहरु गर्नुहोस् । <ul style="list-style-type: none"> कार्ययोजना भनेको के हो कार्ययोजनामा के के विषयहरु हुन्छन् अहिले तयार गरिएको कार्ययोजनामा के के क्रियाकलापहरु राखियो 	५मिनेट	लघु प्रवचन	

प्रशिक्षण – सिकाई क्रियाकलाप	अवधि	प्रशिक्षण – सिकाई सामाग्री	कैफियत
<p>क्रियाकलाप ८ प्रशिक्षणको पश्चात जानकारी र मूल्याङ्कन</p> <ul style="list-style-type: none"> • सहभागीहरुलाई प्रशिक्षण पश्चात्को फाराम वितरण गरी भर्न अनुरोध गर्नुहोस् । • सहभागीहरुलाई प्रशिक्षणको मूल्याङ्कनको लागि तयार गरिएको प्रशिक्षण मूल्याङ्कन फाराम वितरण गरी भर्न लगाउनुहोस् । • सहभागीहरुलाई आवश्यकता परेमा फारामहरु भर्न सहजीकरण गर्नुहोस् । <p>प्रशिक्षणको संक्षेपीकरण र अग्रसम्बन्ध</p> <ul style="list-style-type: none"> • प्रशिक्षकले प्रशिक्षण अवधिभर छलफल भएका विषयवस्तुहरुलाई संक्षिप्त रूपमा स्मरण गराउनुहोस् । • सहभागीहरुबाट आएको अपेक्षाहरुको पुनरावलोकन गर्दै प्रशिक्षणमा समेटिएका र नसमेटिएका विषयवस्तुहरुको जानकारी गराउनुहोस् । • सहभागीहरुलाई सक्रिय सहभागिताको लागि धन्यवाद दिई प्राविधिक सत्रहरु समाप्त भएको भन्दै अव यस पछि समापन कार्यक्रम हुनेछ भनी सत्र अन्त्य गर्नुहोस् । 	१५मिनेट		फारामहरु
<p>क्रियाकलाप ९ समापन कार्यक्रम</p> <ul style="list-style-type: none"> ■ अतिथिहरुलाई आसन ग्रहण गराई प्रशिक्षणको प्रभावकारीताको बारेमा बढीमा दुई जना (एक जना महिला, एक जना पुरुष) सहभागीहरुलाई आफ्नो विचार राख्न लगाउनुहोस् । ■ अतिथिहरुबाट प्रशिक्षणको समापन मन्तव्य व्यक्त गर्दै प्रशिक्षण कार्यक्रम समापन भएको घोषणा गर्न लगाउनुहोस् । 	१५मिनेट		

प्रस्तुति सामग्री (पावरप्प्लाइन्ट स्लाइड)

 स्थानीय विकास प्रशिक्षण प्रतिष्ठान
स्थानीय विकास प्रशिक्षण प्रतिष्ठान ऐन, २०७८ द्वारा स्थापित
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Established by Local Development Training Academy Act, 2049

"An Autonomous, Professional, Client Centered, Gender Responsive National Institute of Excellence in the area of Local-Self Governance."

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Training on urban design Session I

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स्थानीय विकास प्रशिक्षण प्रतिष्ठान ऐन, २०७८ द्वारा स्थापित
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प्रशिक्षण औपचारिकता

- परिचय
- नाम:
- ठेगाना:
- पद:
- कार्य अनुभव:

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साधारण उद्देश्य

- सहभागीहरुको अर्वान डिजाइन सम्बन्धी ज्ञान र सिपमा अभिवृद्धि भएको हुनेछ ।

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निर्दिष्ट उद्देश्यहरु

यस प्रशिक्षणको अन्तमा सहभागीहरुले

- अर्वन डिजाइन र यसको क्षेत्रको बारेमा सहभागीहरूलाई सक्षम गराउन;
- सहभागीहरूलाई अर्वन डिजाइनरहरूको भूमिका बुझाउन
- स्मार्ट र जिवन्त शहरको विभिन्न सुविधाहरू सिक्के र काठमाडौं उपत्यकाका ऐतिहासिक शहरहरू स्मार्ट रहने योग्य शहरका लागि योग्य छन् वा छैन भनेर जाँच गर्ने।

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निर्दिष्ट उद्देश्यहरु

यस प्रशिक्षणको अन्तमा सहभागीहरुले

- विकास नियन्त्रणको समग्र अवधारणाको बारेमा सिक्के र प्रचलित योजनाको मान्यता र मापदण्ड बुझनका साथै नेपालमा Bye laws बनाउने र उनीहरूको सीमितता बुझ्ने।
- स्थानीय तह स्तरमा शहरी विकासमा नेपालको सन्दर्भमा अन्तर्राष्ट्रिय उत्तम अभ्यासबाट सिकेका पाठहरूको उपयोगिता जाँच गर्ने।

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अपेक्षा संकलन

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प्रशिक्षणका विषयवस्तु

- Introduction of urban design and its scope
- Livable city/smart city design and its major components (pedestrian friendly neighborhood, mixed use, etc.)
- Development control, planning norms & standards and building bylaws
- Successful urban design projects international case studies
- Urban design approach in land pooling
- Municipal sustainable development goals, disaster risk reduction and management and climate change

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प्रशिक्षणका विषयवस्तु

- Post-earthquake housing reconstruction in the urban historic core and rural areas
- Urban design guidelines and incentive mechanism
- Urban design techniques in public infrastructure design and implementation
- Debt financing for municipal infrastructure development
- Municipal planning process and urban design approach for selection of projects

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प्रशिक्षणका विषयवस्तु

- Sharing of review of municipal projects & discussion
- Discussion on possible sites, issues and detailing of the project for group exercise
- Site visit & discussion
- Group exercise & discussion
- Group presentation & discussion

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प्रशिक्षण विधि

- मष्टिस्क मन्थन, समुह अभ्यास, लघुप्रवचन, प्रश्नोत्तर आदि। हरेक दिनको अन्तमा दिनभर छलफल भएका विषयवस्तुको संक्षेपीकरण गर्ने।
- दोस्रो दिन पहिलो दिन संचालन भएका गतिविधिको पुनरावलोकनबाट सत्र शुरुवात गर्ने।
- व्यवहारिक अभ्यासको लागि आवश्यक फाराम अभ्यास सिटहरू तयार गर्ने।

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समय तालिका



०७३० – ०८३०	१ घण्टा	चिया र नास्ता
०८३० – ०९००	३० मि.	अधिल्लो दिनको पुनरावलोकन
०९०० – १०३०	१ घ ३० मि	पहिलो सत्र
१०३० – १०४५	१५ मि.	चिया विश्राम
१०४५ – १२१५	१ घ ३० मि	दोस्रो सत्र
१२१५ – १३१५	१ घण्टा	दिवा भोजन विश्राम
१३१५ – १४४५	१ घ ३० मि	तेश्रो सत्र
१४४५ – १५००	१५ मि.	चिया विश्राम
१५०० – १६३०	१ घ ३० मि.	चौथो सत्र

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समूह मान्यता

- समय तालिकाको पालना
- मोबाईल साइलेन्ट मोडमा
-
-

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धन्यवाद

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Introduction of urban design and its scope Session II

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Specific objectives

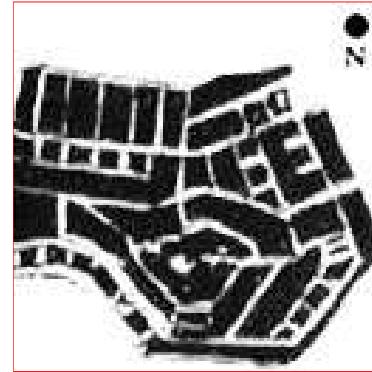
At the end of this session, participants will

- [a] understand the emergence of urban design profession acting as a bridge between architecture and urban planning;
- [b] comprehend the scope of urban design;
- [c] learn various elements of urban design; and
- [d] realize the future prospects of urban design in Nepal

How do you evaluate the planned areas?

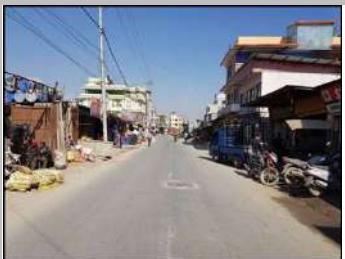


Planned Sinamangal land pooling



Planned Kuleswore housing

How do you evaluate the planned areas?



Sinamangal town planning



Gongabu town planning

What are the differences between traditional town & newly developed area?

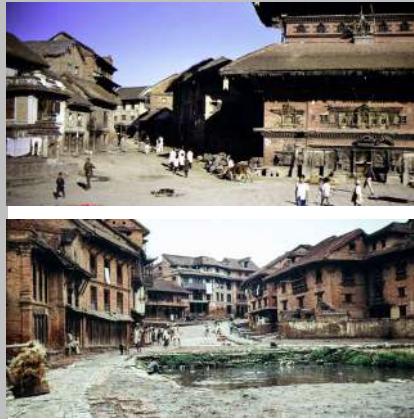


Durbar square, Bhaktapur



Gamcha, Suryabinayak

What are the differences between traditional town & newly developed area?



Historic town of Bhaktapur



Gamcha, Suryabinayak



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Salient features of historic towns of KV



Socio-economic activities on the street [building front]

Street as a stage and celebration of festivals

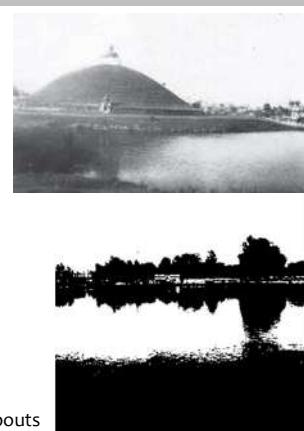
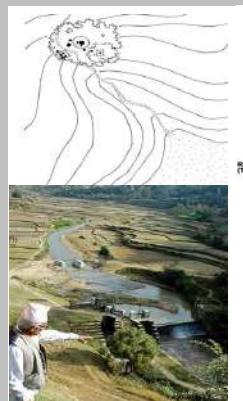


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Salient features of historic towns of KV



Rajkulo (water canal) and ponds and sunken water spouts
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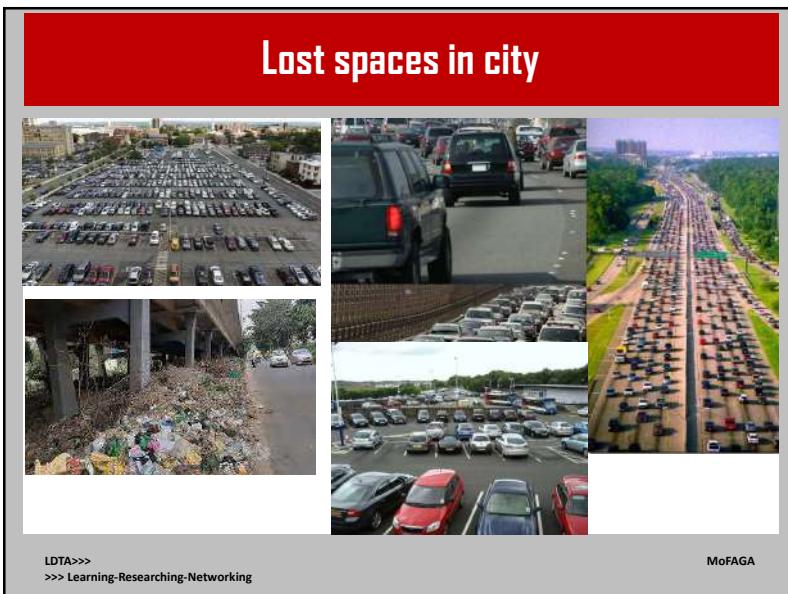
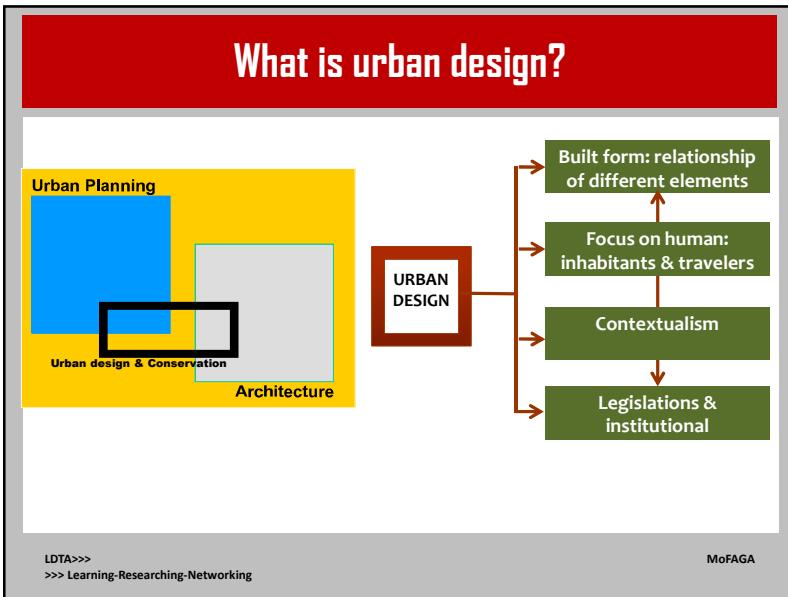
Differences in three settlements

Historic town	Planned area	Haphazard growth area
Holistic planning & design & innovative built form: Buildings, streets and public squares are integrated in design:	Limited to plotting with vehicular access to each plot only. Relationship lacking among different elements	Haphazard built form without any well-defined relationship among different elements
Focus on people: Socialization space, public/ community infrastructure	Focus on parceling of plots rather than people or community	Focus on individual plot or house rather than community
Norms and institutions: Social/community bonding through celebration of festivals, rituals and cultural belief with guthi system	Building bylaws but weak enforcement	Building bylaws but weak enforcement
Contextualism: Locally available building materials and construction technology	Absence of contextualism	Absence of contextualism

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Failure of modern architecture and urban planning

- Dead city – streets mainly for vehicular traffic and buildings with blank walls;
- Wastage of energy and resources – living, working and shopping places are far away and not possible without cars;
- Public space as waste or no man's lands - Spaces between buildings and other open spaces created for community are not functional and people do not use them;
- Social crime increases – the built form and streetscape encourages such activities;
- Anti-urbanism and anti-humanism city or built form;
- Architectural zoo – many distinct buildings but without coherent, visual and functional relations.

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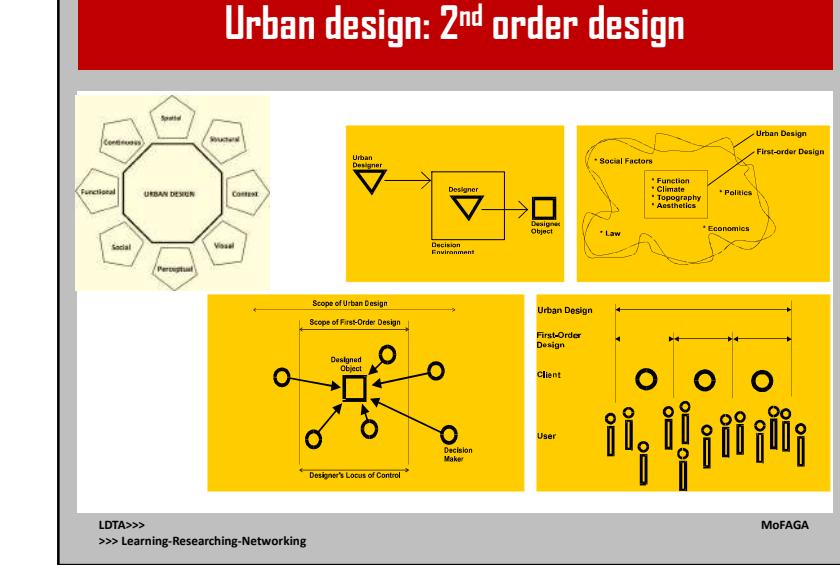
Urban design

Multiple definition of urban design

- Designing cities without designing buildings [Jonathan Barnett, 1982]
- Second order design [R. Varkki George, 1997]
- Involves enabling but not authoring the built environment 'Robert Shilbley, 1982]
- To create built environment by policies, programs and guidelines rather than by blue prints that specify shape and location in details [Kevin Lynch, 1982]
- Process of designing and shaping forms, shape and character to groups of buildings, to whole neighborhoods and the cities, towns and villages
- Focus on 'human component linking physical development with socio-cultural and economic activities;
- Comprehensive entity comprising urban plans, development control and implementation mechanism;
- Research and analytical based.

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Initiation of urban design program

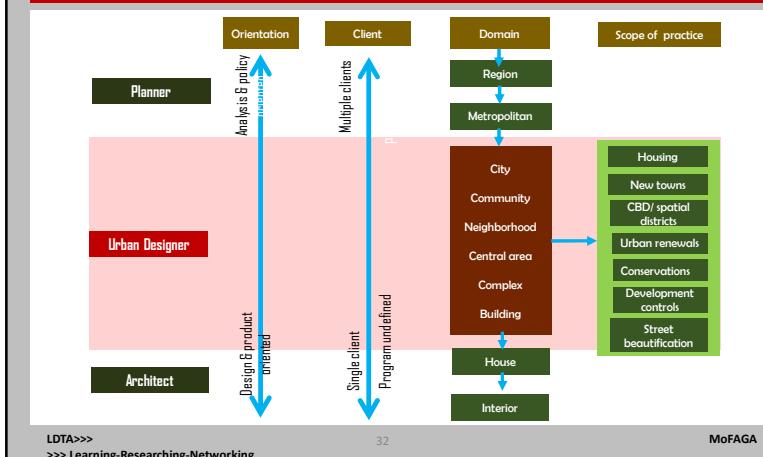


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Scope of urban design



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Relation of urban design, architecture and urban planning

Aspect	Architecture	Urban design	Urban planning
Focus	Individual building/ structure	Public space and community facilities	Land use and transportation
Domain	Private	Public	Public
Client	Single	Single/Multiple	Multiple
Scale	Local site/building specific	Local or urban/city level	Urban/regional level
Volume	3D	3D	2D
Development control	Building code/act bylaws, etc.	Urban design guidelines	Planning laws, zonings, etc.
Implementation	Private sector	Public/private partnership	Public sector

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Scale of urban design

Urban design can be applied at variety of scales

Areas



- Site
- Block
- Center
- District or Neighborhood
- Cities
- Metropolis

Linear systems



Other



- Natural Systems

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Elements and scale of urban design

The region	The neighborhood	The block
City and town	District and corridor	Street and building

Urban design operates at 3 scales

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Elements of urban design

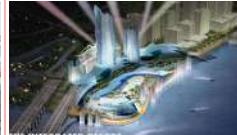
Public dimension of individual building



Public amenities & infrastructure

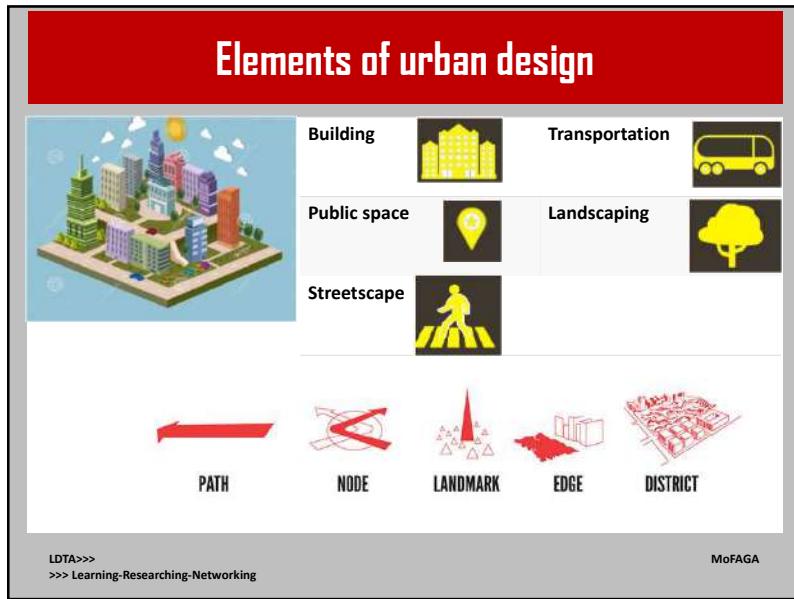


Town & city design



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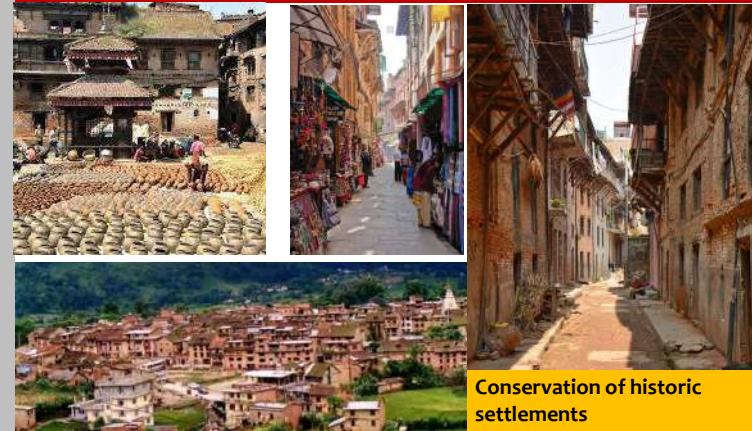
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Urban design projects



Future prospects of urban design in Nepal



Future prospects of urban design in Nepal



Future prospects of urban design in Nepal



Thank you and any question?

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tesekkürle				nandri	Thank you
謝謝	הודות			Danke	tack så mycket
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सहयोग मानित तथा समर्पण प्रशासन मंत्रालय

Livable/smart city design and its major components Day-session I-III

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Specific objectives

At the end of this session, participants will:

- [a] understand the diverse nature of municipalities (and provinces) of Nepal;
- [b] learn about various principles of urbanism, livable cities and smart cities including their components and relates them to the historic towns of Kathmandu valley;
- [c] possibility of converting existing cities, towns or settlements into livable and smart

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What are your opinions on these issues?

What is the impact on urban development due to diverse nature of municipalities and provinces in Nepal?

Are historic settlements of Kathmandu valley livable and smart cities?

Is it possible to improve the existing settlements up to smart cities?

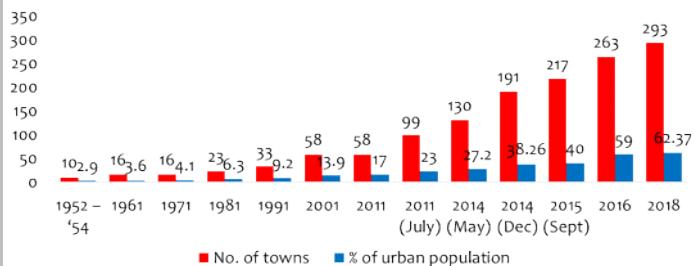
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Urbanization in Nepal & its characters

There was only 10 towns with 2.9% as urban population in 1952-'54, which has increased up to 293 municipalities with 62.37% living in these municipal (urban) areas in 2018



Urbanisation in Nepal is not largely due to an economic structural transformation. It is mainly because of combination of four reasons: (a) extensions of town's geographical area, (b) increase in the total number of towns, (c) natural growth rate of population and (d) rural-urban migration.

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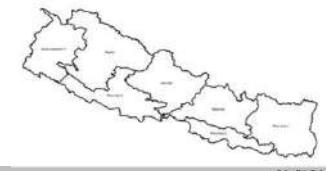
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Municipal no and average area in each province

Particulars	Province	Province	Province	Province	Province	Province	Province
	1	2	3	4-Gandaki	5	6:Karnali	7
No. of municipality	49	77	45	26	37	25	34
Total municipal area (sq. km)	8448.65	6753.78	5488.38	3808.55	6863.6	6014.74	6615.24
Avg. municipal area	172.42	87.71	121.96	146.48	185.50	240.59	194.56
Radius (km)	7.41	5.28	6.23	6.83	7.68	8.75	7.87



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Municipal character: population, area & density

Province	Largest		Smallest		Largest		Smallest		Largest		Smallest	
	Population	Area (sq. km)	Population	Area (sq. km)	Pop density (p/sq.km)	Population	Area (sq. km)	Pop density (p/sq.km)	Population	Area (sq. km)	Pop density (p/sq.km)	Population
Province 1	Biratnagar	Madi	Triyuga	Damak	Biratnagar	Solo	Dudhkunda					
	214663	14470	547.43	70.86	2787.83	38.62						
Province 2	Birjung	Saptakoshi	Bardibas	Gaur	Birjung	Nijgadh						
	240922	21131	315.57	21.53	1824.2	122.08						
Province 3	Kathmandu	Jiri	Kamalamai	Bhaktapur	Kathmandu	Jiri						
	975453	15515	482.57	6.89	19726.05	73.43						
Province 4-Gandak	Pokhara	Rainas	Pokhara	Rainas	Pokhara	Dhorpatan						
	426759	18527	464.28	71.97	919.18	117.63						
Province 5	Ghorai	Swargadwari	Sitganga	Siddharthanagar	Siddharthanagar	Sitganga						
	156164	30940	610.43	36.03	1761.94	71.05						
Province 6-Karnali	Birendranagar	Thuli Bheri	Aathabiskot	Raskot	Birendranagar	Thuli Bheri						
	100458	8370	560.34	59.73	409.93	19.86						
Province 7	Dhangadi	Badimalika	Bungal	Mahakali	Tikapur	Badimalika						
	147741	16818	447.59	56.84	650.58	60.93						

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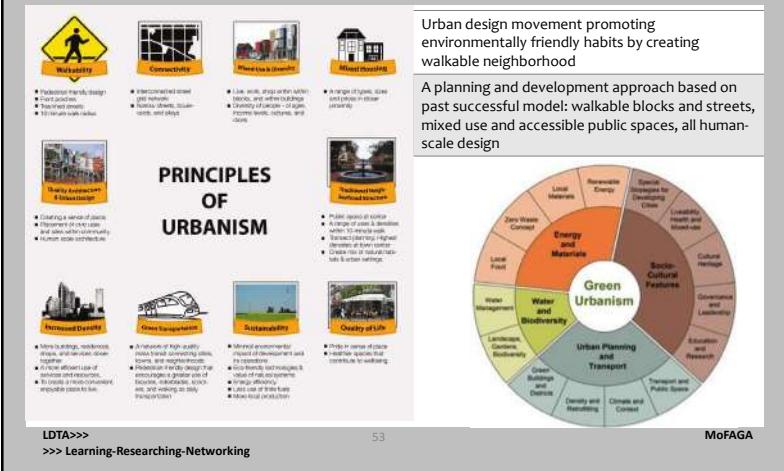
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Budget allocation and capital expenditure in provinces (FY 2018-'19)

Particulars	Provinces							Total
	1	2	3	4 (Gandaki)	5	6 (Karnali)	7	
Total population	4,534,943	5,404,145	5,529,452	2,735,661	4,114,184	1,623,602	2,552,517	26,494,504
Area (s. km)	25,905	9,661	20,300	22,585	17,318	71,873	19,539	147,181
Total budget (billion)	35.936	29.3885	35.616	24.023	28.09	27.283	25.066	1315.16
Capital (billion)	18.878	14.961	21.773	15.908	16.624	21.254	11.715	314
Per capita budget (NRs in million)	0.792424513	0.54381405	0.644114462	0.8781424	0.6827599	1.6803995	0.9820111	4,96389741
Per capita capital expenditure (NRs in million)	0.416278661	0.27684305	0.393764156	0.5815048	0.4040655	1.3090647	0.4589587	1.185151456
Per sq. km investment (NRs in million)	138.7222544	304.1972881	175.4482759	106.36706	162.20118	37.960013	128.28702	893.566425
Per sq.km capital expenditure investment (NRs in million)	72.8739625	154.8597454	107.2561576	70.43613	95.992609	29.571605	59.957009	213.342754
	6							8

New/green urbanism



Concept of livable cities



Components of livable cities

5 Es of livable cities



Concept of smart cities



Smart cities use connected technology and data to [a] improve the efficiency of city service delivery, [b] enhance quality of life for all, and [c] increase equity and prosperity for residents and businesses;

A smart city is a developed urban area that creates sustainable economic development and high quality of life by excelling in multiple key areas; economy, mobility, environment, people, living, and government;

A smart city as a resilient city - one that is technologically enabled, connected and agile to address 21st-century environmental, social and economic challenges

Dimensions and characteristics of smart city

6 Dimensions and 28 Characteristics of IM Smart City

SMART ECONOMY Growth & Competitiveness	SMART ENVIRONMENT Natural resources	SMART PEOPLE Social and Human Capital
<ul style="list-style-type: none"> Economic Growth and Value Creation Innovative economic growth Equitable Wealth Distribution Entrepreneurship 	<ul style="list-style-type: none"> Clean environment Environmental protection Green development Green infrastructure Smart Growth Green Economy 	<ul style="list-style-type: none"> Caring community Racial Harmony Skilled and Talented Human Capital
SMART GOVERNANCE Efficient & Participation	SMART MOBILITY Connectivity & ICT	SMART LIVING Quality of Life
<ul style="list-style-type: none"> Public Participation Efficient Public and social services Private Public Partnership Transparent governance 	<ul style="list-style-type: none"> Efficient Road accessibility Efficient Public transportation Non motorized accessibility Availability of ICT infrastructure 	<ul style="list-style-type: none"> Safety and security Low Carbon lifestyle Housing quality Educational quality Health Conditions Cultural facilities Tourist/rec attractiveness

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Walkability, connectivity, mixed use

Walkability: 10 min walk [slow speed streets, increased density of building];



Connectivity: interconnected streets grid to disperse traffic
Hierarchy of boulevards, streets and alleys;

Mixed use and diversity: mixture of residential, retail and office within the neighborhood;
diversity of people promotes safer neighborhoods; mixture of single family and multi family dwelling units



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Smart transportation system

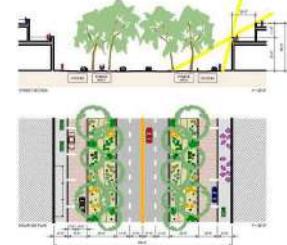
URBAN MOVEMENT HIERARCHY



Development of intermodal transportation system

Priority on pedestrian in the city areas

Investment on pedestrian network, cycle lane, public transport and the least priority on private vehicles
Redesign of the existing street networking



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Smart mobility: dedicated bus lanes

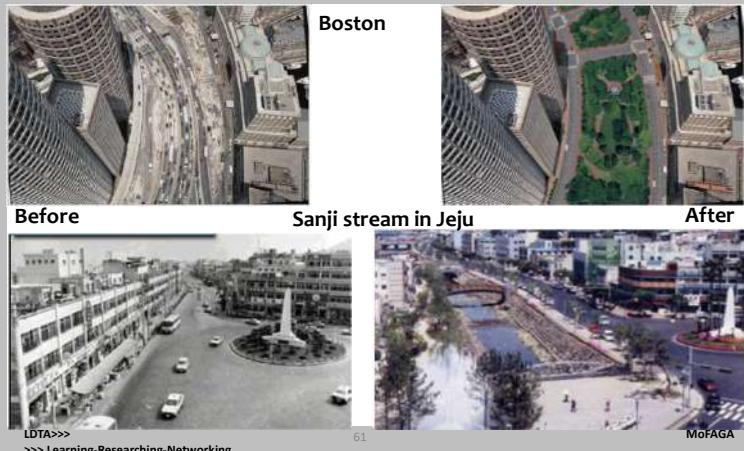


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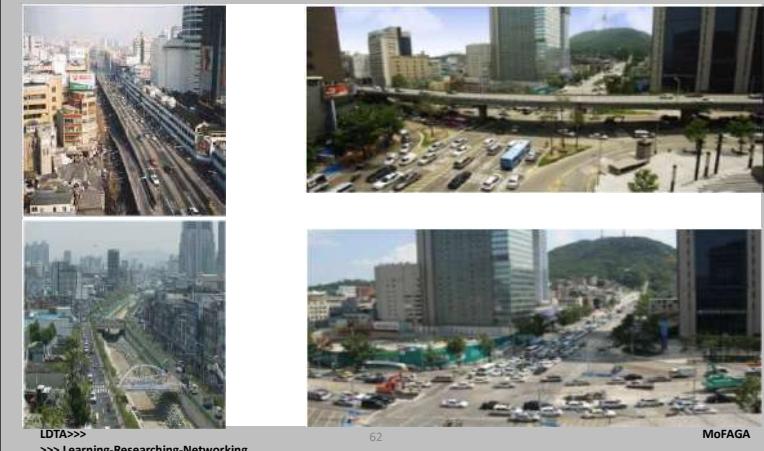
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Urban mobility: reviving water body, park & pedestrian paths



Urban mobility: dismantling of fly over



Conversion of vehicular paths into plazas

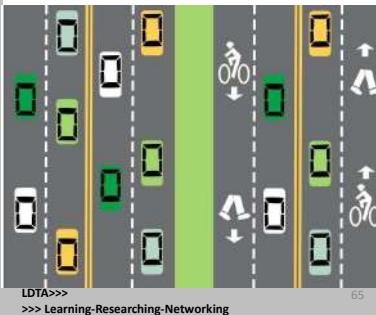


Pedestrianisation and cycling



Remodeling of streets & transportation mode during covid 19

- Prioritization to pedestrian and bicycle for maintain social distance;
- Public transportation over private vehicles;
- Hand washing and sanitizer facilities at various places



Green public open spaces



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Historic towns of Kathmandu valley

Principal cities



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Patan

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Bhaktapur

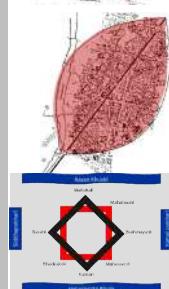
Historic settlements: smart living

Location: trade route, compact settlements developed an elevated topography (not suitable for agriculture)

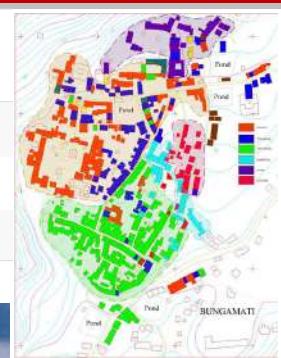
Mixed use housing centering royal palace or important deity

Astramatrika on eight peripheral areas as limits of the town growth

Homogenous town with heterogeneous communities



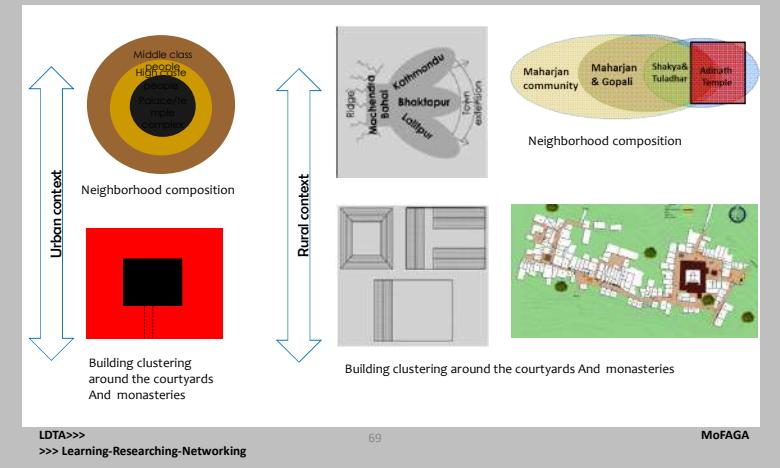
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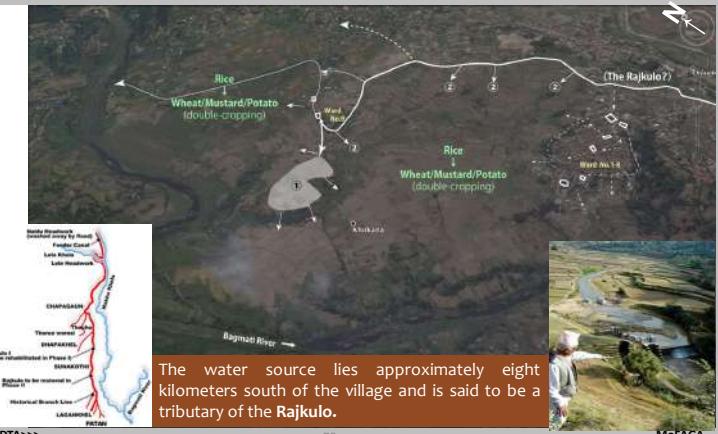
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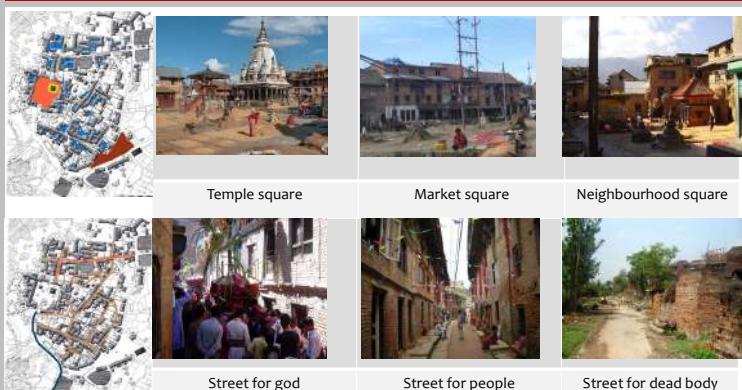
Historic settlements: town form & housing



Historic settlements: agriculture based economy



Hierarchy of streets and open spaces



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Historic settlements: way of socialization



Socio-economic activities on the street [building front]



Street as a stage and celebration of festivals

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Historic settlements: environmental sustainability



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Historic settlements: agriculture by-products



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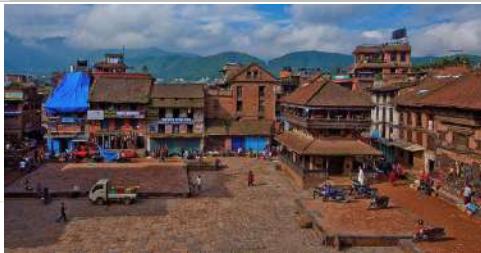


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Historic settlements: architecture

Unifying elements

- ✓ Dominating sloped roof;
- ✓ Brick exposed vertical façade;
- ✓ Horizontal band separating floors;
- ✓ Decorative wooden windows



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Historic settlements: Maintenance of infrastructure & individual behavior

Annual
festivals

Rato Matsyendranath
jatra : linkage with
rajkulo, ponds and
dhunge-dharas

Community
participation

Community from
different neighborhoods
and castes

Large
maintenance &
operation

12 year event with
participation of whole
community

Religious belief
& spiritual value

A bath in Bagmati river
during Shivaratri and Sali
river in mid January



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Rapid urbanization & complex problems



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Take home message

Municipalities in Nepal have diverse characters in terms of area, population, density, topography and capacity and hence they present a diverse nature of challenges in urban development;

New urbanism, livable settlements and smart cities have many commonalities. All of them focus on human priority in settlements and neighborhoods, economy and affordability, diverse housing and jobs, efficient transportation system and municipal services, environment and ecological conservation. For all, people, communities and individuals should also be smart;

Historic settlements of Kathmandu valley have numerous features of smart cities and can be termed as smart towns. However, with rapid urbanization and expansion of settlements along with complex nature of urban problems and services, the concept of smart city supported by information, communication and technology (ICT) is essential.

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Any Questions?

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bedankt	salamat	Merci	Đakujem	go raibh maith agat	
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Development control, planning norms and building bye-laws Day-session I-IV

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Specific objectives

At the end of this session, participants will:

- [a] understand the overall concept of development control in regulating urban growth of cities;
- [b] learn about planning norms and standards practiced in Nepal; and
- [c] comprehend the prevailing building bye-laws and its various clauses including emerging issues in building construction and planning regulations

What are your opinions on these issues?

What type of planning regulations and building byelaws exist in Nepal?

Do you think municipalities in Nepal have facilities, amenities and infrastructure provision as per planning standards and guidelines?

Why people generally do not follow building byelaws especially in Kathmandu valley and other major cities?

Is there other way to regulate building construction and urban growth better way rather than building byelaws alone?

Development control: concept

Development control

- Control of use and form of development as per planned scheme for
 - development of land and building (erection or alteration of buildings and engineering works) on, above or under ground and
 - any material change in the use of existing buildings or land, which may or may not involve construction operation
- The mechanics through while entire process of urban development is regulated to achieve the objective of promoting overall benefit of the society and creating a distinct image of the city.
- Forms an integral part of the planning practice
- Mechanism place for maintaining standards through the concept of zoning, covenants and other forms of regulating agreement to guide developers and beneficiaries
- Growth and development, character, fabric and personality of a city, formulation of the development control should satisfy the basic requirements of the [a] health, [b] safety, [c] convenience, [d] economy and [f] amenity

Development control

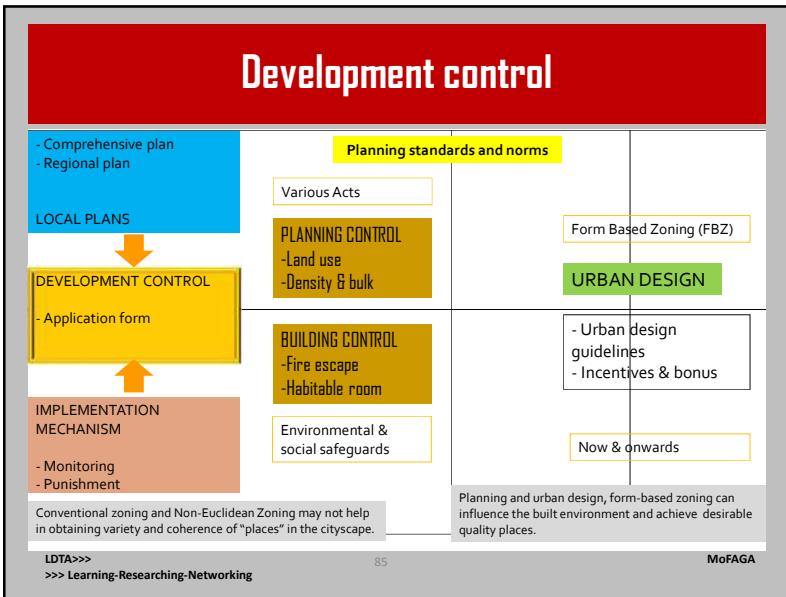
Development plans

- A report explaining the objectives and how future developments were to be achieved in relation to the maps delineating zones for various land uses and building densities within the city
- A set of planning and building regulations
- Development control takes into account the social, political and economic context of its area of operation,
- Purpose of development control is to guide the development of a city in a planned and orderly manner.

Components of development regulations

Elements of development regulations

- Master plans, zonal plans, detailed development plans
- Land use, usage of buildings, ground coverage, FAR, set backs, open spaces, height, nos. of storey, parking requirements, etc. for various developments on land and for various categories of buildings
- Town Planning Legislation and the municipal Building Bylaws are the main instruments based on which schemes can be notified and development control regulations can be enforced.



Components of zoning ordinances

Section	Description	Examples
Zoning maps	Show zoning district boundaries on the map	Separate map book or pocket map
Definitions	Describe terms used in the zoning ordinance	Dwelling unit, structure, lot, yard
General provisions	Describe operational rules and provisions applicable to the zoning ordinance	Title, purpose, authority, applicability of zoning ordinance, establishment of zoning districts, rules of interpretation
Zoning district regulations	All zoning district and overlay district regulations. It also includes development standards	Permitted and conditionally permitted uses in agricultural, residential, commercial, industrial, and floodplain overlay districts; parking
Special development standards	Specific development standards applicable to all uses and districts	Signs, non-confirming uses and structures, home occupations, recycling facilities, bed and breakfast inns
Administration and enforcement	Procedural requirements for all administrative and legislative reviews, appeals, enforcement, and penalties	Site plan review, architectural review, zoning ordinance amendments and rezoning, filings of appeals, enforcement and revocation of permits and penalties

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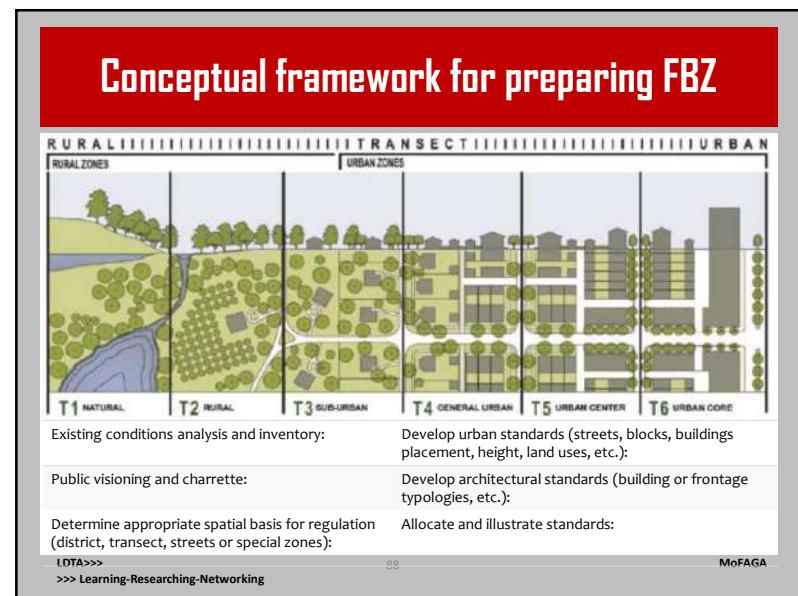
Components of zoning ordinances

Euclidean Zoning	Dispersed uses with few distinct centers, spatial separation of key daily activities, excessive land consumption, streets designed for cars rather than people, inconvenient, cost-effective transit, limited choice in housing supply, and fear of density.
	Rigid nature of Euclidean zoning emphasizes regulation by use, within limited use or single use zoning district and disconnects between land use and urban form and design with one size fits all standards.
	Have proven to be limited in their ability to regulate physical design in the context of socio-economic changes
Use	Residential, commercial, industrial and agricultural
Intensity	-Amount of use of land in terms of building areas; -FAR; -Height restriction, placement of building, and parking requirement
Bulk	-Actual size and volume of the buildings;
Set back	-regulates the relationship between buildings and their location with respect to the size and height of the building, location of exterior walls at all levels in relation to lot lines, streets, or other buildings
	Provision of adequate light and air, landscaping, and signage are also key components in regulating the overall quality of built environment.

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Non-Euclidean zoning techniques

Zoning type	Advantages	Disadvantages
Inclusionary zoning	-Provides certain percentage of affordable housing for low and moderate income groups	-Sometimes the housing cost is shifted from developer to buyers
TDR	-Helps in preserving open space, historical areas, wetlands, and other environmentally sensitive areas; while creating higher density development in urban areas	-Finding the areas with permitted higher density might be difficult ; -TDR might not be enable in all cities or states
Cluster zoning	-Preserves open space by concentrating development with high density in certain part of the site; -Reduces cost of development and infrastructure	- Might create leapfrog development
Performance zoning	-Monitors the impact of development on environment and sets performance standards to avoid the negative impacts; -More flexible than Euclidean zoning in following development standards	-The calculations of performance estimates could be confusing and difficult to comprehend

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Form based zoning: emerging concept

Form Based Zoning	Regulates the FORM of the built environment					
	Creates a predictable through city/county regulations					
	Design is more important than use					
	is a legal document that regulates land development, setting careful and clear controls on building form, with broad parameters on building use, to shape clear public space (good streets, neighborhoods, and parks) with a healthy mix of uses.					
	uses simple and clear graphic prescriptions and parameters for: height, siting, and building elements to address the basic necessities for forming good public space					
New urbanist planners and architects used FBZ to create a more compact, pedestrian oriented and mixed-use style of development with a range of housing options.						
Preparation of FBZ could be based on the ten principles of New Urbanism:						
1. Walkability 2. Connectivity 3. Mixed-use and Diversity		4. Mixed Housing 5. Quality Architecture and Urban Design 6. Traditional Neighborhood Structure				
7. Increased Density 8. Smart Transportation 9. Sustainability 10. Quality of Life						

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Form based zoning

Form Based Zoning	Regulating plan	-defined areas based on the community's vision and the kind of physical character is desired; - somewhat similar to a zoning map, the exceptions are that it is more detailed for proposed streets and blocks and avoids any labeling of use; - usually the zoning maps have too many confusing zoning (land use) classifications and their related code document is overly descriptive; whereas, regulating plans have between 3 to 10 building types with their specific location and detailed building form standards based on their location.
Building form standards	Regulations that control the configuration, features, and functions of buildings defining and shaping the public realm. Usually, this standard provides a set of annotated building cross-sections and plan diagrams.	
Public space/street standards	Street types with typical junction details, on-street parking, width of traffic lanes, street furniture, sidewalks, paths, curb height, etc.	
Administration	Well defined application and project review process	
Definition	A glossary is an integral part of FBZ.	

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Comparison between Euclidean & non-Euclidean zoning

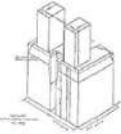
Zoning type	Euclidean zoning/traditional zoning	Non-Euclidean zoning
Definition and purpose	-Division of a municipality into districts, classified by height & use limitations, & other regulations for bulk, density & minimum acreage of a parcel; - Primary purpose is to separate incompatible uses and to promote health, safety, and general welfare	- Regulatory patterns varying traditional pattern of parcel-by-parcel, district-by-district zoning; - Includes everything else other than Euclidean zoning. Various types of non-Euclidean zoning are pre-set in the applicable zoning ordinance; - Primary purpose is to overcome the rigidity of Euclidean zoning and to provide flexibility
Type	-Agriculture -Residential (single family, multi-family, mobile home, etc) -Commercial -Industrial	-Bonus/incentive zoning -Overlay zones; -cluster zonings; -planned unit development (PUD) -Transfer of Development Rights (TDR) -Performance zoning -Form based codes
Review process & getting approval	If the proposal meets all the zoning standards, it is not time consuming	Could be time consuming depending on getting approval for variance and special exception
Feature of zoning	Focuses mainly on land use, setbacks, density and building height	Different for different zoning types- includes land use, standards for streetscape, parking, actual building footprint with setback, building height, density, architecture, and environment
Built environment	Limited in regulating physical design based on the socio-economic requirements	Depending on the detailing of the zoning codes, predictable built environment can be achieved

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Form based vs Euclidean zoning



Form-Based

- > Primarily focused on building form
- > Allows nuanced control over building massing and height

- Typical components:
- > Build-to-Line
 - > Setbacks
 - > Building Heights
 - > Minimum Floor Heights
 - > Parking Maximums
 - > No Parking Minimums



Euclidean

- > Primarily focused on land-use

- Typical components:
- > Land Use
 - > Floor-Area-Ratio (FAR)
 - > Density
 - > Building Heights
 - > Parking Minimums

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Hierarchy of urban area

Metro city

It corresponds to the current metropolitan city i.e Kathmandu. This is the highest level in the urban area hierarchy. The population for this level of urban areas will be above 300,000. This can include either a single city with population more than 300,000 or neighboring settlements/cities within a certain distance of each other having a combined population of more than 300,000 and who share the common resources and services.

Sub Metro City:

It corresponds to the current sub metropolitan cities like Pokhara, Biratnagar, Lalitpur etc. The population for this level of urban areas will be above 100,000 and equal to or less than 300,000

City

It corresponds to the current municipalities like Bharatpur, Dhangadi, Bhaktapur etc. The population for this level of urban areas will be above 40,000 and equal to or less than 100,000.

Sub City

It corresponds to the current small towns and the population for this level will be above 10,000 and equal to or less than 40,000.

Market Center

It is at the lowest level in the urban hierarchy and corresponds to the current market centers. Areas having at least 50 shops or outlets within 100 m from the center will be categorized as market centers.

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Planning norms and standards: market centre

S.No	Type of Infrastructure / Norms	Standard(s)	Source
A	Physical Infrastructure		
1.	Road	Collector street and Local street	Neural Urban Road Standard 8, 2012
2.	Water Supply	Standpipe	National Urban Water Supply and Sanitation Sector Policy, 2011
3.	Sanitation Coverage	90% sanitation with septage tank	Constitution article 19(2)(b), 1999
4.	solid waste management	Collection Center with bio-digester plant (bio-digester, gas & energy generation)	Constitution article 19(2)(b), 1999
5.	Security	Electricity supply system through reliable grid connection, lighting, security, safety, security, L&T	Utility Electricity coverage
6.	Tele-communication	Community Telephone kiosk	2.5 CTC per market center (Urban area point)
7.	Healthcare infrastructure	Primary/Basic Health	1.4 P/H 3000 population at a distance of 0.4 - 0.8 km
8.	Health institution	Basic Health Post	1.4 per 3000 population (0.94 ha per post)
9.	Open space	0.5% or one tenth area	Gorkha earthquake of 2072 BS
10.	Community Center	Community building including	1 community center per market center (0.2 ha)
11.	Security	Police Post	0.4 ha per market center
12.	Transport infrastructure	Tarred road (asphalt)	2.2 ha per site
13.	Housing	Storage facility, residential need houses with total storage facility	Master Plan of Kathmandu, 2020
14.	Housing	Housing unit space (Two floors, Four bedrooms, But park/Track park)	Planning for one market center (0.2 ha)

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Development of building bye laws in KV

1	Building bylaws	Rationale	Purpose
2	Building byelaws 2034 BS	Master plan 2069 BS	As a part of implementation of Physical Development Master Plan of Kathmandu Valley 1969
3	Building byelaws 2050 BS	Rapid expansion and haphazard building construction in Kathmandu valley	To regulate haphazard and uncontrolled building construction
4	Building byelaws 2064 BS	To complement Kathmandu Valley Development Plan 2020	To regulate zoning requirements and to manage future urban growth of the city
	Building byelaws, 2072 BS	Gorkha earthquake of 2072 BS	To ensure safer building construction and city development

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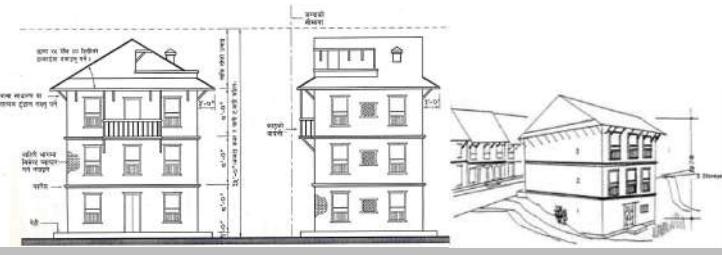
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Modification of building byelaws

S.N.	Building byelaws	Provisions introduced
1	Building byelaws 2034 BS	- Basically prescriptive clause of ground coverage and height restriction only with maximum ground coverage of 60% for minimum plot of 2 anna.
2	Building byelaws 2050 BS	- Provision of FAR (floor area ratio) introduced to regulate ground coverage and building height; - The concept of light plan is introduced to regulate the height of the building; - Earlier minimum plot size of 2 anna is increased to 2 anna 2 paisa
3	Building byelaws 2064 BS	- New land use map based on latest map was introduced ; - Modification on regulations basically associated with Narayan Hiti Palace area, setback from the river and introduction of Apartment housing; - Pashupati area was added and voids greater than 1.5m X 1.5m were made exempted from FAR calculation
4	Building byelaws, 2072 BS	- Minimum road of 6 m wide for construction of new houses. However, the technical committee can recommend and approve it within 4m in case of geographical constraints. For such newly constructed roads, minimum setback from the road edge must be 1.5 m; - Every road should be made 5 m for existing buildings constructed already along the road having less than 4 m wide; - Main road connected to land plots should be at least 8 m wide in plotting; - Maximum ground coverage allowed for residential building on plot 250 sq.m is 70%, which will be only 60% for plots greater than 250 sq. m. Average building setback for keeping windows is 1.5 m from previous provision of 1m only.

Building bylaws for HCA in KV

Ground coverage:	80 to 90% for construction in vacant land based on plot size, 100% for reconstruction or residential houses, 50% for other buildings
Maximum building height	35 feet (3+attic floor) but not exceeding the height of adjacent monument
Floor to floor height	2.4 m
Set back	Average 1.5 m for open sides and original foot print at front



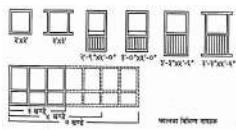
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Building bylaws for HCA in KV

Plinth level	30-45 cm in general but not exceeding 90 cm in line with adjacent houses
Apron	30-45cm high and up to 75cm wide in line with neighboring houses within own property line
Structure	Traditional, confined masonry or hidden RCC frame
Attic head room	1.2m min
Window opening	Windows shall be of odd numbers. Traditional windows are possible to install at attic but only one panel window shall be installed on the ground floor. For other odd number of windows, minimum width of 2' 6" in each bay shall be maintained. The ratio of width and height of longer windows and door shall be 1:15 to 1:2. In the case of lattice window, such windows shall not be bigger than 3feet x 3 feet.



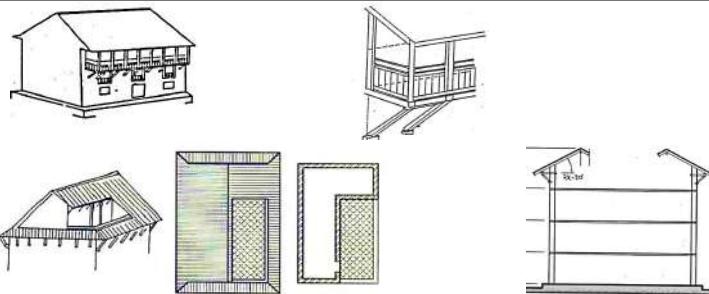
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Building bylaws for HCA in KV

Roof	[a] lean to or double slop roofs, [b] up to 33% of flat terrace, [c] pith of 25-30, [d] traditional struts to support a roof projection up to 90 cm wide, [e] over head water tank, solar panels, etc. not visible from public spaces
Balcony	[a] up to 90 cm wide wooden [b] extended from 2 nd floor [c] not recess towards public face, [d] entirely atop own land



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Building bye laws: issues not addressed

Vertical division and haphazard renovations of part of them



Change in building use/occupancy



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Building bye laws: issues not addressed

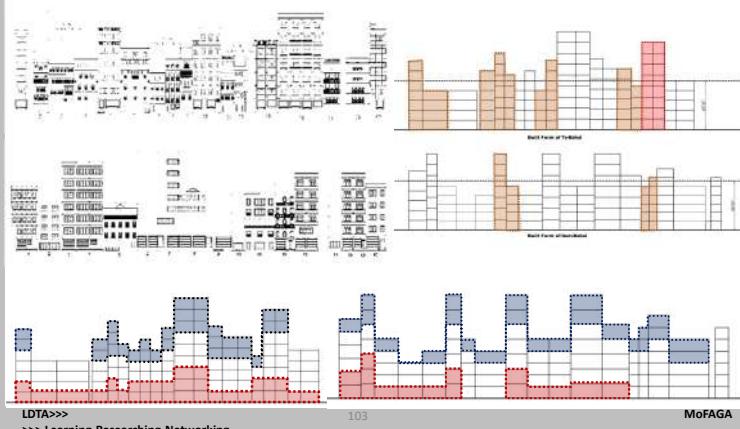


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Weak enforcement of building byelaws



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Weaknesses of the building bylaws

Planning regulations

Lack of Master plan/development plan

Planning and building norms are combined into a building byelaws

Not clear what sort of urban form intend to achieve

UD is missing

The concept of FBZ is far away

Building byelaws

What to achieve is not known

Inadequate control over change in building use

No control over vertical division and haphazard renovation and reconstruction

No control over urban signage control

Hardly any guidelines on building material, construction technology and colouring

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Take home message

Development control prepared in Nepal is weak as it is not related with master plan and intended built form;

Population requirement is different to become a municipality is different for terai, mountain and hilly regions but the planning standards and norms have same for all three regions;

The concept of form based zoning and urban and architectural design guidelines are missing;

The prevailing building byelaws have numerous weaknesses and general people have violated many clauses whereas the concerned municipalities have been found weak in enforcement and punishing the defaulters

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Any Questions?

Dziękuję	شكراً	Thanks You	Terima Kasih	<i>hvala</i>	Дякую
bedankt	саламат	Merci		Ďakujem	go raibh maith agat
tesekkürle				nandri	Thank you
謝謝	תודה			Danke	tack så mycket
Obrigada	ありがとう			tack	faleminderit
Shukriyâ	mange tak			Mulțumesc	Спасибо
takk	Grazie	너를 감사하십시오			
Eυχαριστώ	díky	děkuji vam	<i>kiitos</i>	anugurihiitosumi	köszönöm
aitäh	<i>Muchas gracias</i>	ddhanya-waa		ačiū	

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Specific objectives

At the end of this session, participants will

- [a] understand the value of water in present context;
- [b] learn the urban design approach, technique and strategy adopted in designing as well as in developing development control and institutional arrangement;
- [c] check the relevancy of urban design techniques in the context of urban areas in Nepal.

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How do you design a large area?

- [a] How do you initiate design of a large area, say neighborhood?
- [b] If given to design four architects, each will produce one's own design and how to know the best design in the given site?;
- [c] What are design criteria, technique or approach to achieve the best solution?



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Waterfront transformation & role of water

- | | |
|----------------------------|---|
| Cause of waterfront change | <ul style="list-style-type: none"> ❖ Technological advancement in maritime industry; ❖ Socio-economic modernisation; ❖ Strict environmental regulations; ❖ Public concern on health and environment |
|----------------------------|---|

- | | |
|------------------------|--|
| Delay in redevelopment | <ul style="list-style-type: none"> ❖ Political debate over controlling waterfront development; ❖ Environmental pollution; ❖ Existence of industrial infrastructure; |
|------------------------|--|

- | | |
|-----------------------------------|--|
| Catalytic agent in present change | <ul style="list-style-type: none"> ❖ Globalisation of economy and international division of labour; ❖ Corporatisation of cities; ❖ Restructuring of capital; ❖ Foreign direct investment [FDI] |
|-----------------------------------|--|

Role of water in present context

WATER	Visual & aesthetic values	Public enjoyment
	Emotional & psychological values	Public identity
	Real estate & recreational values	Economic development

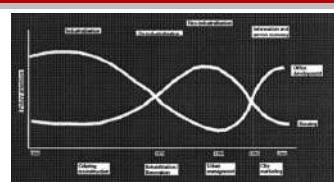
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Waterfront transformation

Stage	Symbol	Period	Characteristics
I Primitive chapter	(○) City (●) Port	Ancient medieval period	Close spatial and functional integration between port and city.
II Expanding chapter	(○●)	Early modern period	Rapid commercial and industrial development of port and city, with lower port and higher city.
III Modern Industrial chapter	(●●)	mid-modern	Industrial growth, separation of port and city, and introduction of container and road technologies require separation and increased space.
IV Action from the waterfront	(○●●)	modern	Changes in maritime technology induce changes in port and city, and the need for development areas.
V Endorsement of the waterfront	(●●●)	post-modern	Large-scale modern port construction stage, where port and city are fully separated.



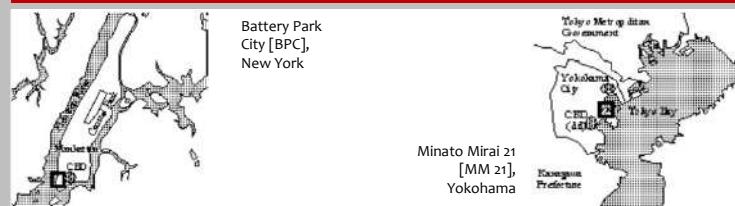
Water	Front door	Isolation from the city	Deterioration & neglect	Initiation of redevelopment	Actual development [Master plan approval]
BPC, New York	Waste land & state of neglect		Yes	1963	1979
MM 21, Yokohama	New waterfront for port shifting & redevelopment together		No	1979	1983

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Battery park city, New York and Minato Mirai 21, Yokohama



Battery Park
City [BPC],
New York

Minato Mirai 21
[MM 21],
Yokohama

Project	Total area [ha] [100%]	Commercial, office, [ha] [51.0%]	Road & railway [ha] [19.0%]	Park & open space [ha] [30.0%]	Port facility [ha]	Development period [yr]	Budget
BPC [New York]	37.4 [100%]	18.9 [51.0%]	7.2 [19.0%]	11.3 [30.0%]	-	1979 -	US\$ 4 billion
MM 21 [Japan]	186.0 [100%]	87.0 [46.8%]	42.0 [22.6%]	46.0 [24.7%]	11.0 [1.4%]	1983 - 2000	Yen 2 trillion [1983 based]

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Planning & design principles: BPC

- ❖ Should not be a self contained new town in the town but a part of Lower Manhattan;
- ❖ Should take a less idiosyncratic, more recognizable and more understandable form; and
- ❖ Should reproduce and improve what is the best about New York's neighbourhoods
- ❖ Think small: plan in increments by many designers on a phase wise basis;
- ❖ Learn from what exist, get clues from the existing areas;
- ❖ Integrate: integrate with streets at grade level; and
- ❖ Design streets and not buildings: use design guidelines for coherent public realm design



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Battery park city



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Planning & design principles: MM 21



- ❖ a 24 hour international cultural city;
- ❖ a 21st century information city [new type]; and
- ❖ a humanistic city rich in water, greenery and historic relics

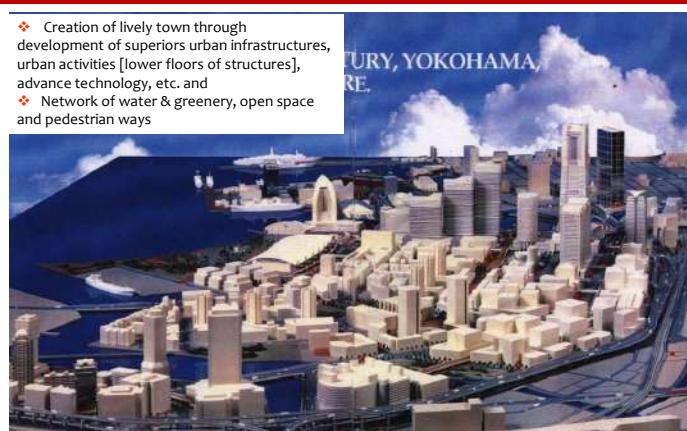
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Planning & design principles: MM 21

- ❖ Creation of lively town through development of superiors urban infrastructures, urban activities [lower floors of structures], advance technology, etc. and
- ❖ Network of water & greenery, open space and pedestrian ways

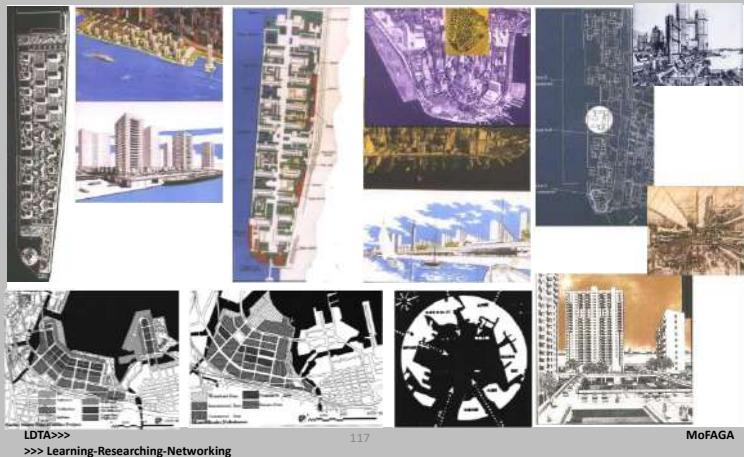


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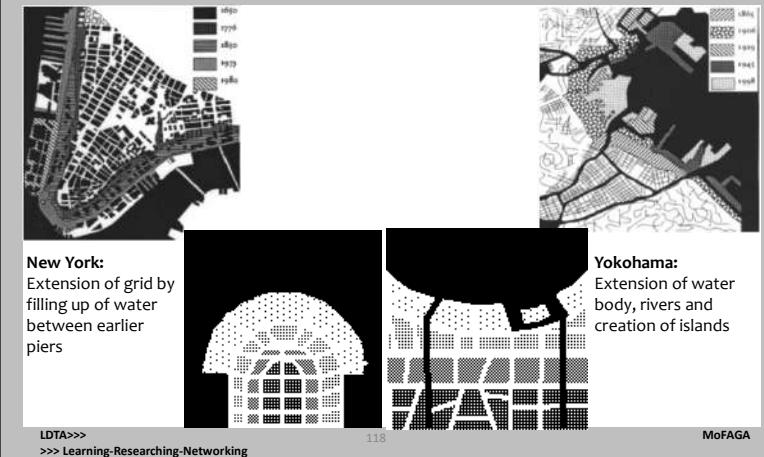
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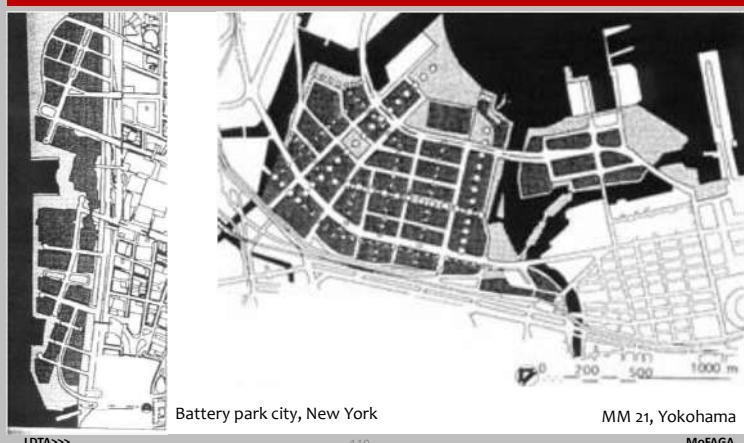
Multiple proposals for control over BPC



Pattern of land reclamation



Urban block formation



Characters of new development

Case study	Proposed block [per sq. unit area]	Existing block [per sq. unit area]	Building on the plot	Building typology
BPC, New York				
MM 21, Yokohama				

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Comparison of new development with adjacent areas

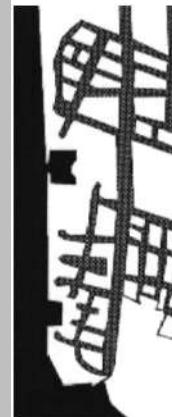
Elements	BPC [New York]	MM 21 [Yokohama]
Site area [ha]	37.4	186
No. of urban block	27	39
Buildings in urban block [Max. no. & Min. no.]	5 max. 1 min.	4 max. 1 min.
No. of urban block [proposed/existing] – per sq. unit area	7 [proposed] 9 [existing surrounding area]	15 [proposed plan] 56 [existing surrounding areas]
No. of building in a block [proposed/existing]	7/9	17/57
No. of block with direct water view	15	14
Street junctions	40	47
No. of existing continued	8	4
No. of non-continued street	2	3

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Street patterns



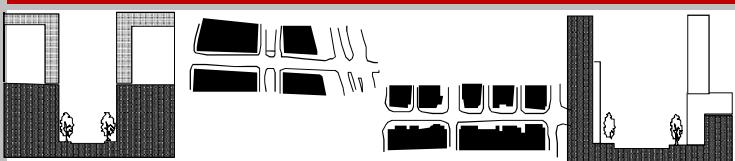
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Street characters



BPC, New York



MM 21, Yokohama

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Street pattern : MM 21



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Open space typology

BPC,
New
York



MM 21,
Yokohama

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Variety of public spaces: BPC

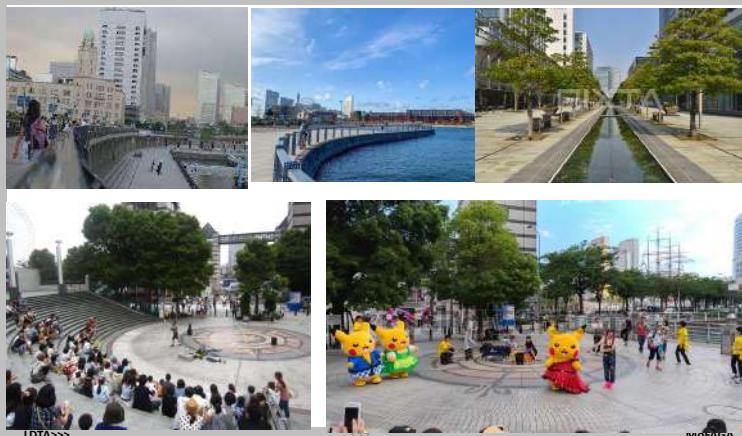


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Variety of public spaces: MM 21



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Variety of public spaces: MM 21



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Battery park city: greenery



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Battery park city: green parks



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Greenery spaces: MM 21

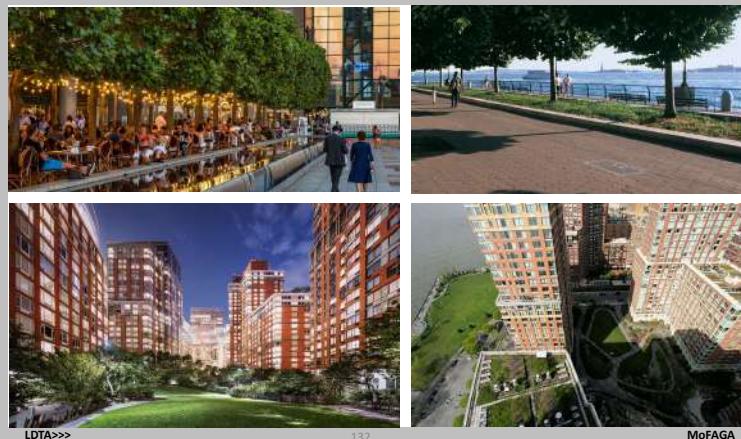


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Waterfront promenades & green parks: BPC



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Battery park city: waterfront promenade



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MM 21: waterfront promenades



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Public art and sculpture: BPC



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Public art and sculpture: MM 21



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Battery park city: skyline



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MM 21: skyline



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MM 21: night lighting



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Master plan approval

BPC, New York	Political controversy on development plan and	Competitions over controlling waterfront development	Non cooperation environment
MM 21, Yokohama and CWRP, Hong Kong	Comprehensive feasibility studies	Political and financial support from different sectors	Cooperation and coordination environment

Comparative study of Master Plan Approval – Time taken & Agency involved

Project	Initiation	Approval	Time taken	No. of approval level
BPC 1969 Master development plan	New York City [April 1963]	Battery Park City [Oct. 1969]	6.5 Yrs.	2 [State/City]
BPC 1979 Master plan	UDC take over BPCA [Jan 1979]	BPCA & NYC agreement [June 1980]	1.5 Yrs.	2 [State/City]
MM 21	Yokohama City [1979]	City & other agencies [Nov. 1983]	4 Yrs. [18 Yrs. for study]	3 [Central/Prefecture/City]

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Master plan approval

Comparative study of development approval required outside the agency

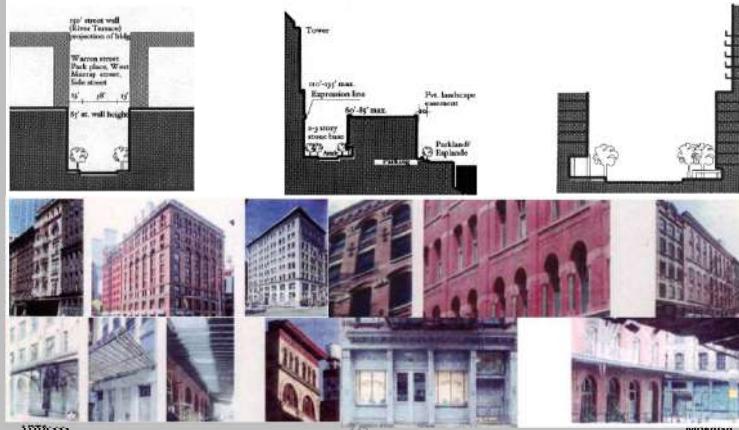
Project	Implementing agency	Permission required	Permission required outside the agency
BPC [1969 master development plan]	Battery Park City Authority	[a] Special district zoning [b] Permanent architectural board [c] Community board review, and [d] Board of estimate review	4
BPC [1979 Master plan]	Battery Park City Authority [under UDC]	[a] BPCA reviews design [b] ULURP zoning review [c] Community board review [for north neighbourhood only]	0 2 for North neighbourhood only
MM 21	Public sector & Third sector [Yokohama MM 21 Corporation]	[a] Town development council reviews the design [b] City planning council and Prefecture council [for specific block only]	0 2 for specific block only

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Urban design guidelines

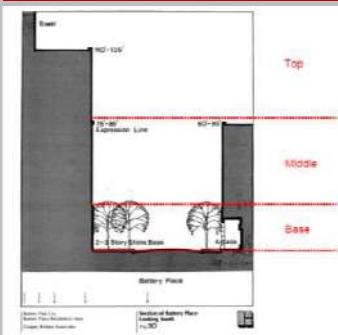


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Urban design guidelines: BPC



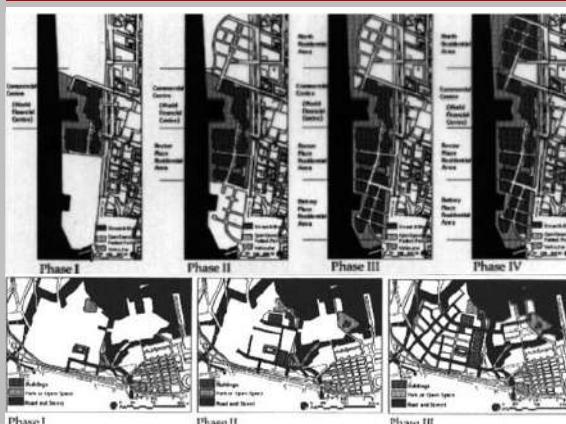
Battery Place Residential Area, Design Guidelines, 1985

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Phasing development work



BPC, New York

MM 21, Yokohama

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Phase wise development work



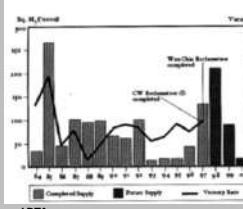
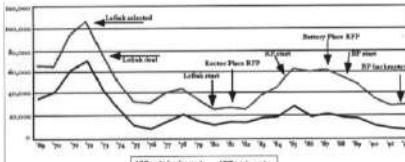
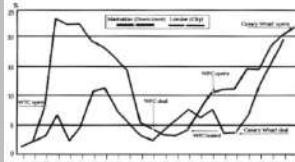
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Adjustment in local real estate market

Adjustment in local real estate market and vacancy rate



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Take home message

- Water is a special land use and has multiple values including real estate value;
- New area development should be designed in an integrated way by linking land development, public spaces, street network and open space hierarchy and buildings altogether, which is not the case in land pooled areas in Nepal. The proposed built form should be based on design principles established based on the study ;
- Development of diverse public spaces along the water's edge and providing direct well defined public access to link them;
- Desirable built environment is possible through formulation of urban design guidelines;
- Public agencies should work with private sector for the best results.

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Any Questions?

Dziękuję

شُكْرًا

Thanks You

Terima Kasih

hvala

Дякую

bedankt

salamat

Merci

Đakujem

go raibh maith agat

tesekkürle

nandri

Thank you

nandri

謝謝

תודה

Danke

tack så mycket

Obrigada

ありがとう

faleminderit

Shukriyâ

mange tak

ধন্যবাদ

tack

takk

Grazie

너를 감사하십시오

Mulțumesc

Ευχαριστώ

díky

děkuji vam

Спасибо

aitäh

Muchas gracias

ddhanya-waa

köszi

déküji

vam

kiitos

anugurihiitosumi

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नेपाल सरकार
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Urban design approach in land pooling Day-session 2-II

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Specific objectives

At the end of this session, participants will

- [a] understand the present trend of land pooling in different parts of Nepal;
- [b] identify strengths and weaknesses in the present practices of land pooling;
- [c] acknowledge the need of urban design approach in land pooling projects.

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How do you evaluate land pooled areas?

How land pooled areas different from other haphazardly growth neighborhoods?

Is it convenient and comfortable to live in the land pooled area?

Is land pooled area different from other parts of the city except in terms of vehicular access to each plot?

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Contextual background for land pooling

Contribution of different sectors in GDP of Nepal

Year	Agriculture (%)	Industry (%)	Service (%)
1986	60	10	20
1990	55	15	25
1995	50	18	28
2000	45	20	30
2005	40	22	32
2010	38	24	34
2012	36	25	35
2014	34	26	36
2015	33	27	37
2016	32	28	38
2017	31	29	39

New development
Post earthquake reconstruction
Urban regeneration [slums & squatter settlements]

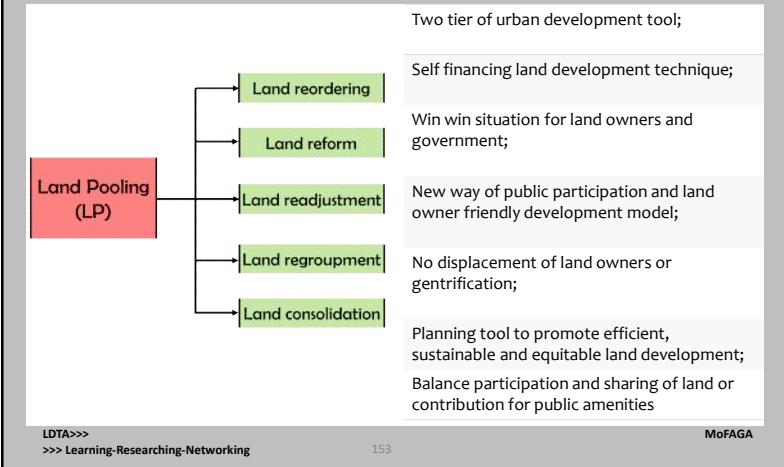
Land pooling tool for urban development	GON's policy	UD programs & plans	Infrastructure cost gap
	Constitution of Nepal 2015	Integrated urban development plan for 138 municipalities	NRs. 370 billion investment gap [293 municipalities]
National Urban Development Strategy 2017	13 smart cities, 3 mega city and 10 new towns	Development plans and infrastructure provision for newly formed municipalities [235 nos]	
National Shelter Policy	Outer Ring Road, International Stadium	Development plans and infrastructure upgrading in old municipalities [58 nos]	
Proposed Urban Development Act 2018			

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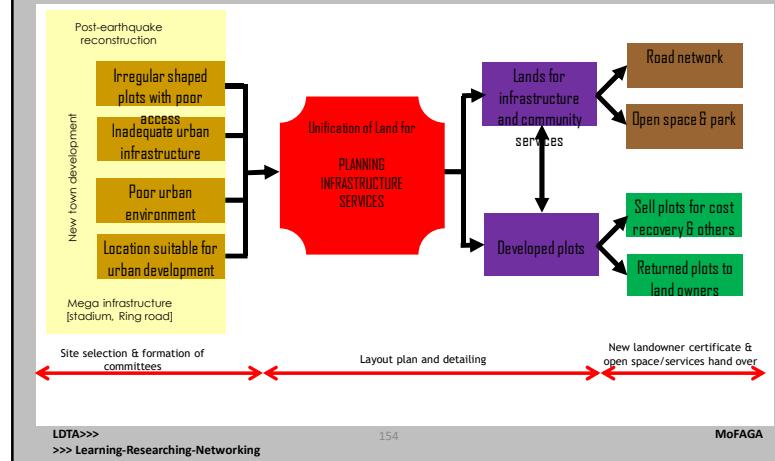
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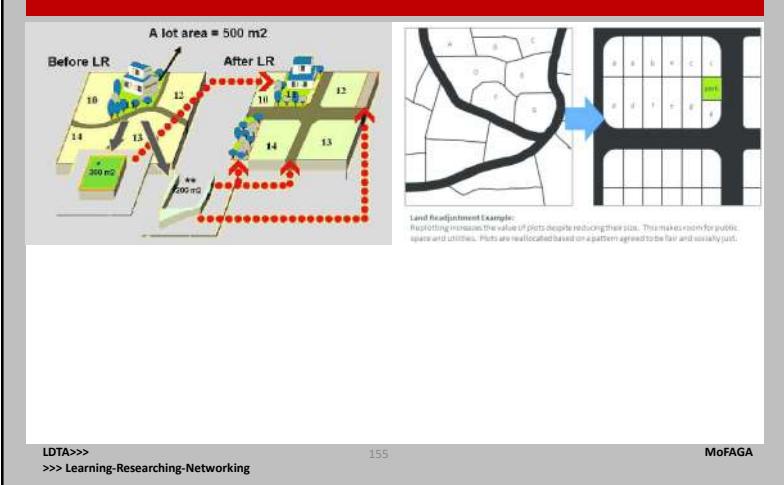
Features of land pooling process



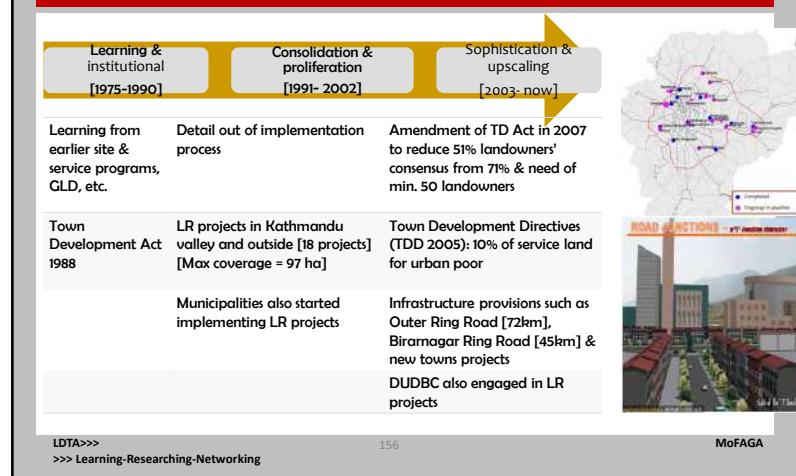
Land pooling technique



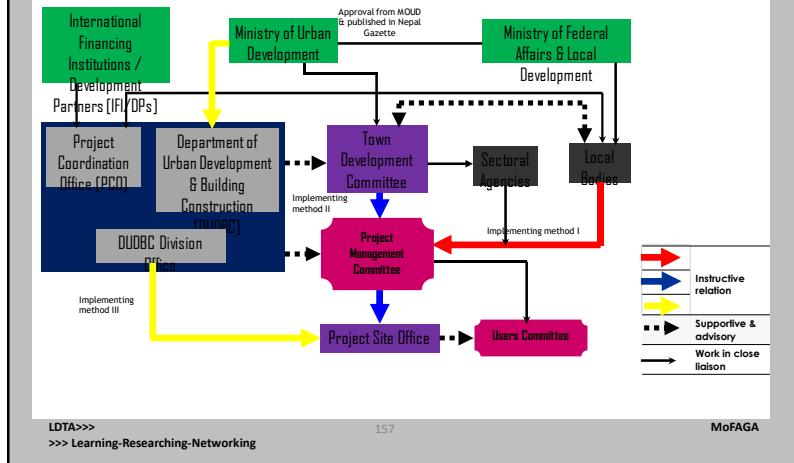
Land pooling process



Historical development of land pooling process



Implementing agencies for land pooling



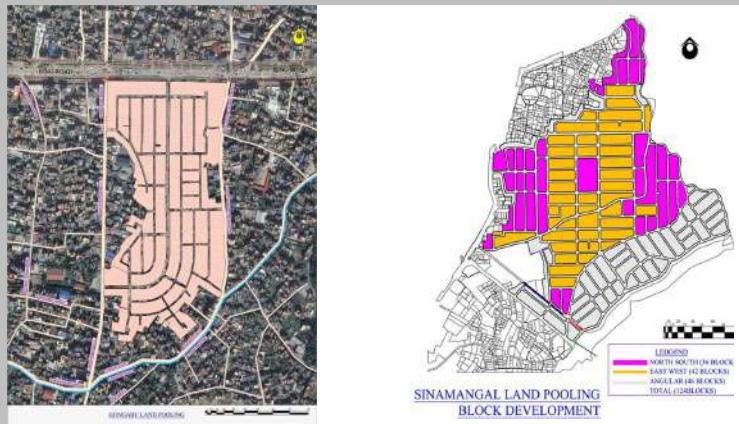
Land pooling process: successful aspects

<input checked="" type="checkbox"/> Self financing infrastructure & service scheme - win-win situation benefiting both government and landowners;	<i>Land development program</i>	Road length (km)	Road area (Rop)	Open space (Rop)	Total	Cost (NRs. 20 million/Ropani)
<input checked="" type="checkbox"/> Creation of public assets;	Site and services	20.68	175.74	31.49	207.19	414.00
<input checked="" type="checkbox"/> Development cost fairly shared among landowners is lowest & without disturbing the daily life of communities;	Guided land development	324	2,546.00	-		5,092.00
<input checked="" type="checkbox"/> No gentrification and displacement of people, as in site & service programs;	<i>Land pooling</i>	Completed	78.84	1,093.00	621	1,714.00
<input checked="" type="checkbox"/> Upgrading existing cadastral maps & land registration records including increase in government tax revenue due to increase in land price;	Ongoing	123.00	1,591.00	238	1,829.00	3,658.00
<input checked="" type="checkbox"/> People trust government's land development rather than private sectors.		Total	546.52	5,405.70	6,296.00	12,592.00



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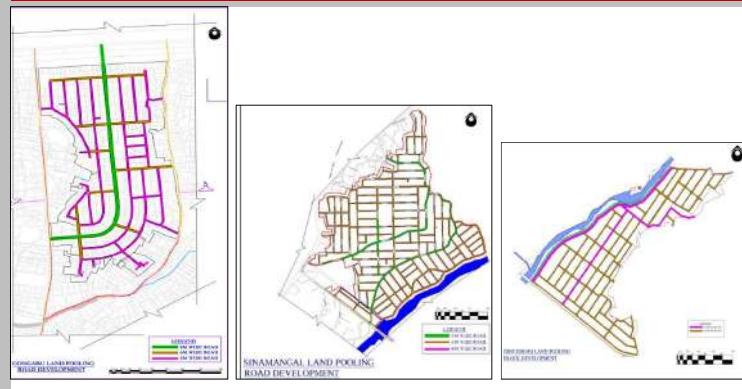
Land pooling process: urban block & integration with surrounding areas



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Land pooling process: street pattern



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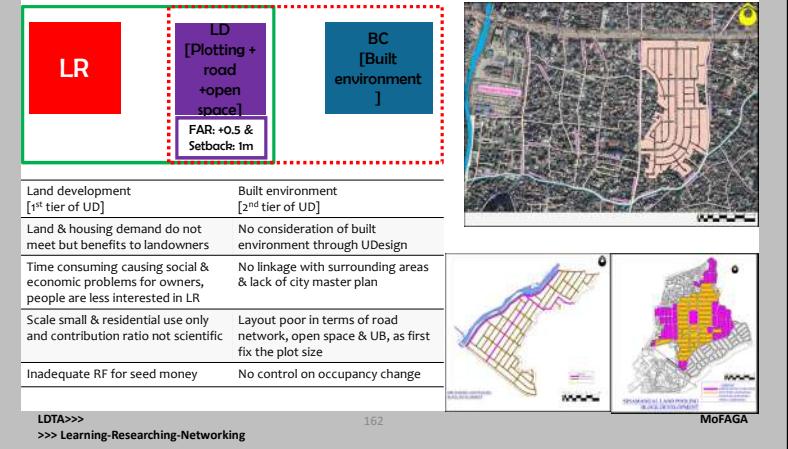
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Land pooling process: open space hierarchy



Land pooling technique: weaknesses



Land pooling technique: site specific standards

SN	LP	Location	Time (AD) (Year Interval)	Land Owner No.	Area (ha)	Developed Plots No.	Contribution Ratio (%) (Min - Max)	Contribution Distribution Percentage			Implementing Agency	
								Private Plot	Road	Open Space		
1	Chhiple Dhunga Dalu (Moved From Site & Services)	Pokhara	1975 - 1978 (3)	N/A	148	N/A	N/A	50.00	35.00	5.00	10.00	TDC
2		Kathmandu	1978 Started, 1990 - 2001 (3)	455	20.14	750	40.00	60.00	25.00	7.00	8.00	KVTDC, Ltp
3	Boglung Bus Park	Pokhara	1980 - 1981 (1)	N/A	3	N/A	N/A	25.00	60.00 Including Bus Park	15.00	15.00	TDC
4	Gongbu	Kathmandu	1989 - 1994 (7)	376	14.4	406	14.00 - 46.00	72.43	16.75	4.90	5.92	KVTDC, Ktm
5	Sardine Phase I	Nepalgunj	1999 - 2001 (10)	80	5	8	25.00	25.00	40.00	15.00	20.00	TDC, Barke
6	Sainju	Bhaktapur	1991 - 2003 (12)	536	28.08	540	56.00	44.00	22.00	12.90	20.30	KVTDC, Ltp
7	Komolangchay	Bhaktapur	1991 - 1996 (5)	170	7.38	205	28.00	67.50	21.50	4.20	6.80	TDC, Blkt
8	Bognatti Corridor	Lalitpur	1992 - 2001 (6)	239	10.02	258	12.50 - 54.00	78.30	19.00	2.70	—	KVTDC, Ktm
9	Bognatti Nagar	Kathmandu	1992 - 1995 (3)	62	63.38	2600	40.00	69.98	17.00	4.90	8.02	KVTDC, Ktm
10	Kanekotar	Thimi	1992 - 1996 (4)	N/A	458	2520	45.00	68.56	20.13	4.35	6.96	KVTDC, Blkt
11	Lalitpur	Lalitpur	1993 - 1996 (4)	207	1.68	243	16.00 - 20.00	68.70	17.80	4.43	6.60	TDC
12	Mithangu Narayan	Kathmandu	1994 - 2001 (7)	456	23	225	12.00 - 31.00	7.00	19.50	2.00	6.40	KVTDC, Ktm
13	Naydebar	Khulbu	1995 - 2003 (6)	536	42.25	540	56.00	70.00	22.00	4.00	4.00	Municipality
14	Sharmagi Phase I	Pepako	1995 - 2004 (9)	700	8.09	1251	83.33 - 37.50	67.44	20.97	4.75	5.81	TDPIC, Ktm
15	Sharmagi Phase II						63.33 - 52.00	65.24	22.63	8.09	9.34	TDPIC, Ktm
16	Chakali	Kathmandu	1995 - 2002 (7)	342	10.9	292	12.50 - 51.00	66.45	22.70	3.80	7.05	TDPIC
17	Uxell	Bhaktapur	1996 - 1999 (3)	667	34.54	770	12.50 - 30.00	64.50	28.60	2.80	7.10	Municipality, Blkt
18	Santor	Bhaktapur	1998 - 2005 (7)	271	27.5	671	12.50 - 38.00	67.80	18.80	3.40	10.00	TDPIC
19	Dibyashil	Motijharpur	2006 - T8 (2)	100	281	58	6.00 - 41.00	67.20	21.80	6.93	9.28	KVDA, Ktm

Note:- TDC= Town Development Committee, KVTDC= Kathmandu Valley Town Development Committee, TDPIPC= Town Development Plan Implementation Committee, KVDA= Kathmandu Valley Development Authority, Ktm= Kathmandu, Ltp= Lalitpur, Blkt= Bhaktapur. (Source :- KVTDC, 1999, TDPIPC, 2000, Korki, 2007, DUJDC, 2015, Sharma, 2015, KC, 2015, KVDA, 2017, ADB, 2017)

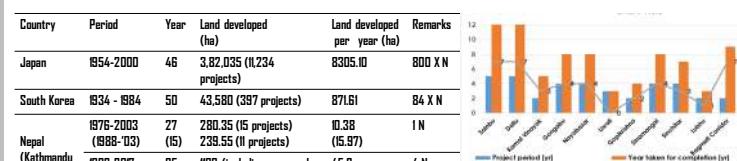
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Land pooling technique: weaknesses

Comparative study of area developed through land pooling system in different countries



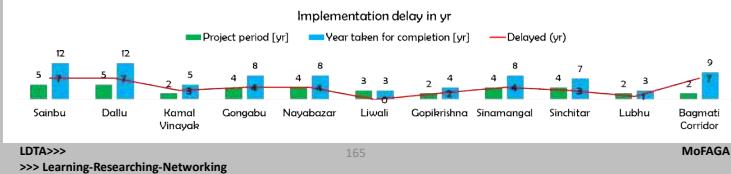
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Land pooling: weaknesses

Land development part	Built environment aspect
Small size with residential plot only	Poor layout: first determine the plot size
Delayed implementation period	No consideration of surrounding areas in terms of land use, density and road network [no integration]
Land owners benefitted more	Street network and public open space are poor in terms of location, size and connectivity
Do not solve housing & land demands in the city	No control on change in building use [private hospitals, schools, etc are running on residential houses]
Private sector can not involve	Townscape and building architecture has no meaning [identify, legibility, character, etc.]
No infrastructure providing agencies	Project specific planning and design norms



Land development: public vs private sector

Particulars	Land pooling projects		Land development projects	
	Kameratar, Madhyapur Thimi	Saiju Bhaisepati, Karya Vinayak Kathmandu	Bungamati service land, Karya vinayak (Vibor Bank)	Balkumari service land, Madhyapur Thimi(A-Z pte ltd)
Project area (approx.)	75.6 ha	24.97 ha	153.26 ha	3.30 ha
Project period	2005-17	1993-05	2006-16	2010-15
Land parcel	4,400	552	2050	165
Open space	4.57%	12.90%	2.2%	As per law
Road network	23.2 km road	22.89%	-	-
Contribution	45%	56%	40%	
Land price before/after development (per rop. in million)	NRs 0.25-2/ NRs 11.2-64	NRs 0.6-0.8 / NRs 28.8-35.2	NRs 2.4-3.6 / NRs 25.6- 27.2	NRs 2.4-4.0 / NRs 12.8-14.4 NRs 25.6-27.2
Increased land price (approx.)	32-45 times	44-48 times	8-11 times	2.85-3.65 times
Land cost outside the planned area	45-50% cheaper	50-60% cheaper	40-50% cheaper	40-50% cheaper
Initial fund	Undeveloped land sell	Govt. loan @12% interest and land sell	Govt. loan @ 12% interest	-



Note: 1ha = 19.65 rop.

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Land pooling technique: impacts

Demographic change	Agriculture to urban use: Nayabazar land pooling: 36% local & 64% migrants [54% from KV & 46% outside valley];
Occupation change	Before LR, 95% on agriculture but after LR, they changed into Retails, workshops & other SMEs [low level education] sold piece of land and open new business, buy taxi and rent the space;
Built environment	- No unifying elements over buildings built in different time period: different plinth height, material, colour and architectural style - Open spaces yet to be fully utilized; - Absence of temples, art and cultural facilities; - Conversion of open spaces into temple, paved and other activities by Users Committees
Land value	Increases many times [3-10 times]



Land pooling technique: recommendations

- | | |
|-------------------------|--|
| Policy level | <ul style="list-style-type: none"> Engage infrastructure providing agencies; Encourage private sector participation; Provide adequate size of Revolving Fund ; Engage Central, Provincial and Local Governments in large scale LR projects; Ensure equal sharing of Development Gain between all participating agencies including landowners; |
| Planning & design level | <ul style="list-style-type: none"> Use Urban Design approach for layout plan, land use and density; Prepare planning standard and guidelines for infrastructure provisions including urban design and architectural guidelines & link them to incentive mechanism wherever necessary; Enhance capacity of implementing agencies and educate landowners; |
| Scale | <ul style="list-style-type: none"> Increase the size and scale of LR project; Diversify the use of LR techniques for variety of usages other than residential use only. |

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Take home message

- LP model having implication beyond the project site can be successfully applied for achieving balanced, inclusive and disaster resilient community in new development, post-disaster reconstruction and urban regeneration;
- Integration of land development and built environment through Urban Design Approach is desirable;
- Master plan and development framework at Regional/city level is required to implement LP project at city/local scale.

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Any Questions?

Dziękuję	شکرًا	Thanks You	Terima Kasih	<i>hvala</i>	Дякую
bedankt	سالامات	Merci		Đakujem	go raibh maith agat
tesekkürle				nandri	Thank you
謝謝	תודה			Danke	tack så mycket
Obrigada	ありがとう			tack	faleminderit
Shukriyâ	mange tak			Mulțumesc	Спасибо
takk	Grazie	너를 감사하십시오			
Eυχαριστώ	díky	děkuji vám	<i>kiitos</i>	anugurihiitosumi	köszönöm
aitäh	<i>Muchas gracias</i>	ddhanya-waa		ačiū	

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सङ्कीर्ण मानिता तथा सामाजिक प्रशासन मन्दिरालय

Municipal sustainable development goals, disaster risk reduction and climate change Day-session 2-III

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Specific objectives

At the end of this session, participants will:

- [a] understand the interrelationship between sustainable development goals (SDGs), disaster risk reduction (DRR) and climate change adaptation (CCA);
- [b] learn about impacts of disasters and climate change on various aspects in Nepal; and
- [c] comprehend the localizing SDGs, DRR and CCA at municipal level through formulation of strategic action plans, establishment of institutional set up and enacting new legislations

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What are your opinions on these issues?

What are the interrelationship between sustainable development goals (SDGs), disaster risk reduction (DRR) and climate change adaptation (CCA)?

National plans, programs and policies for SDGs, DRR and CCA have been prepared but how to localize them at province and municipal levels?

How can municipality effectively play a role in implementing those plans, programs and policies?

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Sustainable Development Goals [SDGs] (2016-'30)



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दिगो विकास लक्ष्यक ५ स्तम्भ

- पृथ्वी: पृथ्वीमा रहेका प्राकृतिक साधन श्रोत र वातवरण भावां पुस्ताका लागि सरक्षण गर्ने
- मानव: सबै प्रकारका गरिबी र भोकमरीको अन्त्य गर्ने र मानवां एवम् सम्बन्धात कायम गर्ने
- समुद्धि: प्रकृतिसँग सामन्जस्यता कायम गर्दै समृद्ध र सम्प्रभुता जीवनको सुनिश्चितता गर्ने
- शान्ति: शान्तिपूर्ण न्यायसंगत र समावेशी समाजको निर्माण गर्ने
- साझेदारी: सशक्त विश्वव्यापी साझेदारीको माध्यमबाट दिगो विकासका एजेण्डाहरूको कायन्त्रयन गर्ने



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Sendai framework of DRR: main features

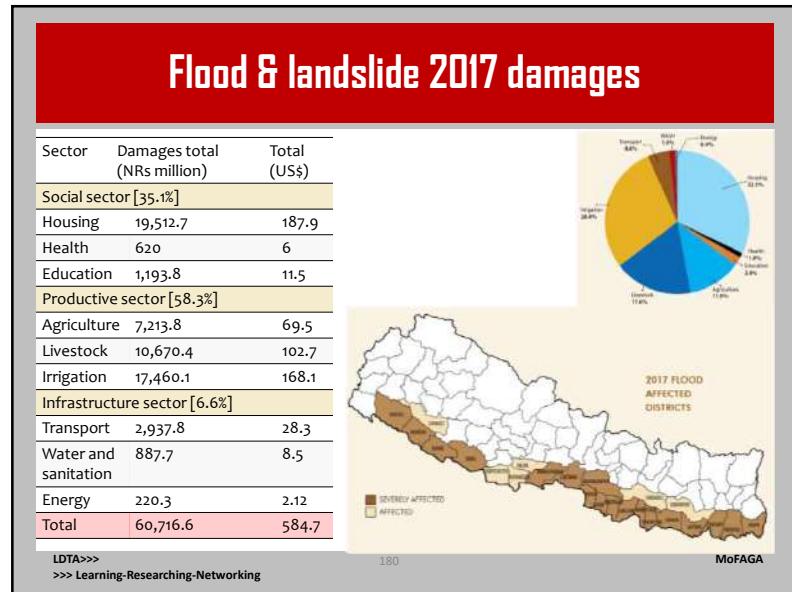
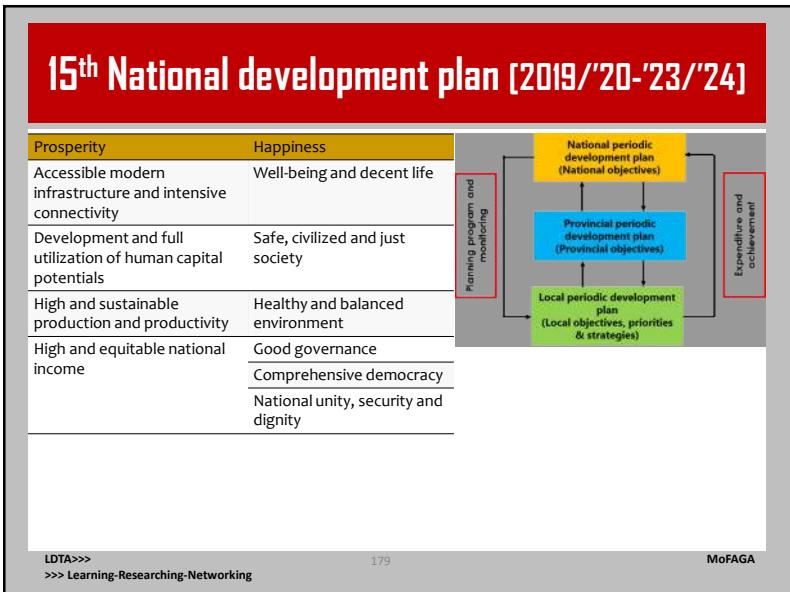
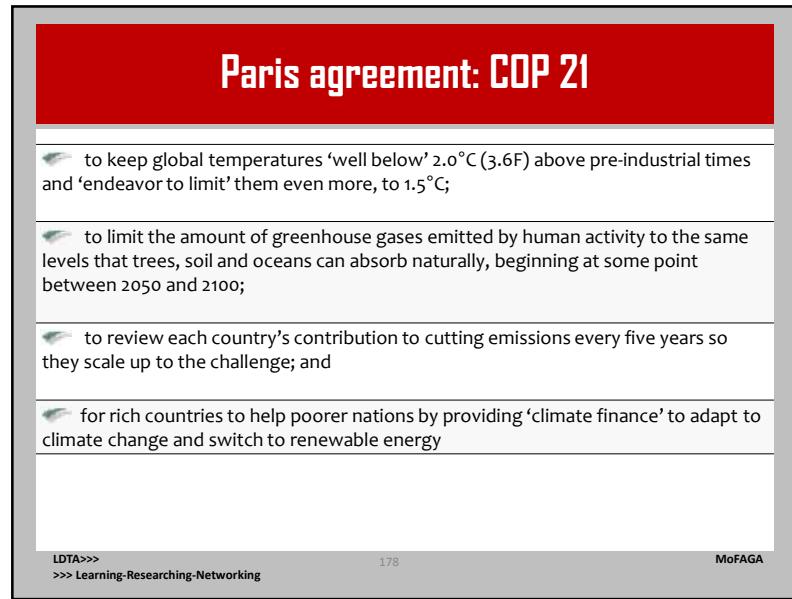
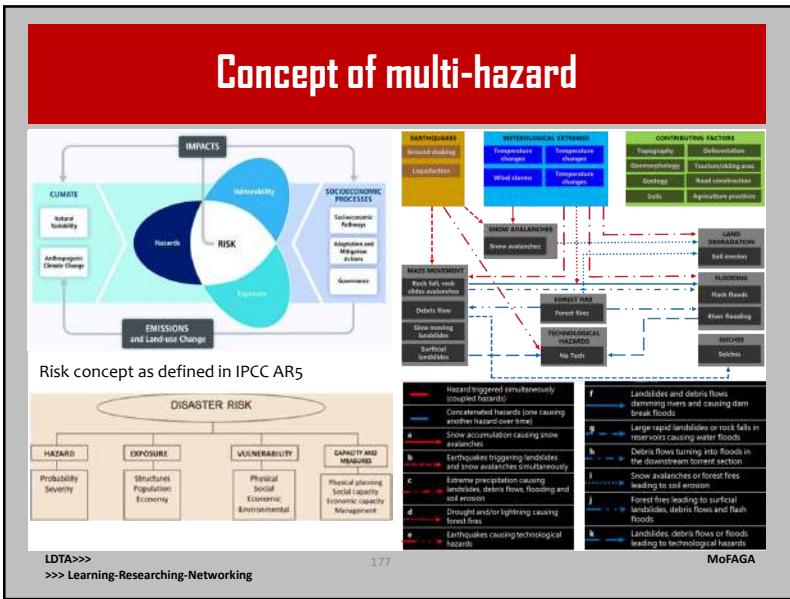
Shift their focus from managing disasters to managing risks	which requires a better understanding of risk in all its dimensions of vulnerability, exposure and hazards.
Focus on People-centred	all-hazards, and multisectoral based approach to disaster risk reduction.
Multi-hazard management of disaster risk	in development at all levels as well as within and across all sectors with Engagement from all of society
Wider Scope- include small scale, frequent and infrequent, sudden and slow-onset disasters, caused by natural or man-made hazards as well as related environmental, technological and biological hazards and risks including epidemics and pandemics	risk of small-scale and large-scale, frequent and infrequent, sudden and slow-onset disasters, caused by natural or man-made hazards as well as related environmental, technological and biological hazards and risks including epidemics and pandemics

4 PRIORITIES FOR ACTION	National and local dimensions Regional and global dimensions
Priority 1. Understanding disaster risk Policies and practices for DRR should be based on an understanding of risk in all its dimensions of vulnerability, exposure and hazards, hazard characteristics and the environment	
Priority 2. Strengthening disaster risk governance to manage disaster risk Strengthened risk governance at the national, regional and global levels is of great importance for an effective and efficient disaster risk reduction	
Priority 3. Investing in disaster risk reduction for resilience Public and private investment in DRR are essential to enhance the economic, social, health & cultural resilience of persons, communities, countries, and assets, as well as environment	
Priority 4. Enhancing disaster preparedness for effective response to disasters Disaster preparedness is key to effective response. Recovery, rehabilitation and reconstruction strengthened disaster preparedness for response, recovery, rehabilitation and reconstruction are critical to build back better	
Priority area 1: Understanding disaster risk Comprehensive understanding of disaster risk through national platforms of risk assessment	
Priority area 2: Strengthening disaster risk governance of disaster risk Strengthening of disaster risk governance at federal, provincial and local levels	
Priority area 3: Promoting of public and private investments of resilient development based on comprehensive information Investments in disaster risk reduction	
Priority area 4: Enhancing disaster preparedness for effective response, recovery, rehabilitation and reconstruction Enhanced disaster preparedness for response, recovery, rehabilitation and reconstruction	

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Tornado in Bara & Parsa, March 2019



In March 2019, Bara and Parsa districts of Nepal were hit by a tornado, the first recorded wind-induced disaster of the country, killing 28 people and injuring over 600 persons. Most of the deaths and injuries were caused by houses being demolished by the high winds, trees falling on at least one bus, cars being blown away, and by flying debris.

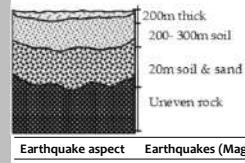
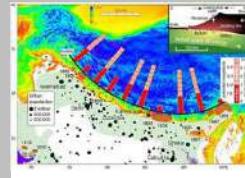
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Earthquake hazard of Nepal



Earthquake aspect	Earthquakes (Magnitude in Richter Scale)
5 to 6	41
6 to 7	17
7 to 7.5	10
7.5 to 8	2
> 8	1

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Priority ranking of climate change impacts in Nepal

Resource/ranking	Certainty of impact	Timing of impact (urgency)	Severity of impact	Importance of resource
Water resource and hydropower	High	High	High	High
Agriculture	Medium – low	Medium – low	Medium	High
Human health	Low	Medium	Uncertain	High
Ecosystems/biodiversity	Low	Uncertain	Uncertain	Medium - high

Impacts on water resources and hydropower	Greater water scarcity in High Mountain Region
	Affect water quality and availability in the Middle Mountain
	Cause more water related disasters (flooding, landslides, sedimentation, water borne diseases, vector borne disease) in the 'Churia/terai' region

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Disaster ranking in Nepal [1971-2017]

Disaster ranking	Year (loss of human)	Disaster by type			
		Human loss	Livestock loss	Farm lost (ha)	Property loss (in mln)
First	2015 (9,276)	Earthquake (9,719)	Flood (543,214)	Drought (465,901.7)	Earthquake (706,0581.00)
Second	1993 (1,889)	Landslide (6,024)	Earthquake (516,353)	Flood (275,364.31)	Flood (15,747.62)
Third	1999 (1,450)	Flood (5,026)	Landslide (11,073)	Hailstorm (133,481.9)	Hailstorm (2,732.85)

Note: (a) 16,817 person lost life due to epidemic, the biggest disaster killer; (b) Fire killed 21,893 livestock, (c) NRs 25,223.98 million was lost due to fire

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Multi-hazard scenario of Nepal by its socio-economic loss [1971-2018]

Disaster type	No. of Incidents	Human loss			Houses damaged	
		Death	Missing	Injured		
Fire	12,694	1,755	-	2,176	265,962	90,044
Lighting	2,143	1,780	129	3,235	7,758	1,000
Landslide	3,729	5,141	191	2,053	559,347	34,094
Wind storm	298	21	-	95	1,718	1,279
Flood	4,368	4,628	87	615	3,726,261	230,900
Epidemic	3,474	16,598	-	44,992	513,409	0
Avalanche	3	17	4	7	1	0
Snow storm	7	97	7	0	10	0
Hailstones	134	9	-	24	3,407	157
Earthquake	175	9,771	-	29,142	890,995	982,855
Cold waves	438	563	-	83	2,441	0
Others*	1,134	626	13	919	3,214	2,461
Total	28,597	41,006	431	83,341	5,974,523	1,342,790
Average	608	872	9	1,773	127,118	28,570

Source: NEOC, MOHA, 2018 (*- Structure collapse, drowning, boat capsize, animal attack and others)

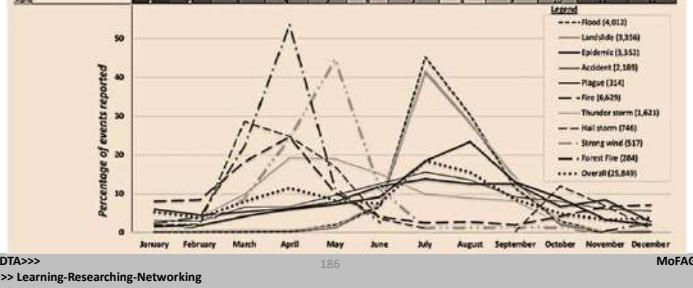
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Frequency of disaster events [1971-2016]

Events	January	February	March	April	May	June	July	August	September	October	November	December
Hood (4,012)	0.1	0.1	0.3	0.4	2.1	0.7	65.3	30.4	17.6	3	0.1	0.1
Landslide (3,954)	0.6	0.6	0.7	0.7	1.6	7.8	61.7	28.6	14.4	2.5	0.3	0.4
Epidemic (3,352)	1.7	1.9	4.3	6	7.3	9.2	18.5	23.5	13.1	9	3.5	2
Accident (2,189)	3.2	3.1	6.6	6.8	9.6	12.7	15.6	13.6	9.2	8.1	6	5.7
Plague (314)	6.1	4.5	5.4	6.4	8	12	14	12.7	12.7	6.7	8.0	1.0
Fire (6,259)	8.3	8.3	14.1	14.7	15.9	16.1	2.2	2.5	4.3	6.7	7.2	7.2
Thunder storm (1,623)	2	4.1	10	13.3	19	12.3	10	8	8.3	3.3	0.2	0.4
Hail storm (745)	2	2.3	28.6	24.8	17.2	3.6	3.1	0.9	0.9	32.1	7	3.2
Strong wind (517)	0.6	2.1	9.1	24.6	44.7	11.6	1.5	1.5	1.7	3.5	0.2	0.8
Forest fire (284)	2.5	4.2	22.5	53.5	11.6	2.8	0.4	0.4	0.4	2.8	0.4	0.4
Overall (25,849)	5.4	5.7	8.2	11.6	8.4	7.6	18.6	15.6	8.7	4.9	3.4	3.9
Rank	1	2	3	4	5	6	7	8	9	10	11	12

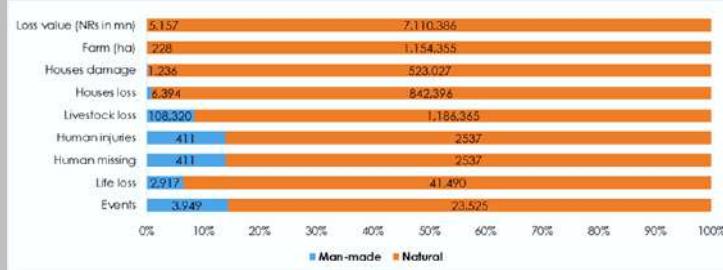


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Man-made disaster vs natural disaster events & impacts [1971-2017]



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Hazard geographical prevalence & seasonal risk

Hazard type	Geographical prevalence	Season
Flood	Terai (sheet flood), Middle Hills	Monsoon period (June – September)
Landslide and landslide dam breaks	Hills, Mountains	Monsoon period (June – September)
Glacier Lakes Outburst Floods (GLOF)	Origin at the tongue of glaciers in higher Mountains, flows reach down to Middle Hill regions	Monsoon period (June-September)
Avalanche	Higher Himalayas	Winter season (November-February)
Fire (forest)	Hills and Terai (forest belt at foot of southern-most Hills)	Dry season (March-June)
Drought	All over the country	Monsoon period (June-September); Dry season (March-June)
Windstorms	All over the country	Dry season (March-June)
Hailstorm	Hills	Monsoon period (June-September)
Lightening	All over the country	Monsoon period (June-September)
Epidemics	Terai and Hills, also in lower parts of Mountain region	Monsoon period (June-September)
Fire (settlements)	Mostly Terai, also mid-Hill region	Dry season (March-June)

Source: adapted from MoHA & DPNet-Nepal, 2015

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Disaster events by Province [1971-2016]

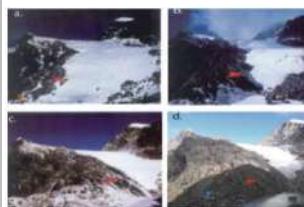
Provinces	Event (%)	Death (%)	Missing (%)	Injured (%)	Destroyed house (%)	Affected people (%)
1	5,646 (21%)	5,578 (13%)	551 (19%)	15,016 (18%)	88,393 (10%)	9,31,696 (12%)
2	4,373 (16%)	5,363 (12%)	288 (10%)	9,296 (11%)	90,139 (11%)	31,28,830 (39%)
3	5,820 (22%)	14,694 (33%)	599 (21%)	34,469 (41%)	5,03,229 (59%)	13,84,987 (17%)
Gandaki	3,373 (13%)	4,025 (9%)	473 (17%)	5,595 (7%)	1,01,038 (12%)	10,61,501 (13%)
5	3,044 (11%)	4,518 (10%)	456 (16%)	5,964 (7%)	37,110 (4%)	5,18,149 (6%)
Karnali	2,097 (8%)	4,901 (11%)	270 (10%)	2,249 (3%)	5,072 (1%)	4,45,989 (6%)
Sudur	2,312 (9%)	4,789 (11%)	205 (7%)	10,795 (13%)	22,323 (3%)	5,28,482 (7%)
Pachhim						
Total	26,665	43,868	2,842	83,384	847304	79,99,634

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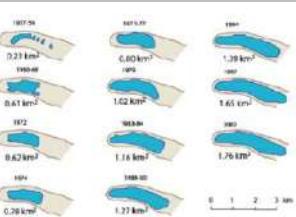
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Climate change impacts on water resources



Tsho Rolpa
Glacier
Lake, Nepal
L=3.3 km,
B=500 m,
D=142 m



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- ❖ Glacier AX010 in the Shorong Himal: retreat from 1978 to 1989 was 30 m, which was equivalent to 12 m thinning of the glacier surface and the glacier terminus was further retreated by 14 m after 1998;
- ❖ There are 2315 glacier lakes of varied sizes, the total area of which is 75 sq. km;
- ❖ A disastrous GLOF occurred at Dig Tsho Glacier Lake on 4 August 1985 in the Langtang valley of Khumbu region in eastern Nepal causing serious damage to the nearly completed Namche Hydropower Project, washed away big area of cultivated land, bridges, houses including livestock and inhabitants along its path downstream.

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Impact of climate change on water resources



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Impact of climate change: landslide

Mountainous regions are more vulnerable than the corresponding lowlands;

Existence of pockets of higher vulnerability within less vulnerable regions at the aggregate level;

More than 60% of the population of Nepal falls in the moderate to high vulnerability categories;

Overall, lack of adaptive capacity is the biggest cause of vulnerability;

Vulnerability reduction activities should focus on increasing incomes across different populations, diversifying livelihood opportunities, increasing connectivity among people by building transportation networks and other relevant infrastructures, and maintaining forest cover.



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Climate change impact: agriculture, forest & gender

- Communities in Rasuwa, manang and Mustang districts have experienced shifts in vegetation patterns and reduction in production and supply of timber and non-timber forests products (NTFPs);
- Losses of forest species and medicinal plants have been confirmed in Banke and Bardia districts;
- Species such as tigers, rhinos and elephants are threatened by habitat modification and deforestation thereby impacting tourism;
- Creating favorable environment for pests, diseases and invasive species to emerge, spread and encroach the agricultural land, forestlands and other pasture land



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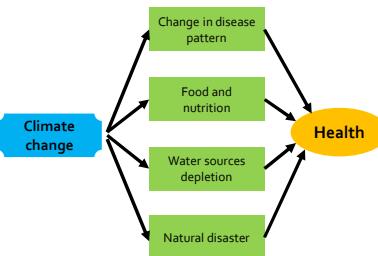


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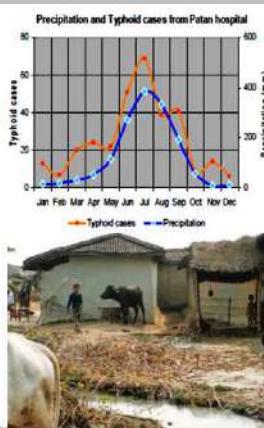
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Climate change impact: health



- Growing risk of Malaria, Kalaazar, and Japanese Encephalitis outbreak particularly in sub-tropical and warm temperature regions of Nepal
- Increased exposures to floods and vector-borne diseases

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MoFAGA

Plans, policies and strategies with DRR & CCA

Plans, policies and strategies	Types of disaster					Level of governance		Disaster cycle		CC impact		Measures					
	Flood/landslides	Earthquake	Rain & hailstorm	Drought	Fire	Epidemics	Federal	Provincial	Local	Preparedness	Response	Rehabilitation	Agriculture	Forest	Water resources	Mitigation	Adaptation
National policy for disaster risk reduction, 2018																	
National DRR strategic plan of action (2018-2030)																	
Forest fire management strategy 2007																	
Forest encroachment prevention strategy 2068																	
Community forest's wood collection and selling guidelines 2071 (2014)																	
National Urban Development Strategy (NUDS), 2017																	
Land use policy 2015																	
National climate change policy 2076 (2019)																	
National Adaptation Plan (NAP) 2015																	

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Regulatory framework for DRR and CCA

Regulatory framework	Types of disaster					Level of governance		Disaster cycle		CC impact		Measures				
	Flood/landslides/Earthquake	Rain & hailstorm	Drought	Fire	Epidemics	Federal	Provincial	Local	Preparedness	Response	Rehabilitation	On Agriculture	Forest	Water resources	Mitigation	Adaptation
Disaster Risk Reduction and Management Act 2017																
National Building Code 1994																
Local Government Operation Act 2017																
Environment Protection Act, 2076 (2019)																
Forest Act 1976 (2019)																
Public Health Service Act 2018																
Constitution of Nepal 2015																

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Institutional framework with DRR and CCA

Institutional framework	Types of disaster					Level of governance	Disaster cycle			CC impact		Measures	
	Flood/landslides	Earthquake	Rain & hailstorm	Drought	Fire		Preparedness	Response	Rehabilitation	Agriculture	Forest	Water resources	
National Council for DRR and Management						Federal	Provincial	Local					
National disaster risk reduction and management authority (NDRRMA)													
Province Disaster Management Committee													
District/Local Disaster Management Committee													
National Council of Climate Change													
Municipalities													

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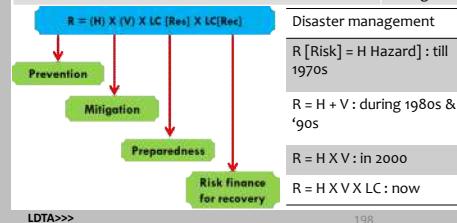
Changing perception of risk & DRR



Disaster risk management cycle



Integrating SDGs, Sendai DRR framework and Climate change



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Integrating DRR and CCA at municipality



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Localizing national plans & policies: (SDGs, DRR & CCA)



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DRR policies & strategic action plan

S. No.	Indicator	Baseline (till 2020)	Short term (by 2024)	Medium term (by 2027)	Long term (by 2030)
1. Substantially reduce municipal disaster mortality rate					
1.1	Annual average disaster mortality (except roads accident)	1.59	0.70	0.52	0.39
1.2	Annual average mortality by roads accident	1.73	0.76	0.57	0.43
2. Substantially reduce the number of disaster affected people					
2.1	Annual average number of families directly affected by disaster	61.04	48.83 (80%)	36.62 (60%)	30.52 (50%)
2.2	Annual average number of injured people by disaster	0.53	0.42	0.32	0.26
2.3	Annual average number of people injured by road accident	2.63	2.10	1.57	1.31
2.4	Annual average number of houses damaged by disaster	4.72	3.77	2.83	2.36
3. Significantly reduce the direct disaster economic loss in municipality					
3.1	Annual average direct disaster economic loss in municipal GDP	2%	0.5%	0.2%	0.1%
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DRR policies & strategic action plan

4. Substantially reduce disaster damage to critical infrastructure and disruption of basic services, including through developing their resilience					
4.1	Developing resilience of health facilities by retrofitting	12 (75% of total 16)	4	8	12
4.2	Developing resilience of classrooms by maintenance and retrofitting (Nos.) (343 classrooms: 75% of total school needs retrofitting; and each high school has 10 classrooms and basic school with three classrooms)	257 nos. of classrooms	86	171	257
4.3	Developing resilience of school buildings by retrofitting	63 no. (75% of total 84 no)	22	44	63
4.4	Developing resilience of cultural heritages and touristic places (monuments and places) by retrofitting (Nos.)	42 (75% of total places and monuments)	14	28	42
4.5	Temporary public community buildings to be made permanent structure (no.)	7	2	4	7
4.6	Protection of forest area through infrastructure development (Nos.) (Community forest = 87)	44 no (50% of total 87 no)	14 no	28 no	44 no
4.7	Percentage of HHs requiring ≥15 min. to collect drinking water (4091 HHs)	36%	24%	12%	0%
4.8	Percentage of HHs using wood for fuel (total HHs 6066 or 53.37%)	53.37%	36%	19%	0%
4.9	Farming HHs not have access to irrigation facility in their lands	29%	20%	10%	0%
4.10	HHs throwing solid waste either in the river or public spaces (road and open spaces) (1750 HHs)	11%	0%	0%	0%
4.11	Developing resilience bridges over different rivers (Total no. of bridges = 21)	Temporary -1, Dilapidated condition-4; Renovation required-15	7	14	21
4.12	Developing resilience of public rest house and "chauparas" (PRC), playground (PL) and parks and greenery (PG) by retrofitting and improving infrastructure (Nos.)	70 (PRC), 75 (PL) and 20 (PG)	23 (PRC), 25 (PL), 6 (PG), 46 (PRC), 50 (PL), 12 (PG) (PG)	70 (PRC), 75 (PL), 20 (PG)	
4.13	Protection of riverbanks by bio-engineering techniques (87.5 km on both sides makes 175 km in total)	17.5 km (10% of total length of 175 km)	5 km	10.5 km	17 km
4.14	Developing climate smart villages		1	1	1
4.15	Developing climate smart agriculture		1	1	1
4.16	Households not taking completion certificate of their houses (6,868 HHs)	95% or 1,030 HHs of total 6,868 HHs	5%	10%	15%
4.17	Households having own income sufficient for the whole year or more	65.49% of total HHs	77%	88%	100%

DRR policies & strategic action plan

5. Prepare disaster risk reduction strategy and action plan at local levels					
5.1	Percentage of Government agencies involved in resource management and implementation for recovery, rehabilitation and reconstruction based on 'Build Back Better' principle	100%	100%	100%	
6. Substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments					
6.1	Percentage of the area that has established multi-hazards monitoring and early warning system in proportion to the total area of the country	50%	70%	100%	
6.2	Percentage of population receiving early warning via local or national information system in proportion to the population of disaster affected area	50%	80%	100%	
6.3	No. of wards having forecast based preparedness plan	4	8	14	
6.4	No. of wards disseminating locally useful disaster risks information and assessment to the general people	4	8	14	
6.5	Percentage of population evacuated to safe places from disaster prone areas after receiving early warning	50%	100%	100%	

Note: (a) For information associated with human and property damage was taken between 1971-2018 whereas for road accident, the data considered is between 2005 BS to 2076 BS;
(b) The proposed target figures are based on the target sets for Syangja district and national DRR policy and strategic action plan.

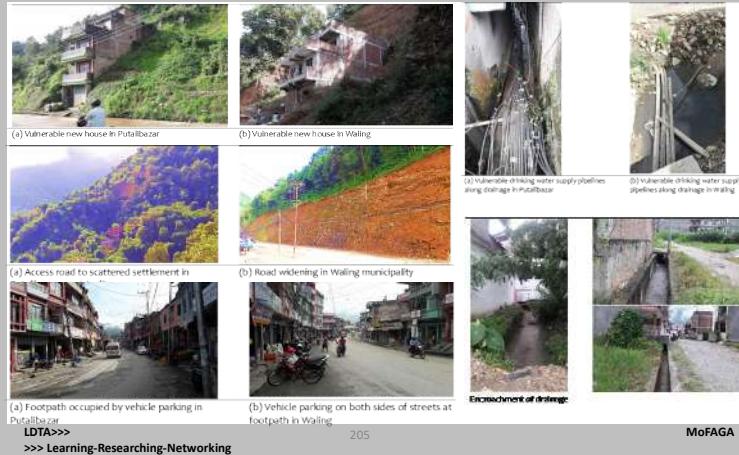
Strengthening disaster governance at municipality

Establishment and strengthening of institutional structures

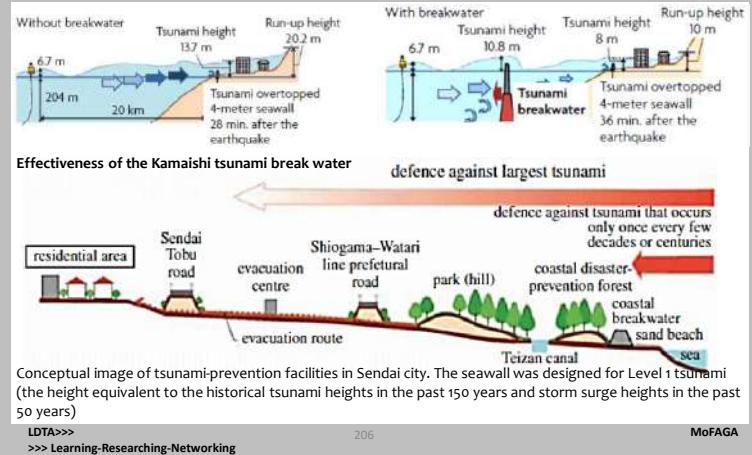
Strategic activity	Expected outcome	Time frame	Supporting agencies	Budget sources
Establish a coordination mechanism (vertically with federal and province governments and horizontally with line agencies, NGOs, CBOs, including private sector) to integrate and implement the concept of DRR and CCA in every sector of development	A coordination mechanism will be established at municipality	Short term	MOHA, NDRRMA and province government	Municipality and participating agencies
Establish a special fund and develop a monitoring mechanism for retrofitting of the existing risk structures (private and public) and different sectors	Financial arrangement and accountability will be established	Short term	MOHA, DUDBC, academic institutions, province government	Municipality, province and federal governments
Establish Disaster Risk Management Committees in schools and hospitals including other 'mass gathering' uses	DRM in schools and hospitals will be effective	Short term	Concerned ministries and province government	Municipality, Federal and province governments
Establish Emergency Operation Centre at municipal level	The disaster preparedness and emergency responses will be effective	Short term	MOHA, NDRRMA, MoFAGA	Federal and province governments

Note: MOHA – Ministry of Home Affairs, NDRRMA – National Disaster Risk Reduction Management Authority, DUDBC – Department of Urban Development and Building Construction, MoFAGA – Ministry of Federal Affairs and General Administration

Issues associated with DRR at municipality



Tsumani prevention techniques



Take home message

Sustainable development is not possible without disaster risk reduction and climate change adaptation.

Integration of disaster risk mitigation components and techniques as well as climate change adaptation is essential in urban development process at municipality.

National level plans, programs and policies have been prepared for SDGs, DRR and CCA, however, their localization at municipal level is yet to be carried out. Above all, adaptation of those policies and strategic action plans in daily life activities as well as in planning and selecting ward level projects is essential at municipal level.

Any Questions?

Dziękuję	شُكْرًا	Thanks You	Terima Kasih	<i>hvala</i>	Дякую
bedankt	salamat	Merci		Đakujem	go raibh maith agat
tesekkürle				nandri	Thank you
謝謝	הַדָּם			Danke	tack så mycket
Obrigada	ありがとう				faleminderit
Shukriyâ	mange tak			tack	
takk	Grazie			Multumesc	Спасибо
Ευχαριστώ	díky	děkuji vam	<i>kiitos</i>	anugurihiitosumi	köszönök
aitäh	Muchas gracias		ddhanya-waa	ačiû	

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नेपाल सरकार
 संघीय मानिसले देखा राष्ट्रमन्ड प्रशासन मन्त्रालय

Post-earthquake housing reconstruction in urban historic core area & rural region

Day-session 2-IV

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Specific objectives

At the end of this session, participants will

- [a] understand the level of damages in the historic core area and in rural region;
- [b] learn various proposal proposed specially for the historic core area including their strengths and weaknesses;
- [c] comprehend the post-earthquake housing reconstruction process in rural area and their merits and de-merits.

What are the important aspects to be considered in post-earthquake housing?



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How post-earthquake housing differs in historic core area and rural region?



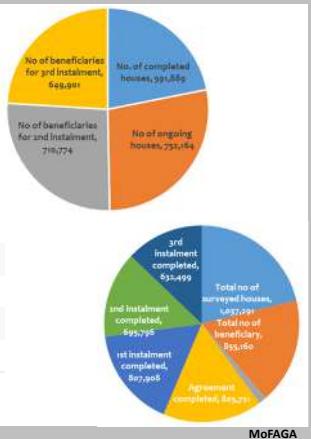
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Status of post-earthquake housing reconstruction

Total surveyed houses	1037,291
Total beneficiary number	855,160
Total beneficiary for retrofitting	65,162
Agreement completed	805721
1 st instalment taken	807908
2 nd instalment taken	695796
3 rd instalment taken	632499
No . Of completed houses	591889
No of ongoing houses	752164
No of beneficiaries for 2 nd instalment	710774
No of beneficiaries for 3 rd instalment	649901



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Impact of Gorkha earthquake of 2015 in Bhaktapur municipality

Private housing	252 person died 397 injured 33.62% housing stock completely collapsed 11.82% partially damaged
Monuments	Existing monuments in Bhaktapur municipality = 860 67 completely damaged (7.8%) 39 partially damaged (4.53%)
Tourism sector	NRs. 18.86 billion damage in tourism sector 5 hotel need renovation (out of 37 hotels) 46 rooms need renovation (out of 372) 91 guest occupancy need renovation (out of 699)

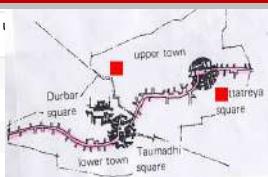
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Study area: Jelna & Byashi - Historic core area

Features	Jela (ward no 2): lower town	Byasi (ward no 10): i town
Ward area	76.15 ha	23.26 ha
Total housing unit	726	595
Housing units surveyed	66	42
Community population considered	414	342
Caste/profession	Mixed: Prajapati, Suwal, Duwal, etc	Majority of Basukala with Phaiju, Suwal



Structure of the questionnaire survey (66+42 households)

1. Personal information - Place of origin, age group, etc.
 2. Socio-economic condition - Type of family, profession, income and expenditure pattern, etc.
 3. Cultural setting - Damage level, physical problem, etc.
 4. Existing building condition - Use of courtyard in daily & festival times
 5. Renovation works - Time of renovation, profession consultation, etc.
 6. Building new house - Type and style of housing unit, sharing of spaces, etc.
7. LDTA required - Type of incentive, Preparation for next earthquake
8. Awareness level - Preparation for next earthquake

35 questions under 8 sub-headings

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Destruction at Jelna



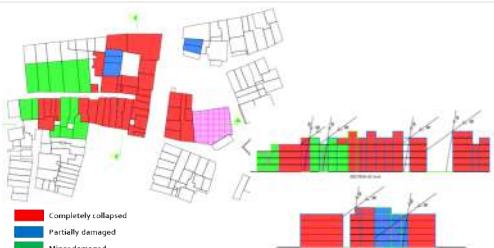
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Destruction of Byashi

Jelna, ward no. 2	Byasi, ward no. 2
Complete collapsed	71%
Structural damage	20%
Minor damage	7%
No visible	2%



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Destruction: World heritage site



Completely destroyed

Partially damaged

Many traditional houses with architectural features were destroyed

Many traditional decorated doors & windows are being sold

Festivals & jatras are celebrated for rituals without enthusiasm

Procession, jatra routes, etc. are being hampered

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Impacts: livelihood of victims



Loss/decrease in income from small scale business, rent & jobs including loss of workshop and decrease in no. of visiting tourists

Expenses increase for rent and basic services

Difficult to switch into new profession



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Impact: health, education & psychology



Health Mental anxiety, unhygienic condition

Education Drop out from school, difficult to study in a single room at temporary shelter

Psychology Living in the damaged vulnerable structure, so feeling unsafe

Feeling unsafe for pedestrian due to temporary support 'tekko'

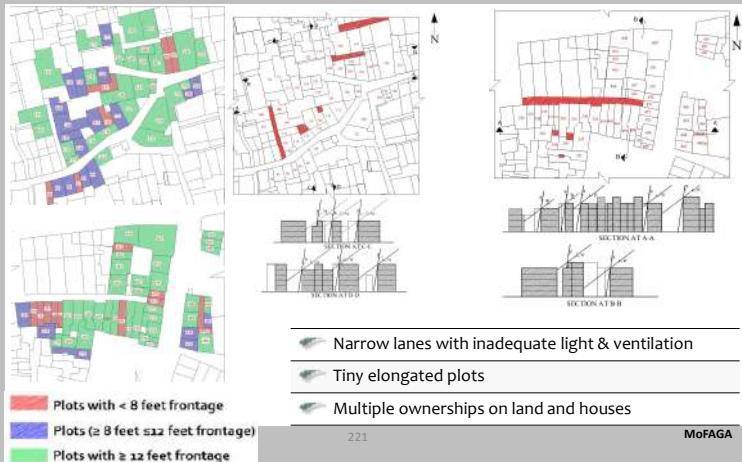
Feel uneasy for women at the time of menstruation due to inadequate water and privacy

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Issues & problems



Issues & problems

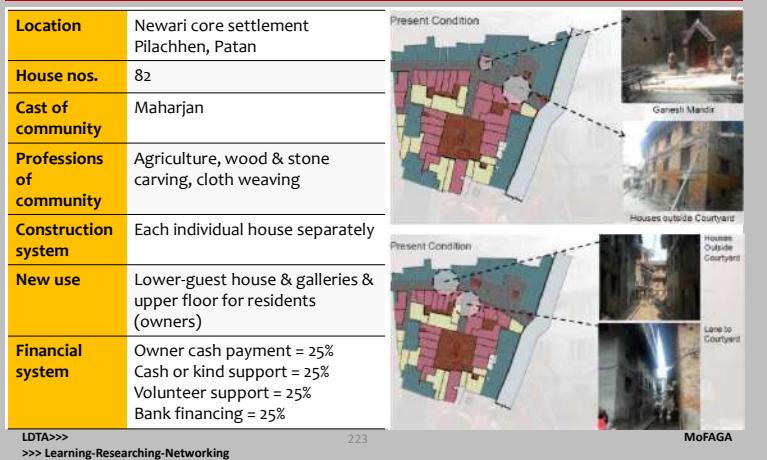
Protection & conservation	- What are the features/characters to be conserved?
Planning & design issue	- Tiny, elongated plot sizes - Multiple ownerships on land & houses
Financial issues	- Low affordability - Inadequate grant or loan support by GON
Permit issue	- No major changes on Building Bylaws for the HCA - Applicable Joint Apartment Act 1997 for mass reconstruction? - House pooling (?) & urban regeneration (?) possible
Safer neighborhood	- How to make safe neighborhood?
Cost effectiveness	- How to achieve cost effectiveness in reconstruction?
Opportunity	- How to incorporate the emerging issues (energy efficient components) and community's needs and aspiration

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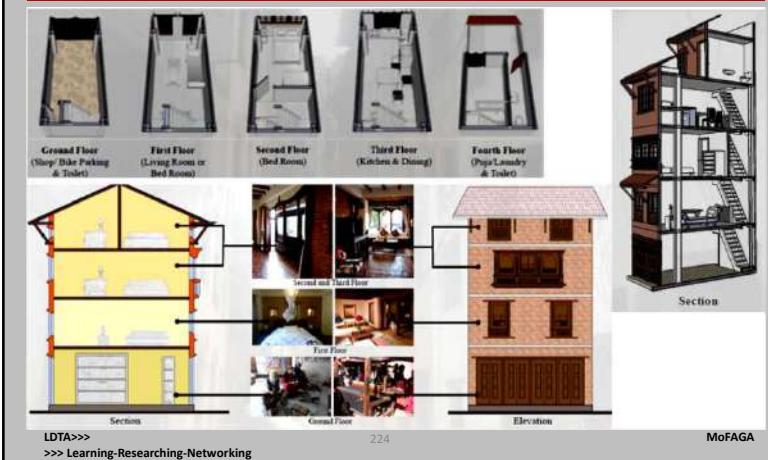
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Reconstruction: Pilachhen in Lalitpur



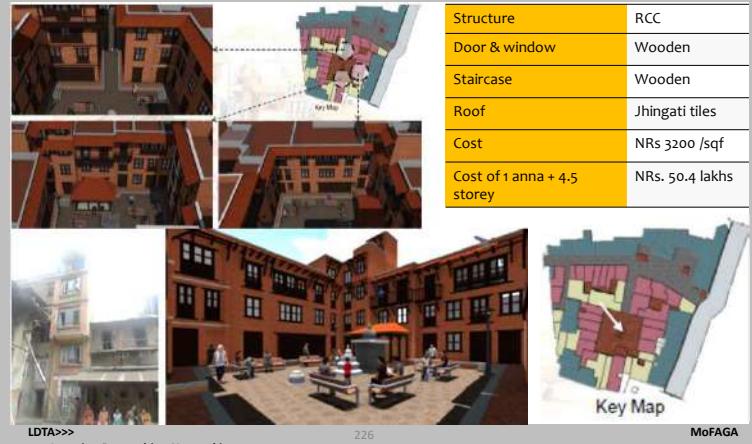
Reconstruction: Pilachhen in Lalitpur



Reconstruction: Pilachhen in Lalitpur



Reconstruction: Pilachhen in Lalitpur

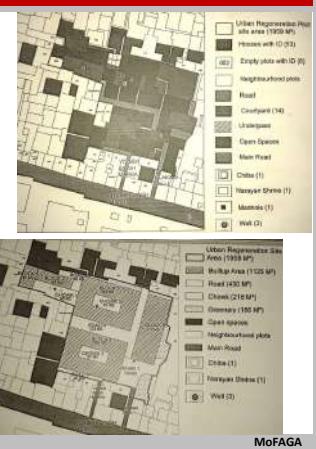


Reconstruction: Pilachhen in Lalitpur

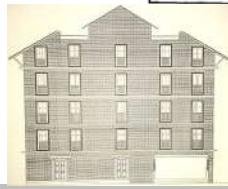
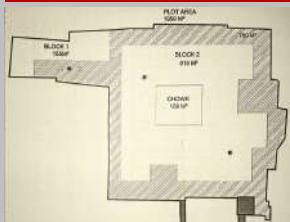


Reconstruction: Dumbo chowk, Kilagal

Location	Newari core settlement: Kilagal, Kathmandu
House nos.	80
Cast of community	Maharjan, Gopals & Dongol
Community profession	Agriculture, animal husbandry with some on trade & services
Construction system	Single monolithic structure
New use	Lower floors for commercial and upper spaces owners on flat system
Financial system	Rental from commercial uses on lower floors



Reconstruction: Dumbo chowk, Kilagal



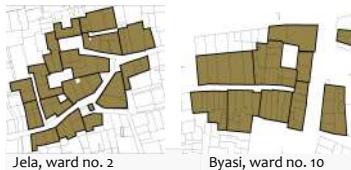
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Proposed strategy: reconstruction in the HCA

Location	Newari core settlement: Jela & Byasi, Bhaktapur
House nos.	66 & 42
Cast of community	Prajapati, Pyatha, Duwal, Suwal, etc.
Professions of community	Agriculture with masons, carpenter, painter with few on trade & service
Construction system	Combination of small plots into one single unit
New use	Lower floor – galleries, restaurants & home/family stay with upper floors for owners use
Financial system	Combination of owners, business entrepreneurs and heritage conservation including debt financing from BM

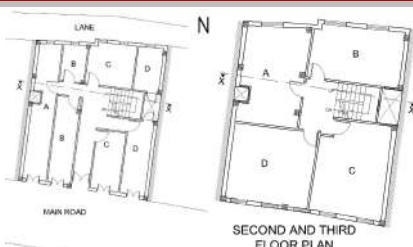
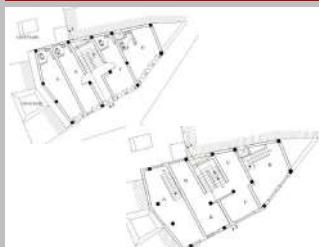


- ❖ Combination of small plots into a single one with common staircases – stable form & bulk
- ❖ Common foundation and columns but can have separate blocks within larger plot area. If needed small wooden staircase is possible for vertical circulation
- ❖ Adequate light, ventilation and convenient circulation inside the houses
- ❖ Easy to regulate and economical in combined construction

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Proposed strategy for HCA - Bhaktapur



Particular	Jela	Byasi
Plot area (individual 4 plots) (sqft)	A (302.79) + B (218.72) + C (221.84) + D (233.90) = 977.25	A (259.27) + B (234.38) + C (286.55) + D (266.18) = 1046.38
Area sharing after deduction for common staircase & lobby	A-30.98%, B-22.38%, C-22.70% & D-23.94%	A-24.78%, B-22.40%, C-27.38% & D-25.44%
Habitable area increase (compared to ind. const.)	Ground floor – 3.87 times First floor – 2.11 times	Ground floor – 10.37 times First floor – 42.18%

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Conservation: essence of newari architecture

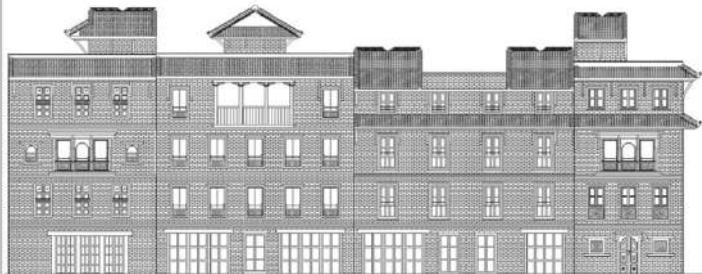
	Malla period	Rana period	Modern period
Original (FA/OA)	2.4:1 – 4.8:1	3.0:1	2:1 – 2.3:1
Roof height (%)	24.5%	11.36%	4.4%
Modified (FA/OA)	1.9:1	2.1:1	2.9:1
Malla period			
Rana period			
Modern period			

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Proposed street elevation for HCA



Byasi street elevation

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Proposed strategy

Financial package

- Loan & grant from the central government taken in bulk as per collapsed/damaged houses;
- Soft loan from local government (Debt financing);
- Partial investment from Donor Agencies (for conservation);
- Soft loan from Town Development Fund (TDF) & donors for integrated infrastructure and community utilities;
- Collaboration with tourism related enterprises and other business groups from planning phase

Incentive package

- Technical (design and supervision);
- Financial (grant & tax cut);
- Training & awareness

Bhaktapur municipality

- Preparation of Urban design guidelines & link to incentive package
- Simplified building permit process & grant/loan distribution
- Promote combined plots construction

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Newly built houses at Jelna, Bhaktapur



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Bulung, Dolakha



Bulung settlement



Bulung settlement



Stone with mud house



Hybrid type house



Stone with cement mortar house

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Balthali, Kavrepalanchowk



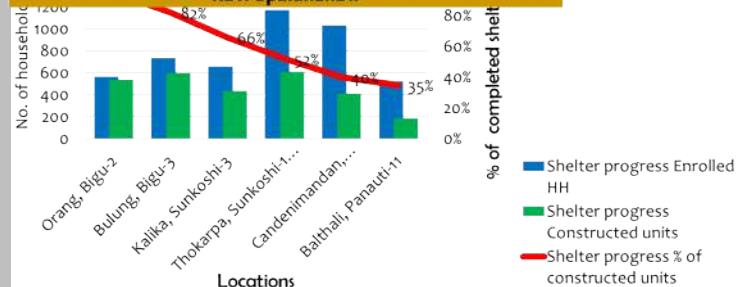
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Post-housing reconstruction in rural area

Shelter progress in three districts: Dolakha, Sindhupalchowk Kavrepalanchowk



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Informing, capacity building & engaging communities

IEC materials



Demonstration houses for most vulnerable families



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Formation of community institutions

Formation of community institutions & their regular meetings

Committees	Shelter group	Community reconstruction committee (CRC)	Advisory committee
No. of participants	20-35 households	7-9 households	11 households
No. of meeting	149	54	6
Frequency of meeting	Monthly	Quarterly	Quarterly
Approach & level of meeting	Participatory group	Ward level	Village level



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Masons' training



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Technical support and facilitation to victims

Technical support to beneficiaries



Grant distribution to beneficiaries



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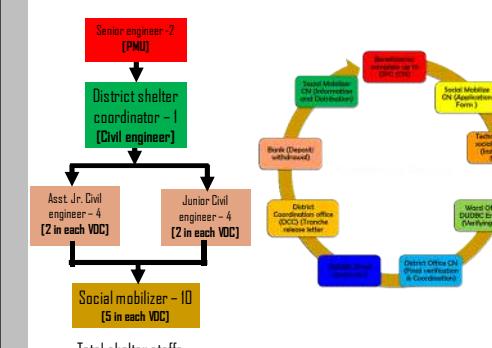
Transportation support to beneficiaries



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Social institutional formation & mobilization



Total shelter staffs =
21 nos

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Technical	<ul style="list-style-type: none"> - Tentative cost estimate; - Layout plan for foundation; - Construction supervision at different stages.
Social mobilizer	<ul style="list-style-type: none"> - Local people as VDC coordinators and 5 local social mobilizers in each location; - Door to door campaign on safer construction, NRA's policies & CN's support; - Filling up grant application firm at different stages & its processing; - Informing deposition of grant in their individual bank account.

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Features of existing housing

- Mostly 2 and half story and 2 bays
- Verandah as extension of community space – living space
- Verandah oriented towards sun
- Dominating roof with attic for storage



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Design catalogue: DUDBC

Catalogue for Alternative Construction Materials and Technologies

DESIGN CATALOGUE FOR RECONSTRUCTION OF EARTHQUAKE RESISTANT HOUSES

VOLUME II

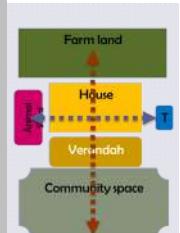
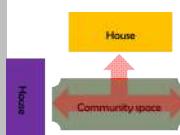
GOVERNMENT OF NEPAL
MINISTRY OF URBAN DEVELOPMENT
DEPARTMENT OF URBAN DEVELOPMENT AND BUILDING CONSTRUCTION
KATHMANDU, NEPAL



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Weakness of newly built housing



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Weakness of newly built housing

- New townscape without respecting past memory
- Socialization pattern & community space



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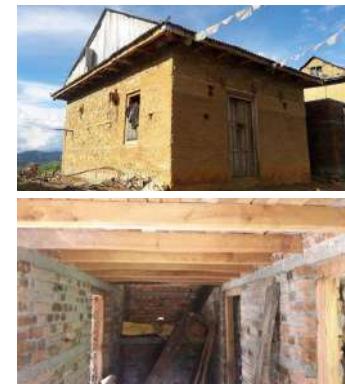
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Newly built houses vs traditional houses



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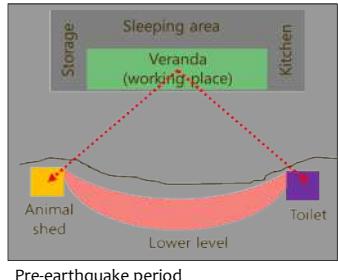


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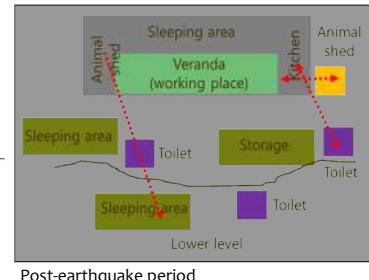
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Post-earthquake housing: weaknesses

Despite integrated approach, inadequate consideration of townscape and living style villagers



Pre-earthquake period



Post-earthquake period

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Weakness of newly built housing

Weaknesses of shelter project: Flooring to wall connection



No tie between floor and masonry wall in some houses



Weak connection of wooden post and beam in veranda

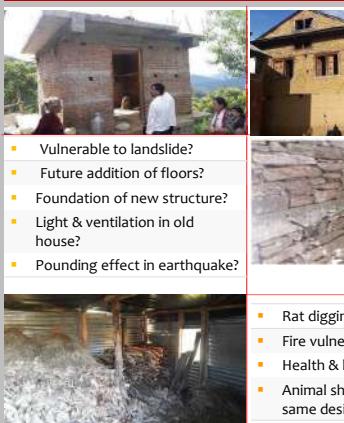
Missing of wooden bracing in CGI roofing

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Issues to be address in future projects



- Vulnerable to landslides?
- Future addition of floors?
- Foundation of new structure?
- Light & ventilation in old house?
- Pounding effect in earthquake?



- No protection for front wooden door & windows
- Fronting RCC slab toilet whereas house of stone in mud?
- Storage of agriculture product & socialization space?



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Take home message

- In the historic core area, the reconstruction should be of ‘community driver’ with considering the planning at settlement level, acknowledging the historic townscape, socialization space and lifestyle of the inhabitants. Cost effectiveness, safer built form and avoidance of gentrification including integration of reconstruction with livelihood improvement and integrated infrastructure provisions programs are essentials. Facilitation through NGOs specially in technical support and grant disbursement is recommended.
- Caritas Nepal’s innovative approach in community mobilization, staffs allocation at site and districts , facilitation in grant collection, building construction and material supply along with inclusion of livelihood programs in the shelter construction has yielded a very good results.
- However, adaptation of ready made design from the catalogue has destroyed earlier townscape, vernacular architecture and lifestyle of the villagers

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Any Questions?

Dziękuję	شكراً	Thanks You	Terima Kasih	<i>hvala</i>	Дякую
bedankt	salamat	Merci		Ďakujem	go raibh maith agat
tesekkürle				nandri	Thank you
謝謝	תודה			Danke	tack så mycket
Obrigada	ありがとう				faleminderit
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Eυχαριστώ	díky	děkuji vam	<i>kiitos</i>	anugurihiitosumi	köszönöm
aiāh	<i>Muchas gracias</i>	ddhanya-waa		ačiū	

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(स्थानीय विकास प्रशिक्षण प्रतिष्ठान रेण, २०८५ इसाय स्थापित)

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Urban design guidelines and incentive mechanism Day-session 3-I

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Specific objectives

At the end of this session, participants will

- [a] understand the importance of urban and architectural design guidelines in urban development;
- [b] learn about different forms of incentives, practices by different public agencies in Nepal;
- [c] some examples of proposed urban design guidelines and incentive.

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Specific objectives

Why planned areas are not so much different from haphazardly growth areas in Nepal?

Building bylaws are hardly changed but our society, lifestyle and economic base of the cities are rapidly changing?

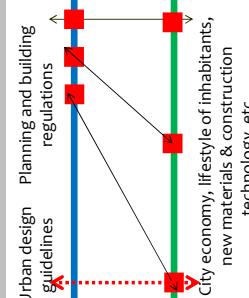
Why ordinary people in most cases do not follow building bylaws?

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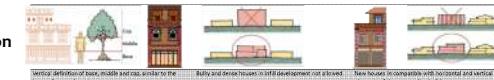
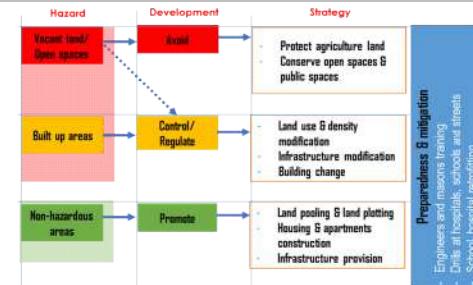
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Urban design guidelines



Huge gap between regulation
and societal needs

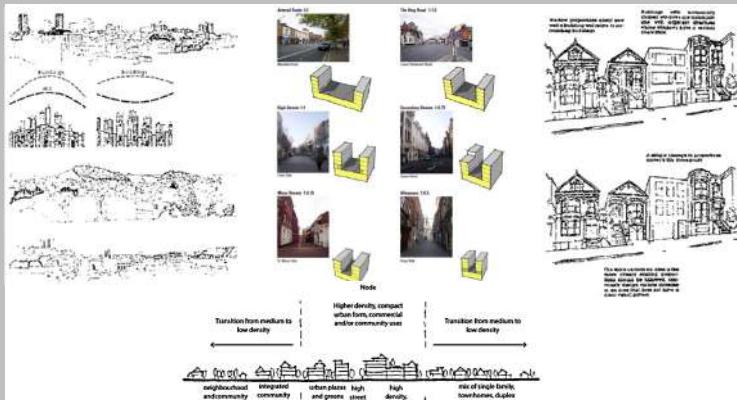
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Urban design guidelines: skyline, street enclosure and building bulk

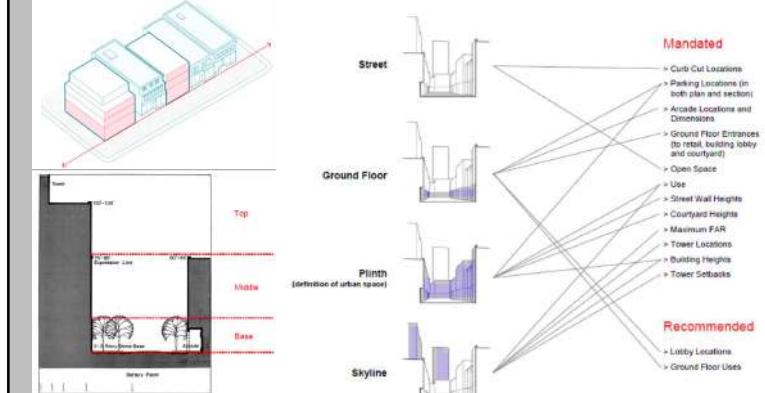


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Urban design guidelines

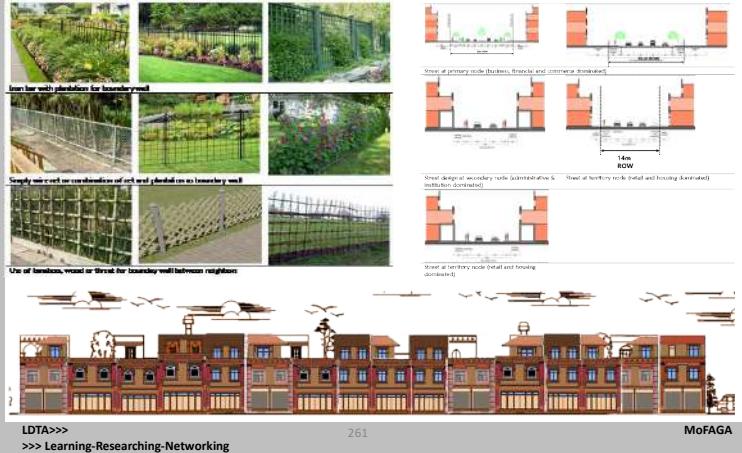


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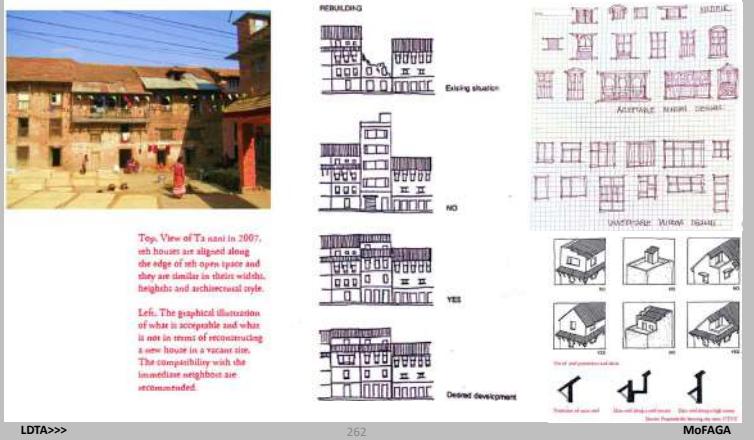
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Urban design guidelines: streets, walls



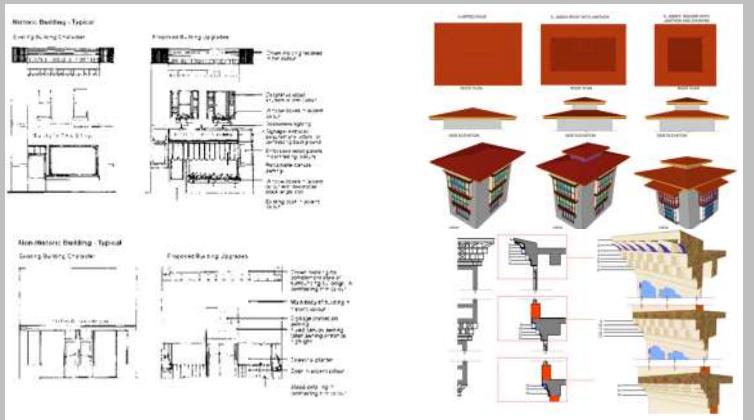
261

Architectural guidelines: openings & roofs



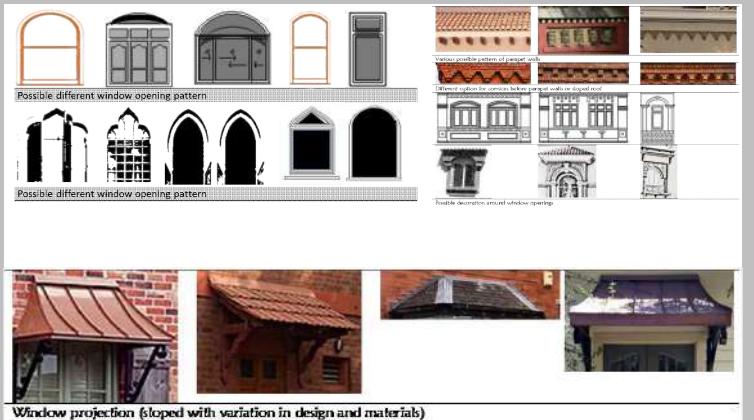
262

Architectural guidelines: building facade, cornice & roof



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Architectural guidelines: windows, cornices & canopies



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Architectural design guidelines: signage and shutter of openings



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Forms of incentives

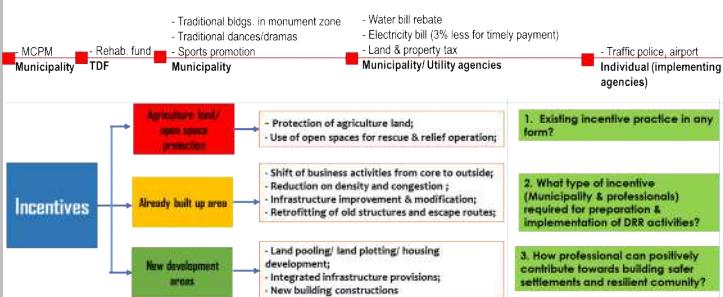


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Existing incentive practices & future required



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Technical incentives

Technical – incentives

Mason Training

- Training for Engineers and Architects
- Seismic Vulnerability Assessment
- Damage Assessment
- Seismic Retrofitting



Mason Training in
Nepal

Image: www.peerasset.org.np

Other Training

- Owner Builders' Training for House Owners;
- Community Based Disaster Risk Management Program (CBDRM), School Based Disaster Preparedness (SBDP);
- Training for Trainers (TOT) & TOT for women
- Basic Technical Training (BTT) for engineers and sub-engineers
- Training to Engineering Students Network

Process has begun; intensification required

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Incentive: municipality to individual homeowners [renovation/retrofitting]

Central government to individual	<ul style="list-style-type: none"> Homeowners renovating/retrofitting of heritage value houses in the 'preserved monument sub-zone' within WHS : 50% in royalty in purchasing woods & 10% of cost incurring for cranes
	<ul style="list-style-type: none"> Apply to DOA, which recommends to Ministry of Finance and then to Ministry of Forest
	<ul style="list-style-type: none"> Compliance with prevailing Building bylaws & National Building Code & permit through the concerned municipality
Municipality to individual homeowners	<ul style="list-style-type: none"> GON through a notice in Nepal Gazette exempt the house and land tax to be levied on the private ancient monuments
	<ul style="list-style-type: none"> Municipality can set the incentive package for the individual homeowners to promote conservation (and retrofitting) of traditional houses. It can even provide necessary technical and financial support to individual for conservation of artistic objects
<p>Safety measure- through renovations/retrofitting (public monuments & private health facilities)</p>	
<p>Renovation/retrofitting of public monuments in Kathmandu valley</p>	
GTZ/ude to user group with involvement of municipality	10% - 90% subsidy with commitment of contributions from users group as well as municipality
DUDBC in coordination with Ministry of Health for regulation of private health facilities	Renewal of private hospital only after retrofitting and other safety measures (each two year period)
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Incentive: Municipality to private developers

FAR incentives for planned residential and commercial developments

Categorization	Historic core area				Residential zone			
	Preserved monument subzone	Preserved heritage subzone	Mixed old settlement	Commercial subzone	Dense mixed settlement subzone	Other residential subzone	Town growing area	Planned resid. subzone
1 Residential	Open plot: GC=80% FAR=3 Story=4 Height =35'	Open plot: GC = 80% FAR = 3.75	Open plot: GC = 80% FAR = 4	Upto 8 anna: GC = 70% FAR = 3	Upto 8 anna: GC = 80% FAR = 2.5	Upto 8 anna: GC = 80% FAR = 1.75	Upto 1 ropani: GC= 70% FAR = 1.25	FAR = 2
	Plot occupied by old house: GC=100% FAR = 3.5 Story = 4 Height = 35'	Plot occupied by old house: GC = 100% FAR = 4.5 Story = 5 Height = 45'	Plot occupied by old house: GC = 100% FAR = 4.5 Story = 5 Height = 45'	Plot bigger than 8 anna: GC = 50% FAR = 3	Plot bigger than 8 anna: GC = 60% FAR = 2.5	Plot bigger than 8 anna: GC = 60% FAR = 1.75	Plot greater than 1 ropani: GC = 50% FAR = 1.25 Height = as per light plane	
2 Commercial				GC = 50% Parking = 15% FAR = 2.5 Minimum 3 Max. height = 13.7m	GC = 50% Parking = 20% FAR = 2	GC = 50% Parking = 20%	GC = like other residential subzone FAR = 3	
								MoFAGA

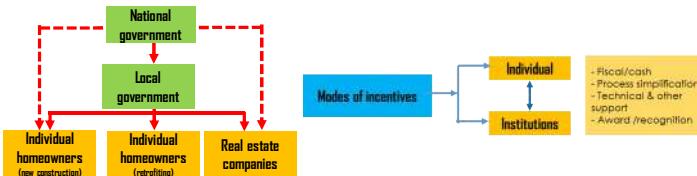
Note: 1 Ropani = 508 sq. m.; 1 Anna = 31.75 Sq. m. (Source: compiled from KVTPC, 2064 BS)

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Incentive: urban development for Kathmandu valley

To analyze Incentive practice in the Kathmandu valley focusing four issues

- [a] Central government's fiscal transfer to Municipality;
- [b] Incentive from Municipality to Real Estate Developer;
- [c] Incentive from Municipality to Individual Homeowners for new construction; and
- [d] Incentive from Municipality to individual homeowners for retrofitting the existing buildings



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Incentive: to homeowners after gorkha earthquake

From Central government	<ul style="list-style-type: none"> Waive land revenue tax in 18 earthquake affected districts
	<ul style="list-style-type: none"> Provide landownership certificate for earthquake victims
	<ul style="list-style-type: none"> 35% waiver in land transfer tax while registering the property on female name
From Municipality	<ul style="list-style-type: none"> 75% discount on building permit fee for houses fully destroyed & 25% for partially damaged buildings in reconstruction (KMC)

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Issues to be considered for incentive mechanism



No incentive related to land use plan & zoning is available: need to work out further



Training masons/carpenters or even engineers on DRR has begun but the homeowners often hire/use their own for construction and renovation activities



Incentive becomes ineffective if the benefit is nominal, if the process is lengthy



A mechanism is essential comprising of individual homeowners (real estate companies), municipality & third party (professionals, trained masons/carpenters, etc.)

Incentive for newly built houses in Bhaktapur



- Building should be lies in WHS and Old City.
- Building should be built as Building Bye laws of Bhaktapur Municipality.
- Building should constructed with traditional form .
- Construction Completion Certificate.
- Filled form should be submitted in Building Permit Section
- Forwarded to concern ward office for ward engineer technical report.
- As per technical report BPS calculate the amount of used traditional materials like Dachhi Brick, butta Brick, Jhingati brick etc.
- Altogether 35 % of building facade brick, timber for door/windows , Jhingati tiles for Pakha and Slope Roofs.

Incentives for newly built houses in Sankhu



- Free Building Permit, No Revenue taken for building permit
- Grant of 100000 (in words one lakh only) for the houses built as per bylaws inside core areas only
- Special considerations for windows of special architecture eg. Sa: jhya, Ga: jhya
- Discount in wooden works for 50 cft from central government
- Plus incentive of 50000 (fifty thousand only) for heritagical building from Nepal Reconstruction Authority (NRA)

Incentives for newly built houses in Sankhu



Take home message

- Urban design and architectural design guidelines are essential to address the societal needs, site context and multiple design options, besides planning and building regulations;
- Urban design guidelines should be linked with different forms of incentive mechanism to encourage real estate developers and individuals;
- Urban and architectural design guidelines can be effectively applied to newly developed area as well as already built up area, depending on the level of regulations of building and urban growth.

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Any Questions?

Dziękuję	شكراً	Thanks You	Terima Kasih	<i>hvala</i>	Дякую
bedankt	salamat	Merci		Đakujem	go raibh maith agat
tesekkürle				nandri	Thank you
謝謝	תודה			Danke	tack så mycket
Obrigada	ありがとう			tack	faleminderit
Shukriyâ	mange tak			Mulțumesc	Спасибо
takk	Grazie	너를 감사하십시오			
Eυχαριστώ	díky	děkuji vam	<i>kiitos</i>	anugurihiitosumi	köszönöm
aitäh	<i>Muchas gracias</i>	ddhanya-waa		ačiū	

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Urban design techniques in public infrastructure design and implementation Day-session 3-II

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Specific objectives

At the end of this session, participants will

- [a] understand the urban design approach in revitalization of a traditional pond in Lalitpur metropolitan city;
- [b] identify the historical values to be conserved and present day needs to be incorporated into master plan and detailing;
- [c] learn how to ensure active participation of local community into planning and implementation process.

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How do you design for revitalization of pond?

How do you proceed design of revitalization of traditional ponds?

How do you convene municipality, ward office and local community on the proposed design whereas two master plans have already been proposed by different agencies?

How do you ensure best design that is acceptable to local communities?

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Why pond & public open space are significant?

Significance of Pond revitalization

- part of Malla period water infrastructure system – heritage;
- landmark, socio-cultural values, special land use (micro climate effect) & public space;
- a special land use in the busy city, near Lagankhel bus park (node);
- community attachment and public sentiment

Significance of open space

- Rapid urbanization, haphazard urban growth – reduction of public green space
- Health value/benefits, besides relaxation, enjoyment & entertainment places
- 9 sqm per capita – Organised green open space required (WHO & FAO)
- 5% of open space in metropolitan city but at present 0.06% of LMC area [0.48% in KMC]

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Urban design approach for revitalization

Urban design approach



History & transformation of pond;

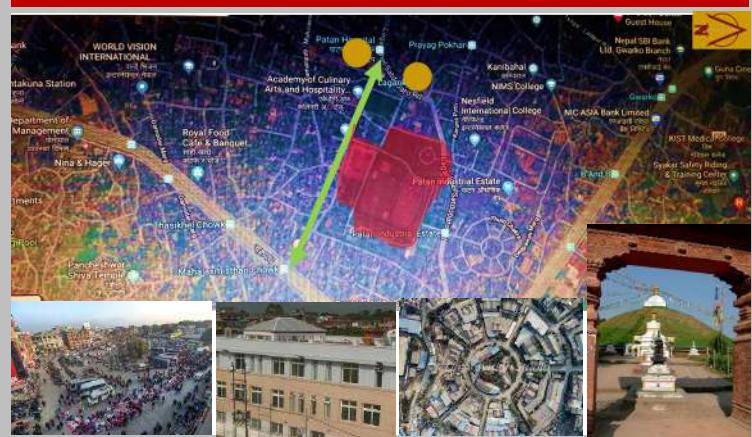
- Contextual study & surrounding area analysis;
- Consultation with communities and experts;
- Study of other ponds in the valley; Incremental basis;
- Construction led by users committee

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Location of the pond



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Master plan proposed by CIUD

Master plan : Rain garden and plantation around pond - CIUD

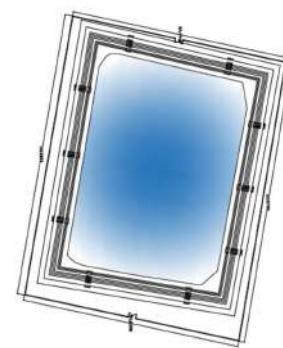


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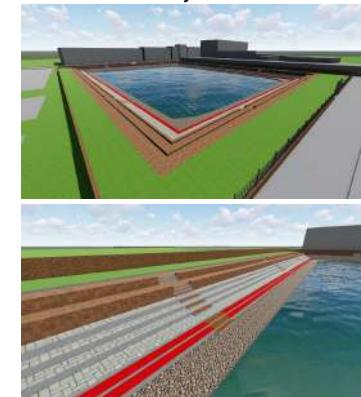
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Master plan proposed by ward office

Master plan : Layer of green and paving all around the water body: LMC



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Revitalization through urban design approach



Contextual study/ history of the pond / present day needs



Establish planning & design principles



Master plan preparation & detailing

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Contextual study

Major activities around Nhu Pukhu



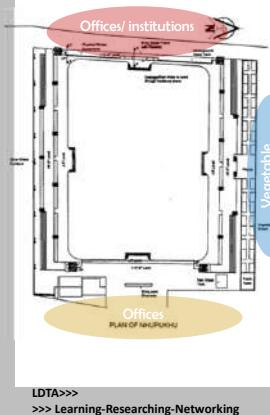
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Contextual study

Immediate surrounding of Nhu Pukhu



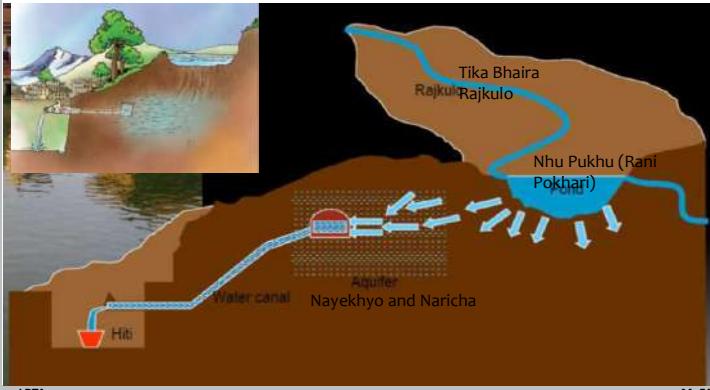
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Nhu pukhu [new pond] in traditional water network

Historical value: Nhu Pukhu [new pond]



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Transformation of pond

History of pond: Transformation of pond: Dumping site

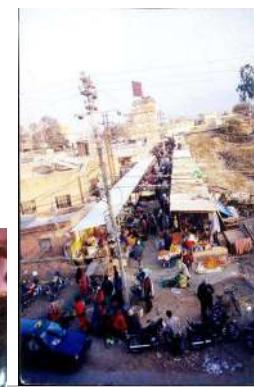


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Transformation of pond

Transformation of pond: encroachment water body & peripheral spaces



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Transformation of pond

Transformation of pond: cleaning of water body



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Transformation of pond

Transformation of pond: clearing encroachment
in peripheral space



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Transformation of pond

Nhu pukhu condition – April 2019



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Pond condition before revitalization

Nhu pukhu condition – June 2019



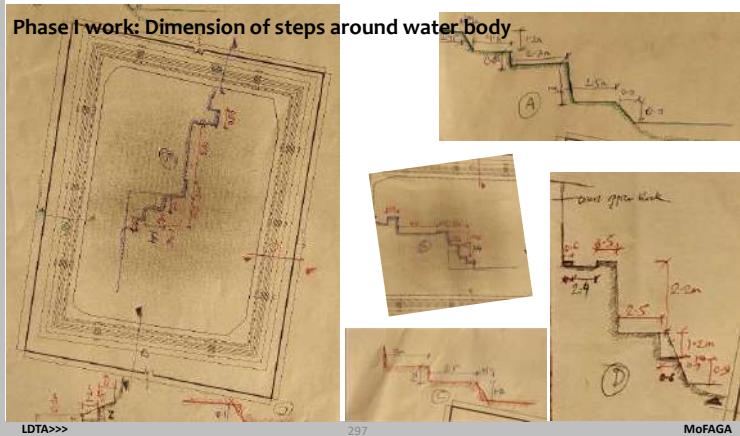
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Revitalization of pond: phase I

Phase I work: Dimension of steps around water body



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Revitalization of pond: phase I

First phase work – plan & cost estimate



S.N.	Description	Unit	Quantity	Rate (NR)	Amount (NR)
1	Site clearance, cleaning	Sq. m.	4458	15.81	70,480.98
2	Water removal by pumping	Lit.	7159.5	17.25	123,501.4
3	Mud sludge removal and transportation	Cu. m.	2863	580.4	16,61,685
4	6" thick aggregate filling	Cu. m.	137.25	3160	4,33,710
5	3' wide brick pavement with 6" brick wall	Sq. m.	254.7	1911	4,86,731.7
6	Dismantle works of southern inclined brick wall	Sq. m.	105.6	196.19	20,717.66
7	6" thick aggregate filling	Cu. m.	137.25	3160	4,33,710
8	Flag stone pavement in 2" thick cement mortar	Sq. m.	274.5	2169	5,95,390.5
9	Inclined vertical brick pavement	Sq. m.	254.7	1911	4,86,731.7
Contingency @ 2.5%					43,12,658.7
					107,893.96
					Grand total 44,20,472.67

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Revitalization of pond: phase I

First phase work – clearing debris of the lowest level



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Revitalization of pond: phase I

First phase work – Repairing the lowest level inclined wall



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Urban design principles



Retain historical evidence/reminiscs wherever possible



Create a meaning/response public space with activities/facilities to attract & engage people [value added activities]



Cost effective design & detailing & incremental/phase wise construction

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Finding elements to be conserved

Historical evidence: original lower level sloped wall around the pond



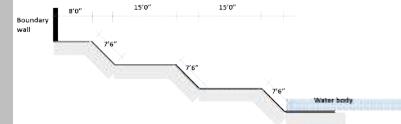
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Finding elements to be conserved

Historical evidence: position of steps & platforms around water body



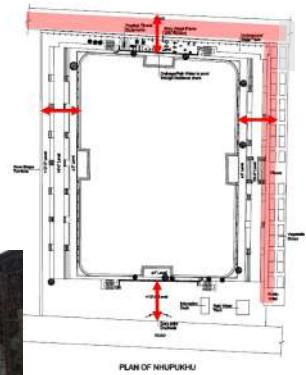
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Encroachment of pond

Encroachment of pond on north and west sides



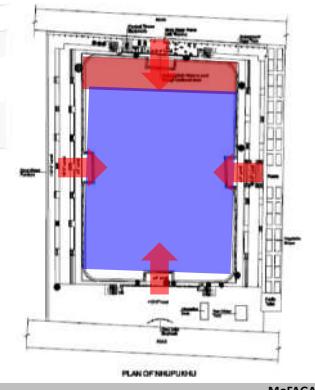
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Findings while cleaning for phase I

Findings while digging/cleaning for first phase work

- Water body >2 feet covered by debris on west side;
- All sides of the pond filled up by debris and wastes;
- Evidence of access platform to water at the centre in some sides;
- Stone retaining walls on east and west sides have inadequate foundation;

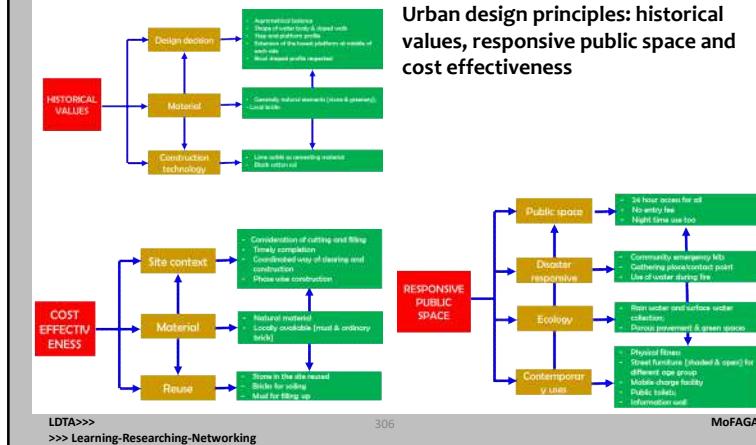


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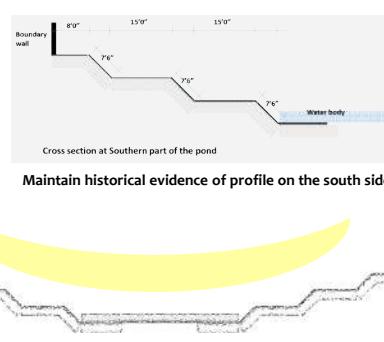
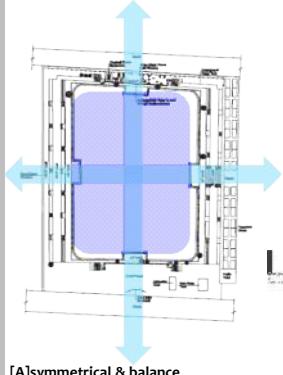
Urban design principles

Urban design principles: historical values, responsive public space and cost effectiveness



Urban design principles

Historical value: Essence of historical values of Nhu Pukhu



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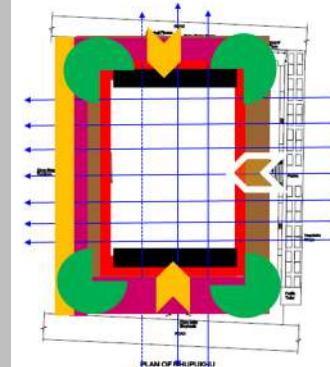
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Master plan concept

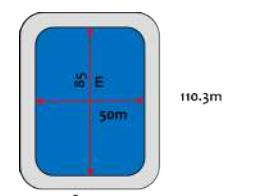
Planning & design concept : Nhu Pukhu

- Three levels: 0'- +6' - +12' - 18'
- Continuous platform around the pond at the lowest level
- Transitional spaces at four corner
- Direct linkage to two sides and one linkage to vegetable market



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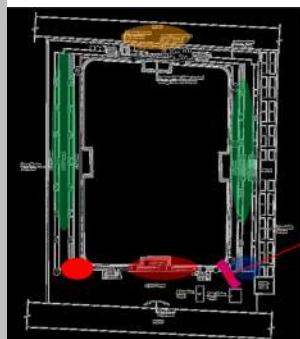
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Master plan concept

Master plan – value added activities around water body



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Physical fitness equipment + street furniture

Public space created through extra steeping (at the corner), recession over inclined walls at regular interval;

Street furniture with cover, provision of mobile chargers at different interval;

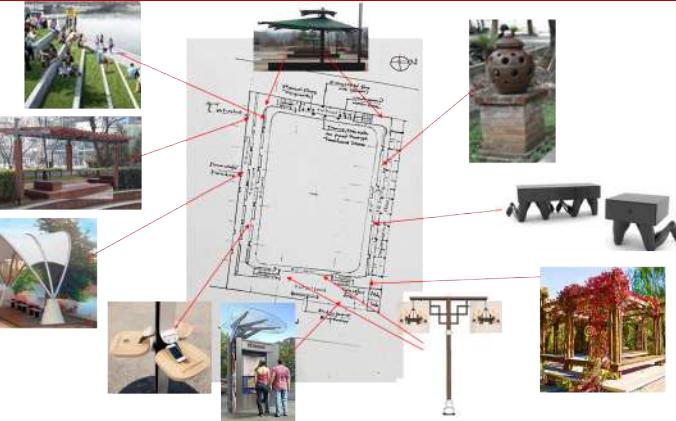
Greenery creepers on the southern wall (of NEA)

Flexible spaces (events, gathering, etc.), storage of emergency kits, public toilet (with underground water tank), street furniture, etc.

Community emergency kits/box

Public toilet with cycle parking provisions

Master plan concept



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Master plan concept



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Master plan concept



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Construction: natural material & traditional technology



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Implementation: phase wise construction



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Implementation: phase wise construction



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Implementation: phase wise construction



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Take home message

- Evidence based master planning is essential to convince all concerned stakeholders and take their confidences;
- Urban design approach helps to balance conservation of historical evidences and needs of present day lifestyle, besides addressing the local context, considering surrounding development;
- Engagement of users committee (local people and ward officials) is essential not only in planning and design phase but also during construction period.

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Any Questions?

Dziękuję	شكراً	Thanks You	Terima Kasih	<i>hvala</i>	Дякую
bedankt	الشّكّر	salamat	Merci	Đakujem	go raibh maith agat
tesekkürle	תודה			nandri	Thank you
謝謝	أهلا	Obrigada	ありがとう	Danke	tack så mycket
Shukriyâ	mange tak		ধন্যবাদ	tack	faleminderit
takk	Grazie		너를 감사하십시오	Mulțumesc	Спасибо
Eυχαριστώ	díky	děkuji vam	<i>kiitos</i>	anugurihiitosumi	köszönöm
aiāh	<i>Muchas gracias</i>		ddhanya-waa	ačiū	

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नेपाल सरकार
सडौपीय मानिता तथा समाजिक प्रशासन मन्त्रालय

Debt financing and public private partnership for municipal infrastructure development Day-session 3-III

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Specific objectives

At the end of this session, participants will

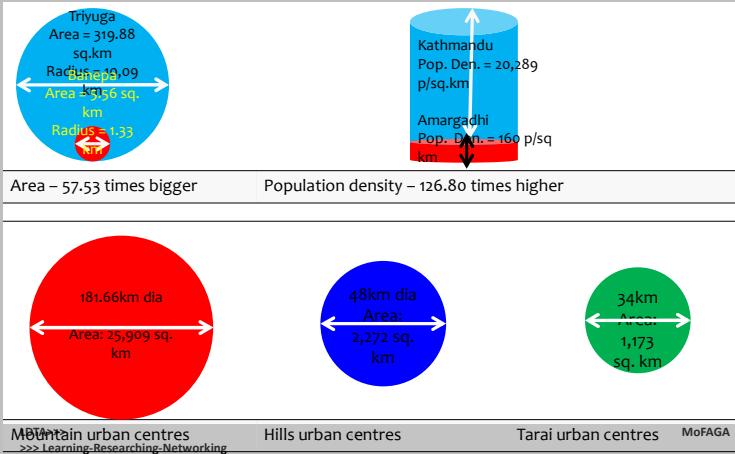
- [a] understand debt financing and public private partnership for municipal infrastructure provision;
- [b] learn about demand and supply on urban infrastructure in Nepal;
- [c] to review the case of pedestrian overhead bridge construction in Kathmandu valley.

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Municipal situation: area, density & accessibility



Uneven investment in municipality

Municipality	Area (sq. km)	Population density	Capital expenditure in NRs (per sq. km)
Bhadrapur	10.56	1,845.35	1,145,591
Rajbiraj	11.96	2,779.51	436,100
Malangwa	9.39	2,189.88	509,328
Banepa	5.56	3,128.77	1,592,666
Bhaktapur	6.56	11,829.72	3,012,856
Kathmandu	49.45	16,388.85	4,953,432
Lalitpur	15.15	12,345.61	3,580,920
Dharan	103.38	1,066.40	326,636
Triyuga	319.88	202.21	25,166
Kamalamai	207.95	177.73	66,898
Bharatpur	162.16	669.54	290,291
Dhangadi	103.73	766.52	106,370
Mahendranagar	171.24	525.17	57,900
Amargadhi	138.85	138.27	27,665

Source: Annual report on detailed revenue and expenditure breakdown published by MLD/MMD, LBFC and gtz/udle, 2008

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Investment gap in infrastructure

Infrastructure: investment & maintenance needs (average 2005-2015)			
Country	Investment (% of GDP)	Maintenance (% of GDP)	Total (% of GDP)
Low income	4.2	3.3	7.5
Source: Estache and Fay (2007)			
Investment in infrastructure (% of GDP)			
0-4%	4-7%	7-10%	
Nepal (0.8%) / Pakistan (1.4%) Azerbaijan (2%)/ Papua New guinea (2%)	India (5.7%) Fiji/ Lao PDR	China (9.3%) Japan/ South Korea Thailand/ Vietnam/ Malaysia	

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Investment required in urban infrastructure

Investment required for urban infrastructure (UI) annually			
1	Present investment in UI Required investment in UI Gap in UI investment	@ \$13 per capita @ \$37 per capita @ \$24 per capita	
	Required investment for 4,52 million	@ \$24 per capita	\$108.57 million
	Required investment for 265 small towns	@ \$24 per capita	\$85.90 million
	Total investment required		\$194.47 million
2	To implement periodic plan projects in 58 municipalities	@ TDF' estimate	NRs. 45 billion (€398 million)
	Municipal revenue	@ revenue	NRs. 4 billion (€35 million)
	Total investment required for UI in municipalities	@ TDF' estimate	NRs. 41 billion rupees (€ 362 million)
3	Total funding required to meet the MDG target	@ Water Aid between 2000-'15	US\$1,099 million , equivalent to \$69 million annually.

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Typical source of revenue in municipality

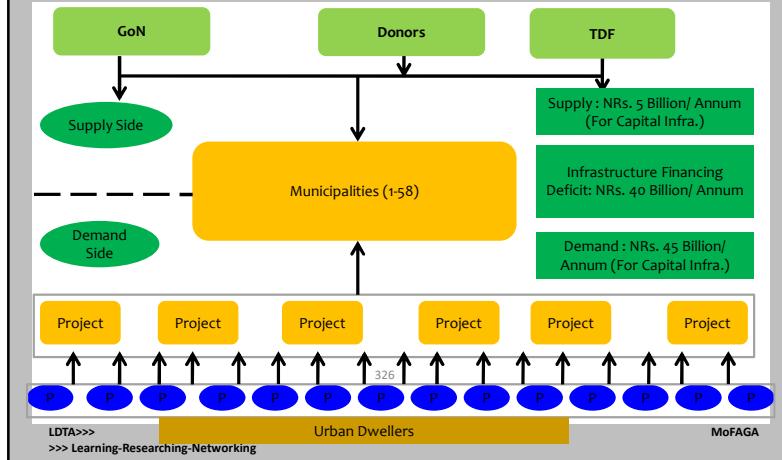
Taxes	Grants	User Charges	Lease Income
Property taxes	From central government	Water	Rental from land & building
License fees/sales tax		Sewerage & drainage	Rental from market
Entertainment tax			

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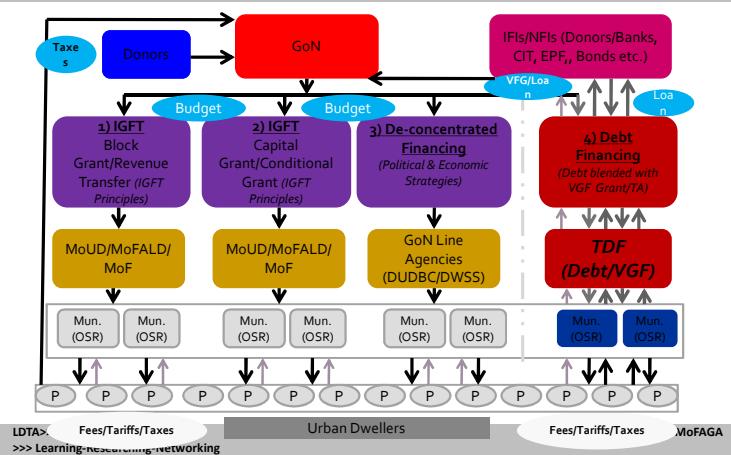
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Demand and supply gap in municipalities



TDF's position in overall municipal finance system



Investment required for urban infrastructure

A) Total Recurrent Revenue	NRs. 4640.86 million/annum
B) Total Recurrent Expenditure	NRs. 1459.26 million/annum
C) Net Operating Surplus	NRs. 3181.60 million/annum
D) Total Borrowing Capacity (BC) : 25% of Net Operating Surplus	NRs. 795.40 million/annum
Class A Borrowers	24 nos. with BC more than NRs. 10 million/annum
Class B Borrowers	27 nos. with BC in between NRs. 5 million to NRs. 10 million/annum
Class C Borrowers	7 nos. with BC less than NRs. 5 million/annum

➤ Source: LBFC Website
➤ If debt financing considered for revenue generating projects, BC may increase based on the revenues from the projects.

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Municipal financing thru' PPP or debt financing

BRIDGING THE INVESTMENT GAP:

Commonest Reason cited for undertaking PPPs

1. Inadequacy of resources with government (commonest reason)
2. By leveraging on committed government funding it is possible to finance projects of much larger magnitudes
3. In this regard the 11th Finance Commission envisages that 30% of the investment requirements would have to be met through market engagement in the form of PPPs or Debt Financing

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Future possible financing

Issuance of bonds Public private partnership Foreign Direct Investment (FDI)

Issues related with grants from higher authority

Transfers can distort local decision-making. Conditional transfers require municipalities to spend the funds they receive according to the guidelines of senior governments and often require matching funds on the part of the recipient municipality

Funding from senior governments can also lead to inefficient local revenue decisions. In particular, there is no incentive to use proper pricing policies for services provided where grants cover a large proportion of capital costs. Large grants for capital projects such as water and sewage treatment plants, for example, may remove all incentives to use volumetric pricing to reduce the demand for water.

Transfers may encourage people to stay in communities at risk. Capital grants may prop up communities that simply cannot survive on their own. Some small, rural, and remote communities, for example, may be unable to provide adequate levels of service at reasonable tax rates²² or at reasonable user fees. On the expenditure side, low population density leads to high per capita expenditures because these communities cannot take advantage of economies of scale in service provision.

A recent study on the effects of financing the metro in Santiago, Chile, from grants provided by the central government indicated that funding large metropolitan capital works from central government grants can lead to increased regional inequality and distorted metropolitan growth.

Generally, transfers reduce accountability. When two or more levels of government fund the same service, accountability problems arise.

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What a PPP is & what it is not

1. **PPP is not privatisation or disinvestment**
2. **PPP is not about borrowing money from the private sector**
3. **PPP is more about creating a structure**
 - ... in which greater value for money is achieved for services
 - ... through private sector innovation and management skills
 - ... delivering significant improvement in service efficiency levels
4. **This means that the public sector**
 - ... no longer builds roads, it purchases kilometres of maintained highway
 - ... no longer builds prisons, it buys custodial services
 - ... no longer operates ports but provides port services through world class operators
 - ... No longer builds power plants but purchases power

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PPPs: common myths & concerns

Myth/Concern	Clarification
• Profit motive of private sector is incompatible with the service motive of public sector	No. The key is to harness private sector's profit motive, by incentivizing them to provide better quality service and earn <i>reasonable return</i> .
• PPPs increase user tariffs	Not Necessarily. When appropriate safeguards like effective regulation and/or adequate competition are in place. However in sectors where existing tariffs are inadequate to cover costs of specified level of service tariffs may initially require some upward adjustment. Over time efficiency gains expected to rationalize tariffs.
• Money for PPPs comes from private sector "pockets"	Initially, YES. But private sector would make those investments provided they can recover those investments either from users or the government with reasonable return.
• Once a private sector partner is brought in, there is little or no role for the public sector	No. Public sector's role changes from direct involvement in construction and service provision, to ensuring that the PPP delivers value for money for the government and better services for users.

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PPP comes in many sizes and shapes

Across many infrastructure sectors...



Private Sector can participate through....

In several ways/forms...

- Performance/management contracts
- Leases
- Concessions (BOT, BOOT, BOO, DBFO, etc..)

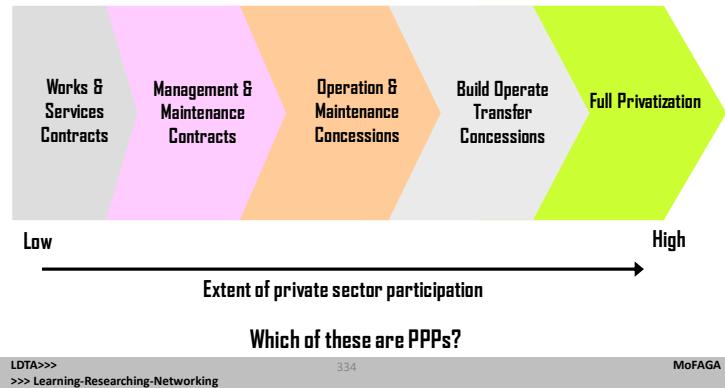
- Designing
- Building
- Financing
- Own
- Operation
- Maintenance
- Transfer

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PPP option



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Types of PPP project

FINANCIALLY FREE STANDING PROJECTS

Examples -Toll Roads/ Bridges, Telecom services, Port projects

1. Role of public sector - planning, licensing & statutory approvals
2. No financial support/ payment is made by government
3. Revenues are through levy of user charges by the private sector

PROJECTS WHERE GOVERNMENT PAYS FOR SERVICES

Examples - Roads - annuity/ shadow tolls, power - under PPAs. In UK-prisons, education, health services, defence related services

1. Private sector paid a fee (tipping fee), tariff (shadow toll) or periodical charge (annuity) by Government for providing services
2. The payment is made against performance
3. There may be demand risk transfer – either in part or whole

Note that: In both cases, the design, financing, construction and O&M risks are fully that of the private partner

HYBRID STRUCTURES

Example – toll road project with either viability gap payment by government or annuity payment based road contract with tolling rights

1. Combine the financially free standing nature – levy of a user charge – with payment by the public entity
2. Payment could be as a viability gap subsidy or an annuity payment

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Pre-requisite condition for PPP

FOR A PROJECT TO BE UNDERTAKEN ON A PPP BASIS

The public entity should have the enabling authority to transfer its responsibility – enabling legislative & policy framework OR an administrative order to that effect

Engagement with a Private Partner should bring in Value for Money

The instrument of transfer is the Contract OR Concession Agreement

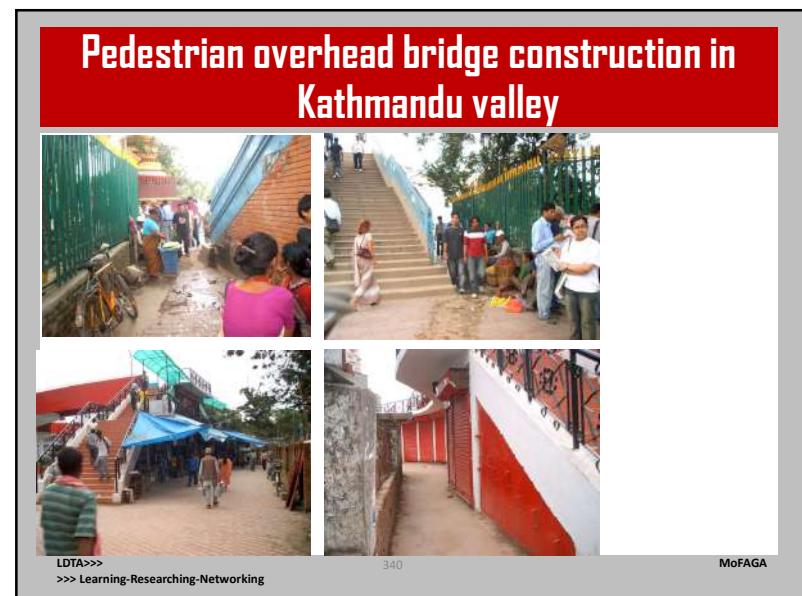
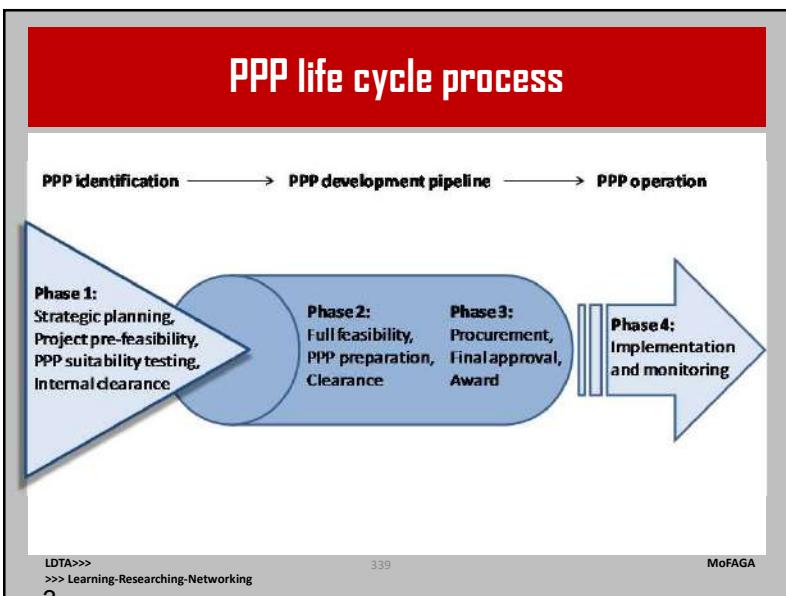
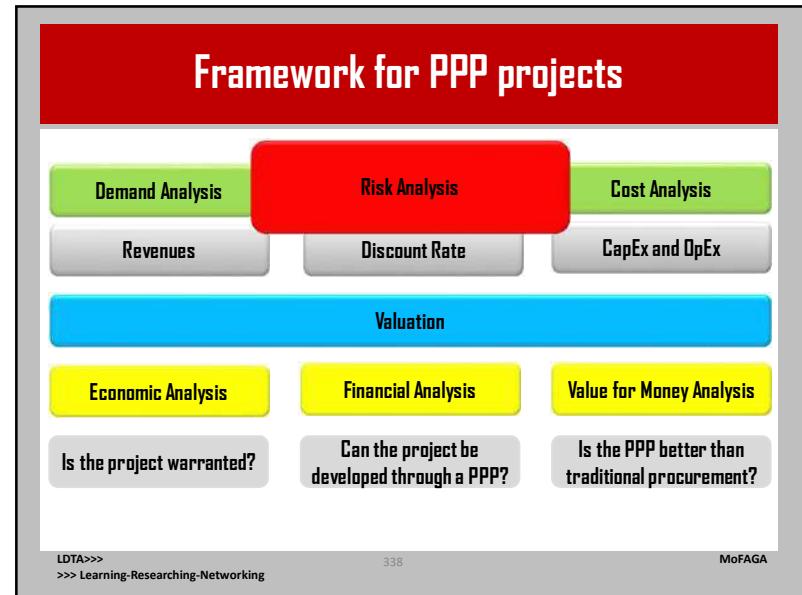
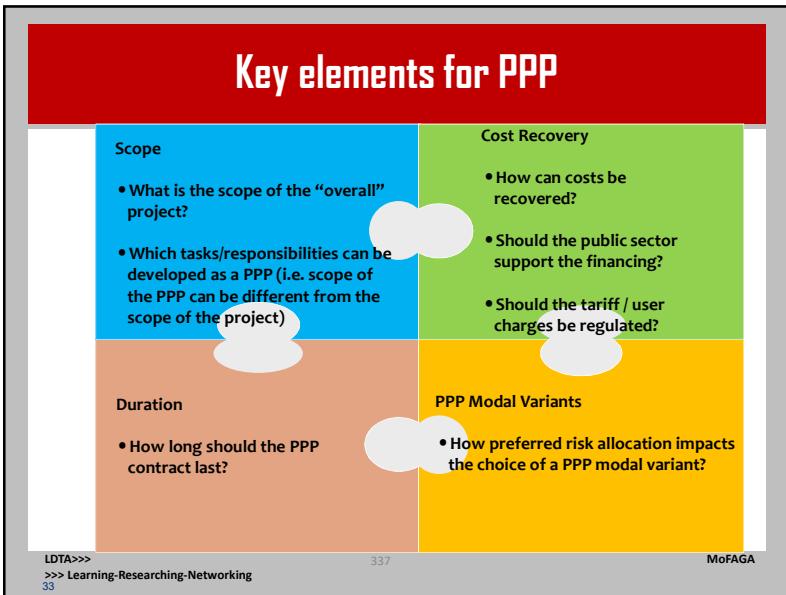
FOR A PROJECT TO BE CONSIDERED A PPP

1. There should be a significant transfer of responsibility to the private entity – usually including financial investment obligations
2. Payment to the private entity for services based on achievement of pre-specified levels and standards of performance – directly by users (tolls/user fees) or paid by the public entity (annuities for instance)
3. The nature of the relationship should be long-term in order to derive maximum benefits

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Contractual agreement between KMC and private party [Innovative concept]

Agreement date: 1st Kartik, 2057 BS;

Lease: 12 pedestrian overhead bridges (6 new construction and 6 already built by KMC) at NRs 1,20,000 per year with 5% increment in every two years;

- Public party: Kathmandu Metropolitan City (KMC)
- Private party: Innovative Concept Pvt. Ltd.
- Type of contract: Lease for 20 years
- Tudikhel Area: Sundhara – Bir-Hospital – Bhotahiti – Ratnapark – City Buspark – Bhadrakali – Sahid Gate and both side footpath area;
- ❖ If private party doesn't work well or doesn't want to work further, Municipality break the contract without any compensation.
- ❖ Income tax, VAT & other taxes shall be paid by private party.
- ❖ Disputes regarding the contract shall be resolved by mediation/arbitration

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Contractual agreement between KMC and private party [Innovative concept]

- ❖ Toilet/ Shops/ Advertisement hoardings can be used in the bridges;
- ❖ Master plan of the developed areas should be developed by the private party to the municipality;
- ❖ Municipality manages W/S, electricity & telephone lines;
- ❖ Maintenance & painting by private party;
- ❖ Restriction for structural change in municipal 6 bridges;
- ❖ Municipal logo & message shall be clearly seen in the overhead bridge;
- ❖ Bridges insurance by private party;
- ❖ Investors' investment security : Municipality
- ❖ Footpath, Tudikhel area to be maintained by private party;
- ❖ All investment shall be payable to the private party if Municipality break its contract

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Pedestrian overhead bridge construction

Kathmandu metropolitan city (Public)	Innovative concept (Private)
New Pedestrian overhead bridges without its investment	Rent from the shops
No need to operate and maintain them for the lease period	Revenue from commercial ads on hoarding board
Public amenities – toilets as well as cleanliness and municipal slogan shall be available without cost	Construction on phase-wise
Ownership of the assets after lease period	



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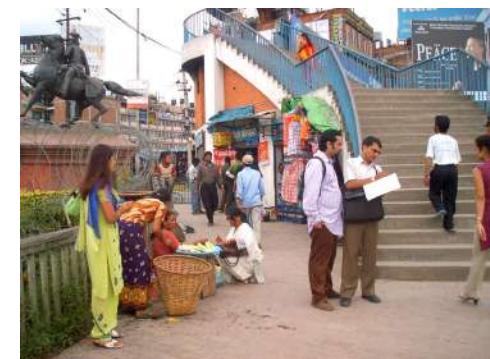
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Sundhara overhead bridge

Sundhara Overhead Bridge (at eastern side of Telecom office)

Shops: 6 (3 shops in each side) and
Rent: NRs. 50,000 / month



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Sundhara overhead bridge

Sundhara Overhead Bridge (at eastern side of Post office)

Total shops: 7 (6 shops at one side, one shop + public toilet at other side)

Rent: NRs. 60,000/month (approx)



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New Road overhead bridge

New Road Overhead Bridge (in front of RNAC Building)

Total shops: 7 (7 shops at one side + public toilet at other side)

Rent: NRs. 85,000/month (approx)



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Bir hospital overhead bridge

Bir Hospital Overhead Bridge (in front of Bir Hospital)

Total shops: 9 (6 shops at one side + 3 shops at other side & public toilet)

Rent: NRs. 50,000/month (approx)



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Jamal overhead bridge

Jamal Overhead Bridge (near Rastriya Nachghar)

Total shops: 11 (9 shops at one side + 2 shops at other side & public toilet)

Rent: NRs. 80,000/month (approx)



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Bhotahiti overhead bridge

Bhotahity Overhead Bridge (in front of Durbar High School)

Total shops: 11 (9 shops at one side + 2 shops at other side & public toilet)
Rate: NRs. 80,000/month (approx)



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Rent collected by private party

Rent collected from all 44 shops	NRs. 3,65,000.00	Only from the KMC built overhead bridges
Revenue generated from hoarding boards	NRs. 1,00,000.00 (approx)	
Advanced deposit from each shopkeeper (NRs. 1 lac to 1.5 lac)	NRs. 60,00,000	

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Outcome of pedestrian overhead bridge

- ❖ Pedestrian safety, convenient and comfort;
- ❖ Grade separation;
- ❖ Local character, city aesthetic and architectural features

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Take home message

- ❖ Debt financing is necessary for basic infrastructure provision in many municipalities in Nepal.
- ❖ Public private partnership is another technique of building infrastructure for win-win situation on both parties (public and private);
- ❖ Project appraisal and financial calculation should be done effectively for successful implementation of ppp projects, which is not the case for pedestrian overhead bridge construction in Kathmandu valley

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Any Questions?

Dziękuję شكرًا Thanks You Terima Kasih *hvala* Дякую
 bedankt salamat Merci  Ďakujem go raibh maith agat
 tesekkürle תודה nandri Thank you
 谢谢 tack så mycket
 Obrigada ありがとう Danke
 Shukriyā mange tak ধন্যবাদ tack faleminderit
 takk Grazie 너를 감사하십시오 Mulțumesc Спасибо
 Ευχαριστώ díky děkuji vam *kiitos* anugurihiitosumi köszsi
 aitäh Muchas gracias ddhanya-waa ačiū köszönöm

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Municipal planning process and implementation of projects through community participation Day-session 3-IV

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Specific objectives

At the end of this session, participants will:

- [a] understand the municipal planning process; and
- [b] learn about implementation of projects through community participation and its multiple advantages.

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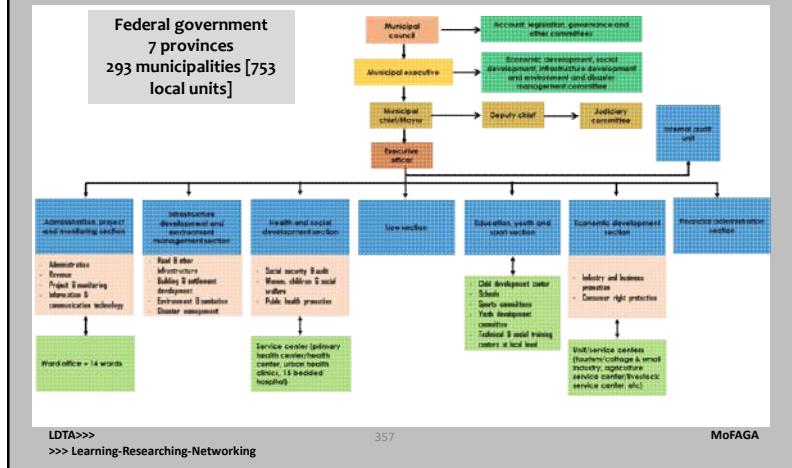
What are your opinions on these issues?

How municipalities prepare their annual programs?

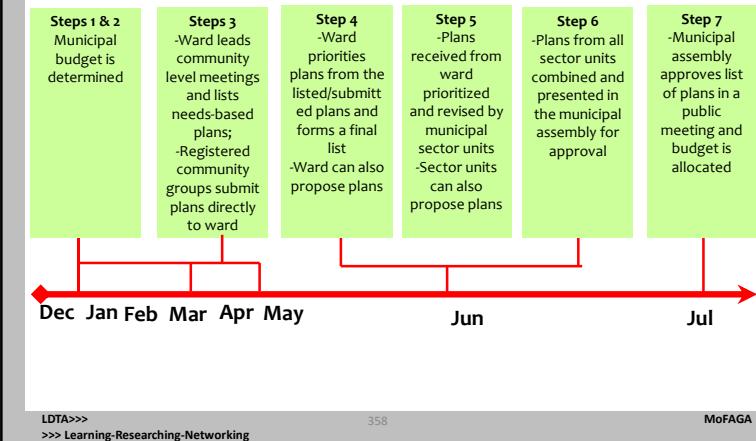
What are the benefits of engaging communities in implementation of projects?

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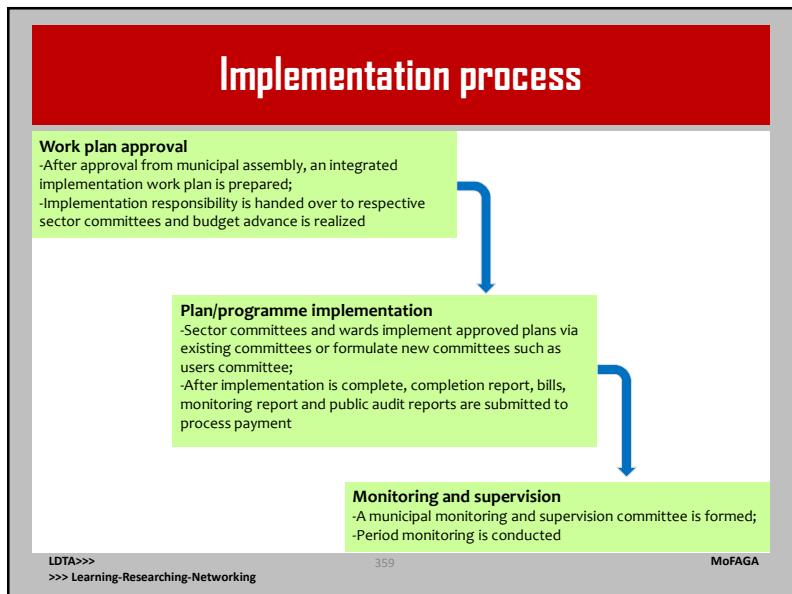
Waling municipality's organization chart



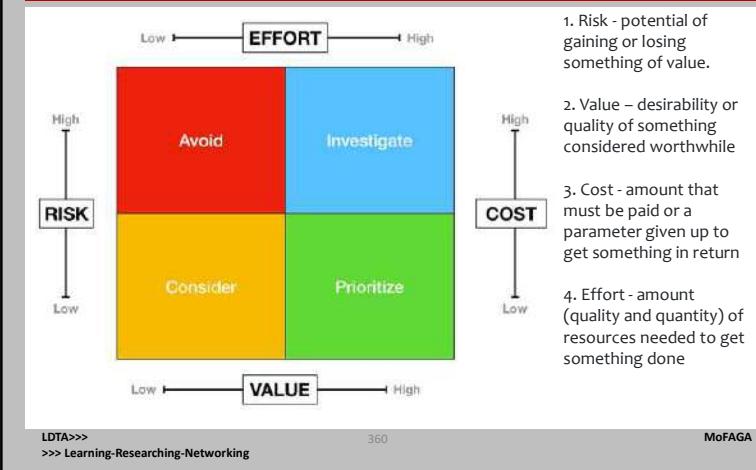
Seven steps of municipal annual planning

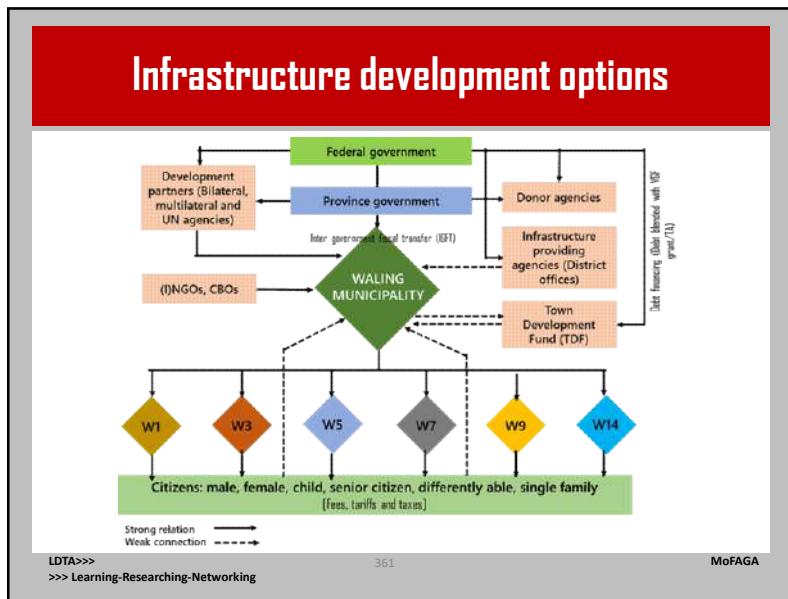


Implementation process



RCVE project prioritization matrix





Ward level recommended project: Putalibazar [2075-'76 BS]																			
Wards	Economic	Social	Forest, soil conservation	Environment & DM	Road and bridges	Draining & sewerage	Building	Women, youth & sports	Drinking water	Irrigation	Industry	Electricity	Culture & tourism	Park & playground	Agriculture	Education	Health	Energy	Promotional & institutional
1	1	3		7	8	3	1											2	
2		26	2	2	22		10	2	6	2	1	3	3					2	
3					15			2	5	2			2	3	4	2	2		
4	2			7	14		4	3	7	5		1	5				1	6	
5					24		5			12			1				1		
6	1	1	1	23		7	1	12	2	1		1	3	8			1		
7					14	2	1	1	6			1		1					
8					9	5		3										1	
9		3	3			5	6	2				6	1	9			2	10	
10		1	11	5	12									2				2	
11		5	21	1	5			6	5			3	1	5				2	
12	3	2			13	2	2		2			1	1						
13	4				9		16	2	3	4			3					9	
14					1	88		25	8	25	15		1					5	
	8	34	2	27	274	11	99	25	72	53	2	3	22	9	34	2	3	4	39

S.N.	Project names	Level of priority	Category	Budget allocated (NRs in '000)
1a	Protection of Birendra Nagar settlement through construction of gable walls	Top priority	Physical	1500
1b	Irrigation at Lamage fat	Top priority	Economic	4500
2a	City level park construction and management (Kamidanda- multi year project)	Municipal	Environment	500
2b	Wire mess boundary for Kavre playground	Municipal	Children	50
2c	Aadhikhola dairy development corporation	Municipal	Economic	500
2d	Management of Orangje nursery	Municipal	Economic	400
2e	Management of Coffee nursery	Municipal	Economic	100
2f	Shera Thulakhel/ Databise irrigation project	Municipal	Economic	150
2g	Hudikhola Pashase irrigation project	Municipal	Economic	150
2h	Rangkhola Jagetar irrigation project	Municipal	Economic	100
2i	Gable wall construction at Jhodungpul Simchalaur	Municipal	Environment	500
3a	Construction of greenery child park at Narayanasthan	Ward no 1	Child centric	100
3b	Vegetable farming irrigation at Lagantum	Ward no 1	Irrigation	100
3c	Irrigation frin Bhuvankhola Thati	Ward no 2	Irrigation	20
3d	Training for differentlyable persons on disaster management at community learning centre	Ward no 2	Differently able people targetted	20
3e	Costruction of Raudi irrigation at Kuwarbasti	Ward no 3		50
3f	Construction of play ground at Godar gaun	Ward no 3		100
3g	Training on vegetable farming (seson and on-season)	Ward no 4		30
3h	Disaster management and reconstruction or renovation	Ward no 4		200
3i	Landslide control at Dhordunga	Ward no 4		50
3j	LDTA's 59th structure of Tari irrigation	Ward no 4	Infrastructure	50
3k	>>> Learning Research and Networking	Ward no 4	Infrastructure	30
3l	Irrigation at Lamadanda	Ward no 4	Infrastructure	50

Conditional grant from centre to Putalibazar [2075-'76 BS]

S. No.	Project sector	No of programs	Budget allocated (NRs in '000)	S. No.	Project sector	No. of programs	Budget allocated (NRs '000)
1	Energy	4	1,292	6	Women, children and senior citizen	14	1,403
2	Agriculture	11	3,604	7	Youth council & sports	5	882
3	Environment	2	181	8	Education	68	234,411
4	Culture	2	1,000	9	Rural drinking water & sanitation	12	6,307
5	Forest and soil conservation	4	1,300	10	Health	85	55,320
Total							
Fiscal year grant							
Total grant from Government of Nepal							

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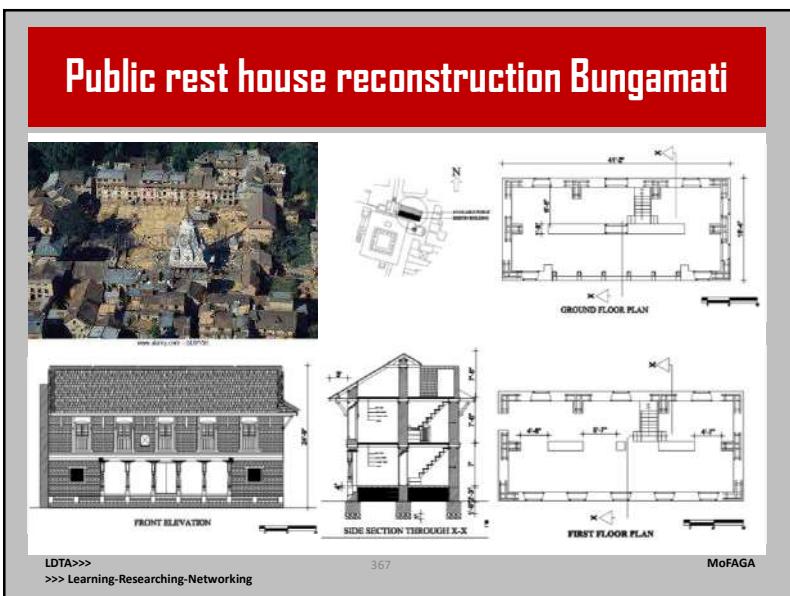
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Ward level projects at Waling municipality																		
Wards	Economic Social (gender balance & social inclusive)	Forest, soil conservation	Environment& DM	Infrastructure (Road and bridges & buildings)	Drainage & sewage & solid waste	Building	Women,youth & sports	Drinking water	Irrigation	Industry	Electricity	Culture & tourism	Park & playground	Agriculture	Education	Health	Energy	Promotional & institutional
1	5		1	9	1		1	1	3					3	1			4
2	1			12			1	5	3			2		1	3			1
3	3			2		6	1	4				3		1	3			
4	1			8		1	1			1	1	6	1	1				1
5	4			14			1	2	3	1	4	1		1				3
6				10		5		5	3			2						
7				13		4	1	6			4	2	1	1	1			
8	1		1	7	4	2		2	1			1	1	1				
9	3		1	10				4	1		1	2	1					1
10	3			4	2		2	3			1	11	1					2
11				1	2	1	3	4			1	2	3					3
12	1	4		1	5		6	1	2		2	2		1	1			
13	LDTA>>>	1		8	3		1	5				3	1					MoFAGA
14>> Learning-Researching-Network				13		4	2	10				8	2					2
				9		9	9	9	9			9	9	9				

Projects implemented by Waling municipality [2076-'77 BS]

S. N.	Project names	Level of priority	Category	Budget allocated (NRs in 'ooo)
1a	Tarikhett irrigation construction at ward no 5	Municipal	Economic	300
1b	Replacing thatched roof by colored CGI sheets	Municipal	social	5000
2a	Environment protection, disaster management and climate change in all wards	Federal government	Economic	1720
2b	Formation of volunteers and training for them on disaster management	Federal government	Social	300
3a	Baire irrigation pond construction at ward no 14	Provincial government	economic	200
3b	Lower Lyauntari irrigation project	Provincial	Economic	2880
3c	Amale Bhodhichaur irrigation	Provincial	Economic	500
3d	Parithoch irrigation pond construction	Provincial	Infrastructure	200
3e	Udiyachaur irrigation	Provincial	Economic	500
3f	Pandekhola drinking water and Mani khela irrigation	Provincial	Social development	500
3g	Thulo irrigation project	Provincial	Economic	500
4a	Distribution of seeds pf rice, wheat, maize as well as fruits, distribution of equipments for farming including training of bee farming in all wards	UNDP	Economic	
4b	Support in animal husbandry in all wards	UNDP	Economic	



Public rest house reconstruction Bungamati

- 3. Trench digging, foundation layout and wall construction up to plinth level
- 4. Super structure, door and window fitting
- 5. Roof construction and terrace flooring

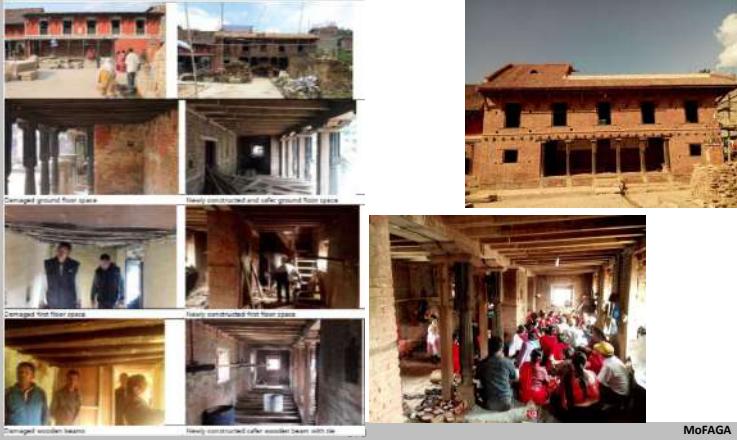


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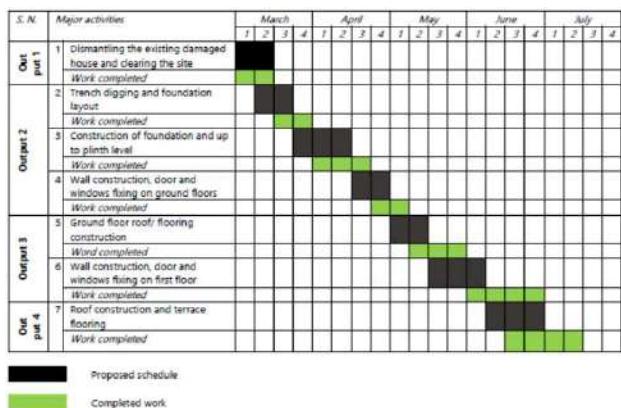
Public rest house reconstruction Bungamati



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Planned vs actual implementation time

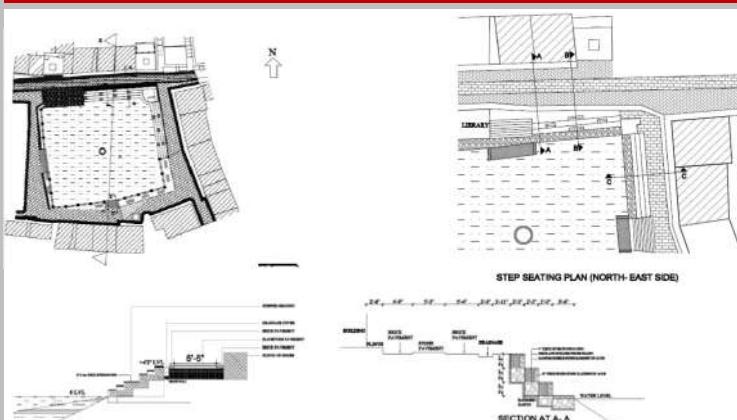


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Main pond revitalization in Bungamati



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Main pond revitalization in Bungamati

1. Formation of community users' committees (CUCs) and orienting them;
2. Cleaning of water by removing debris



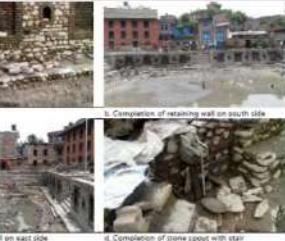
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Main pond revitalization in Bungamati

- 3 Stepping improvement and construction of walls
- 4 Boundary and railing fixing around the peripheral walls
5. Street furniture and solar lighting



a. Inner stone platform



b. Completion of retaining wall on south side

c. Completion of retaining wall on east side

d. Completion of stone layout with stair



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Main pond revitalization in Bungamati

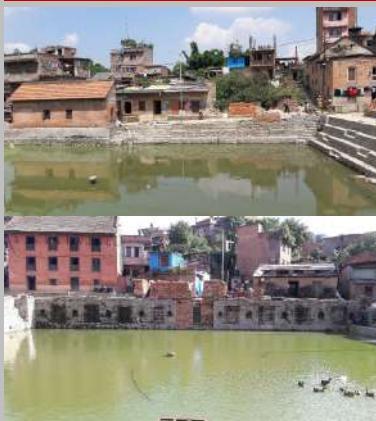


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Main pond revitalization in Bungamati



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Proposed vs actual implementation time

S. No.	Major activities	March				April				May				June				July			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Out put 1	1 Cleaning of water at De Pukhu with clearance of exist and entry point																				
	Work completed																				
Out put 2	2 Stepping improvement and construction																				
	Work completed																				
Out put 3	3 Boundary /railing fixing around the pond																				
	Work completed																				
Out put 4	4 Street furniture																				
	Work completed																				
	5 Solar lighting																				
	Work completed																				

Proposed schedule

Completed work

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Cost estimate: community contribution

(a) Reconstruction of Public Rest House (Pati) at Machchendra Bahal

Particular	Contribution (%) of total estimated cost	Cost (NRs)
Total estimated cost	100%	7,385,885.12
UN-Habitat's contribution	75%	5,539,413.84
Community's contribution (cash in kind)	25% (10% + 15%)	1,846,471.28

(b) Revitalization of De-Pukhu at Kota Tole

Particular	Contribution (%) of total estimated cost	Cost (NRs)
Total estimated cost	100%	2,546,928.00
UN-Habitat's contribution	90%	2,292,235.00
Community's contribution (cash in kind)	10%	254,692.80

Cost estimate of combined projects

Particular	Contribution	Cost (NRs)
Total cost	100%	9932,813.12
UN-Habitat's contribution	78.84%	7831,648.84
Community's contribution	21.16%	2,101,164.08

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Advantages of users committees

Users committees	Sense of ownership and hence take care of renovation and operation
	Contribute in cost through labor contribution
	Earn some financial benefits by local people
	Ensure quality during construction and selection of material
	Strengthen municipal and ward level with community organizations and local individuals

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Take home message

- Present municipal planning process allows direct engagement of local people through ward in identifying their needs/desires in the form of projects;
- Municipality can select the project based on local needs, balance development and socio-economic benefits of citizens; and
- Active participation of community organization and implementation of projects through users committees have multiple benefits

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Any Questions?

Dziękuję	شکرًا	Thanks You	Terima Kasih	<i>hvala</i>	Дякую
bedankt	salamat	Merci		Đakujem	go raibh maith agat
tesekkürle				nandri	Thank you
謝謝	הודות			Danke	tack så mycket
Obrigada	ありがとう			tack	faleminderit
Shukriyā	mange tak	�ন্যবাদ		Mulțumesc	Спасибо
takk	Grazie	너를 감사하십시오			
Eυχαριστώ	díky	děkuji vam	<i>kiitos</i>	anugurihiitosumi	köszöni
aitäh	<i>Muchas gracias</i>	ddhanya-waa	ačiū		köszönöm

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Sharing of review of municipal projects & discussion

Day-session 4-I and II

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Sharing of review of municipal projects and discussion

Specific objectives

At the end of this session, the participants will

- [a] learn different types of municipal projects: planning, designing and implementation including post-construction management;
- [b] share among participants on various issues and problems faced during the development process; and
- [c] observe those already implemented projects from urban design perspective and realize the areas for improvements.

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Sharing of review of municipal projects and discussion

Activity 1: Each participant will share experience of municipal project implementation

- While sharing the experience of municipal project implementation, focus will be on
 - (i) planning, designing and implementation process,
 - (ii) problems faced and issues raised and
 - (iii) agencies involved, budget allocation and related legislation.

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Sharing of review of municipal projects and discussion

Activity 2: Categorization of projects and issues and problems faced

- All the meta cards can be grouped as per nature of the project (physical, economic, social, etc.) and the issues/problems faced during development process.
- Those issues might be associated with weak planning, lack of community participation, failure of individuals to follow building bye laws and National Building Code, cost override, delay in implementation and so on

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Sharing of review of municipal projects and discussion

Activity 3: think of those identified issues and problems from urban design perspective

- Discuss, brainstorm and facilitate on how those problems and issues raised during the development process could have been addressed through urban design approach, techniques and strategies

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Sharing of review of municipal projects and discussion

Activity 4: Lessons learned

- Identify the lessons to be learned from the past mistakes and proposed recommendations for the future municipal project design and implementation

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Discussion on possible sites, issues and detailing of the project for group exercise Day-session 4-III and IV

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Discussion on possible sites, issues and detailing of the project for group exercise

Specific objectives

At the end of this session, the participants will

- [a] come up with consensus for possible projects for group exercise;
- [b] develop check list for each project; and
- [c] understand the parameters to be observed during site visit

Discussion on possible sites, issues and detailing of the project for group exercise

Activity 1: Brainstorming and discussion over development of possible projects for group exercise

- Discuss over possibility of developing a project for group exercise based on the earlier categorization of various municipal activities/projects as per their nature and features

Discussion on possible sites, issues and detailing of the project for group exercise

Activity 2: Group formulation and refinement of discussion towards finalization of projects for group exercise

- Divide the whole participants into 4-5 groups, each group comprising at least 4-5 participants.
- Ensure that each group is balanced in terms of gender and educational background (architect, draft person, engineers, overseers, etc.)
- Develop at least four-five different type of projects for group exercise.
- Make sure each project for group exercise is relevant to municipality and has activities that resembles to municipal activities

Discussion on possible sites, issues and detailing of the project for group exercise

Activity 3: Finalize the possible projects for group exercise

- Possible projects for group exercise might be of different natures:
 - [a] Master layout plan preparation of any proposed land pooled area,
 - (b) pedestrianization of mixed use area (existing one) through improvement of footpaths, instalment of street furniture and public amenities (street lighting, dust bins, signage, street marking, etc.),
 - (c) development of public open spaces by improving linkages, linking with surrounding buildings (especially ground floor uses), providing public amenities such as drinking water, public toilet, furniture and other activities to engage people of different age groups, and
 - (d) identification of salient features, heritage values of historic districts (neighborhoods) and formulation of urban design guidelines along with incentive mechanism for conservation of townscape.

Discussion on possible sites, issues and detailing of the project for group exercise

Activity 4: Assign the group with project of group exercise base on individual interest, educational background and work experience

- Development of important check list for each project while visiting site in next session (Day 5).
- For instance, to carry out group exercise on ‘pedestrianization of mixed use area’ check list can be: width of the footpath and its continuous network, available facilities for pedestrian, safety and security condition, possibility of using foot path by blinds and differently able persons, linkage with ground floor use of buildings on both sides of streets, light and ventilation on streets, street characters and so on. Also, ensure the list of drawings, data and other information required for each project.

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Site visit, observation, mapping and discussion

Specific objectives

At the end of this session, the participants will

- [a] gather adequate information of the site for group exercise;
- [b] take note of site specific information and data through different means; and
- [c] understand the site context and major issues and problems.

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Site visit & discussion Day-session 5-I and II

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Site visit, observation, mapping and discussion

Activity 1: Visit the site along with check list and maps

- Each group with visit the site along with check list and maps
- Each member of the group observe the study area focusing on the aspects mentioned in the check list, take pictures, note in the map and draw other information as necessary

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Site visit, observation, mapping and discussion

Activity 2: Note down site specific issues and problems

- Each member will not only rely on the check list but also take note of site specific issues and problems, talk with local people and visitors for extra information

Activity 3: Discuss with other members of the group and teacher whenever necessary

- Discuss with other members of the group and teacher on various issues during site visit in order to get maximum contextual knowledge

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Site visit, observation, mapping and discussion

Activity 4: Familiarize with site context and various issues to be addressed

- Each member of the group makes the site context familiar by collecting sufficient information through different means and noting them

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Group exercise & discussion Day-session 5-III and IV

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MoFAGA

Group exercise and discussion and preparation for presentation

Specific objectives

At the end of this session, the participants will

- [a] understand the major problems and issues associated with site;
- [b] develop a framework for addressing those issues and problems by combining the information of the site and knowledge gained from previous various lectures from Day 1 and
- [c] propose some key solutions along with recommendations

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Group exercise and discussion and preparation for presentation

Activity 1: Critically review the information collected from site

- Familiarize the site context by mapping and writing various information collected during site visit over maps so that all information are available in a collective way for all participants in the group

Activity 2: Develop a framework based on site context and knowledge gained from lectures in previous days

- Each participant can develop a separate framework based on personal observation and understanding of the site context

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Group exercise and discussion and preparation for presentation

Activity 3: Brainstorming among group member

- Each participants can develop a conceptual plan along with solutions for the identified problems and issues. Brainstorm among themselves on each issue and problem

Activity 4: Finalize the conceptual plan along with other detailing

- Finalize the conceptual plan and other detailing by incorporating views by respecting views and ideas of each participants through intensive discussion and consensus building. Also, prepare final presentation materials.

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सङ्गीय मानिता तथा सामाजिक प्रशासन मन्त्रालय

Group exercise & discussion Day-session 6-I to IV

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Group exercise and discussion and preparation for presentation

Specific objectives

At the end of this session, the participants will
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MoFAGA

Group exercise and discussion and preparation for presentation

Activity 1: Critically review the information collected from site

- Familiarize the site context by mapping and writing various information collected during site visit over maps so that all information are available in a collective way for all participants in the group

Activity 2: Develop a framework based on site context and knowledge gained from lectures in previous days

- Each participant can develop a separate framework based on personal observation and understanding of the site context

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Group exercise and discussion and preparation for presentation

Activity 3: Brainstorming among group member

- Each participants can develop a conceptual plan along with solutions for the identified problems and issues. Brainstorm among themselves on each issue and problem

Activity 4: Finalize the conceptual plan along with other detailing

- Finalize the conceptual plan and other detailing by incorporating views by respecting views and ideas of each participants through intensive discussion and consensus building. Also, prepare final presentation materials.

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Group presentation & discussion Day-session 7-I to III

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Group presentation and discussion

Specific objectives

At the end of this session, the participants will
[a] able to come out with solutions of various problems and issues identified in the given site;

[b] develop the capacity of working in a team; and

[c] able to understand others presentation and commenting on them.

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Group presentation and discussion

Activity 2: Encourage active participation of members of other groups in question-answer session

- Facilitate the question-answer session by encouraging some questions from other groups.
- Also make sure that members of other groups also attend the presentation.
- For that if necessary, submission can be taken before starting the presentation

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Group presentation and discussion

Activity 3: Encourage each group by commenting on their presentation on various issues and problems

- Facilitate each presentation by quickly commenting on their strengths and weaknesses on various issues during presentation itself so that the participants can develop confidence level

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Group presentation and discussion

Activity 4: Make overall comments and review over all presentation

- Its always recommended to make overall comments over presentation at the end of all presentations by the facilitators

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मन्त्रालय समिति का एक सम्बन्धीय संस्थान

कार्य योजना, प्रशिक्षण मूल्याङ्कन तथा समापन Day-session 7-IV

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धन्यवाद

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सहभागीका लागि अध्ययन सामग्री

Day 1: Urban design and city planning theories

Module: Introduction of urban design and its scope (DIM1)

Bridging the gap between Architecture and Urban (and City) planning: Emergence of Urban Design

Bijaya K. Shrestha, Ph.D. MUD. B. Arch.
Email: bkshrestha@hotmail.com

History of Architecture and Urban Planning

- Evolutionary process;
- Incremental basis; and
- Continuity of the past

Industrialization and development of new means of transportations and communications gave birth of modern architecture and town planning in the early of the last century.

Modern Architecture and Urban (and City) Planning

- Traditional pattern of development and buildings were replaced by totally new forms based on modern, rational and humanistic thinking;
- Internal function and structural requirement dictate the building form, ignoring the role of the building in defining cityscape and streetscape;
- New buildings do not respect the surrounding older buildings but isolates itself in terms of styles, construction technique and other detailing;

Numerous problems resulted

Modern city becomes:

- Architectural Zoo - many distinct buildings but without coherent, visual and functional relations);
- Dead city – streets mainly for vehicular traffic and buildings with blank walls;
- Wastage of energy and resources – living, working and shopping places are far away and not possible without cars;
- Public space as waste or no man's lands - Spaces between buildings and other open spaces created for community are not functional and people do not use them;
- Social crime increases – the built form and streetscape encourages such activities;
- Anti-urbanism and anti-humanism city or built form;

New Paradigm in Architecture and Urban Planning

Catalyst by:

- Deindustrialization, corporatization, globalization of economy and international investment;
- Change in economic base from manufacture to information and service oriented;
- Competition for city image, high quality urban space equipped with modern telecommunication systems;
- Development of public private partnership and negotiation in planning and urban development;

Emergency of Urban Design

Multiple definition of urban design:

- ‘Designing cities without designing buildings’ (*Jonathan Barnett, 1982*);
- Involves ‘enabling but not authoring the built environment’ (*Robert Shilbley, 1982*);
- To create built environment by ‘policies, programs and guidelines rather than by blue prints that specify shape and location in details’ (*Kevin Lynch, 1982*), etc.;
- ‘Second order design’ (R. Varkki George, 1997).

Wide scope of urban design:

- Ranging from product to process, from site level to city scale, from short term to long term.
- Dealt with quality of built environment and seeks to control changes in the nature as well as in the man-made environments;

Urban design – As a function of Architecture

- Involves preparation of different types of plans, site planning or project design as a ‘product’, i.e., Chandigarh by Le Corbusier;
- Involves forming and manipulating spaces;
- Focuses on visual and aesthetic principles and has a notion of spatial quality.

Urban design- An integral part of Urban (city) planning

- Considers social, environmental, and economic factors and the ways they are changing in urban system and then integrate inputs from diverse sources for functional, coherent and visually appealing built environment creation;
- Programs – capital investment program, new town and housing program, downtown revitalization program, etc.;
- Policies – broad statement of collective intent that influence specific decisions made individually or collectively, e.g., historic preservation, preservation of old neighborhood, etc.;
- Regulations and guidelines – not mandatory but provides some options, e.g., guidelines for facade treatment or building bulk, etc.

Future prospect

- Plays crucial roles not only in virgin site to create ‘urban future’ but also in the existing built up area to influence the ‘future’;
- Quality of urban design depends on the process (design objectives, design principles and regulations and guidelines prepared to achieve them);
- The roots of urban design lie on architecture and city planning and its relation with them is growing faster and clearer;
- Urban design as a distinct discipline in urban development

Module: Livable city/smart city design and its major components (pedestrian friendly neighborhood, mixed use, etc.) (DIM2)

Creating smart, green and livable cities

<https://stateofgreen.com/en/creating-smart-green-liveable-cities/>

By 2030, six out of ten people will live in urban areas. City dwellers must contend with increased congestion, waste and water management issues as well as overcrowded, polluting transportation systems. All of this poses direct negative effects on citizens' physical health and wellbeing. This is the reason why the United Nations has chosen to focus specifically on sustainable cities and communities in their Sustainable Development Goal number 11 (SDG 11).

But how do we get there? The transition to sustainable cities depends on social, cultural, economic and climatic factors. In the fast-growing cities of developing economies, basic needs such as energy, water, and mobility should be met sustainably, while resources are managed effectively. In cities located in more developed economies, smart approaches are needed to ensure that cities are optimized for economic activity, energy consumption and environmental impact.

Regardless of a city's particular state of development, ensuring 'the good life' for urban citizens should be a guiding principle. To meet the challenges of urbanization, we need to take a holistic approach when developing urban areas and make the necessary investments.

However, if we can harness the might of cities to accelerate the transition to inclusive, safe, resilient and sustainable cities and communities, we can meet the SDG 11. In this way, there will be room for all of us to live and thrive in the cities of the future.

Urbanization is a powerful global trend

By 2030, six out of ten people will live in urban areas. This rapid expansion puts cities under massive pressure with increased CO₂ emissions and climate change being the most urgent challenges. Today, cities account for 70 per cent of global CO₂ emissions. City dwellers must contend with increased congestion, waste- and water management issues as well as overcrowded, polluting transportation systems. All of this poses direct negative effects on citizens' physical health and wellbeing.

Cities house both some of the wealthiest and the poorest citizens on the globe. They display the challenges of environmental damage and economic inequalities we are seeing today. However, as the political, economic and technological power of cities grows, they can harness this to act as frontrunners in the green transition and drivers of the green economy – thereby contributing to the UN Sustainable Development Goals.

The transition to sustainable cities depends on social, cultural, economic and climatic factors. In the fast-growing cities of developing economies, basic needs such as energy, water and mobility should be met sustainably. At the same time, resources should be managed effectively. In cities located in more developed economies, smart approaches are needed to ensure that cities are optimized for economic activity, energy consumption and environmental impact.

Regardless of a city's particular state of development, ensuring 'the good life' for urban citizens should be a guiding principle. To meet the challenges of urbanization, we need to take a holistic approach when developing urban areas and make the necessary investments. However, if we can harness the might of cities to accelerate the transition to a greener future, we can secure healthy and livable cities with room for all of us to live and thrive.

A holistic approach to urban development

Urban water management, waste handling, electricity, heating and cooling, urban mobility, public and private buildings, climate adaptation, resiliency, green and blue areas and clean air are all vital elements to consider in developing livable cities of tomorrow. However, rather than thinking of these aspects independently, substantial economic and environmental gains can be made from adopting a more integrated and holistic approach to urban planning.

Designing sustainable environments should be a comprehensive process that balances social, cultural, environmental, economic and political aspects. When developing new projects, we must ask ourselves: What projects are considered most urgent by authorities, private actors and citizens respectively? How can we make this investment address more than one issue? What materials and structures should we use to ensure resilience, good duration, functionality, live ability and even aesthetics?

Spurring urban development through partnerships

To achieve the goal of holistic urban development, partnerships and interdisciplinary collaboration between various partners is required. Gaining support from citizens and the industry is key for success and compliance. This is an aspect that many fail to recognize when developing and implementing sustainable initiatives. Public-private partnerships and citizen involvement ensure diversification of risk and extend management responsibility while increasing ownership and commitment from the involved parties.

Danish cities, both big and small, have applied unique public-private partnership models for solving many of their challenges related to climate adaptation, energy efficiency, mobility and livability. Known as the Copenhagen model, it is characterized by the integration of design and engineering, relying on a close ongoing dialogue between the City and its private partners. This takes place from the initial phase of identifying issues to the inception of solutions, implementation as well as maintenance. Citizens and educational institutions are often engaged as well, forming Triple Helix (university-industry-government) and Quadruple Helix (university-industry-government-citizens) partnerships.

Green cities as drivers of economic growth

In the coming 30 years, a huge proportion of the world's GDP will be invested in cities. It is vital for the global green transition that these investments are in sustainable solutions. It is a common misperception that investments in sustainable solutions exceed the cost of traditional urban planning. In Denmark, we already have substantial proof that this is hardly the case. On the contrary, the implementation of green urban solutions offers strong business cases with short payback times and high return on investment (ROI).

Public-private partnerships encourage synergies and help foster innovation and far-reaching, integrated projects. For the industry, the partnership means more stable regulatory frameworks. For governments, the practices of the industry become more transparent and aligned with long-term political visions. In addition, experience shows that this funding model allows for rapid and more agile dissemination of sustainable solutions.

To be successful in furthering the green transition in Denmark, we are looking into global research and solutions for energy efficiency in buildings as well as solutions for a more circular economy. Our own research institutions are also working at full speed. We hope to engage in more dialogue to expand our knowledge and understanding of our own, as well as the global, green transition. We each hold insights and experiences that are valuable to others.

Connect. Inspire. Share. Think Denmark

Through State of Green, you can connect with the accumulated public and private Danish actors involved with urban sustainable development, including urban water management, waste handling, electricity, heating and cooling, urban mobility, buildings, urban planning, climate adaptation, resiliency and clean air. We recognize the unique financial, political, economic and geographic challenges cities are facing around the globe. However, we challenge you to present us with a situation, where our solutions are not applicable or translatable. Our goal is to help your city with holistic, sustainable solutions that enable green growth and livable conditions for a growing population. We look forward to hearing from you.

Module: Development control, planning norms and standards and building byelaws (D1M3)

Development Control Regulations (DCR)

Development Control Regulations are a set of rules that are planned to ensure the proper and effective development of a city, as well as the general welfare of the public. Regulation is necessary to ensure planned development. It depends on a “plan-led system” whereas development plans are made and the public is consulted.

It is a mechanism that controls the development and use of land. This involves the construction of new buildings, the extension of the existing ones, and the change of use of the building or land to another use. Developing new houses/industrial buildings/shops are important for supporting economic progress. At the same time, it is also necessary to protect or improve the quality of towns, villages, countryside, etc.

What are the motives of the Development Control Regulations (DCR)?

The motive of Development Control Regulations (DCR) is that any approved plan is implemented by individuals and by corporate or by public-sector developers and thus all new developments should adhere to the terms of the plan.

Why is Development Control Regulations necessary?

Development Control Regulations are a must for every growing city because the area immediately beyond the city limits is often a source of health risk to the city and generally under no strict control of the effective local authority.

What are the objectives of the Development Control Regulations?

1. To stop the unfavorable demand and misuse of land.
2. To assist private interest along with public interest in all phases of development.
3. Development control is legal in nature and the planning authority has the power to punish the defaulters.
4. To control and limit overcrowding on land.
5. To control the private development as per the required rules in connection to public safety, health, and convenience.

How many types of Development Controls Regulations are there?

1. Town and Country Planning Act
2. Building Bye-laws
3. Land Acquisition Act
4. Zoning Regulations
5. Slum Clearance Act
6. Periphery Control Act

How is Zoning Regulations dealt with?

1. Allotment of land for special purposes.
2. Limitation on the use, construction, and height of the building.

What are the key objectives of Zoning?

1. Zoning proves to be a useful means for making any town planning scheme effective and successful.
2. Zoning supports proper coordination of various public amenities such as road, electricity, drainage, water connection, transport facilities, etc.
3. Rezoning for better uses of land by amending their zoning laws can be possible.
4. The town planner gets enough opportunity for designing the future growth and development of the town.

Where is building Bye-laws applicable?

1. New construction
2. Additions and modification to buildings
3. The need for open space

What are the objectives of building Bye-laws?

1. The building bye-laws stop reckless development without any similarity to the development of the area as a whole.
2. To give open spaces, noise, air breeze, smoke, and manage safety against fire, etc.
3. To control land development keeping in mind the bye-laws.
4. It becomes more accessible to pre-plan the building activities and provisions of bye-laws, give directions to the designing architect or engineer.

Day 2: Domestic and international case study analysis

Module: Successful urban design projects international case studies (D2M1)

Urban Waterfront Development Patterns - Water as a structuring element of urbanity -

Dr. Bijaya K. Shrestha and Ar. Sushmita Shrestha

Abstract

Critical comparative review of the three ongoing mega urban waterfront projects namely Battery Park City in New York, Minato Mirai 21 in Yokohama and Central Wan Chai Reclamation Project in Hong Kong reveals that water has not only dictated the master layout plan and land use provision but has also influenced the building form and landscape detailing. Though the track of development history, planning and implementation system differ in each case, nonetheless, they have many commonalities in terms of formulating urban design guidelines, adopting flexible development control, fulfilling the developers' needs and adjusting the market conditions during the construction phase. Numerous lessons learned from these cases have worldwide implications on planning theory, education and practice thereby presenting a new dimension in urban development.

Keywords

Waterfronts; master layout plan; design guidelines; implementing agency; urbanity; public realm.

Overview Of Waterfront Development Trend And Study Objectives

Technological advancement in maritime industry, socio-economic modernization of city and strict environmental regulations including public's concern for health and quality of life all have caused the shift of port activities into new peripheral areas, away from the city centers (Hoyle et al, 1988). Redevelopment of such sites was delayed due to political debate over controlling the waterfront lands, environmental pollution of the sites and existence of deteriorated industrial infrastructure. However, globalization of economy and international investment (Harrison and Bluestone, 1988), corporatization of cities (Harvey, 2001), restructuring of capital (Beauregard, 1991) has made these abandoned waterfront sites favorable places for new development with water enhanced land use for the postindustrial society (Olds, 1995). Similar developments in planning, land use, and cultural life are evident in the revitalized waterfronts in many port cities (Sieber, 1990). They have been marked by an international style in architecture and urban design as an icon of 'landscape of power.' Though this post-industrial transformation seems uniform, unrelenting, and clear cut throughout the world with convergence of development policies, it is in fact, not. As broader issues of waterfront change, local site context, city's track of development history including socio-cultural differences vary, numerous revitalization projects driven by private capital and worldwide market economy in the early phase (during the 1960's and '70's) have been facing many problems by the late 1990's. Local municipalities are facing financial problems due to cut-back of funds from the central government, and at the same time, trying to create business environment to attract world class financial actors through tax cut and enacting developers' friendly policy. Thus, waterfront transformation is a complex phenomenon, possessing many challenges as well as opportunities. Against such background, this paper aims to conduct a comparative analysis of three prominent ongoing waterfront redevelopment projects namely Battery Park City (BPC) in New York, Minato Mirai 21 (MM21) in Yokohama and Central Wan Chai Reclamation Project (CWRP) in Hong Kong, focusing the role of water in shaping the built form in planning stage and analyzing the adjustment in legal and institutional framework during the project implementation phase. It has threefold objectives. First, it presents a brief project background of each case and then checks the role of water in structuring the master layout plan and built form at three levels: morphological, street level and skyline analysis. Second, it compares and contrasts the legal and institutional framework and identifies the adjustment done during the implementation process. Finally, it draws a conclusion and suggests some key recommendations for future waterfront development.

Case Study Project Background

All the three selected waterfront redevelopment projects are located adjacent to central business district of post-industrial cities with comparable population and economic development. Planned on the reclaimed lands, they have similar land use programs: mixed use with significant open spaces and office, retail, hotels, etc. (Table 1). However, they have different track of development history and each city has somewhat different planning and development system with variation on socio-cultural and political dimensions. Also, they are implemented by public agencies with different mandate, institutional arrangement and implementing approach.

Table 1: Comparison of case study project background

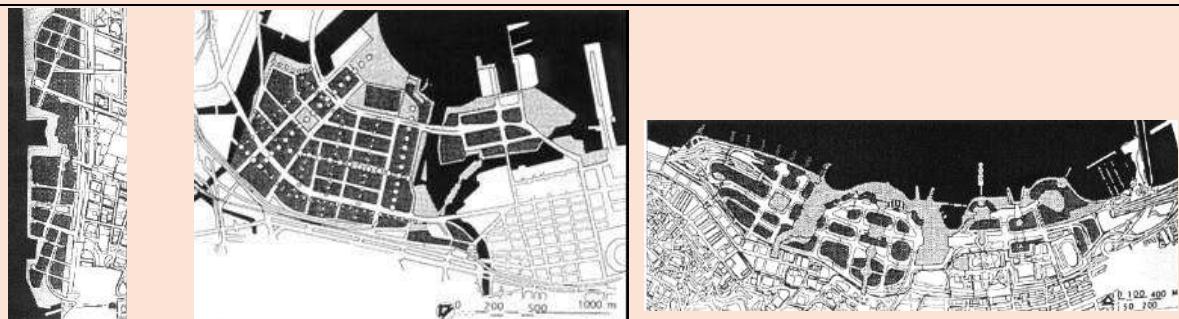
Project	Total area (ha)	Commercial, office, (ha)	Road & railway (ha)	Park & open space (ha)	Port facility (ha)	Develop. period (yr.)	Budget
BPC	37.4 (100%)	18.9 (51.0%)	7.2 (19.0%)	11.3 (30.0%)	-	1979 -	\$ 4 billion
MM 21	186.0 (100%)	87.0 (46.8%)	42.0 (22.6%)	46.0 (24.7%)	11.0 (1.4%)	1983-2000	2 trillion Yen (1983 based)
CWRP	122.7 (100%) (3 cells)	37.9 (30.8%)	54.1 (44.2%)	29.0 (23.6%)	1.7 water basin (1.4%)	1993- 2011	HK\$ 18,500 million (mid 1988 based)

Source: BPCA, 1979; Yokohama MM 21, 1997; Maunsell, 1993

Comparative Analysis Of Master Layout Plan

Morphological analysis

Water having visual, emotional and real estate value makes waterfront unique in their potential to provide economic development, public enjoyment and civic identity. Waterfront being an interface between land (urban city) and water (natural element), production, consumption and exchange processes occur at high intensity. The ephemeral quality of water such as buoyancy, waves, currents, ripples and light offers a new dimension on urban space, which affects the spirit, energy and expressiveness of people. Such multiple roles of water have been acknowledged and applied in shaping the built form of the selected waterfront projects in different way (Figure 1).



BPC, New York

MM21, Yokohama

CWRP, Hong Kong

Figure 1: Comparison of Master Layout Plan of waterfront development project

Many waterfront sites in the Lower Manhattan are still dominated by highway and industrial uses whereas others had remained as 'waste land' or 'no man's land' for decades before their redevelopment. However, waterfront changes in Yokohama and Hong Kong are taking place on a systematic basis by shifting the port functions to a new peripheral location and replacing the earlier industrial sites by new urban functions thereby creating two new waterfront frontiers simultaneously. The general practice of extending the existing 'grid iron street' pattern towards the sea and filling up of spaces between the earlier

finger piers has created straight water's edges in New York. This is not the case in Yokohama, where new land is reclaimed in the form of island to limit the expansion of the growth from the surrounding areas. In Hong Kong, successive land reclamations has produced 'layering effect,' with each wave of reclamation generating a distinct urban block and street pattern demonstrating the socio-economic reality and political power of that time. Despite differences in shape of the reclaimed land, the master layout plan of the case study projects has many similarities especially related to water. First, the entire water's edges are dedicated for the diverse public uses ranging from passive parks and promenades to active eating, shopping and recreation facilities. Second, water's edges are modified not only to enhance visual and aesthetical values but also to experience the water by creating inner water body and irregular shoreline configuration. For instance, the earlier shoreline in MM 21 has been rectified to capture the view of 'Bay Bridge' as well as to relate with the entire shoreline encircling Tokyo Bay. Third and last, public access to water's edges is given higher priority in all three cases. Urban blocks at BPC match with the surrounding existing areas whereas they do not in the remaining two cases: four times bigger at MM 21 and two and half times larger at CWRP (Figure 2). Similar proportion holds good for number of buildings within an urban block. Moreover, the 'court type' of building layout at BPC has many advantages against the configuration of 'building on the plot' at MM 21. It accommodates higher density, creates many street fronts and forms a vehicle free community space in the form of courtyard. The traditional practice of building 'tower on podium' connecting to the surrounding towers through sky bridges has also been continued at CWRP in Hong Kong.

Case study urban waterfront development	Proposed block [per sq. unit area]	Existing block [per sq. m. area]	Building on the plot	Building typology
BPC, New York				
MM 21, Yokohama				
CWRP, Hong Kong				

Figure 2: Comparative study of urban fabric and building layout on the plot

Street level analysis

Streets and public open spaces [public realm] have been emphasized in each case with different design strategy (Figure 3). First, the concept of street design at BPC was to keep them simple, short and pedestrian friendly by linking to waterfront promenade and greenery park system whereas the streets at MM 21 and CWRP have a singular function of carrying vehicular traffic only. Pedestrians are separated from the vehicular street either by developing a separate pedestrian path at MM 21 or by creating a pedestrian network at podium level through 'inner pedestrian malls' and enclosed overheard bridges at CWRP. Second, numerous urban design criteria such as positioning a landmark at the end of the cul-de-sac, regulating the buildings on both sides of the streets in terms of architectural design and detailing, building height and materials and keeping ground floor of buildings on both sides for retail and other

public related activities have been applied to make street lively and vibrant as well as to attract people towards the water's edges at BPC. Such quality can not be achieved in the street of MM 21 due to variation in building setback and height, blanks walls along the street façade and absence of activity nodes at street junctions. However, in both the Asian cases, many public activities such as stage performance, exhibition and socialization that used to take place in outdoor open spaces at BPC often occur inside the shopping mall in an enclosed environment. Private developers get tax cut, floor area ratio bonus and other facilities for allowing some of their spaces for public uses whereas the private security guard and surveillance cameras installed in various locations dilute free pedestrian movement. Casual walkers other than customers find it psychologically inconvenient in using such spaces. In addition to the major pedestrian network at podium level the proposed master plan of CWRP has also emphasized the street level pedestrian movement by regulating land use (ground floor) and building façades through urban design guidelines. Third, there are wide promenades along the water's edges with different design detailing. Wooden benches, street lamps along with plantation derived from the existing New York typology coupled with keeping of public art at strategic locations have made the open spaces and promenades lively and active. Despite locating public art at different locations, promenades and open spaces except few are not actively used at MM 21 and CWRP not only due to lack of landscaping and street furniture but also because of engagement of majority of pedestrians inside the shopping malls.

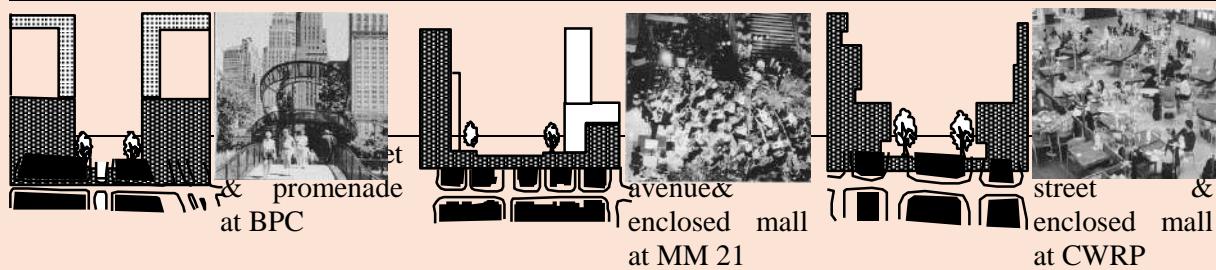
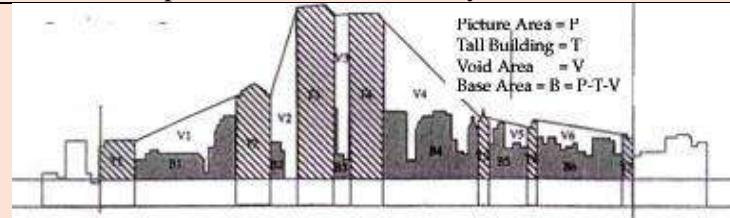


Figure 3: Comparative study of street and open space typology in the case study waterfronts

Skyline analysis

A skyline can be seen as 'figure ground' based on 'gestalt laws of visual organization.' The selected material for skyline analysis of the urban scene (existing and new development) consists of panoramic view photographs from prominent locations, postcards and other visual materials collected from various sources. Each photo is demarcated into picture area with skyline contour on the upper side and a datum line on the bottom, which forms different pockets of base (B), void (V) and tall building (T) areas (Table 2). The values of each pocket is calculated on a 'unit area' basis and added up at the end to find out the total value of T, V, and B. Adding up of all these values gives the total picture area (P). Finally, values of T/P, V/P and B/P are calculated for each photo to get the 'unitless' figure, which describes the character of skyline (Table 2). Such calculation is carried out for each case at two levels [for the existing areas and the proposed development] in longitudinal and transverse directions. As the surrounding area of MM 21 is low rise residential areas, only skyline analysis for the proposed new development is performed to compare with the other two cases. As the differences between the values of T/P, V/P and B/P for the existing and new skyline (longitudinal and transverse sections) is very small and the tall building area is larger compared to the void area and base area, the new development at BPC does not destroy the earlier skyline character. However, the smaller value of T/P but larger figure of V/P compared to corresponding values for the existing skyline at CWRP (both directions) means the new construction will change the earlier character with domination of bulky buildings and isolated tall structures. The new skyline at MM 21 will also have similar skyline characters as that of CWRP at longitudinal direction but the effect of tall buildings in descending order towards the water's edge will be clearly visible across the transverse section. The cross national comparison reveals that the effect of tall building will be clearly visible at BPC and MM 21 due to large T/P value but will be least experienced at CWRP due to low T/P value.

Table 2: Comparison of old and new skyline characters in the case study waterfront



BPC, New York			MM 21, Yokohama			CWRP, Hong Kong			
Long.	Exist.	New	Differ.	Exist.	New	Differ.	Exist.	New	Differ.
T/P	0.545	0.582	0.037	-	0.412	-	0.435	0.206	0.229
V/P	0.244	0.241	0.003	-	0.237	-	0.281	0.434	0.153
B/P	0.210	0.195	0.015	-	0.350	-	0.288	0.295	0.007
Trans.									
T/P	0.447	0.573	0.126	-	0.628	-	0.454	0.211	0.243
V/P	0.319	0.212	0.107	-	0.290	-	0.330	0.355	0.025
B/P	0.233	0.215	0.018	-	0.081	-	0.216	0.434	0.218

Note: P- Picture area, T-Tall building area, V-Void area and B-Base area [B=P-T-V]

Comparative Analysis Of Legal And Institutional Framework

As the project realization background, development coalition and planning system differs in each city, it is interesting to investigate how waterfront projects having similar goals and objectives are implemented under different legal and institutional framework. Numerous adjustments have been carried out during the construction phase in each case. First, the political controversy over development plan and control over waterfront development has created an environment of 'non-cooperation' among development coalitions at BPC. Both MM 21 and CWRP projects being a part of the comprehensive city restructuring programs were realized based on the series of studies over a long period. This coupled with political and financial support from different concerned agencies have resulted in smooth 'start up.' For instance, Kanazawa prefecture (for construction of public facilities), Housing and Urban Development Corporation (for land readjustment, road and residential area development), 'Private Sector' (for construction of office, commercial and cultural facilities) and Yokohama MM 21 Corporation as a 'Third Sector' (for survey, public relation promotion, coordination and development of community) have been engaging for the development of waterfront site in MM 21. Moreover, it took more than six years for approval of 1969 master development plan of BPC whereas despite huge development site and complex nature of the projects, the master plans of MM 21 and CWRP were approved within four years (Table 3). Second, urban design guidelines for master planning and building regulation and simplified mechanism for plan approval have been adopted instead of rigid development control in all three cases. Nothing was constructed at the site for a decade even after approval of 1969 plan at BPC due to monolithic mega structure development plan, sky rocketing cost for public infrastructure construction and tedious planning approval process from the City Commission (approval needed from about fifteen agencies). A new master plan based on the historical precinct of New York's basic pattern of development - street and block system, building forms, density, mixed land use and efficient transportation system (BPCA, 1979) replaced the earlier rigid plan in 1979. Prepared under the consensus between the State and the City, this new plan was approved in less than two years.

Table 3: Comparative study of master plan approval - time take and agency

Project	Initiation	Approval	Time taken	No. of approval level
BPC 1969 Master Development Plan	New York City (April 1963)	Battery Park City (Oct 1969)	6.5 yr.	2 (State/City)

BPC 1979 Master Plan	UDC take over BPCA (Jan 1979)	BPCA & NYC agreement (June 1980)	1.5 yr.	2 (State/City)
MM 21	Yokohama City 1979.	City & other agencies [Nov. 1983]	4 yr. (18 yr for study)	3 (Central/ City) Prefecture/
CWRP	Hong Kong govt. in 1989	Hong Kong government (1993)	4 yr. (10 yr. feasibility study)	1+1 (Hong Kong & China (for airport core))

Replacement of the earlier complicated 'Master Lease' and 'Special Zoning District' by simple mapping and zoning classification together with use of five major steps [master plan, street mapping, zoning text, provision of infrastructure and design guidelines] as a development control has significantly helped the smooth implementation of the new master plan at BPC. The Battery Park City Authority has prepared detail urban design guidelines for each neighborhood and architectural detailing of each building within the City's planning framework to reinforce street map and zoning text, to help developers in bidding process and to the authority's own design review process. As the authority has received the street mapping and planning permit in advance from the City Commission for the office and residential construction (except for north neighborhood development), the developers simply need to follow the guidelines and get the building permit from the City (Table 4).

Table 4: Comparative study of development approval required outside the agency

Project	Implementing agency	Permission required	Permission required outside the agency
BPC (1969 master development plan)	Battery Park City Authority	(a) Special district zoning, (b) Permanent architectural board, (c) Community board review, and (d) Board of estimate review	4
BPC (1979 master plan)	Battery Park City Authority (under UDC)	(a) BPCA reviews design, (b) ULURP zoning review; and (c) Community board review (for north neighborhood only)	0 for North neighborhood only
MM 21	Public sector and Third Sector (Yokohama MM 21 Corporation)	(a) Town development council reviews the design, (b) City planning council and Prefecture council (for specific block only)	0 for specific block only
CWRP	TDD & other government departments	(a) Town planning board, (b) Land agency (for lease agreement)	1

[Note: ULURP - Uniform Land Use Review Process, TDD –Territory Development Department]

In the case of MM 21 too, for the first time, the development coalition (public, private and land owners and third sector) has reached to an agreement (Town Development Agreement) regarding the basic theme of the development and some policies for project implementation (Yokohama MM 21, 1995). The Town Development Council comprising of twenty five members [including all land owners] comprises of many planning and design elements ranging from the theme of the development to the detailing of pedestrian network, setback of the structure, skyline, signage and so on. For super-blocks and other large scale development, the council forwards the application to the City Council and Prefecture government. As numerous planning parameters such as floor area ratio, site coverage, land use and other development detailing are incorporated in the land lease condition and are fixed at the time of lease agreement in Hong Kong, urban design guidelines and site specific requirements have been prepared to achieve the quality development at CWRP. Thus, simplified development approval mechanism not requiring permission from outside of the implementing agency in case of BPC, based on Town Development Agreement at MM 21 and pre negotiation during lease agreement at CWRP has not only increased developers' confidence but also minimized the time required for planning and building permit thereby encouraging developers for higher price bidding and quick construction work. Third, despite differences in scale,

shape and initiation of the project, all the implementing agencies have used similar type of strategy during implementation phase with some variations. In the case of BPC, the negative 'image' of the site was changed by taking the site out of the lease from the City as well as by constructing high quality infrastructures and public amenities in the early phase to attract private developers. Moreover, the completion of World Financial Centre with opening of offices by many renowned private sectors has further strengthened the quality of the waterfront site. In both Asian cases, the regional transportation network linking various centers to waterfront sites have been constructed in the initial phase to encourage decentralization of business activities from city centers. They have also constructed high quality infrastructures and public facilities including office spaces in the subsequent phases to build a new 'icon' of the site: Landmark building at MM 21 and Hong Kong financial center at CWRP (the tallest buildings in both cities). To ensure the quality, BPCA has used two stages for developer selection: financial criteria and limited design competition. It has adjusted its working schedule based on local real estate market cycle by investing on public infrastructure during the recession period. Only for the construction of prestigious buildings, limited competition was carried out at MM 21 and CWRP; otherwise single stage for developer selection is the general practice. Fourth and last, absence of public consultation in the early phase and emphasis on road and infrastructure development even on the waterfront sites, on the one hand, and increasing awareness on democracy and sense of ownership among the people of Hong Kong specially after handover of the State to China in 1997, on the other hand, have intensified the concern on local community's over the massive land reclamation in the Victoria Harbor. Despite the existence of wide-ranging urban design principles in government planning guidelines, implementation is weak due to the historical reasons of land use planning serving mainly utility purposes, and thereby driven by the needs of government departments rather than for the enjoyment of the community. After prolonged litigation by Hong Kong's Society for the Protection of the Harbor, the Special Administrative Region's highest court in 2004 issued a landmark ruling, forcing the government to redraw the plan for its CWRP (part III) and setting tight restrictions on how further harbor land can be reclaimed. As per court ruling, land reclamation in the part III of CWRP has been reduced and incorporated into the approved Central District (Extension) Outline Zoning Plan (Planning Department, 2006). Also, the Planning Department released an illustrative design concept for the new harbor front together with drawings, pamphlets, and a physical model in May 2006. In the meantime, the Harbourfront Enhancement Committee (HEC) has completed a public participatory program called 'Central Harbour front and Me' (CDarM) to consolidate public views on new waterfront development.

Conclusions And Recommendations For Future Waterfronts

Redevelopment of mega urban waterfront projects, adjacent to the city center is a new global phenomenon. Because of presence of water, such development is complex and possesses both challenges and opportunities, which are best illustrated by the three ongoing prominent waterfront development namely Battery Park City in New York, Minato Mirai 21 in Yokohama and Central Wan Chai Reclamation Project in Hong Kong. Though the multiple attributes of water has been recognized and used in structuring the built form in the master layout plans, numerous adjustments in legal and institutional framework have been carried out during the implementation of the project. Critical comparative analysis of these cases up to present stage reveals that the success lies at two levels. At broader aspect, comprehensive study of the project feasibility, consensus and cooperation among the development partners including public consultation from the initial phase of the project is essential. At the local context, master layout plan that not only fits into the site context but also suits for incremental construction with integration of urban function and water, formulation of urban design guidelines and architectural detailing, adaptation of flexible development control system (to be adjustable over a long run of implementation) and strategy of fulfilling the developers' needs and adjusting the market conditions all lead towards the success of waterfront implementation. Lessons learned from these cases have worldwide implications on urban design theory, education and practice. The following key recommendations are suggested for future waterfront change:

- [a] Use water as a structuring element for urbanity by exploiting its multiple attributes in master layout plan and building design;
- [b] Dedicate water's edge for public enjoyment and recreation through diverse design criteria and provide direct public access (physical, visual and psychological) towards those amenities;
- [c] Develop urban design guidelines (to address present needs to respond site context) and implement them through adopting flexible and simple development control mechanism keeping rooms for negotiation, suggestion and incentives;
- [d] Build the capacity of implementing agency not only for maintaining cooperation and coordination among development partners but also for balancing the public goals and private money during the implementation phase.

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Module: Urban design approach in land pooling (D2M2)

Land Pooling System in the Kathmandu Valley - Need of Urban Design & Conservation Approach -

Bijaya K. Shrestha, Ph. D.

Abstract

Instead of integrating land plotting and building component at site level and linking project site to fulfil the planning goals of urban development at city level as the cases of Japan and South Korea, the present practise of land pooling system in the Kathmandu Valley is limited to small scale land development with formation of residential plots, successful only in financing basic infrastructure but failure in achieving lively urban environment. Absence of Master Plan and Development Control for the Kathmandu Valley, lack of planning standards and guidelines for land subdivision and infrastructure provision, poor technical and managerial capabilities of the implementing agencies namely Kathmandu Valley Town Development Committee and Municipalities including lack of alternative mechanism in financing the development cost other than contribution from the benefited landowners all have constrained the effectiveness of land pooling system. To reverse this trend, an urban design and conservation approach in preparation of master layout plan and formulation of site specific design guidelines for building construction and infrastructure provision incorporating the surrounding existing areas of the project site as well as linking land pooling program to city development goals is essential. Moreover, the strengthening of the implementing agencies, networking among the concerned line agencies for provision of physical infrastructure and social and emergency amenities, and identification of alternative financing mechanism together with involvement of private sectors based on the scale, size, location and nature of the project are also recommended.

Key Words: Land pooling, Kathmandu Valley, Infrastructure provision, Urban environment, Master plan, etc.

Contextual Study and Objectives of the Study

Land Pooling (LP) also known as urban land readjustment, land consolidation, land regroupment, land reform and land reordering comprises of land management and infrastructure allocation (and improvement) through assembling the groups of land parcels for unified planning, modifying them in terms of shape, location, size with selling some of the new reserved plots to recover the cost of redistribution and then finally returning the remaining serviced plots back to the land owners. Characterised by self-financing, land owners friendly (Doebele, 1982), minimum conflict (Yomralioğlu, 1993), new dimension in public-private partnership, this system as a two tier urban development technique has been successfully implemented in Japan, South Korea, Taiwan and Australia (Archer, 1997). In the Kathmandu Valley too, this program has been implementing since 1988 to create serviced housing plots and to develop open spaces and community facilities. Nearly a dozen of land pooling projects has been implemented in the Valley alone and many others are on the pipelines (DUDBC, 2003). However, their critical review particularly from urban development perspective is yet to be done. And this paper aims to fulfil that gap with threefold objectives. First, it reviews the key features of land readjustment techniques practised in Japan and Korea. Second, it compares these international case studies with the existing land pooling system of the Kathmandu Valley and then identifies its numerous weaknesses. Finally, it proposes some key strategy to improve the existing practice in the Valley as well as to provide policy guidelines for future land pooling projects.

Land Readjustment in Japan and South Korea

Japanese Land Readjustment (LR) as bottom-up style of planning and city building (Sorensen, 2002), initially limited to agricultural land consolidation and irrigation improvement projects (Latz, 1989) was made widespread use for peripheral city expansion, post disaster construction and new town and industrial development after enactment of new 'Land Readjustment Act' in 1954. Numerous factors help to synchronise the land development and infrastructure provision of LP areas with the urban planning at city level. First, the implementing agency and mechanism of execution is determined based on the nature

and scope of the LR project. For instance, private sector is generally limited to small scale new land development located in suburban areas whereas public agencies are involved on large scale projects. However, administrative bodies including local government can also perform nationally important projects (Miyazawa, 1982). Second, consensus among all landowners, lease holders including project affected persons is essential in individually initiated projects. However, such consensus is not required for projects that have city wide impact. Third, public exhibition of the project plan and detailing and ultimate review of them either by the Governor of the Prefecture or the Minister of Construction is compulsory for all types of LR projects, irrespective of project initiators. Fourth, those government implemented projects having city wide impact are largely covered by public finance through central and local grants besides sharing by the benefited land owners. Fifth, the municipal government staffs are involved in different ways in the projects initiated by individual and Association not only to strengthen the managerial and technical capability of private sector but also to frame those projects within the city development plan. Finally, scientific method is used in replanning the area and in calculating the contribution ratio by considering the ‘evaluation method’ of land value or the ‘areal method’ of combination of both (Hayashi, 1982).

Initiated by the colonial government after the enactment of Colonial City Planning Law in 1934, the Land Readjustment (LR) scheme in South Korea has been extensively implemented as an ideal tool for urban development since 1937. It has numerous distinct features, differs from the techniques used in other Asian countries. First, the land readjustment programs have been used to fulfil the goals of urban development in different time periods. Whereas the reshaping of the plots and realigning of the circulation system in order to reconcile the peripheral areas with the existing old settlement has been the primary concern in the land readjustment programs up until the end of the 1950s, the focus of the later programs in the late 1960s and 1970s shifted to provide housing and urban services for both the existing residents and the new arrivals (Lee, 2002). Second, land readjustment program has been primarily used as a tool for financing the installation of infrastructure network and providing lands for housing. No fund is channelled down by the central government even for the major projects. Third, though landowners and other private bodies are eligible for the project initiation, most of the projects both in large cities and in smaller towns have been executed by the public bodies, namely local municipalities. Land readjustment techniques in Korea after the enactment of the ‘Residential Land Development Promotion Act 1980’ became more refined and comprehensive in regulating the urban growth. The changes can be perceived at least in three different aspects. First, this act shifted the overall responsibility of land development from local to central government and provided the latter especially the Ministry of Construction, wider and more direct supervision over the relevant activities of the municipal governments. Second, new land readjustment projects have also provided non-residential urban functions and community facilities to create a truly comprehensive urban environment against the earlier practice of producing lots for mainly middle income housing acting as a mere dormitory section of the city. Third and last, land readjustment programs initiated by the central government are not only bigger in size and scale but also include the housing for low income family through cross-subsidy schemes.

Land Pooling System in the Kathmandu Valley

The land pooling system of the Kathmandu Valley under the Town Development Act 1988 can be broadly categorized into three stages. First, the project site is decided either by the planning agency based on the feasibility study or by the landowners and tenants themselves (at least consensus of 75% of total numbers) by requesting to the government agency. After approval from the public agency, ‘Users Committee’ comprising of the stakeholders and the ‘Project Management Committee’ consisting of experts and local officials are formed (Joshi, et. al, 2000). New construction on the site is controlled through an enforcement of moratorium. Also, a Land Management Subcommittee (LMSC) is formed to review the project’s progress, approve the project’s annual budget and resolve the land related disputes. In the second phase, after implementing arrangement and project office establishment, land records and cadastral maps of the project site are collected. Contribution ratio and quality of infrastructure provision

are also decided. Minimum developable plot size allowed is not be less than 80 sq. m. whereas the minimum street front is generally kept 6m with plot depth of two and half times the width of the plot. This scheme is to be supervised by the Project Management Committee and needs government's approval before implementation. The last stage is sending of the final re-plotting map to the survey office for preparation of new cadastral map and of delivering the new land owners' certificate. For the operation and continuous maintenance, the ownership of the open space, park and playground including community structures are transferred to the users committee whereas the infrastructure such as road, drainage, electricity, drinking water and so on are handed over to the concerned line agencies of the government.

Weaknesses in the Existing Land Pooling System in the Kathmandu Valley

Eleven completed land pooling projects in the Kathmandu Valley have produced 239.55 hectares of serviced land with 7184 plots benefiting 5980 landowners and developing urban infrastructure without public fund. Another fourteen projects are on the pipelines aiming to produce 67,980 number of plots (without plots of the Manahari, Madhyapur Thimi, Bhaktapur) on 1484.5 hectare of lands (DUDBC, 2003). However, the existing land pooling system of the Kathmandu Valley after relating with international case studies of Japan and South Korea has numerous weaknesses, which can be analysed at two levels: land development and infrastructure provision and master layout plan and construction of buildings.

Land development and infrastructure provision

First, the land and plot developed through land pooling system so far is insignificant to fulfil the housing demand of the Valley (need of 3,273 hac land and 1,96,376 dwelling units by 2011 assuming the household size of 5 with gross density of 300 pph) and to address the present trend of rapid urbanisation (with 6% annual population growth in Kathmandu). The average annual building permits issued by the Kathmandu Metropolitan City (KMC) alone was 3619 (permit record 1999 to 2001), whereas the government sector produced just 8095 (7184 from land pooling and 911 from site and services) housing plots in the last two and half decades (1977-2003). In the period of 27 years (1976-2003), Nepal was able to produce just 280.35 hac of serviced land from 15 projects, whereas Japan developed 3,82,035 hac of land (11,234 projects) in the period of 46 years (1954-2000) and South Korea produced about 43,580 hac (397 projects) in the period of 50 years (1934-84) (Table 1).

Table 1. Comparative study of area developed through land pooling system in different countries

Country	Period	Year	Land developed (hac)	Land developed per year (hac)	Remarks
Japan	1954-2000	46	3,82,035 (11,234 projects)	8305.10	800 X N
South Korea	1934 - 1984	50	43,580 (397 projects)	871.61	84 X N
Nepal (Kathmandu Valley)	1976-2003 (1988-2003)	27 (15)	280.35 (15 projects) (11 projects)	10.38 (15.97)	1 N

Second, only those participating land owners benefited from the projects as the land prices increased from 300% to 600% (Karki, 2004). In many occasions, such developed lands are resold many times just to gain the profit in transaction. Third, designation of the project area for commercial use, residential precinct, open space, and so on in the new layout plan carries a different value per square meter land. The present method of calculating the contribution ratio does not address such complicated issues in providing equity to all landowners. Finally, need of land owners' consensus in the project from concept to completion means quality and quantity of the physical infrastructure, contribution ratio and other decisions are influenced by landowners rather than actual need basis. For instance, landowners in the 'Bagmati Corridor' Project were ready to participate in the program only after agreeing on the cancellation of the open space allocation in the layout plan. For public utilities such as electricity, telephone line and so on, the project area needs to be depended on government's line agencies.

Master layout plan and construction of building – urban environment

As land pooling projects basically focus on land development and physical infrastructure provision, its integration with urban development through layout plan preparation and building regulation is weak in the context of Kathmandu Valley. The reasons are numerous. First, land pooling projects are limited to conversion of irregular plots into regular one with provision of vehicular access to each plot. Layout of street network and urban block with provision of open spaces is carried out on the basis of trade-off between the local landowners and project staffs (Table 2). The need to maintain self-sufficiency in the project financing combined with the pressures from the land owners for maximum return have significantly reduced the area allocation for open spaces and road network including provision of public facilities.

Table 2. Land use allocation in the land pooling areas

S. No.	Project name	Project area (ha)	Road (%)	Open spaces (%)	Selling plots or Reserve plots (%)	Land contribution (%)	Serviced plots to be returned (%)
1	Sainbu	24.57	22.8	12.9	20.3	56	44
2	Dallu	20	25	7	8	40	60
3	Kamal Vinayak	7.32	21.5	4.2	6.8	32.5	67.5
4	Gongabu	14.33	17.5	5.2	6.9	29.6	70.4
5	Nayabazar	40	22	4	4	30	70
6	Liwali	33.45	23.6	2.8	7.1	33.5	66.5
7	Gopikrishna	10.88	22.7	3.8	7	33.5	66.45
8	Sinamangal	35.97	20.3	5.3	7	32.6	67.4
9	Sinchitar	27.5	18.8	3.4	10	32.2	67.8
10	Lubhu	13.5	17.9	4.4	9	31.3	68.7
11	Bagmai Corridor	9.8	19	0	2.7	21.7	78.3

Source: (KVTDC, 1999; DUDBC, 2003)

Second, these projects have neglected the social aspects of urban life and thus failed to improve the community environment as a whole. Lack of socio-religious activities, retail outlets including other facilities needed for daily life have created inconvenient and monotonous life in the housing estates, developed through LP technique. In many cases, the residential buildings have been converted on ad hoc basis into elementary school, health care centre and other public facilities as per market demand thereby creating new set of problems of street congestion, poor streetscape and above all intensification of earthquake vulnerability. Third, absence of master plan at city (and Valley) level and lack of planning standard and guidelines has dramatically reduced the effectiveness of LP projects right from the site selection to the detail layout plan and land use allocation. Moreover, it is not suitable as a method for planning the overall development of the city at present. Fourth, the inclusion of urban poor and homeless families is not possible in the present LP scheme of the Kathmandu Valley due to lack of public fund and landowners' eagerness to get maximum serviced lands. In fact, the major beneficiaries are land owners having larger plots who will be least interested to contribute more lands for low income public housing. Fifth, almost all the land pooling projects were delayed by many years except the case of 'Libali,' implemented by Bhaktapur Municipality. Those projects executed in the early 1990s namely 'Sainbu,' 'Dallu' and 'Bagmati Corridor' Projects were delayed by 7 years whereas 'Gongabu,' 'Nayabazar' and 'Sinamangal' projects were extended 4 years beyond their designated period. Finally, LP requires a large number of experienced staffs to carry it out, including land appraisers, surveyors, urban designers and project administrators, which is missing in the case of Kathmandu Valley. The key role of urban designers in preparation of layout plan and formulation of building design guidelines is yet to be acknowledged not only by local landowners but also by the public implementing agencies.

Conclusions and Recommendations

Public financing and cost sharing among the concerned agencies in land readjustment projects in Japan and involvement of central government and incorporation of larger area in the developed sites in South Korea together with integration of the land development into building components through preparation of comprehensive master layout plan and formulation of new planning and design guidelines have made land readjustment projects successful and viable as a development tool in both cases. However, in the case of Kathmandu Valley, land pooling is limited to small scale land development and provision of basic infrastructure without integrating land development into building construction and linking project site with master plan of the city. The key strategy to improve this situation includes the preparation of Master Plan including formulation of planning standards and guidelines for the Kathmandu Valley, control of haphazard land development by private real estate company and individual land brokers, coordination and cooperation among the concerned lines agencies for provision of telephone and electricity lines, solid waste management and sewer-line construction. Inclusion of urban poor in land and housing unit provision through participation of private sectors as well as central government's involvement in cross-subsidy, soft loan provision and other mechanism is equally crucial. Last but not the least, an urban design and conservation approach is necessary to achieve above mentioned attributes. In this way, not only is the gain of the lost opportunity but the land pooling project can also be an opportunity to demonstrate the capability of local government in utilising local resources and building community in the weak of financial constraints.

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Module: Municipal sustainable development goals, disaster risk reduction and management and climate change (D2M3)

Disaster risk reduction, sustainable development and climate change

Contextual background

The unique geo-physical settings and the tropical location makes Nepal vulnerable to a wide range of natural and climate related hazards (earthquakes, floods, landslides, droughts and Glacial Lake Outburst Floods (GLOF)). It is among the 20 most disaster-prone countries in the world, both natural and man induced. It ranks 4th, 11th and 30th in terms of climate change, earthquake and flood risk respectively (Maplecroft 2011; BCPR 2004). It is the seventh most vulnerable nation in the world for deaths related to floods, landslides and avalanches combined; eight for flood-related deaths alone; and twenty third in terms of total natural hazard related deaths (MOHA, 2009). More than 80 percent of the total population of Nepal is at risk of natural hazards such as floods, landslides, windstorms, hailstorms, fires, earthquakes and Glacial Lake Outburst Floods (GLOFs).

The growing likelihood of a more than 2°C warmer world requires better adaptation policy (Di Gregorio et al., 2017) to reduce the current and future effects of climate change. Moreover, IPCC (2014) noted that the longer we wait to take action, the more it will cost and the greater the technological, economic, social and institutional challenges we will face. Nepal, as one of the most vulnerable countries to climate change (CC), is invariably exposed to water induced disasters and hydro-meteorological extreme events such as droughts, storms, floods, inundation, landslides, debris flow, soil erosion and avalanches. The Ministry of Science, Technology and Environment (MOSTE) identifies that current climate variability and extreme events have led to major impacts and economic costs in Nepal, emanating not only from floods and landslides but also from rainfall variability on agriculture (rain fed agriculture, soil erosion, droughts) and Glacial Lake Outburst Floods (GLOFs) (MOSTE 2014).

Though the whole country lies in the seismic belt, Terai region is prone to flooding and fire and the hilly and mountain areas are hazardous to landslides and glacial lake outburst floods. Valleys are highly susceptible to liquefaction; and the middle hills and higher mountains being highly susceptible to earthquake-induced landslides.

Variations in settlement patterns (including land use and density), socio-economic capability of inhabitants, adaptation of policies and programs causing uneven development in the past including climate change have resulted in wide variations in vulnerability and capabilities thus causing different impacts of the same intensity of disaster. A shift from a primary economic base (mainly agriculture) to a tertiary one (mainly service and information), changes in family structures (from joint families to nuclear families), and rapid urbanization has resulted in the transformation of settlements and societies with numerous consequences on disaster risk vulnerabilities. Increasing population, poverty, unplanned urban settlement and lack of risk-informed development are the main causes of the increasing vulnerabilities in Nepal.

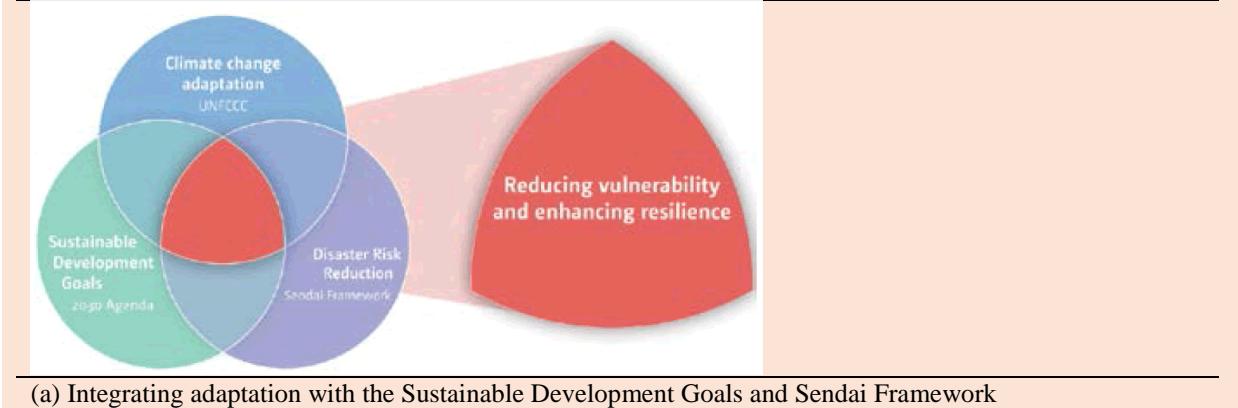
The latest examples are Gorkha earthquake of 2015, flood & landslide of 2014 & 2017, recent strong windstorm ‘Tornado’ at Bara & Parsa of 2019 that caused great loss of lives & properties. During a period of 45 years (1971 to 2015), a total of 22,372 disaster events have been recorded. Nepal is annually exposed to about 500 events of disaster (MOHA, 2016). Fire (7,187) is one of the most recurrent hazards in Nepal, followed by flood (3,720), epidemic (3,448) and landslide (3,012). As a result of disaster during a period of ten years (2005- 2015), over 700 thousand people lost their lives, over 1.4 million were injured and approximately 23 million were made homeless. In total, more than 1.5 billion people were affected

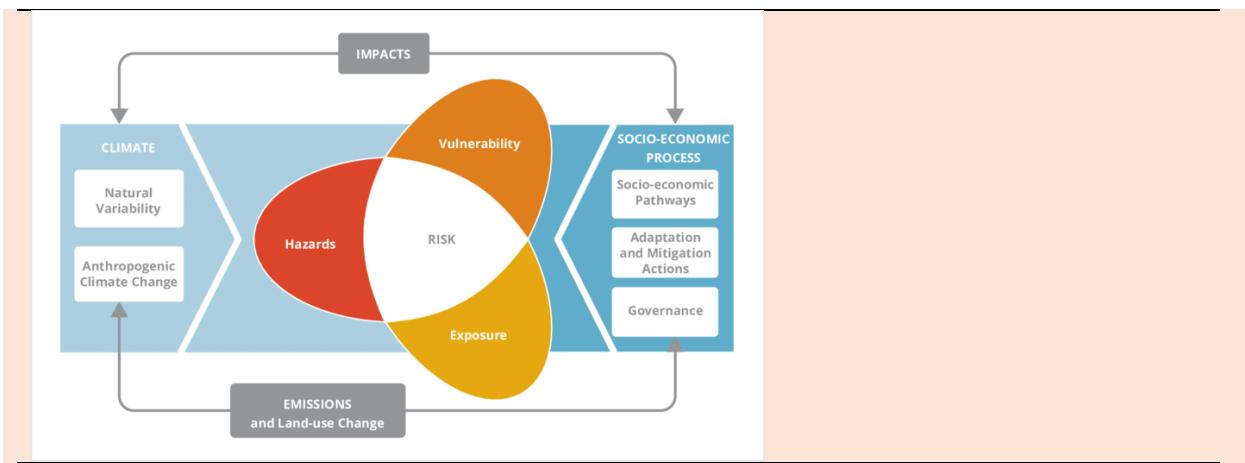
and more than \$1.3 trillion economic loss was made by disasters in various ways (MOHA and DPNet-Nepal, 2015).

The year 2015 was marked by three global initiations: Sendai Framework for disaster risk reduction (DRR), Sustainable Development Goals (SDGs) and Paris Agreement, COP21. Priorities under each global agenda were mutually reinforcing and guided Nepal to further prioritize country's specific agenda for resilient and sustainable development. Nepal has also made consistent efforts in strengthening legal frameworks, policy and planning, organizational aspects, institutional capacities and partnerships for Disaster Risk Reduction and Management (DRRM). The Constitution of Nepal has set the policy of disaster risk reduction, early warning, disaster preparedness, rescue, relief and rehabilitation for safeguard & sustainable development to minimize the risks from disasters caused by natural hazards, engaging all levels of governments. It devolves power and resources to provinces and local government units, necessitates urgent support for mainstreaming DRR and CC across three tiers of periodic planning, budgeting and implementation to adopt the risk informed development practices. The National DRR Policy 2018 and DRR Strategic National Action Plan (2018 – 2030), consistent with Sendai Framework for Disaster Risk Reduction (SFDRR) priorities have paved out wider opportunities to work with Nepal's federal system of governance to work on DRRM. With the promulgation of new Disaster Risk Reduction & Management Law (2017), Nepal has shifted its focus from reactive to proactive engagement for DRRM. National Planning Commission (NPC) has already taken steps to address climate and disaster risk management as an integral part of the Sustainable Development Goals and has given priority in the 15th five years Development Plan.

Integration of climate change adaptation, sustainable development goals and disaster risk reduction

Three landmark global agendas were produced in 2015: Paris Agreement; the Sustainable Development Goals (SDGs) within the framework of the 2030 Agenda for sustainable Development; and the Sendai Framework for Disaster Risk Reduction 2015-2030. Given the interconnectedness of climate change, sustainable development and disaster risk reduction, focus on the opportunities and challenges associated with pursuing the three global agendas collaboratively, as well as on options to support their future integration, especially on the country level is essential (Fig.1) (UNCCS, 2017).





(b) Linkages between adaptation, sustainable development and disaster risk reduction

Fig. 1 Relationship between climate change, sustainable development and disaster risk reduction (Source: UNCCS, 2017)

The scope of the Sendai Framework includes consideration of the need to recognize small scale and large-scale, frequent and infrequent, sudden and slow onset disasters, caused by natural or man-made hazards as well as related environmental, technological and biological hazards and risks. The Sendai Framework is the first disaster risk reduction framework to include specific targets against which progress can be measured.

Though each agenda has been formulated through a distinct process with different actors and legal frameworks, some level of integration in policies, program and legal and institutional framework associated with these three agenda is essential. It can be viewed as a series of steps or a continuum, where complete fragmentations is portrayed in opposite to perfect integration. Integration is required in identifying policy priorities, developing sets of targets and indicators that could be used to measure progress, and determining actions that contribute positively to multiple outcomes. It also allows better use of available sources and capacity in terms of human, technical and financial capabilities.

There are some common themes. Resilience features strongly in all three agendas. Climate change adaptation suggests that resilience can include both the ability to recover from a hazardous event and the opportunity to improve or ‘adapt forward’ whereas the Sendai Framework, in contrast, utilizes the concept as ‘the ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recovery from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions through risk management. By putting resilience at the core of the planning, actors can pursue solutions that contribute to all three global agendas. Sectoral approaches to planning centred on resilience, provide an opportunity to foster better policy integration. Like resilience, ecosystems can function as a common concept that brings together adaptation, sustainable development and disaster risk reduction. Ecosystem based adaptation has emerged as an important concept within the adaptation dialogues, and encourages ‘the conservation, sustainable management, and restoration of ecosystems to help people adapt to the impacts of climate change.’

Another opportunity for integrating the three post-2015 agendas is created by the common need to operate across a wide variety of sectors and scales. Adaptation, sustainable development and disaster risk reduction often involve coordinated action among a multitude of actors, including multiple ministries and government agencies, different sectoral experts, private sector actors, NGOs, local stakeholders and international partners. It includes cross-sectoral and inter-ministerial planning efforts.

Yet, another common connotation is common objectives impacting people and communities, who can play a central role in each of the three agendas. They benefit from action, have the opportunity to innovate and lead on new ideas, galvanize neighbors and other groups, and lead through example. Communities can also act as agents of change when working independently. In such cases, financial and technical assistance can be instrumental in enabling communities to achieve their goals.

Concept of multiple hazards

Built environment are becoming vulnerable due to a combination of natural, climatic and technological hazards as well as because of rapid urban growth and economic development in hazardous areas. To manage the overall risk, all hazards threatening the area of concern have to be analyzed. A multi-hazard approach accounts different probability of occurrence and intensify from hazard to hazard, assessing the hazards, which are frequently damaging the losing in built environment.

The concept of multi-hazard is related to the analysis of different relevant hazards, triggering and cascade effects threatening the same exposed elements with or without temporal concurrence (Komendantova et al. 2014). The impacts of one hazardous event are often exacerbated by interaction with another (Marzocchi et al., 2009). The mechanism by which these interactions occur varies, and may be a product of one event triggering another, or ‘crowding’, where events occur independently without evident common cause, but in close proximity, spatially, temporally, or both (Tarpainen et al. 2006; Carpignano et al. 2009; Marzocchi et al. 2012). Close proximity between events may lower resilience to disaster and make recovery more difficult, and illustrates how risk from multiple natural hazards is often greater than that suggested by risk assessment that considers hazards as independent events.

Many factors contributing to the occurrence of hazardous phenomena are either related to the environmental setting (topography, geomorphology, geology, soils, etc.) or to anthropogenic activities (e.g. deforestation, road construction, tourism). These factors contribute to the occurrence of the hazardous phenomena but they are not directly triggering the events. Triggering phenomena can be of meteorological or geophysical origin (earthquakes, or volcanic eruptions) (Van Westen et al 2014).

Four principal factors influence mountain climates, namely, altitude, continentality, latitude and topography (Barry, 1992). The effects refer to responses to an increase in the factor listed. These climatic differences, in turn, influence vegetation type and cover, hydrology, and sometimes geomorphic features (Table 1).

Table 1 Climatic effects of the basic controls of mountain climate

<i>Factors</i>	<i>Primary effects</i>	<i>Secondary effects</i>
Altitude	Reduced air density, vapour pressure; increased solar radiation receipts; lower temperatures	Increased wind velocity and precipitation (mid-latitude); reduced evaporation; physiological stress
Continentality	Annual/diurnal temperature range increased; cloud and precipitation regimes modified	Snow line altitude increases
Latitude	Daylength and solar radiation totals vary seasonally	Snowfall proportion increases; annual temperatures decrease
Topography	Spatial contrasts in solar radiation and temperature regimes; precipitation as a result of slope and aspect	Diurnal wind regimes; snow cover related to topography

Source: Barry, 1992

Multi-hazard risk assessment

Human settlements are often situated in zones such as the floodplains of rivers or mountain terrain. Often these regions are threatened by a combination of hazards occurring due to mutual interrelations either quasi simultaneously (flood and ground destabilization such as mudslide) or in a sequence (earthquake and aftershocks) or simply coinciding (earthquake and storm). In every situation the overall risk produced due to these combinations can be greater than the mere addition of the individual risk of each event. Therefore, the importance of addressing the totality of the possible hazards that may take place in a single incident is becoming more and more recognized.

Multi-hazard risk is a set of different hazards (of natural or technological origin) that spatially and/or temporally coincide and act in a combined way, such that they trigger secondary events and/or cause increased frequency and probability of occurrence of secondary hazards and/or increase the vulnerability of the exposed elements-at-risk. Different approaches have been used to assess multi-hazard risk. First, risk is quantified with indicators (sometimes weighted) and indices (Greiving, 2006; Schmidt-Thomé et al., 2010). Second, risk matrix is developed with type, frequency and intensity of combination of hazards and vulnerabilities and their impacts (Komendantova et al., 2014; Schmidt-Thomé et al., 2010; De Pippo et al., 2008; Gill and Malamud, 2017, 2014; Kappes et al., 2010; Tarvainen et al., 2006). Scenarios can be built from interactions provided in these matrices. Last, probabilistic approaches are used for quantitative assessment e.g. (Liu et al., 2016; Marzocchi et al., 2012, 2009), which in the multi-hazard risk context are used for limited types of hazards interactions mostly when one hazardous event directly triggers a secondary hazardous event.

Probability of mega earthquake in western part of Nepal

Mapping of numerous mega earthquake in Nepal and surrounding around in the past many hundred years clearly reveals that there is a huge gap in the western part of Nepal, where mega event has not been taken place in the last many hundred years (Fig. 2). Also, it is believed that the April 2015 mega earthquake was the recycle of similar events occurred in 1344 and 1833. So, the scientists have predicted that any future mega earthquake in the Himalayan region will badly impact the western part of Nepal, which includes Gandaki Province.

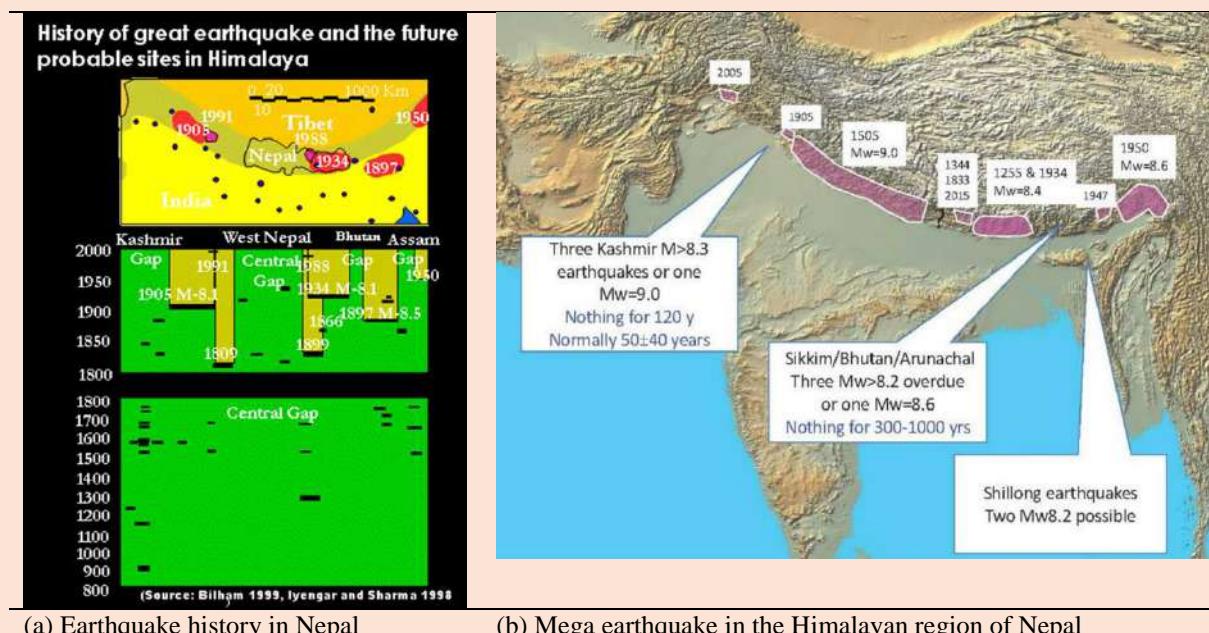


Fig. 2. Probability of mega earthquake in the western part of Nepal

Probability of climate associated hazard and impacts on various sectors in Nepal

Nepal's temperature is rising faster than the global average, and rainfall is becoming unpredictable. Warming for Nepal has been projected above the baseline average (1961–1990) as 1.2°C for 2030, 1.7°C for 2050 and 3.0°C for 2100 (MOE, 2010). The analysis under the National Communication for the United Nation's Framework convention on Climate Change (UNFCCC) also agrees with the IPCC analysis and predicts less significant change and high standard deviation in the precipitation change. This result is also largely consistent with PRECIS (Providing Regional Climates for Impact Studies) and OECD results (MOPE, 2004). Among various sectors, water resource and hydropower has been found the high certainty of impact and its severity followed by agriculture and human health in Nepal, based on biophysical risk only without considering socio-economic and demographic factors (Table 2).

Table 2 Priority ranking of climate change impacts in Nepal

Resource/ranking	Certainty of impact	Timing of impact (urgency)	Severity of impact	Importance of resource
Water resource and hydropower	High	High	High	High
Agriculture	Medium-low	Medium-low	Medium	High
Human health	Low	medium	Uncertain	High
Ecosystems/biodiversity	Low	Uncertain	Uncertain	Medium - high

Vulnerability projection under A2 emission scenario in 2050 places Nepal under significant vulnerability category for static adaptation capacity (Gray et al, 2006). Climate change is expected to cause: (i) greater water scarcity in the High Mountain Region, (ii) affect water quality and availability in the Middle Mountains, and (iii) cause more water-related disasters (flooding, landslide, sedimentation, water-borne disease, vector-borne disease) in the ‘Churia/Terai’ Region. These hazards have already been observed, and are projected (with high confidence) to increase further over the coming decades. The flood of 1985 had caused nearly total destruction of the newly built ‘Namche Bazaar’ hydropower facility. As many hydropower plants are based on the run-of-river, changes in temperature and rainfall will affect not only the energy supply generated from hydropower plants but also the entire watershed management (Smith, 1988). Infrastructure and human settlements located on riverfront and sloped area will be highly vulnerable to flooding and landslides.

Problem of frequent drought, severe floods, landslides and mixed type of effects in agricultural crops have been experienced in Nepal because of climate change (Malla, 2008). Sharp reduction of agricultural GDP and low energy output owing to the run-off-the river hydropower resulting to a significant drop of economic growth is expected due to drought (Acharya & Bhatta, 2013). Growing risk of Malaria, ‘Kalaazar’ and Japanese Encephalitis outbreak particularly in subtropical and warm temperate regions of Nepal is identified as potential impacts of climate change on health, besides increased exposure to floods and vector-borne illnesses. Communities in ‘Rasuwa,’ ‘Manang’ and ‘Mustang’ districts have experienced shifts in vegetation patterns and reduction in production and supply of timber and Non Timber Forest Products (NTFPs) (Dahal, 2006). Losses of forest species and medicinal plants have been confirmed in ‘Banke’ and ‘Bardia’ districts. Species such as tigers, rhinos and elephants which need large areas for survival are threatened by habitat modification and deforestation thereby impacting tourism. Change in temperature and rainfall pattern is creating favourable environment for pests, diseases and invasive species to emerge, spread and encroach the agricultural land, forestlands and other pasture land. Women being responsible for water collection, taking care of their families and in agricultural production, impact of climate change on them will be high.

Gandaki river basin and vulnerability

Covering 32,057 sq. km. of area inhabited by over 4.5 million people of diverse ethnicities, the Gandaki basin encompasses a varied topography from the trans-Himalayan desert and the snow-capped high Himalayan mountains in the north, down through the mid-hills to the Churia (Siwalik) range and the low-lying plains of the Terai in the south (Fig. 3). Elevation ranges from 8,091m at the peak of Annapurna I, the tenth highest mountain in the world, to around 200m above sea level in the Terai. It has important water resources with several major perennial rivers: Kali Gandaki, Seti, Marsyangdi, Daraundi, Budhi Gandaki, Trishuli, and Rapti. The eastern part of the basin was seriously affected by the 2015 earthquake.

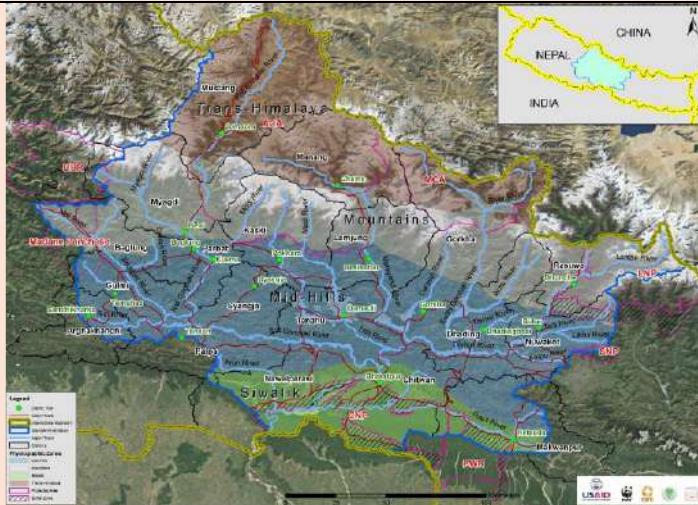


Fig. 3 The Gandaki river basin in Nepal, showing major rivers and bio-geographical zones

In rural areas people are still heavily dependent upon forests and ecosystem services for their livelihoods and wellbeing; the basin has about 35% forest cover (Ministry of Forests and Soil Conservation, 2015). Remittances from employment are the major source of household income (46%). Agriculture, tourism, salaried jobs/services and wage labor are the next largest income sources. Of the 19 districts in the Gandaki River basin, three (Mustang, Manang and Rasuwa) are in the Mountain category, 14 (Arghakhanchi, Gulmi, Palpa, Baglung, Parbat, Myagdi, Syangja, Kaski, Tanahun, Lamjung, Gorkha, Nuwakot, Dhading and Makwanpur) in the Hill category and two (Nawalparasi and Chitwan) in the Terai (Table 3). There are a high percentage of households living in medium to high climate change vulnerable districts.

Table 3 Climate change vulnerability status of the Gandaki river basin districts

Vulnerability status	Districts
Very high	Lamjung
High	Chitwan, Dhading, Gorkha, Manang
Medium	Mustang, Nawalparasi, makawanpur, Tanahu, Kaski, Prabat, Baglung, Myagdi, Rasuwa
Low	Syangja, Gulmi, Arghakhanchi, Nuwakot
Very low	Palpa

Source: (MOPE, 2010)

Patalibazar municipality and Waling municipality

Both Patalibazar and Waling municipalities have comparable area, population density, geographical condition and location including economic base (Table 4).

Table 4 Contextual background of Patalibazar and Waling municipalities

Aspects	<i>Putalibazar municipality</i>	<i>Waling municipality</i>
		
Area	147.21 sq. km.	133.85 sq.km.
Population	56,262 as per 2018 HH survey (M: 28,888 and F: 27,374), 44,876 as per 2011 census	45,608 as per 2018 HH survey (M: 21,108 and F: 24,500)
Density	382 person per sq. km.	341 persons per sq. km.
No. of wards	14	14
Economic base	Mainly agriculture and livestock and then service	Mainly agriculture and livestock and then service
Municipal status	29 Falgun 2073 BS	2054 BS (1987) and revised on 2016 AD
Physical features	749 m to 1931 m elevation from MSL	731m to 1696 m elevation from MSL

Source: Municipal profile, Putalibazar, 2018 and Municipal profile, Waling, 2018

Major findings

Low level of understanding disaster risk in Putalibazar and Waling municipalities

Both municipalities have low level of understating disaster risk within their municipal boundaries. Due to recent restructuring of the local areas, there is lacking of settlement plan of both municipalities with new boundaries. Information and data associated with hazards, vulnerability and risk are not available. District Emergency Operation Centre of Syangja started keeping records of casualties and losses due to natural and man-made disaster (and social crime) from few years only. Recently, both municipalities completed preparation of municipal profiles based on new boundary. Discussion in the inception meetings and consultations with municipal staffs in both municipalities also reveals the lack of information of hazards, disasters and impacts. Understanding of the concept of multi-hazard and risk assessment is a long way to go in both municipalities.

Municipal locations with huge variations in elevations from MSL, many rivers criss-crossing the municipality and scattered settlements all have not only ensured the existence of multi-hazards vulnerability and exposure but have also possessed multi-risk (Fig. 4).



(a) Settlement and natural topography in Putalibazar municipality



(b) Settlement and natural topography in Waling municipality

Fig. 4 Mountain topography and river system in Putalibazar and Waling municipalities

Low level of disaster risk governance to manage disaster risk

Lack of planning to manage existing settlements and to plan for future growth

Both municipalities lack planning documents to manage the existing towns and to manage future growth. As a result, there is no regulations to manage building use while issuing building permit in both municipalities. Each of them rely on ward office recommendation regarding use of building before issuing building permit. In Waling, nine story hotel was allowed to build in the residential neighborhoods, irrespective of access road and other parameters. In both municipalities, petrol pumps lie in the dense area.



(a) Petrol pump within city center



(b) Nice story hotel in residential neighborhood

Fig. 5 Inadequate regulation on building use in both municipalities

Infrastructure construction on ad-hoc basis modifying hazard vulnerability

In both municipalities, settlements are scattered among many mountain regions. Providing access to those few houses by cutting the road on ad-hoc basis using dozers has significantly increased the vulnerability of landslides (Fig. 6). Due to steep slope and unscientific connection with main roads, such road networks are also vulnerable to accident. It has also disturbed the natural drainage system.



(a) Access road to scattered settlement in Putalibazar municipality



(b) Road widening in Waling municipality

Fig. 6 Construction and widening of road on ad-hoc basis

Similarly, squeezing river system by building gable walls and road network on both sides is not desirable, as it separates the settlements from water body and the scope of providing open spaces and recreation facilities along the waterfront will be lost forever (Fig. 7). Conventional type of land pooling technique

has numerous shortcoming and needs to be reviewed from disaster risk reduction perspectives while preparing master layout plan.



(a) Construction of road on both sides of river in Patalibazar



(b) Construction of road on both sides of river in Waling

Fig. 7 Road alignment and gable wall construction on both sides of rivers

Layout of drinking water pipeline vulnerable

Polythene pipelines of drinking water in both municipalities are aligned along with surface drainage and openly exposed. In some locations, they are running over streets and footpaths (Fig. 8). In many cases, the waste water from kitchen and washing is directly thrown into drain system and such dirty water has been mixed with drinking water due to damages of pipelines and weak connection. It has significantly increased health vulnerability.



(a) Vulnerable drinking water supply pipelines along drainage in Patalibazar



(b) Vulnerable drinking water supply pipelines along drainage in Waling

Fig. 8 Health hazard of drinking water

Haphazard parking and inconvenient for pedestrian in the main market

The main road and market in both municipalities are characterized by uneven and fragment footpaths, most of the time occupied by illegal vehicle parking and extension of goods by shop owners (Fig. 9). As a result, pedestrian are forced to share the road space dedicated for vehicular movement thereby intensifying traffic vulnerability.



(a) Footpath occupied by vehicle parking in Patalibazar



(b) Vehicle parking on both sides of streets at footpath in Waling

Fig. 9 Vehicle parking along footpaths on both sides of major streets

Weak implementation of building bylaws and building codes

Though both municipalities are implementing building bylaws and building codes, they have been found inadequate. In the absence of planning, it is not clear how type of built form and city is formed by the prevailing building bylaws? In Waling, the basis of new building bylaws was taken from the central government prepared general bylaws in the post-earthquake period. Minimum plot area of 2 anna 2 paisa used for Kathmandu is not practical for Waling and Patalibazar, where majority of the citizens depend on agriculture and livestock. Minimum plot area should be adequate to incorporate animal shed and storage, besides space for house.

Many newly built houses are vulnerable as they have been embedded into sloped site. There is no connection of all columns at different levels (Fig. 10). Earthquake safer house is not possible just considering only structure but ignoring the site context. Supervision of construction is equally important, which has been found inadequate.



(a) Vulnerable new house in Patalibazar



(b) Vulnerable new house in Waling

Fig. 10 Vulnerable new houses in sloped sites

Similarly, there is a common practice of exposing the rods of columns and slabs for many years in the houses for future expansion. Those rods after contacting with the Sun and rain get eroded and transferred into other parts thereby making the structure weak (Fig. 11).



(a) Exposure of iron rods for future expansion in Putalibazar (b) Exposure of iron rods for future expansion in Waling

Fig. 11 Iron bar exposure for future expansion - vulnerability

There has been some cases of encroachment of drain. Buildings are built either over drain or just next to drain system (Fig. 12). Such situation has arisen due to combination of many reasons: absence of master plan of the municipality, poor land information system and weak enforcement mechanism. Surface drainage is very much crucial in mountain topography of both municipalities and must have clear spaces for smooth run off of rain water. Drainage master plan at municipal level is required and accordingly clauses of building regulations can be formulated.



Fig. 12 Encroachment of drainage

Possibility of investing in disaster risk reduction and for resilience

Due to close linkages to Pokhara and Butwal, these two municipalities are growing faster. As a result, demands of hotels and restaurants as well as tourist related facilities are growing up. The municipal government can encourage private sector with incentive mechanism for resilient construction. Tourist related facilities can be developed in public private partnership.

Schools and open spaces as basic unit of DRR preparedness

Convention practice of disaster preparedness generally focuses on stock piling of medicines in the hospitals and strengthening of fire fighters and ambulance. Such preparedness has been found inadequate. Both municipalities have poor facility of fire brigade and ambulance facility.

Both municipalities have public institutes with ample open spaces scattered around different wards can be used as basic unit for DRR preparedness. They can be used for information centre as well as evacuation

centre for longer period (Fig.13). Those schools need investment in developing safer school buildings, community hall and better access.



(a) Public school in Putalibazar municipality

(b) Public school in Waling municipality

Fig. 13 Public schools can be used as information centre and evacuation area during emergency period

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**Module: Post-earthquake housing reconstruction in the urban historic core and rural areas
(D2M4)**

**Reconstruction and Recovery Process in Earthquake Affected Residential
Neighbourhoods: Cases of Ward Nos. 2 and 10 in the Historic Core Area of Bhaktapur
Municipality**

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Abstract

Residential neighbourhoods of the historic core area (HCA) in Bhaktapur municipality are still lively, vibrant and above all represents the cultural heritage of the ‘Lichchhavi’ (1-9th century) and ‘Malla’ (13th – 18th century) eras sustaining the socio-economic transformation of the city and the societies. A detailed study of ‘Jela’ (ward no 2) and ‘Byasi’ (ward no 10) confirms heavy casualties and damages in the HCA by the ‘Gorkha’ earthquake. Reconstruction of the housing stocks ensuring disaster resilient and safer community on one hand, and recovery of the past socio-cultural glory of the neighbourhoods, on the other hand, has become a challenging task. Multiple ownerships on rooms, houses and lands, tiny and elongated plots with inadequate natural light and ventilation and growing family members are the local issues to be addressed. Analysis of international cases of reconstruction and recovery processes reveals the needs of central and local governments’ funding, flexibility in planning and financial mechanism and active participation of local community. However, the government of Nepal (GoN)’s numerous efforts have been found inadequate particularly for reconstruction of housing in urban areas. To tackle this situation, an urban design approach is suggested with threefold strategy. Small plots (3-5 numbers) based on household consensus should be combined into a single unit for planning purpose with common foundation and sharing of circulation spaces. Grants and soft loans from GoN, donor agencies and other sources should be put into a single basket for investing in integrated infrastructure development and housing construction (at least skeleton frame). The Bhaktapur municipality must come up with urban design guidelines and incentive package to encourage individual households for sharing of plots. It should also coordinate with central government agencies (including National Earthquake Reconstruction Authority) and local communities including third sector (NGOs, CBOs, and academic institutions) for housing reconstruction plans, detailing including construction supervision. Only this way, safer, better, cost effective and continuation of the past socio-cultural dimension is possible in the reconstruction process.

Keywords: *Historic core area, Bhaktapur, earthquake damage, reconstruction, urban design, incentive package*

Background, study objectives and methodology

Residential neighbourhood, the single most important planning components of cities guides the urban growth pattern, provides places for socialisation and recreation, enhances economic sustainability, and expresses the vernacular architecture and daily activities of inhabitants. These qualities can be clearly visible in the residential quarters of the historic core area (HCA) in Bhaktapur municipality, which are still vibrant, lively and above all have been sustaining the past socio-cultural trend. However, the M7.8 rector ‘Gorkha’ earthquake of the 25th April 2015 and major subsequent aftershocks has caused huge damages in these traditional social fabrics with numerous consequences. The death toll was 252 persons (397 injured) with damages of 45.44% of housing stocks (33.62% complete collapse and 11.82% partial damage) in the city alone (Bhaktapur Municipality, 2015). Even after ten months of the earthquake, many people are still living in temporary shelters. Others are forced to reside in the damaged vulnerable houses. Reconstruction of individual houses on isolation basis is gradually coming up. Government, donor, private and non-government organisations have been engaging for reconstruction process, yet tangible result is not apparent so far. Rebuilding of housing units particularly in the HCA possesses diverse challenges: planning, social, financial and legal including implementation techniques. Architectural and cultural heritage of the residential quarters needs to be conserved and recovered in the reconstruction of neighbourhoods. At the same time, safer and cost effective rebuilding technique is to be discovered.

Quality and timely completion of housing units is also urgent. Against, these backdrops, this paper aims to explore the reconstruction of buildings in the HCA of Bhaktapur municipality with fourfold objectives. First, it critically reviews various literatures on post-earthquake reconstruction and international case studies of earthquake recovery to draw some relevant lessons for our context. Second, it identifies different issues and problems associated with rebuilding the housing units taking the cases of two sites namely ‘Jela’ (ward no 2) and ‘Byasi’ (ward no 10) of Bhaktapur municipality. Third, it links those issues to GoN’s recently formed legal and institutional framework of earthquake reconstruction to check its effectiveness. Fourth and last, it proposes an urban design approach for redevelopment strategies and implementation techniques.

Among the seventeen wards, two areas within the HCA of Bhaktapur municipality namely ‘Jela’ on the ‘upper town’ and ‘Byasi’ on the ‘lower town,’ the most earthquake affected communities were selected for the detailed case study. The site was visited many times and consultations were done with the ward secretary and Bhaktapur municipal staffs from time to time. A standard questionnaire survey with altogether 35 questions categorised into eight different sub-heading was prepared. The series of questions included are of different nature: (i) personal information and awareness level, (ii) socio-economic condition, (iii) existing housing condition with physical problems and renovation activities, (iv) idea on new house construction, and (v) incentive required by the government. About 66 households at ‘Jela’ and 42 families at ‘Byasi’ were interviewed, few weeks after the earthquake.

Literature reviews and international case studies

Urban design is basically concerns three dimensional urban forms and an enhancement of the quality of urban life through collaboration between various disciplines focusing on cultural, ecological, political, social and aesthetics (Waterman & Wall, 2009). The quality of life includes physical characteristics of the place, such as urban fabric, street and open space network as well as socio-cultural aspect such as the sense of neighbourhood (Chapman & Larkham, 2007), increased vitality and safety, amenities and facilities. It also focuses on development vision (Ciborowski, 1982), strategy making and the role of key stakeholders in the production of space (Lin & De Meulder, 2012; Salet, 2006). Earthquake causes serious damages to the spatial forms in which economic activities and social networks are embedded. Post-disaster reconstruction and recovery should not recreate the pre-disaster vulnerabilities but aims to utilise the opportunity to build resilient communities. Policy makers need to respond quickly and effectively and hence massive development and reconstruction process is to be compressed in time and space (Olshansky et al., 2012). In post disaster situations, the management, planning, budgeting, and project implementation is expected to be much more rapid and flexible (JICA, 2013). While core fiduciary principles apply, post disaster financing is fundamentally different from the implementation of regular development projects. In nutshell, urban design for post-earthquake reconstruction emphasises strategies, guidelines and regulations, separate institutional mechanism and incentive packages.

Some specific lessons learned from various recovery projects carried out in different parts of the world would be relevant for redevelopment of earthquake affected urban areas in Nepal. First, creation of extraordinary mechanism, a separate institutional arrangement is essential for post-earthquake reconstruction. A comparative study of fourteen reconstruction programs reveals that leadership, the ability to act and knowledge of available resources, capacity of the local officials determine the success or failure of a reconstruction program (Rubin et al., 1985). Though such institutions work as a single window for donors and lenders which will reduce their burden of having to interact with multiple government agencies, however, their success depend on the nature and structure of such organisation. In India, after the Gujarat earthquake (2001), Gujarat State Disaster Management Authority (GSDMA) was set up as a statutory authority for long-term disaster management with huge budget provisions even after the completion of reconstruction work whereas Project Management Units (PMUs) were established after Maharashtra earthquake (1993) and Tamil Nadu Tsunami (2004) (Thiruppugazh, 2014). The GSDMA was also able to bring together political executives and bureaucrats on the same platform. However, in Maharashtra the

policy decisions remained with the political executives, implementation including procurement was delegated to the PMU. In Tamil Nadu the powers for policy decisions were retained by the government and a two-tier mechanism was created that separated procurement from implementation (*ibid*). Due to inadequate coordination, inter-departmental rivalry and fractured politics the ‘super reconstruction agency’ in the form of a special reconstruction ministry set up aftermath of Great Kanto Earthquake in Japan could not function effectively (Schencking, 2006). National Reconstruction Committee (NRC) with special power created after the 1976 Guatemalan earthquake was seen as a threat to their powers by bureaucrats and political leaders (Bates, 1982). Nonetheless, the creation of Earthquake Reconstruction and Rehabilitation Authority (ERRA) after the 8 October 2005 Earthquake in Pakistan prepared Disaster Management Plan, monitored reconstruction process and ensured community engagement in project implementation, which ultimately removed the earlier delay in recovery activities and confusion and inadequate coordination among participating agencies (UN-ESCAP, SAARC & GoN, 2015).

Second, quick drafting of reconstruction plans without understanding the dynamics of revitalisation processes is not always helpful. The reconstruction plans for the two past earthquakes (Hokkaido-Nansei-oki Earthquake in July 1993 and Great Hanshin-Awaji Earthquake in January 1995) in Japan were both drafted in an extremely short period of time to meet the timeline of the national budget. Despite more than 70% of the population of the cities of Kobe-shi, Nishinomiya-shi and Ashiya-shi in Hyogo prefecture worked in the tertiary industry, mainly in personal services, restoration of infrastructure through injection of the government’s heavy fund did not realise gradual return of the residents and revival of the industrial sector not only due to decline in demography but also because of the rise of competition with overseas manufacturer industries and the decline of the main shopping streets (Okada, 2011). Virtually none of the large facilities built in city centres across Japan for the revitalisation of the closed shopping districts have succeeded (*ibid*). Given the costly maintenance and repair accompanying these facilities, the costs will serve as a heavy burden particularly in areas with the aging population. The quick and participatory approach planning in China after the Great Wenchuan Earthquake (May 2008) has become ineffective, as those earthquake victims either have no passion to care about the planning or have not generated their opinions thoughtfully (Ying, 2009). Majority of ordinary people at that time still have not recovered from the shadow of the disaster.

Third, in disaster struck regions, livelihood support should be differentiated from restoration and reconstruction. Despite many reconstruction planning criteria formulated by China Academy of Urban Planning and Design and Sichuan Institute of Urban Planning and Design after the Great Wenchuan Earthquake, the reconstruction plans were much more of physical planning with little consideration of livelihood aspects such as job opportunities, local economy revitalisation and tourism promotion (Ying, 2009). Similar was the case for Kobe reconstruction plan, which mainly focused on physical redevelopment at neighbourhood level with little attention on social and economic needs of communities. Fourth, post disaster reconstruction decision is generally affected by five variables: (i) property ownership and parcel characteristics, (ii) sources and types of financing, (iii) effects of pre-existing plans, (iv) institutional framework, and (v) government intervention and regulatory framework (Robert, et al., 2005). As catastrophic urban disasters are extraordinarily expensive, external funding and resources for temporary and permanent housing are important prerequisites for successful recovery. The central government in Kobe and federal government as well as private insurance company in Los Angeles funded large scale infrastructure repairs, and subsequently for housing, business and individuals (*ibid*). Instead of distributing the central government’s relief fund directly to individuals and households in Kobe, it was invested indirectly through public housing, subsidies for joint housing, assistance for construction of rental housing and small loans for business and households. As the planning standards required changes in parcel size and street width in post-construction, small plots, land ownership and tenure issues made the recovery planning more complex, complicated and time consuming in Kobe. However, establishment of neighbourhood (machizukuri) planning process and the local government’s purchasing of small parcels and buildings simplified the redevelopment process. Moreover, Kobe City and Hyogo Prefecture

funded consulting planners to work with local ‘machizukuri’ citizen organisation for coordinating between City Hall and residents, building consensus, and negotiating complex agreements. The rebuilding and retrofitting efforts required a massive mobilisation of engineers, architects and masons in the affected sites (Hausler, 2004).

Issues and problems associated with housing reconstruction

Socio-cultural dimension of the residential neighbourhood

The traditional ‘Newari’ built form of Bhaktapur, listed in the World Heritage Site (WHS) was formed by unifying the three different ‘Kirata’ (pre-historic) settlements into one by placing the eight mother goddesses, ‘Astamatrikas,’ around them ‘during the ‘Malla’ period (13th to 18th century) (Tiwari, no date). The ‘Malla’ towns were characterised by unique features – compact and dense town form with integration of open and built spaces as ‘figure-ground,’ building blocks of three to four storey built in a row, narrow non-axial streets and houses clustered around the courtyards and street junctions based on the social status and natural ecology (Shrestha, 2010) including balance architectural composition of buildings and monuments (Hosken, 1974). It is the socio-cultural setting (of that period) that has dictated the settlement pattern, managed the town growth and sustained the urban life for the last many centuries and finally shaped the attitudes and behaviours of the inhabitants through socio-cultural norms embedded into the local festivals and daily activities.

Open spaces in the form of courtyards, squares and pedestrian lanes in the residential neighbourhoods are often supported by community amenities such as rest house (paati), temple, well or public tap. They are used for multipurpose activities in daily life as well as in festival season including for gathering in the event of earthquake. Street layout and open spaces has not only fulfilled the functional needs but they are the shared community spaces with religious and ritual meanings. This combined with the significant places like ‘chhwasa’ (a place protected by a demon) and ‘lachhi’ (private space in front of the house allocated for public use) has added cultural meaning to the streets and public squares. Display of god and goddess images, performance of religious dance, drama and ‘bhajan and kritan’ (religious pray) have been carried out on ‘dabali’ (square platform) and ‘paati.’ It has provided an opportunity for interaction of private and community life to enhance social bonds (Maskey, 1982). Common life style, use of locally available materials (brick, mud, wood, etc.) and similar construction methodology have led to the formation of singular composition on building facades with little variations on building bulk, architectural style and roof-lines thereby forming unifying street scene, enhancing volumetric definition and achieving sense of enclosure for pedestrian. Though the town has been spatially and socially divided into different ‘toles’ (neighbourhoods) based on the caste and lineage system (Levy, 1990), use of urban design techniques in space planning, installation of ‘ganesh’ image and performance of rituals and celebration of festivals are the three principles that has been combined to promote harmony between people from different classes and castes across different ‘toles.’

Planning and design issues

About 56% of houses was completely collapsed and another 29% has massive structural damage with 11% of the buildings sustained minor cracks at ‘Jela’ (Fig. 1). The corresponding figures for ‘Byasi’ are 71% completely collapsed, another 10% with major structural damage with 7% of minor cracks. Such heavy destruction of traditional houses in both areas is due to combination of many reasons. First, traditional houses were often constructed keeping the sun dried brick on the ‘outer’ layer (main façade) with mud brick ‘inside’ the wall. The bond between these two layers of bricks is always weak.

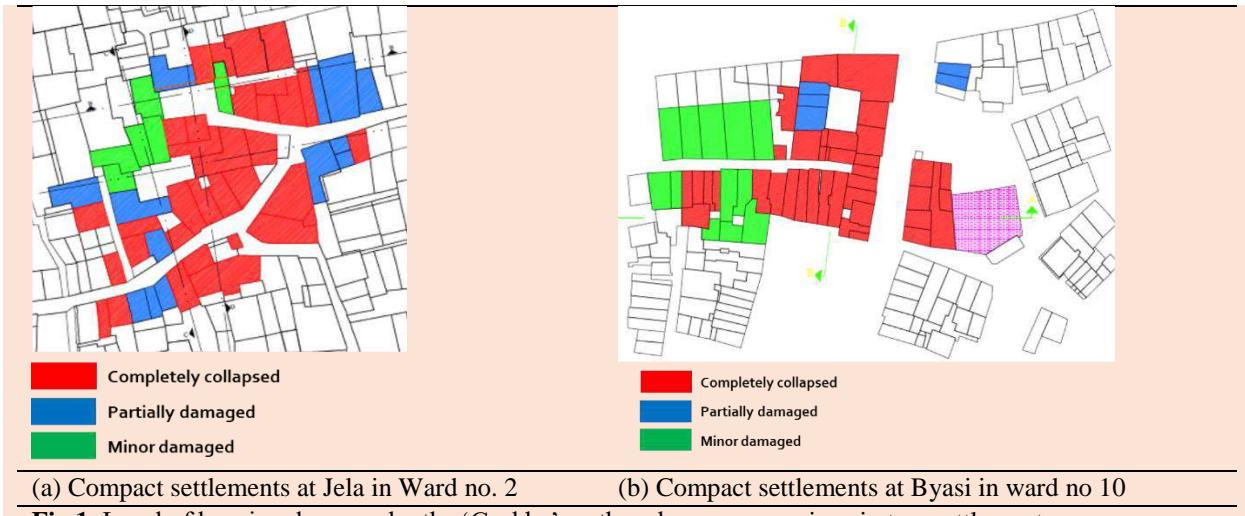


Fig.1. Level of housing damages by the ‘Gorkha’ earthquake – a comparison in two settlements

Second, traditional houses are vulnerable due to shallow foundation, absence of damp proof course, lack of tie at corner walls, heavy tiles with mud mortar on the roof and poor strength of building materials. Vertical division of traditional building stocks and then creation of new openings haphazardly on the load bearing front walls, provision of toilets and staircases in the divided part by destroying the part of the existing structure, and addition of habitable rooms by either converting the ground floor to a room, removing significant parts of the load bearing walls or adding new floors often of different materials, floor height and construction techniques on the top of the existing buildings have become norm when parental properties are equally divided among children. This whole process of rebuilding - formation of soft storeys, discontinuity in load transferring system, lateral stiffness and strengths resulting in torsional effect, creation of ‘pounding effect’ due to differences in floor and building heights, material and construction technique in adjacent buildings – has weakened the old houses of the historic core against the seismic force. Third, those collapsed houses have undergone various form of transformation. More than two third of houses at ‘Jela’ and ‘Byasi’ are more than 50 yr. old. Roof leaking, poor light and ventilation inside the room and dampness on the lower floors were the common problems faced by the inhabitants in both cases. They had carried out renovation works: addition of floors on the existing old houses, creation of door and window openings and outer plaster, through untrained masons without seeking advice from professional people. About one third of the inhabitants in both cases have hardly done any renovation work in their houses. Another issue identified in the study areas is tiny, elongated plots with small frontages (Fig. 2).

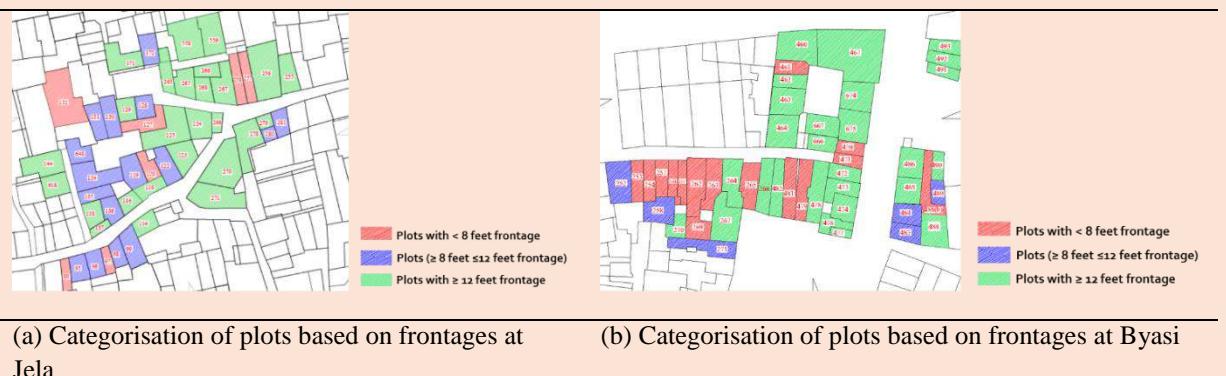


Fig.2. Irregular shaped, tiny plots with inadequate frontage for housing unit

About 18% of the plots in ‘Jela’ and 36% in ‘Byasi’ has one of the frontage less than 2.4 m (8 feet). Many of them have both frontage less than 2.4m. Layout of rooms and staircases will be extremely difficult in such plots, besides getting adequate natural light and ventilation inside the houses. Many households living in joint families (only 47% single family at ‘Jela’ and 31% in ‘Byasi,’ the rest are in joint family either with joint kitchen or separate kitchen) particularly of female members prefer to have separate housing units in post-earthquake construction. About one third of houses in the study sites have extra illegal floors beyond 35 feet (or four story) height restriction. Family members living in these illegal spaces must also be accommodated within the restricted 35 feet of building envelop in new houses.

Social problems

Social issues associated with reconstruction process are also diverse. First, multiple ownership on a single house is a common phenomenon in a ‘Newari’ community due to tradition of living in a joint family and social system of dividing the parental properties equally among children. In many instances, family members are having ownership on rooms located at different sides in different floors; others own lobby and staircase areas. Such ownership is often fixed on mutual understanding among family members rather than through legal documents. The worse situation is that some owners have sold their rooms (and other spaces) to the third party, other than their family members. Consensus among them in sharing spaces (rooms), style of new building and timing of construction and investment to be done in post-earthquake construction has become a daunting job. Those victims living in temporary shelters prefer to rebuild the house at the earliest possible whereas other owners having houses in other places are less interested in investing in the collapsed houses. Second, there is a conflict and debate regarding ownership over the ‘common walls’ between two houses, as ‘Newari’ houses are often seen in compact form with common walls at least in one side. In such a jointly built houses, demolition of the damaged part can also lead to destruction of the surrounding structure. Third, majority of households in both cases (75% in Jela and 61% in Byasi) do not prefer to share common staircases with their neighbours, citing the problems of ownership and space management.

Financial aspect

Issues related to finance are of twofold. First, majority of the victims in the study areas (62% at Jela and 42% at Byasi) have agriculture as their major source of income; others are depended on services such as masons, carpenters, office workers, drivers and shop owners. As the earthquake has also hampered their businesses and livelihoods they are not in a position to build their own houses by themselves without partial external support. Second, the GoN’s announcement of either giving a grant of NRs. 200,000.00 (two lakh) or providing a soft loan up to NRs, 2500,000.00 (twenty five lakh) for the earthquake victims in urban areas is inadequate for housing reconstruction compared to the growing high cost of building material and labour cost. Moreover, the official procedure to get this amount through the bank on four instalment basis is not only long, tedious and still unclear but it also requires submission of many documents and approval from government agencies.

Safer and cost effective reconstruction of residential neighbourhoods

Safer and cost effective reconstruction of residential neighbourhoods is still challenging due to many reasons. First, reconstruction of the individual houses in small plots will be costly and risk. Foundation footings need to be cantilevered. Traditional materials such as brick in mud mortar and wood can be used through improved detailing but it costs a lot and requires larger wall thickness, which ultimately reduces the inner spaces. Reinforce Cement Concrete (RCC) frame structure will also be expensive than normal construction cost due to needs of raft foundation and minimum column size of 30cm X 30cm (as per National Building Code), irrespective of the span. Second, despite engineering construction, such structures will always be vulnerable not only due to the cylindrical shape of the houses but also because of the ‘pounding’ effects against the seismic vibration. Third, transportation of building materials and construction management of rebuilding on individual house basis will again be costly and at the same time difficult to regulate the traditional architectural features over building design and façade treatment.

Unlike in other countries, where earthquake victims are kept in temporary housing, the earthquake affected households in Bhaktapur are living in temporary shelter. Hence, building their housing units is urgent and must get the top priority in national reconstruction process. Many donor agencies are willing to support conservation of public monuments and religious structures whereas hardly any of them is ready to invest in the reconstruction of private houses. The residents of the HCA of Bhaktapur has complied both the ‘Building Bylaws 2060 BS’ and ‘Ancient Monument Act 1956’, administered by the municipality and Department of Archaeology. As a result, the municipality was able to collect huge amount from foreigners as ‘tourist entry fee.’ However, hardly any fraction of such amount is available when those residents are in bad need of money.

Legal and institutional framework

The legal and institutional framework formed by the GoN for reconstruction of earthquake affected areas particularly on urban housing sector is inadequate. Numerous facts confirm it. First, the National Reconstruction Authority (NRA) has been assigned huge responsibility ranging from preparation of plans (integrated housing, house pooling and relocation of vulnerable settlements) to formulation of necessary bylaws and regulations to implement them including monitoring and supervision of sites as per Earthquake Affected Infrastructure Reconstruction Act 2015 (2072 BS). However, various governmental departments under different ministries and the concerned municipalities (as per Local Self-Governance Act 1999) are also responsible for urban (re)development activities. On the top of that, numerous international non-government organisation, donor agencies and local community organisations have also been involved in reconstruction works. Hence, coordination and cooperation of NRA with these agencies to avoid duplication of works and their jurisdiction areas is the pre-requisite condition for the success. Synchronisation between the permanent government staffs and the politically nominated Chief Executive Officer (CEO) and the experts at NRA is essential. The NRA recently urged all INGOs to stop their haphazard reconstruction activities carried out without coordination. Lack of transparency in supporting earthquake victims and project expenses has becoming a crucial issue. Second, though need of sustained redevelopment on inclusive basis have been cited in the directives by the Ministry of Federal Affairs and Local Development (MoFALD) and Ministry of Urban Development (MoUD) including in the Earthquake Affected Infrastructure Reconstruction Act 2015, various activities carried out on the ground have basically focused on physical aspect with little linkages to improvements of livelihood and business activities. Also, the boosting of construction industries and building material supply is also yet to get priority. Third, the two ministries’ directive clearly spelt out the concept of house pooling and urban regeneration for reconstruction of the HCA in the valley and have assigned the concerned municipalities for preparation of necessary regulations and guidelines before project implementation. However, the Infrastructure Reconstruction Act 2015 has assigned this job to NRA. None of them has prepared the said document so far. The existing legal and institutional framework is not enough to implement such integrated housing projects in the core areas. If the existing ‘Ownership of Joint Apartment Act, 2056 (1997)’ is applied, it requires not only a separate procedure for getting planning and building permit but also needs different provisions on building density and setback requirements. Redevelopment schemes proposed by some organisations and individual professional for the HCA are of two type: (a) new urban typology with mixed land use by destroying the earlier built form and socio-cultural setting and (b) individual house construction on isolation basis. Both of them do not address above mentioned issues of conservation, safer and cost effective redevelopment. Fourth, since Bhaktapur municipality has changed nothing in its recently revised Building Bylaws for the regulation of construction in the HCA, it is most likely that each individual will start constructing houses in their own tiny plots. Even a single house before the earthquake will be rebuilt as many independent houses, depending on the number of property division. It will have negative implications on safety, cost effectiveness and conserving the past traditional architectural features. Due to high percentage of areas in consuming in circulation space in the divided houses (and tiny plots), the probability of construction of illegal extra floors to accommodate the growing family member will be high. Fifth, still there are many confusion and contradiction on the existing regulations thereby making the law enforcement difficult. For instance, a single house divided

into many parts in parental property division is allowed to rebuild new houses on those divided parts as a separate building, irrespective of its size and shape. However, another clause of the same Building Bylaws requires a minimum staircase width of 2.4m in new construction. The revised National Building Code also suggests the minimum size of 30cm X 30cm RCC column. In that case, it will be not possible to rebuild a new house in those plots having width less than 2.6m. Many plots both in ‘Jela’ and ‘Byasi’ having plots with less than 2.6m are not entitled for new construction. The Ancient Monument Preservation Act 1956 in the World Heritage Site does require the reconstruction of traditional houses in its original form whereas the Building Bylaws allow the sub-division of such houses up to 2.4m in property division. Both the Acts need brick exposed façade, cornices at floor levels, traditional door and window and sloped roofs in rebuilding (or renovation) of houses in the HCA. However, the essence of ‘newari’ architecture and its quantitative aspect is hardly mentioned. As a result, these elements are placed on the building facades on ad-hoc basis with little compatible with the surrounding houses. The GoN’s new directives for regulation of new construction do not allow to keep any shutter or shop on the ground floor of the residential houses, which discourages formation of lively streetscape and vibrant town. Though Bhaktapur municipality allowed the use of 23cm X 23cm RCC column for housing construction before the earthquake, the City is now confused in issuing the permit for addition of floors on such structures, as the revised Code requires bigger column size.

Key strategy and implementation technique

Conservation and recovery of the socio-cultural aspect of residential neighbourhood

An urban design approach is required to address above mentioned multiple issues. As the residential neighbourhoods in the HCA of Bhaktapur municipality are still vibrant and lively, there is nothing to ‘regenerate.’ Instead, such qualities must be conserved and continued in the rebuilding of housing units. As the community spaces in the form of square, courtyards and pedestrians lanes including public amenities such as temples, ‘patis,’ and ‘dabalies’ have multi-functions, besides sentimental attachment of the local residents, they must be kept in its original form. However, building fabrics which have been under transformation from time to time with the changing lifestyles and city economy are suggested for intervention to balance the essence of traditional architectural values and present day needs of the inhabitants including improving the environmental condition in the rebuilding process.

Strategy for safer and cost effective housing units

Safer and cost effective housing units at the HCA of Bhaktapur municipality can be achieved through combining small plots into one single plot for planning purpose (Fig. 3). It has multiple benefits and is a win-win situation for each households. First, sharing a common staircase among multiple households result in significant increase in habitable spaces compared to individual house construction on each plot. Such increase in inner space depends on the individual plot size and shape to be combined. While combining only two plots at ‘Jela,’ the habitable spaces on ground floor as well as on first (and typical) floor increases by 136% (i.e., 1.36 times) (Fig. 4a).

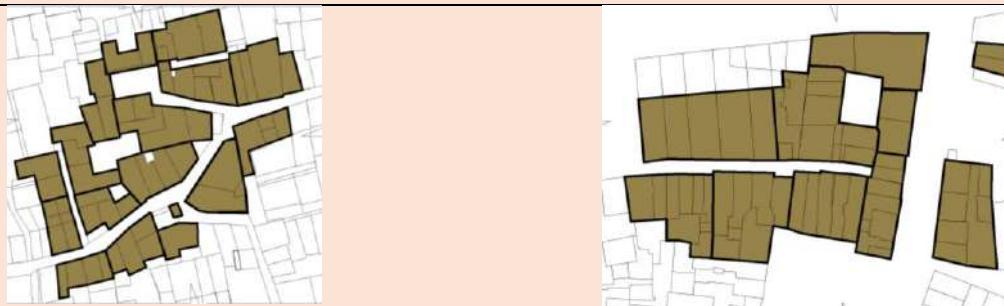


Fig. 3. Proposed possible housing blocks for common foundation and sharing of staircases at Jela and Byasi

This figure goes up to 171% on ground floor and 211% on each typical floor if four plots are combined into one unit for planning purpose. Similarly, about 5.7 times extra space on ground floor and 34.31% in each typical floor can be achieved at ‘Byasi’ while combining two plots (Fig. 4b). Upon combining four plots into one unit, as better as 10.80 times on the ground floor and 41.83% extra space can be generated. In addition to these, the circulation will be comfort and convenient and the available rooms will be of better shape and size with improved natural light and ventilation. Second, such approach results in safer and cost effective construction due to combined foundation and positioning of RCC columns (or load bearing walls) at optimum spans. Significant cost can be reduced in transporting building materials for all combined houses. Quality control during construction period will be easier. The building form itself will be more stable in terms of ground coverage and volumetric aspect compared to individual cylindrical house. Third, conservation of ‘newari’ architecture will be definitely easier in such single houses built on combined plots. As staircase and lobby area will be used by all households, equal contribution from each household is required. However, sharing of the extra habitable spaces will be carried out on proportional basis, taking reference of the plot size. For privacy and better circulation, those households having large plot areas can have their own small staircases inside their part.

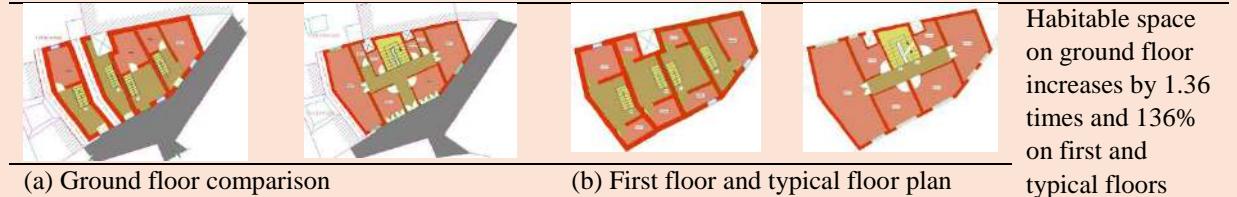


Fig. 4.a. Comparison of internal spaces: housing units on individual plots versus combined plots at Jela

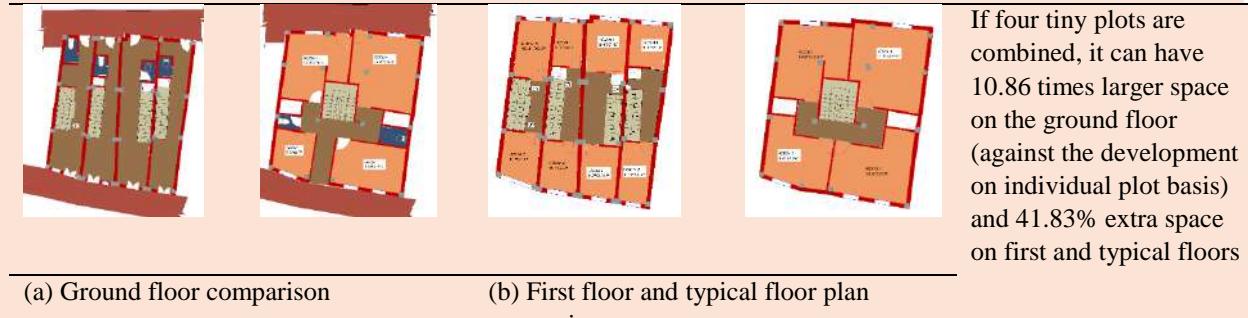


Fig. 4.b. Comparison of internal spaces: Housing units on individual plots versus combined plots at Byasi

Implementation techniques

Though majority of households in both wards during the interview time are not willing to share their properties for combined construction, nonetheless, they are expected to agree on the proposed scheme after knowing multiple benefits in terms of cost, safety and convenience. However, incentive package in the form of property tax cut, density bonus or extra Floor Area Ratio, building permit subsidises or combination of them should be designed to encourage them. Many of the households already expressed the needs of financial and technical support in rebuilding process. Bhaktapur municipality should acquire the property (land or house) of those households who are not willing to participate in the scheme even with incentive packages. All the possible funds from various sources – soft loan and grant given by the central government to earthquake victims, soft loan from the municipality through debt financing, partial funding from donor agencies (on conservation) including soft loan to be taken from Town Development Fund and other donor agencies, if possible – should be combined into a basket for investing on integrated infrastructure and skeleton frame of the housing units with outer walls. The inner partition and other detailing shall be done by the household themselves on incremental basis with their taste upon availability of money. Available cash incentives given to household even before the earthquake for new house construction confirming the traditional features as per the Ancient Monument Act and Building Bylaws

should also be collected in bulk. Finally, Bhaktapur municipality should develop urban design guidelines and link them to incentive mechanism, simplified planning and building permit system and above all coordinate with the central government and earthquake victims including NGOs, CBOs, donor agencies and academic institutions like Post Graduate Department of Urban Design and Conservation of Khwopa Engineering College for utilising their specialities in the reconstruction process.

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Post-Earthquake Housing Reconstruction in Rural Nepal: Strengths and Weaknesses

Bijaya K. SHRESTHA

Abstract

Caritas Nepal (CN) with financial support from Caritas Internationalis has been implementing shelter project under Nepal Earthquake Recovery Program (NERP) in three districts namely Dolakha, Sindhupalchowk and Kavrepalanchowk in coordination with National Reconstruction Authority (NRA), local governments (VDCs and Gaupalikas) and communities. Integrating with livelihood, water, sanitation and hygiene (WASH) and protection and psychosocial components of NERP, the shelter project has three interlinked components: capacity building, grant and technical support and cash for work. Innovative project concept design, formation of different committees at site, village, and district levels through mobilisation of local residents and CN's effective coordination between beneficiaries and government agencies have resulted in good progress in safer house construction. However, failure to consider the shelter project at settlement level and adaptation of pre-designed housing models have numerous negative consequences – demise of vernacular architecture and townscape, degradation on family and social bonding due to distribution of family members into different house units, reduction of family income from farm lands and above all formation of non-functional housing units. Consideration of social aspects of family and future needs, local architectural character and protection of community spaces through a holistic urban design approach is recommended for future shelter program of such scale. A mechanism is to be developed before the closure of the program for effective utilization of community institutions and their capability and networking in maintenance of public infrastructure and construction of safer houses in future.

Keywords: *Shelter project, Caritas Nepal, Gorkha earthquake, capacity building, fund and technical support*

Contextual background, study objectives and methodology

The Gorkha earthquake of 25th April 2015 with the strike of M7.8 rector scale together with four major aftershocks of greater than 6 rector scale, with M7.3 on 12th May 2015 caused total death of 8,898 person and injured 22,309 person in Nepal (NDRR, 2015). Millions of people became homeless. Numerous buildings and monuments were either completely collapsed or damaged; others have developed cracks on walls and roofs. Economic losses has been estimated as high as NRs. 706 billion (US\$ 7 billion) (NPC, 2015). Private sector lost has been calculated as NRs. 540,362 million (76%) compared to public sector loss of NRs.166,100 million (24%) (*ibid*). Social sector loss accounts 58% of total loss and housing sector alone covers 86% of social sector loss (*ibid*). Around 508,724 houses were destroyed and another 270,000 were damaged. The impact was greatest in rural and remote areas, where the earthquake destroyed communities' livelihoods and basic infrastructure (NRA, 2016).

For sustainable recovery and reconstruction, the government of Nepal (GON) has adopted 'top-down' mechanism by establishing a powerful National Reconstruction Authority (NRA) at the center with central and district level project implementation units. Post-Disaster Recovery Framework (PDRF) was prepared with a recovery vision of 'establishment of well-planned, resilient settlements and a prosperous society.' 'Owner-driven' approach has been adopted by giving choices to owners themselves for reconstruction with their own resources. They are provided financial and technical assistance so that people can rebuild safer permanent shelters as early as possible. NRA has been implementing reconstruction works through government's various ministries and departments in coordination with public, private, non-government and community organizations, international donors, political parties and civic society.

Nearly after four years of the earthquake, varying degree of progress has been seen in post-earthquake reconstruction works, implemented in different modality in urban and rural areas. Among them, works done by Caritas Nepal (CN) under Nepal Earthquake Recovery Program (NERP) in earthquake hit villages are comprehensive and context-specific approach under a participatory process. Shelter project

under NERP covers 4,825 households for housing reconstruction with housing grants and technical support. Additional 3,000 households receive only technical support. CN has made a notable endeavour to support 13 villages of Dolakha, Sindhupalchowk and Kavrepalanchowk for shelter reconstruction. This paper aims to review the shelter project¹ only focusing housing reconstruction carried out by CN in three districts. It has three objectives. First, it elaborates shelter project within Nepal Earthquake Recovery Program (NERP) and then analyses its project planning and implementation mechanism. Second, it identifies various strengths and weaknesses of the housing reconstruction works. Third and last, it draws a conclusion and proposes some key recommendations.

The study methodology combines different techniques and uses both qualitative and quantitative data. Numerous reports associated with NERP and various documents related to the shelter project were critically reviewed to understand project planning, background, objectives and implementation techniques. Construction sites were visited to check ongoing works and to observe completed houses. Beneficiaries and trained masons were consulted. Discussion was also done with technical staffs of CN and NRA, and chairpersons of the participating wards. Before visiting the sites, staffs from the central office of CN briefed on various activities of the shelter project and work progress.

Planning and implementation mechanism of the shelter project

While doing significant relief work, CN undertook post disaster need assessment study and formulated NERP for the period of three years. This program in accordance with GON's post-disaster need assessment policies and guidelines was also recommend by CN's stakeholders meetings at village and district levels. CN has committed to bring fund of NRs. 1,561,803,203.00 from Caritas internationalis for shelter project. It is one of the top contributors to post-earthquake reconstruction in Nepal, both financially and in terms of the number of staff assigned to earthquake response and community development projects. The main goal of shelter project of NERP is to ensure earthquake affected communities rebuild safer and dignified lives. It enables people of Nepal who were most affected by the Gorkha earthquake to rebuild their houses, restore access to safe water and sanitation facilities, restore livelihoods and enhance their resilient to future disasters. To fulfil this goal, the project has set three interrelated goals:

- (a) to build capacity of households and to mobilize them for construction of earthquake resistant houses by utilizing local resources;
- (b) to provide fund and technical support as per NRA guidelines for helping earthquake victims in constructing earthquake resistant houses; and
- (c) to provide cash for work to households for improving community infrastructure as part of developing model villages.

The shelter project is grouped into two parts: 4,769 households receiving full shelter package linking to water, sanitation and hygiene (WASH), livelihood and protection and psychosocial parts whereas 3,536 households get only technical support with livelihood and protection (Table 1).

Table 1 Shelter project in different locations of three districts

District	Location	Shelter full package, WASH, Livelihood, Protection & Psychosocial		Shelter technical support, Livelihood and Protection	
		Households (HHs)	Population	Households (HHs)	Population
Do lak ha	Orange, Bigu - 2	565	2801		
	Orange, Bigu - 3	759	3762		

	Sailung – 6		550	2,726
	Sailung - 7		580	2,875
	<i>Total</i>	1,324	6,563	1,130 5,601
Sindhupal chowk	Kalika, Sunkoshi -3	656	3252	
	Thokarpa, Sunkoshi - 1 and 2	1178	5839	
	Sunkhani, Sunkoshi-5		771	3822
	Yamunda, Sunkoshi - 4		473	2345
	<i>Total</i>	1,834	9,091	1,244 6,167
Kavrepalanchowk	Chandenimandan, Mandan Deupur - 10	1065	5279	
	Balthali, Panauti -11	546	2706	
	Sanowanthal, Chaurideurali -1		277	1,373
	Nagregagarche, Chaurideurali - 2		389	1,928
	Majhifeda, Chaurideurali -3		498	2,469
	<i>Total</i>	1,611	7,985	1,162 5,770
	Grand total	4,769	23,639	3,536 17,538

Source: Caritas Nepal, 2018

CN has adapted GON's owner-driven for house construction in communities with the slogan 'Let us build safer house ourselves' (Surakshit Awas Afain Banau). The shelter project has three interrelated activities namely empowering and capacity building of community members, funding and technical support and cash for work program (Fig. 1). They have been linked with other sectors – WASH, livelihood and protection and psychosocial support. All these activities are carried out in accordance with NRA's policies and guidelines ensuring coordination with NRA and Department of Urban Development and Building Construction (DUDBC)'s district office and Social Welfare Council (SWC).

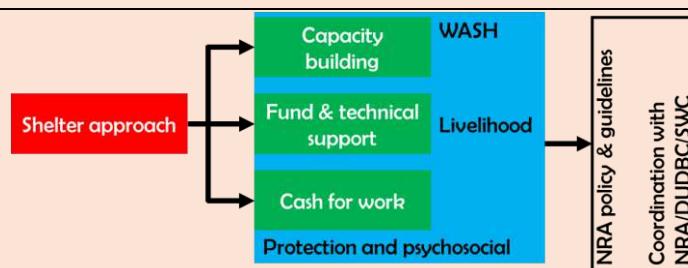


Fig. 1 Caritas Nepal's approach on shelter project of NERP

In the planning phase, CN prepared a 'logical result framework' (LRF) with clear project objectives, defined 'objectively verifiable indicators' of achievements, identified 'means of verification' and outlined various risks and assumptions for different objectives, results expected and activities proposed (Fig. 2). 'Activities' are the main elements of project component which produce the 'results.' 'Results' are the deliverables through which the 'objectives' are achieved. Fulfilment of 'objectives' leads to achieve the main goal. The horizontal rows represent three objectives, expected results and proposed activities with prescribed set of indicators and means of verification for each row. Vertical columns represent three objectives set for shelter project only.

Main objective: Earthquake affected communities rebuild safer and dignified lives

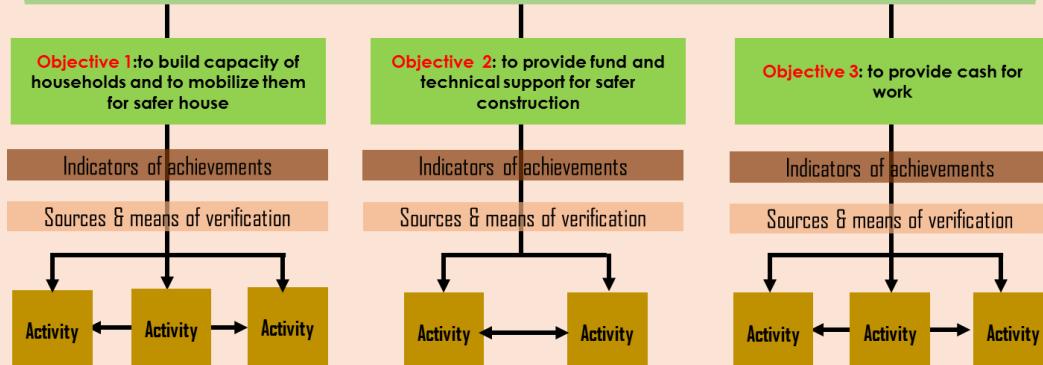


Fig. 2 Simplified form of logical result framework prepared for Shelter project

To build capacity of households and to mobilize them for safer house reconstruction' (objective I), various activities have been successfully completed. Against the target of training altogether 400 no. of masons in three earthquake affected districts, CN has already trained 729 masons (25 female) through 7 days program and 86% of those trained masons have been working full time in construction of safer houses (Caritas Nepal and Caritas Internationalis, 2018) (Fig. 3). About 250 shelter groups have been formed in 13 locations (ibid). So far 7,300 households have been oriented towards earthquake resistant shelter construction using local materials such as stone, mud, wood and bricks. For effective orientation, different committees of beneficiaries were formed: shelter group with 20-35 households, community reconstruction committee with 7-9 households and advisory committee with 11 households in three districts (Fig. 3). At least one dozen of demonstration houses have been built for the most vulnerable families in three districts (Fig. 3). Information, education and communication (IEC) materials on earthquake safer construction were also developed. It distributed 8,000 piece of one type of brochures and different kinds of posters in the three districts by June 2017 (Caritas Nepal, 2017).

There has been completion of house construction for vulnerable families: 321 out of 402 single women and 69 out of 75 households with disability. As of July 2018, 4,682 persons received the 1st tranche distribution of NRs. 50,000.00 and 4,456 households got 2nd tranche disbursement (NRs. 150,000.00). Similarly, 3,434 households have taken the last tranche of NRs. 100,000. Also, 3,083 household in Kavrepalanchowk and Sindhupalchowk and 1,249 households in Dolakha have received extra NRs. 50,000 as transportation support. Though some small community development works were carried out in the initial stage of project implementation, it was abandoned due to limitation of the budget. Its budget was transferred into housing grant support, which was increased from NRs. 200,000.00 to NRs. 300,000.00 as per government's decision.



Trained persons leading construction work in Dolakha, Sindhupalchowk and Kavrepalanchowk



Shelter group meeting in Kavrepalanchowk district



Demonstration houses for most vulnerable families in Dolakha, Sindhupalchowk and Kavrepalanchowk

Fig. 3 Activities associated with training, community orientation and construction of demonstration houses

With all these activities, significant progress is seen in housing reconstruction works (Table 2). Among 4,778 enrolled households, 4,530 (95%) households started house construction and 3,590 (76%) already completed constructing earthquake resistance house. In Orange, Bigu-2, 95% of the enrolled households have completed their new houses whereas 82% of the targeted household have built new houses in Bulung, Bigu-3 of Dolakha district. In the case of Sindhupalchowk, 66% of shelter construction is done in Kalika Sunkoshi-3 whereas this figure is 52% in the case of Thokarpa Sunkoshi-1 and 2. Shelter construction work is somehow slow in Kavrepalanchowk district: 40% completion in Candenimandan Mandan Deupur -10 and only 35% in the case of Balthali-Panauti 11. Most of the households in these locations have alternative house and businesses in other parts of Nepal and showed less enthusiasm in constructing their damaged structures.

Table 2 Status of house construction in different districts

S N	Village/ Municipali- ty	Shelter progress			S N	Village/ municipality	Shelter progress		
		Enrolle- d HH	Construct- ed units	Complete- d units (%)			Enrolle- d HH	Construct- ed units	Complete- d units (%)
Dolakha district					Kavrepalanchowk district				
1	Orang, Bigu-2	565	537	95%	5	Candenimanda- n, Mandan Deupur-10	1035	410	40%
2	Bulung, Bigu-3	734	600	82%	6	Balthali, Panauti-11	520	183	35%
Sindhupalchowk									
3	Kalika, Sunkoshi-3	655	435	66%					
4	Thokarpa, Sunkoshi-1 & 2	1,171	610	52%					

Note: % of house constructed calculated is out of the total enrolled household number in each village. 4680 households have been enrolled and Caritas Nepal will still support additional 145 households if grievances are approved. In this way, Caritas Nepal will support a total of 4,825 households.

Strengths and weaknesses of post-earthquake housing reconstruction

Strengths of the shelter project

Integrated and innovative project concept

The concept of shelter project is innovative and integrated. Various activities are systematically coordinated: first orienting and educating the beneficiaries, then changing their mind-sets and behaviours and finally engaging them for safer construction of their houses. Improvement of access road and distribution of poly tanks for storage of water in some location under ‘cash for work’ activity have facilitated construction work. Many communities have done labour sharing (parma system) to help each other construct houses. The families and communities have worked together to access resources such as tone, bricks, wood, cement, iron rods, and water for construction of the houses. Construction of demo houses has been found effective educating communities over earthquake resistant construction. Integration of shelter project with livelihood, WASH and Protection and Psycho-social support means the earthquake victims get both safer houses and dignified lives. CN has not only mobilized huge amount of fund but it was also able to convenience NRA and SWC in implementing integrated project.

Combined technical and financial support through mobilisation of local people

CN has mobilised its staffs and local residents by forming committees at different levels (Table 3). In each district, it has mobilised at least 21 staffs: 2 senior engineers at project management unit, 1 district shelter coordinator, 8 assistant junior civil engineers and 10 social mobiliser. Acknowledging the need of proper social mobilisation and local leadership in the project, CN appointed local people as VDC coordinators and 5 local mobilisers in each site. Local residents’ familiarity of the local geography, their ability to convey earthquake victims by speaking local language, and their knowledge of vulnerable households were essential for effective implementation of the project. Local shelter committees formed in each neighborhoods met regularly to ensure availability of construction materials, water and human resources. These committees have also encouraged people to share labour to help each other build houses. Labor sharing in Orang and Bulung, and Chandenimandan has reduced at least 1/5 to 1/4 of the housing cost.

Table 3 Formation of community reconstruction committees at different levels

Committees	Shelter group	Community reconstruction committee (CRC)	Advisory committee
No. of participants	20-35 households	7-9 households	11 households
No. of meeting	149	54	6
Frequency of meeting	Monthly	Quarterly	Quarterly
Approach & level of meeting	Participatory group	Ward level	Village level

Source: Caritas Nepal, Head office, 2018

CN’s technical team has supported beneficiaries in many ways. The beneficiaries get suggestion in selecting appropriate building type design and its tentative cost estimate. Once it is decided, then the team helped in layout of foundation and construction supervision particularly at foundation, damp proof course (DPC) and superstructure including roofing ensuring timely completion with quality work. Supports also include in model house construction, masons training and individual guidance.

The social mobilisers have visited door to door level of beneficiaries to aware them of NRA’s policies and guidelines, earthquake safer construction and CN’s roles. They have been supporting in filling up of the grant application forms at different stages and taking those documents to various government agencies including NRA’s district office for necessary approvals. Once all these formalities are completed, CN transfers the instalment amount to beneficiaries’ accounts and informs to the beneficiaries. As a result, they are able to receive payment of each tranche without any problem. In this way, communities are able to build safer houses using local construction materials and human resources.

Bridging between earthquake victims and government agencies

CN has been coordinating between government agencies and earthquake victims in various activities at different levels. Coordination is required empowering local communities and capacity building through different trainings, orientations and construction of demonstration houses. Grant distribution to beneficiaries in time without any hassle is possible only through effective coordination with NRA and DDC office in each district. Understanding among beneficiaries through facilitation from CN is required for effective use of ‘parma’ (sharing labor) system. CN also managed coordination with government line agencies, especially the NRA and SWC, both at national level and within the districts and villages.

Numerous outcomes as a result of various activities carried out are able to bring tangible changes at different levels. Beneficiaries have gained skills and knowledge on earthquake safer construction. Economically weak family and single women were benefitted from the project. Behaviour changes can be seen among the trained masons, engineers, local leaders and households. Trained beneficiaries have acted as ‘change agents’ by transferring their knowledge and skills to their neighbourhoods and communities. During site visits and meetings, members of different committees have developed strong bonds among themselves. Members of social institutions have developed a network with government officials working at local and district levels, local leaders and CN. Trained masons have developed network with masons from neighbouring districts.

The livelihood component of NERP trained 10,000 persons to improve their livelihoods. Each household was given choice to select support either on agriculture or livestock. Material support (cash or kind) and training were given them. Around 6,047 households were benefitted through established 8 cooperatives. About 3,062 households have improved access to safe and hygienic water from 49 drinking water system. Under protection project, school child club members were trained and different able persons got disability cards.

Weaknesses of the shelter project

Owner driver approach in a single house vs community driven strategy at settlement scale

Pre-earthquake houses in these settlements were unique and reflect the socio-cultural setting of communities. Houses were clustered around community spaces (Fig. 4) and those community spaces (either public or private ownership) linked clusters of settlements. Semi-covered veranda was the family gathering place and working area, which also acted as a buffer space between public realm (community space) and private life inside the house. Housing in the rural setting was not limited to the house alone but it also comprised of other units such as toilet block, animal shed and storage. The front community space and backside farm land was also part and partial of housing typology. This setting was also the outcome of agriculture base society of village people and fits on their lifestyles.

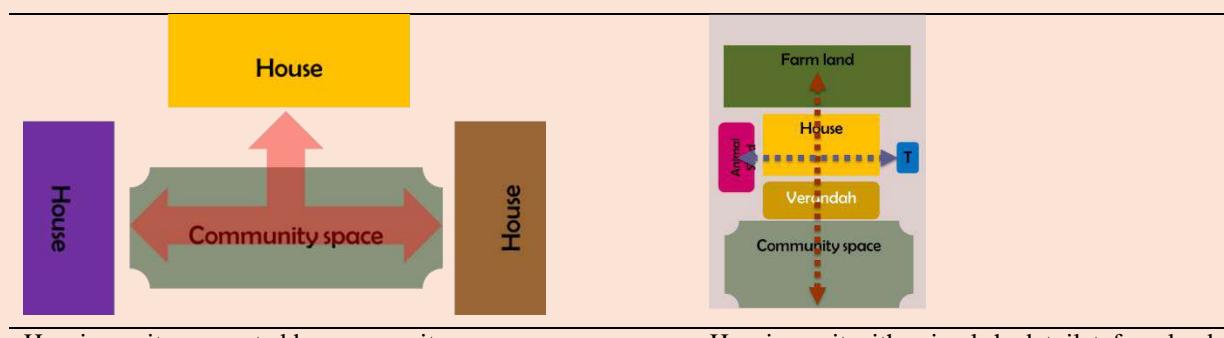


Fig. 4 Features of houses in villages of three districts

Houses were generally two story plus attic space on the top (Fig. 5). Veranda on the ground floor and balcony on the first floor with sloped slate roofs represented vernacular architecture. Local building materials and construction technology were predominated. Interior spaces of the ground floor was often

divided by only wooden posts thereby creating larger flexible spaces for different uses in different time. It allows women working in the kitchen observe their children and gossip with other family members living nearby spaces. It had strengthened family bond among members of joint family system.

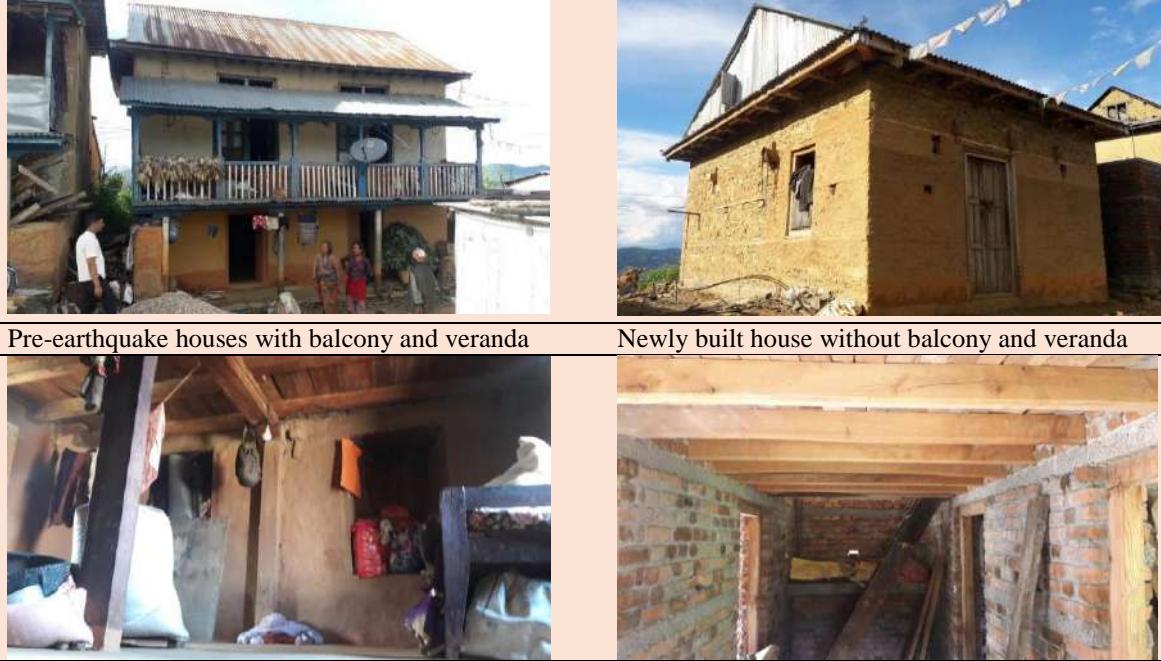


Fig. 5 Newly built houses different from pre-earthquake housing units

However, the adapted reconstruction approach focused structural safety of individual house only rather than considering community at settlement scale. The government has prepared ready-made design catalogue for rural areas and the earthquake victims have to select out of them. Such provision has failed to acknowledge salient features of community spaces, socialization patterns, lifestyle of the inhabitants and local climate and mountain topography. Most of the newly built houses do not have veranda on the ground and balcony on the first floor, which are necessary for socialization and drying out agriculture product. Replacing the locally available slates or thatched roofs by corrugated galvanized iron (CGI) sheets has negative consequences. Occupants have felt cold under CGI in winter and noisy during rainy season.

A single big house has been replaced by many single story (two rooms) units scattered around the farm land. The earlier joint family system is forced to disintegrate and family members are dispersed into two or three units. Two units are not sufficient for daily living. Conversion of earlier temporary shelters into animal shed or kitchen has changed the earlier socialization pattern and linkages of different hierarchy of spaces. It has resulted in close proximity of kitchen, toilet and animal shed thereby impacting on family health and hygiene. Family income has also been reduced due to occupation of earlier farm lands by different small housing units.

Inadequate detailing and future expansion

Some of the newly built houses have inadequate detailing for safer construction (Fig. 6). They have failed to appraise site condition fully. Few houses built along the edge of the ridge in Balthali are vulnerable to land slide. Other houses constructed adjacent to the existing stone masonry structure has problem in foundation layout. Attaching two structures of different mass and construction technology each other is vulnerable to ‘pounding effect’ during earthquake shaking. Some of newly built houses lack bracing

between wooden battens below CGI sheets in the roofs. Wooden ties between flooring and stone masonry are also missing in few houses in Bulung and Balthali.

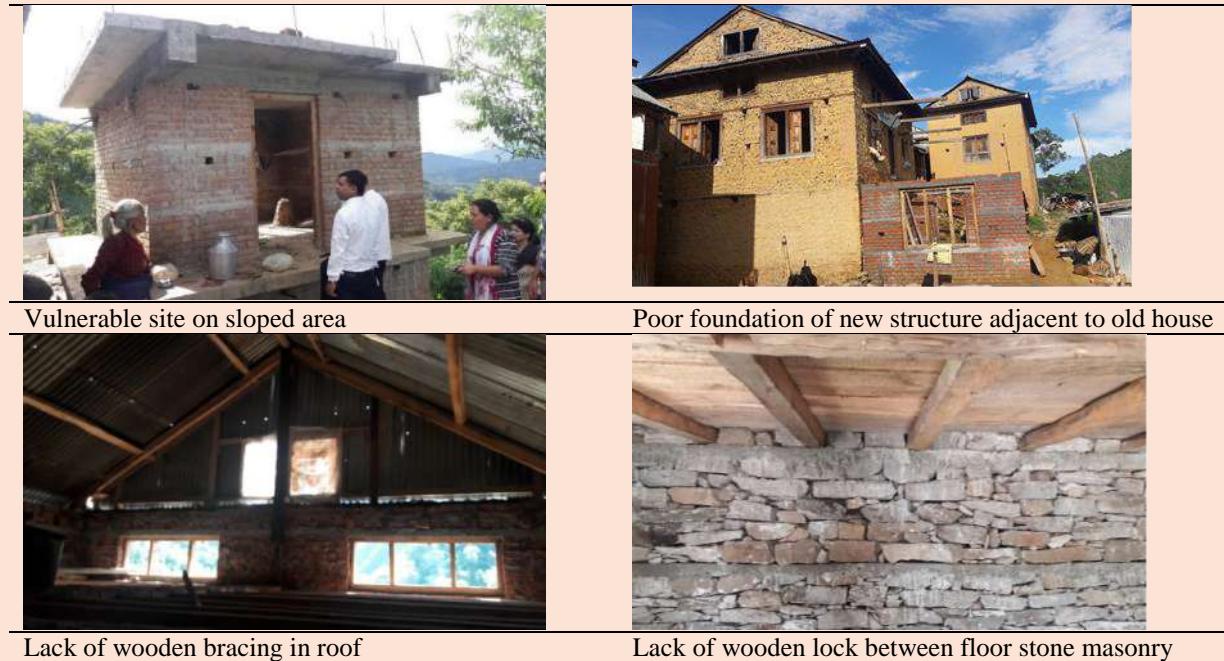


Fig. 6 Inadequate consideration of site and detailing of structure

Conclusion and recommendations

The concept design and implementation modality of shelter project of NERP implemented by Caritas Nepal in three earthquake affected districts (Dolakha, Sindhupalchowk and Kavrepalanchowk) has been found innovative. This single project of three year implemenation period has combined both theory and practice. Its various activities include public awareness, capacity building through training and orientation and application of those knowledge and skill through construction of safer houses. Shelter project has been integrated with other themes for sustainbale development. Local people has been mobilised and various committees have been formed at site, VDC and district levels. Caritas Nepal has been acting as a coordinating agent between beneficiaries and government agencies particuarly NRA and local government. As a result, the work progress has been found satisfactory. However, adaptation of ‘owner driven approach,’ relying on ready-made design of houses and above all failure to consider post-earthquake housing reconstruction work at settlement level has constrained the strengths of the project. The following recommendations have been suggested.

Safer and prosporous community building rather than focus on individual house

While implementing shelter project of such project in future, the strategy should consider wider areas at settlement scale with integrated infrastructure. Community driven approach is recommended against owner driven process. With such strategy conservation of vernacular architecture and townscape is possible by incorporating present day needs amenities. This is an opportunity too to rectify the past mistakes in planning and building construction. Engagement of urban designer is essential.

Long term sustainability: capacity buildings of social institutions and trained masons

For long term sustainability, the formed community institutions and their networking with local governments and Caritas Nepal should be continued. This together with the beneficiaries skills and knowledge should be utilsed for mainteance and operation of community infrastructure and individual

houses as well as for future earthquake safer construction by developing a mechanism at local level before closing the project in 2019.

Improvement of detailing by mobilising senior staffs in the sites

Some of the defected constructon detailing found in the site visit should be rectified by mobilizing senior technical persons before closing of the program. Such technical auditing should also trained the staffs and beneficiaries involved in the construction. Systematic documentation of project : planning, design and execution is essential as a knwoledge which should be disseminated through publications for larger mass.

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Day 3: municipal planning and urban design implementation techniques

Module: Urban design guidelines and incentive mechanism (D3M1)

What Are Incentives?

An incentive is an encouragement or motivation to change behavior or practice and/or a reward for improved performance. In the context of reducing disaster risk in urban areas, an incentive is any inducement offered to stakeholders to take action to reduce exposure and vulnerability to natural hazards in a city. Incentives typically operate on the principle that actions that exceed the minimum level of compliance—or “business as usual”—are rewarded with a bonus which may increase as the level of performance improves. The promise of the bonus—or reward—provides an incentive to act. Depending on the context, the bonus or reward may be awarded before or after the action has been taken. In environments in which the basic level of compliance is not the norm, stakeholders may require the reward to enable them to act. Incentives typically fall into one of two categories: financial incentives or nonfinancial incentives.

Financial

Financial incentives offer a monetary reward for a change in behavior or practice, and/or improved performance. Examples of financial incentives include the following:

- Grants: intergovernmental, or government to person or company
- Personal or company tax credits
- Personal or company tax rebates
- Subsidies
- Discounts: on prices or insurance premiums
- Conditional cash transfers or vouchers
- Bonds and sureties
- Access to concessional loans or credit
- Rebates on fees for development approvals and services

The case studies suggest that the financial incentives most frequently used to incentivize stakeholders on wider urban development-related issues—and most familiar to city governments—are grants, company tax credits and company tax rebates (when targeted at large businesses), subsidies, discounts, and conditional cash transfers (when targeted at households). The existing use of these incentives and the familiarity this suggests present an opportunity to cities considering the use of incentives to reduce disaster risk. However, the use of financial incentives to motivate urban stakeholders to act to reduce exposure and vulnerability to hazards remains limited and depends on the capacity and capability of the institutional environment.

Example of Financial Incentive Supporting Disaster Risk Reduction in Naga City, Philippines

The Performance Challenge Fund is an incentive program to promote good governance among local governments in the Philippines. Administered by the Department of the Interior and Local Government, the Performance Challenge Fund provides grant funding for projects that are geared toward the attainment of the Millennium Development Goals that promote local economic development, and that support climate change adaptation and disaster risk reduction. Naga City has received P2.946 million (\$64,000) from the fund to implement a project entitled Lined Canal Project at Concepcion Pequena, Naga City. The construction of the lined canal will help reduce flooding in the local area. While the grants provided through the Performance Challenge Fund are not adequate to fund large-scale

infrastructure, they can act as a catalyst to demonstrate disaster risk reduction investments and/or act as supplementary financing to strengthen disaster resilience of larger projects. Source: EMI. 2015.

Disincentives and a Perverse Incentive in the Kathmandu Valley, Nepal

In the Kathmandu Valley, a series of incentives exist for owners of homes in historic core areas (including World Heritage sites). The Department of Archaeology offers a 50% discount on the purchase of timber and 10% of the cost of cornice design. The relevant municipality offers reimbursement of a significant portion of the costs required for maintaining brick facades and timber door and window frames, and exemption from house and land taxes. To qualify, renovation or construction works need to follow building bylaws. The long bureaucratic process to obtain these incentives and the quantum of the benefits are disincentives to eligible homeowners. In addition, these incentives have created a perverse incentive to demolish traditional houses in favor of new construction. The majority of new structures have ignored many bylaws. Failure to punish those that demolish traditional houses has also encouraged others to develop two set of drawings: one for submission to the municipality to obtain a building permit and another for the construction of houses on the site.

Source: Parajuli, Y.K. and Shrestha B.K.(2015)

Capability and Capacity of City Governments In Using Incentives

In Naga City, Philippines, there is capability and capacity in the use of incentives focused on economic development and poverty reduction. While city government officials may be less familiar with the use of incentives for disaster risk reduction, this existing capability in the use of incentives for economic development and poverty reduction is likely to be relevant.

In Putting Policy into Practice

In Da Nang, Viet Nam, the city's efforts to minimize delays to investment proposal reviews and detailed site planning requirements put pressure on the city's Urban Planning Institute, which helps investors prepare detailed site plans. The limited capacity of the institute constrains its ability to respond to investors in a timely fashion. This can result in implementation getting ahead of detailed site planning.

In Disaster-Resilient Construction

In the Kathmandu Valley, Nepal, recipients of the national government's Minimum Conditions and Performance Measures grants have provided training in earthquake-resilient construction to municipal engineers. This training has strengthened the knowledge of earthquake-resistant construction in the Kathmandu Valley.

Source: EMI. 2015; ISET. 2015; Y.K. Parajuli and B.K. Shrestha. 2015.

Module: Urban design techniques in public infrastructure design and implementation (D3M2)

Nhu Pukhu [New Pond] Revitalization at Lagankhel Bus Park, Ward No. 5 of Lalitpur Metropolitan City

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Overview

Nhu Pukhu (new pokhari) located at Lagankhel Bus Park in ward no. 5 of Lalitpur Metropolitan City (LMC) is believed to be built during Malla period. Centrally located near the present Lagankhel Bus Park, this traditional pond is not easily visible as it has been circled by buildings from three sides. With growing concern on conservation of cultural heritages among citizens and after resuming the city office by elected representatives, there is a growing concern for need of revitalization of this pond. With initiation of locally elected representatives of ward no. 5 and local business group, an information gathering took place in August 2018 for redevelopment of the pond. The main aim of this study is to prepare a master plan for revitalization of 'Nhu Pukhu' of Lagankhel, Lalitpur. The specific objectives are as follows.

- (a) to carry out contextual study and historical values of the pond;
- (b) to establish urban design principles;
- (c) to prepare master plan along with detailing for the first phase of work;
- (d) to prepare tentative cost estimate, make supervision of phase-I work and to support users' committee.

Immediate surroundings of Nhu Pukhu

'Nhu Pukhu' (New Pond) measuring 110.2 m X 84.5 m (approximately) is at present enclosed from three sides with built structure. Only the west side is fronting to the street. Local vegetable market and nursery act as the northern edge whereas there is a brick boundary wall of Nepal Electricity Authority Office on the south side. The eastern edge of the pond is being occupied by shops with ward office (ward no. 5) along the east side and office buildings (such as hospitals and District Court House) across the road. Immediate land use on the north side of the pond constitutes commercial activities and on the west side is commercial and institutional activities. The water body itself is dirty. Boundary of the pond is not clearly visible and steps around water body are uneven. There is no clear cut boundary of water body and steps around the water body.

Setting urban design principles

After contextual study of the site and cleaning of the debris from water and around the peripheral area including series of consultation with various stakeholders, some important urban design principles were established before preparing master plan for revitalization of the pond (Table 1). It has basically three principles. First, the historical evidence or reminiscences available in the pond especially the width and height of the stepping on the south side should be retained wherever possible. Moreover, the original water edge has also been to be protected by removing the debris from water body on the west side. Second, the revitalization of the pond should also create a meaningful and responsive public spaces for multiple activities for different age groups and communities. Such diverse activities help to attract communities from different places and allow them to engage around the water body. Third, the whole process should be cost-effectiveness and it should use maximum local available local material (stone). Moreover, traditional building materials (bricks and stones) and construction technology would be used and promoted.

Table 1 Established urban design principles for revitalisation of Nhu Pukhu

Urban · Retain historical evidence/reminiscences wherever possible

Create a meaningful/responsive public space with activities/facilities to attract and engage people
(value added activities)

Cost effective design and detailing and incremental/phase wise construction

Historical values can be retained and promoted in three different ways in this project. It can be incorporated into planning and designing of public spaces, in selecting building materials and defining construction technology to be adopted. Responsive public spaces can be achieved through combination of many things. Variety of spaces need to be created for diverse activities associated with public spaces (with free access), disaster management perspective, ecological conservation point of view and contemporary usages. Cost effectiveness can be achieved through balancing cutting and filling materials, use of natural elements as building materials (bricks and stones) and reusing the available materials in the site.

Urban design approach and concept development

Based on the established urban design principles, the date and information collected are analyzed qualitative as well as quantitatively before taking further decisions for concept development and detailing. There has been permanent encroachment of pond areas on the north and east sides which can not be regained (Fig. 1).

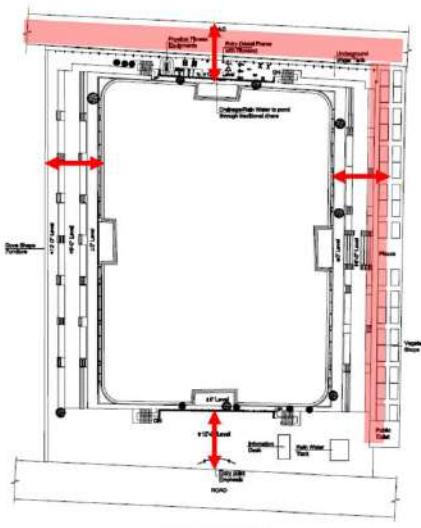


Fig. 1 Encroachment of pond's spaces on north and east sides

Only on the south and east side, there have been larger spaces around the water body. If the cross sectional width existed at present on south side is drawn around all sides, then half of the streets on west sides should be within the pond and the existing nursery and vegetable markets on the north side were built on the pond's space. Though there exist single story shed and ward office, then can be removed when necessary, as their ownership lies to Lalitpur metropolitan city. Hence, the first position made is to retain the original position and height and width of steps on the south side of the pond only. Thought there are adequate set back of the pond on east side, continuation of stepping of the south side towards east is not possible due to variation in levels on the setback on east side.

In order to retain the remaining evidence of the historical pond of Nhu Pukhu, the original edges of water body is identified by removing about 2' of debris from water body on the west side. While studying similar size of ponds in other parts of Kathmandu valley, it has been revealed that most of the ponds do

have platform in all four directions projected towards the water body from the central point, which was also found at Nhu Pukhu. So, this central platform will be restored in all direction in the master plan. The stepping spaces around the water body in all sides are being filled up with debris dumped in the past. Stone retaining walls were built on the east and west sides without any foundations. The inclined sloped walls at different elevations on all sides has functional meaning as it ensures maximum rain water collection. Similar detailing has also been found at Bhajya Pukhu (with similar purpose) in Bhaktapur. Thus, the bowl shaped profile of Nhu Pukhu will be conserved (Fig. 2). As mentioned earlier, the water's edges and profile of stepping on south sides will be retained in their original shape and size. As the setback of pond around water body will not be uniform in all four direction, it is decided to maintain the balance of space and activities across both horizontal and vertical axes through asymmetrical means.

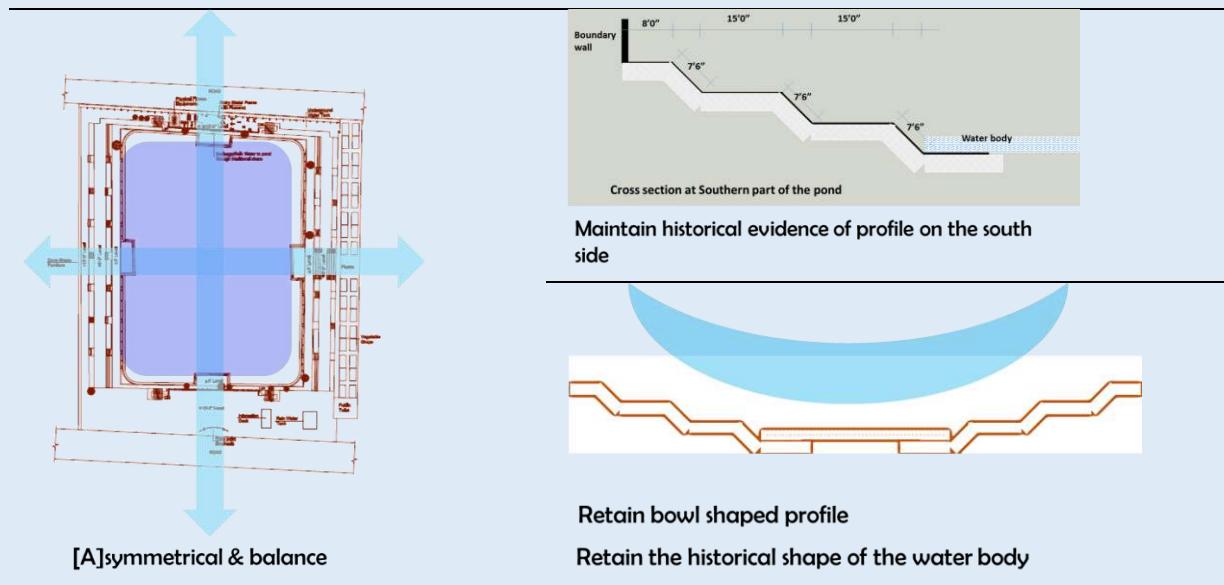


Fig. 2. Retaining historical evidences and reminiscences available at present

Master plan for revitalization of Nhu Pukhu

Above mentioned various conceptual ideas are further developed to prepare the master plan. Public spaces are created on north and south sides through various means: extra stepping of different heights, recessed spaces and transitional spaces at each four corners to make smooth movement of visitors at different levels (Fig. 3). Moreover, these spaces are also equipped with streets furniture and other facilities to engage people longer time within the pond premises. These are the two spaces where the water views can be best obtained with minimum disturbance. Another major activities are planned on the east and west side spaces adjacent to streets. On the west side, the available flat land is minimum and this space has been dedicated for physical fitness activity. There would be provision of few bicycle parking too. Similarly, the spaces on the east side, comparatively large (after demolition of the existing row of sheds including present ward office) are proposed to develop as 'flexible spaces' for multiple activities at different time period. This space comprises of open spaces for emergency situation, storage of emergency kits (at the south-east corner), public toilet (on the north-east corner) and information dispense stand adjacent to public toilet. Bicycle parking has also been planned in this side too.

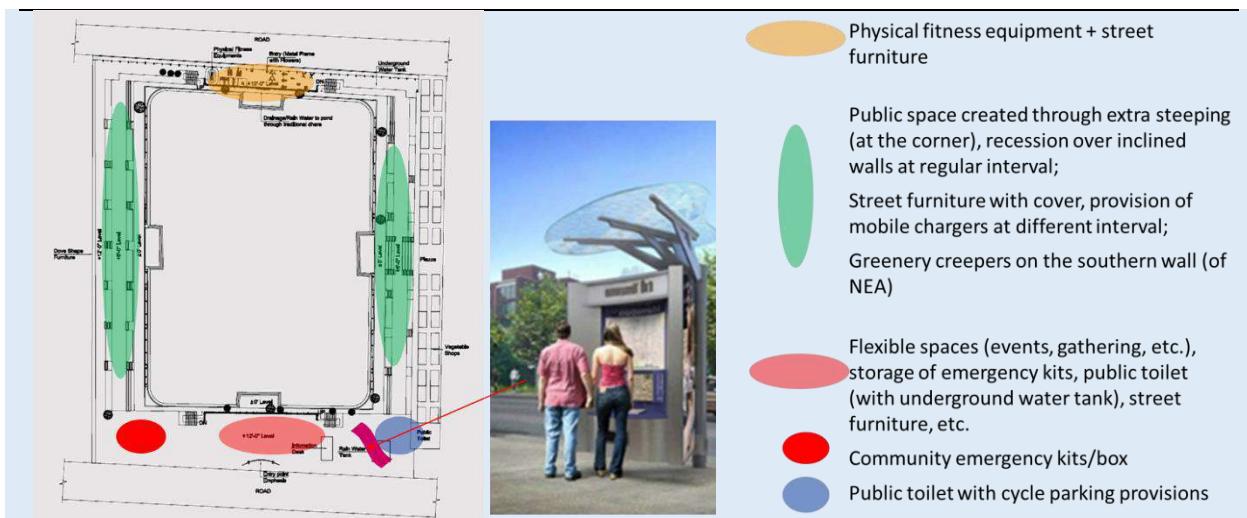


Fig. 3 Conceptual master plan for Nhu Pukhu

In a nutshell various activities are proposed to add value in the pond premises, besides retaining some of the historical evidences of stepping and water body (Table2).

Table 2 Value added activities proposed at Nhu Pukhu

Disaster prevention	Emergency kits with open spaces, public toilets, water and lighting (south side)
Ecological consideration	Ground water recharge with combination of porous pavement, greenery and use of stone
Physical fitness	Various equipment for physical fitness on west side
Contemporary use	Diverse public spaces for different age groups with facility of mobile recharge, semi-covered street furniture on north and south sides
Night time use	Provision of lightning on all sides of water body
Integration with immediate surrounding	Open to street level activities on east and west sides and linkages with vegetable market and restaurants (on the first floor in future) through visual and physical access
Continuing past memory	Retaining original state of water body with walls, height of different platforms and inclined walls between two platforms on the south side

Among the four sides, the southern part will be more active, as it has multiple activities proposed. To save the space and budget, the existing boundary wall (brick) of NEA will be screened through greenery cripplers placed on iron and bamboo posts. To break of monotonous, the entire wall are divided into sub spaces with different design for cripplers. On the uppermost platform, there will also be street furniture (semi-covered) of different design for privacy and feeling of personal space. The corner spaces will have well-defined umbrella for socialization and protection of rain and sun.

The middle platform on the south side is planned for not only movement around the water body but also created public spaces in the form of recessed walls and steps of different heights and materials (Fig. 4). Those public spaces will be equipped with mobile charging facilities using solar power and dustbin with different pots. To avoid children falling into the water, street lighting has been lined up at lower height thereby creating a sort of barrier between the lowest level platform and water body. Even with increase of water level, these lamps will not be affected.



Fig.4 Facilities for pond users (solar powdered mobile charger and dust bin)

On the west side, there would be only two levels connected with a stairway divided into two levels (Fig. 5). From the mid-landing, it is connected to the platform at level +6' on the south side. As the available flat space at the upper level is narrow in width, instead of the boundary wall, only soft boundary in the form of short steel post is proposed. Moreover, the floor level is kept as pedestrian footpath level. However, this space will have combination of tiles and greenery and those tiles will be porous for better ground water recharge. Physical fitness equipment is proposed here so that the street users and nearby communities would be benefitted. There are spaces for parking few bicycle.



Fig. 5 Proposal of physical fitness activities on the east side space, adjacent to street

One can see a good panoramic view including water body from this side (Fig. 6). The existing trees will be retained and adjusted in design. There will not be a visual prominent or well-defined entry point from this side due to lack of adequate space. It will merge gently with the footpath and street.



Fig. 6. Water and east side activities seen from the west side of the pond

Another important activity proposed on the north side is the mini open theatre utilizing the stepping proposed to have direct access to the vegetable market. It is assumed that the existing vegetable market will be dismantled and redesigned with more integration towards the pond area with provision of restaurants (terrace level) on the first floor. The central platform extended towards water body can act as a stage with continuous stepping in front will help to carry out small functions. On the west side, an underground water tank has also been proposed to collect water from surface drain, rain water from streets and Sajha building. The overflow of the tank water will be through a series of stone spouts to the pond. This feature will also be an attractive element for visitors. The east side of the pond will have similar detailing as that of west side. There will be only two levels connected to the lower level through

two stairways located on both corners. However, this side will have main entry point with large open spaces on the upper level, directly linked to the road side (Fig. 7).



Fig. 7. East side view of the pond

Delivering Urban Services in Municipality of Nepal

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Contextual background

Nepal is a landlocked country with 26.49 million populations living over an area of 147,181 square kilometres. It is rapidly urbanising at 6.40% annually against the national growth of 2.25%, with 17% of population living in 58 municipalities at present. If the 80 emerging towns and urban centres are included, the urban population reaches 25% of total population of Nepal. Internal migrants to urban areas have increased over time from 13.4% in 1971, 16.3% in 1981, 17.2% in 1991 and 26.8% in 2001. Urban population increased nineteenth fold and the number of municipalities almost six fold in the period of 60 years (Fig. 1a). If this trend continues, the urban population of Nepal will be 36% by 2025. Rapid population growth and spatial expansion of urban areas has led to a sharp increase in demand of physical infrastructure and urban services.

Infrastructure has a major contribution to growth, poverty reduction and achievement of the Millennium Development Goals (MDGs). Though the central government controlled investment choice and provided infrastructure finance through grants or loans in the past, after the enactment of Local Self Governance Act 1999, the fiscal powers and service delivery responsibilities have been transferred to local municipalities. However, most of them are facing fiscal constraints, such as rigid and narrow tax bases, that impede mobilisation of local resources to finance both services and infrastructure. To address this gap, the Town Development Fund (TDF) since its inception in 1987 has been providing technical and financial supports through grants, soft loans and loan with the support of the Government of Nepal and various donor agencies. This paper aims to focus on urban service delivery in the municipalities of Nepal with threefold objectives. First, it identifies the character of urbanisation in Nepal, presents the general picture of present situation on urban services before demonstrating the gap between supply and demand on infrastructure provisions in municipalities. Second, It forecasts the investment required for urban service delivery based on the investment done in the neighbouring countries and then also proposes alternatives sources of funding. Third and last, it elaborates the strategies taken by Town Development Fund before proposing some key recommendations.

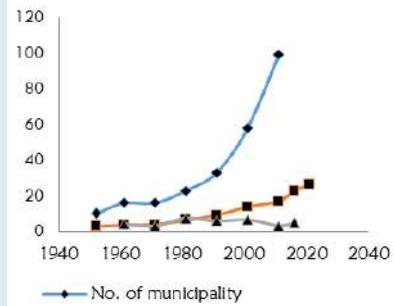


Fig. 1.a Urbanisation trend in Nepal

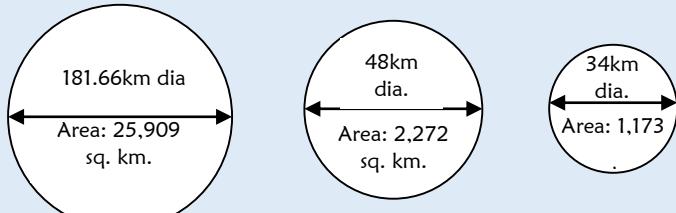


Fig. 1.b Average population served by one municipality in different ecological belt

Urbanisation pattern in Nepal can be analysed from three different perspectives. While looking at ecological belt, about 54.5% of total urban population lived in 29 urban places of hills and mountains and the remaining 45.5% of population used to stay in 29 places in Tarai belt in 2001. In terms of geographical region, Kathmandu valley used to cater 82.6% of total urban population in the 1950s accommodated only 30.9% of total urban population by 2001. From the development region perspective,

the central development region was home of half of urban population followed by eastern development region in 2001. The mid and far western development regions constitute slightly greater than 7% of urban population in 6 municipalities in each case. In the mountain area, one municipality covers about 25,909 sq. km area whereas the corresponding figure is just 1,173 in Tarai region (Fig. 1b). In hills, one municipality covers about 48 km diameter with area of 2,272 sq. km.

Urbanisation in Nepal is not largely due to an economic structural transformation. It is mainly because of combination of four reasons: (a) extensions of town's geographical area, (b) increase in the total number of towns, (c) natural growth rate of population and (d) rural-urban migration. Urban areas have mostly grown haphazardly, expanding over flood-prone areas, and agriculture has remained the main economic activity in most areas. Moreover, urban growth has not adequately transformed potential production sectors in the hinterlands. As a result, urban poverty remains as 31% in 2006 compared to 33% in 1976, even after four decades of continuous efforts. Increase of 'gini coefficient' (poverty indicator) from 0.34 in 1995-'96 to 0.41 in 2003-'04 has clearly indicated the growing gap between the rich and poor. In Kathmandu, 85.3% of wealth is used by the highest 20% of population. Gender imbalance is clearly apparent in resource distributions and control of them.

In the hills and mountains, majority of population are depended on piped water whereas people of Tarai region often use hand pump and boring water for their daily needs. About 58% of households have a source of drinking water within their premises, compared to 46% in five years ago. However, 54% of household in urban areas do not treat drinking water while the remaining 46% use a ceramic, sand or other filter (10%) followed by boiling water (9%) for treatment before drinking. Toilet coverage has increased from 6% of the population in 1990 to 43% in 2009, but huge gap between urban (78%) and rural coverage (37%) still exists. Interestingly, urban toilet coverage has stagnated at around 80% since 2000. The far and mid western development regions have the least sanitation coverage with only about 30%, whereas, western development region has the highest coverage with about 53% of the respective total regional population. The situation of road is poor. It has a very low road density of about 14.0 km per 100 sq km thus indicating poor accessibility to various parts of the country. Still 6 district headquarters namely Bajura, Dolpa, Mugu, Humla, Manang, Solukhumbu lack road connection. Roads link large and medium sized municipal towns, but economic integration with surrounding areas is weakened by lack of road links in the areas themselves. Therefore, flow of goods and people between demand and supply centers is difficult, and the economic cost is relatively high due to time spent carrying goods for sale by foot.

Infrastructure as a capital provides public services, capitalness and publicness. It impacts on economic growth by three ways: lowers the cost of input factors in the production process, improves the productivity of other input factors, and building and construction. It creates positive externalities in at least four other areas: trade, competitiveness, regional integration and tourism. It undermines the competitiveness of cities and their social and environmental sustainability. Availability of long term resources for financing urban infrastructure investments is essential for socio-economic modernisation and improvement of quality of life of citizens through planned and coordinated infrastructure development. In nutshell, adequacy in terms of quality and extent of infrastructure is a key determinant for guided urbanisation process.

Development expenditures as a percentage of gross domestic product (GDP) declined in Nepal by two third between 1990 and 2007. While expenditure levels have been declining, investment requirements have risen rapidly due to delayed investment and damage to infrastructure during the conflict. Private investment is concentrated in sectors with a potential for high returns, such as power, telecommunications and some transport infrastructure, too low to meet the growing demand. Between 1990 and 2003, Nepal's private foreign investment as a percentage of GDP only grew by 0.3% in aggregate. This minor increase in private sector financing was not sufficient to offset the impact of a decline in public infrastructure spending in the last 17 years. The declining levels of capital and recurrent expenditures have also greatly

affected key infrastructure development in Nepal. Finally, low levels of investment also had an impact on the overall quality of infrastructure. The global competitiveness report 2008-'09 ranked Nepal among the lowest South Asian countries in overall infrastructure quality.

Generally, the municipal sources of funds comprise of taxes (property, license fee and entertainment tax), users charges (water, sewerage and drainage, etc.) and lease income (rental from land, building and market) including grants from the central government. Such conventional financing techniques are often insufficient to meet the funding required for infrastructure development. Even if tax defaults are low and user fees are collected, municipal's own revenues are often not sufficient to fulfil the demand of infrastructure provision and urban services. These local bodies vary substantially in their revenue basis and tax administration capacity, and their service delivery potentials and the scope of services provided are diverse. Nepalese municipalities invested nearly NRs. 1,128,288 million as 'capital investment' in basic services (such as road, drainage and water supply) in the fiscal year 2005-'06. On average, municipalities incurred NRs. 344,380.00 for 'capital investment' in every square kilometre improvement (total municipal area of 3,276.28 sq. km.). There is a huge disparity in capital investment patterns among different municipalities. For instance, Triyuga municipality covering an area of 319.88 sq. km. with population density of 202.21 persons per sq. km. used only NRs. 25,166.00 to improve per sq. km. of its municipal areas whereas Kamalamai municipality (with 207.95 sq. km. area with 177.73 population density) spent NRs. 66,898.00 per sq. km. area. The capital city of Kathmandu invested NRs. 4,953,432 per sq. km, the highest among 58 municipalities. Low population density coupled with huge municipal coverage had caused low investment in municipalities located in the mountain and hill belts. Municipalities in Nepal are still highly depended on grants from central agencies. During fiscal year 2005-'06, about NRs. 2.470 billion have been transferred to municipalities with NRs. 1.9 billion from the then Ministry of Local Development alone. Department of Urban Development and Building Construction contributed NRs. 130.6 million and Road Board Nepal about NRs. 137.9 million. Town Development Fund contributes accounts about NRs. 293.8 million. Since the basic services (roads, water supply, health facilities etc.) are provided by the central government, limited room is left for local bodies' initiative to approach Town Development Fund, a financial intermediary. The scope of Town Development Fund's loan operation in total local government spending is still negligible (11% in 2005, declining to 3.5% in 2009) and does not at all bridge the fiscal gap to meet the development requirements of the municipalities. All these have caused huge resource gap between supply and demand of urban infrastructure. At present, per capita urban infrastructure investment in Nepal is about \$13, compared to \$17 in India, \$116 in China, \$127 in South Africa and \$391 in the UK. For low income country like Nepal, 7.5% of its gross domestic product (GDP) needs to be invested in urban services: 4.2% for investment and 3.3% for maintenance and operation. However, Nepal's present investment in urban infrastructure is just 0.8% of its GDP, compared to 5.7% in India and 9.3% in China. It is inadequate even for meeting the required operation and maintenance costs of core urban services, let alone for financing the additional requirements of civic services and other urban infrastructure. India is annually investing at least \$50 per capita (average) for urban infrastructure. For the same level of investment, Nepal needs to invest \$166.50 million per year for its 4.50 million urban population. If the population of emerging towns are also considered, it requires additional \$78.44 million, thus making altogether of \$244.94 million per year.

This situation calls for exploration of additional funding sources. Infrastructure and some services are best financed normatively over the long run so that users of the infrastructure are those who pay for it, creating the demand for debt financing instruments. Debt markets offer the promise of increased access to capital and lower borrowing costs, resulting in more efficient allocation of capital. They balance cost benefit analysis with urban development. Instead of relying on government and direct investments, new approaches to growth financing are often complemented by alternative methods of funding. Adjustments within the intergovernmental fiscal transfer systems might be a possibility; accessing loans to finance infrastructure projects is another option. Thus, more promising models of loan-based infrastructure

projects include long-term financing through specialised institution, Town Development Fund, financed by central government allocations and international donors. New approaches to growth financing include varying degrees of private sector participation through the Public-Private Participation (PPP) model, and support by multilateral agencies. Infrastructure assets around the world are shifting from public to private ownership. Other alternative sources include capital markets, private institutional investors (pension funds, insurance companies and asset leverage (land).

The infrastructure needs are dynamic and therefore changing over time in line with the socio-economic advancement of a nation. A threefold strategy of improving the service provision, creation of conducive environment for infrastructure service provider, and promotion of equitable use of infrastructure among the users is essential. In this context, the Town Development Fund's shall play a multiple roles to ensure sustainable infrastructure development thereby enhancing quality of life of urban dwellers. First, it shall expand its funding sources with supports from various donor agencies as well as government of Nepal. Second, municipalities in Nepal need technical assistance to improve borrowing capacity and management of infrastructure assets. Third, capacity of both Town Development Fund and municipalities need to enhance in project identification, priority, planning and development including implementation and post construction operation and maintenance. Till recent past, TDF had become a 'donor driven' agency investing municipal infrastructure as per donor's terms and conditions. However, its recent restructuring has clearly set its vision as 'lender of relevance,' developed business plan, established new organisation structure, and prepared common new loan and grant policies. At operation level, it has formulated Standard Operation Procedures (SOP) with key relevant documents to ensure efficient workflows. Key Performance Indicator (KPI) has also been developed for staffs' evaluation. In addition to these, national urban infrastructure investment policy is required so that loan and grant mix shall be the same irrespective of the program and donors. Urban development plan shall be prepared on the basis of regional development perspective so that incremental development of infrastructure shall be coordinated and linked with plans. Institutional capacity building for public private partnership (PPP) and other modality of infrastructure finance can also not be ignored.

Module: Municipal planning process and urban design approach for selection of project (D3M4)

Day 4: Review of municipal works and contextual preparation for group exercise

Module: sharing of review of municipal projects and discussion (D4M1)

Matrix for sharing experiences for group exercise

Issues	Possible areas for discussion						
	New area development	Historic settlements	Peripheral sprawl development	Revitalization of area	Post disaster reconstruction	Infrastructure & facilities	Other

Each participants can share own experience and interest for group exercise, which can be simply expressed in the matrix: issues of discussion and sector of development. There might be various issues: planning and design issues, legislation or institutional framework, community engagement, enforcement of development control or punishment of defaulters, budget allocation, safety and security and so on. Similarly, sectors might be new development, historic settlements, peripheral sprawl areas, revitalization of the district or neighborhoods, or provisions of public facilities such as pedestrian friendly street network, public open spaces, sport facilities, etc.

Module: Discussion on possible sites, issues and detailing of the project for group exercise (D4M2)

After filling up of this matrix with all participants' view one can easily find the out the area and issues expressed by majority of them. Accordingly, the sector and issues can be identified and refine further for group exercise.

Again, the site for group exercise will be a new one and that site may not have all the issues expressed by participants. The new site might have additional different issues, which are also to be incorporated while designing project for group exercise.

While dividing the participants for group exercise, ensure that each group is balanced in terms of gender and educational and institutional background.

Possible projects for group exercise might be of different natures: (a) Master layout plan preparation of any proposed land pooled area, (b) pedestrianization of mixed use area (existing one) through improvement of footpaths, instalment of street furniture and public amenities (street lighting, dust bins, signage, street marking, etc.), (c) development of public open spaces by improving linkages, linking with surrounding buildings (especially ground floor uses), providing public amenities such as drinking water, public toilet, furniture and other activities to engage people of different age groups, and (d) identification of salient features, heritage values of historic districts (neighborhoods) and formulation of urban design guidelines along with incentive mechanism for conservation of townscape.

Day 5: Site visit and group discussion

Module: Site visit and discussion (D5M1)

Observe the existing conditions of public realm such as open spaces, street network, spaces between buildings, façade of the building, linkages to ground floor of the buildings from foot path and so on and note down in the paper. In order to understand the issues, problems and salient features of the settlements (neighborhoods) cross section of the areas covering buildings and streets (and open spaces) might be required.

Collected information will be discussed in the group to identify the salient features, problems, issues, strengths and weaknesses.

Always link the existing situation with planning and design principles and legislations and then identify numerous strengths and weaknesses of the study areas. Those strengths and weaknesses can be related with institutional framework to check its effectiveness and capabilities.

Module: Group exercise and discussion (D5M2)

Participants can choose their convenient way for discussion based on the nature of the projects and issues identified. Each of them can separately work out and later on combined into one. Another way of carrying out discussion is to brainstorm on each issues among the group members and then come to consensus.

Class lectures might not be adequate to address various site specific issues. Hence, the tutor should provide extra information and knowledge during group exercise. Sometimes, short lectures might also be required so that the participants can further enhance their knowledge and skills and ultimately the confidence level.

Each group will prepare presentation materials in a sequential way, covering contextual background, major issues and problems, causes of the problems, findings and then solutions. However, media of presentation is up to each group.

Day 7: Presentation and evaluation

Module: Group presentation and discussion (D7M1)

One or two persons will present the outcome of the group exercise to all the participants. While making presentation, emphasis will be given to analysis and finding parts rather than existing situation. At least one person from each group will make short comments or questions in each presentation for active participation.

Also, from the participants, at least two rapporteur can be appointed to take note of discussion during presentation.

At the end of the all presentation, the assigned rapporteurs can summarize the discussion. The tutor can add issues not covered and overall review of the exercise.

Module Evaluation, post-test and closing (D7M2)

Closing session can be formal program with distribution of certification and speech by various dignitaries. Nonetheless, some participants should also be allowed to share their learnings during the training programs and areas needed for improvement in future activities.

The post-training questionnaires can be distributed and give some fixed time to complete it. This can be done before starting formal closing session.

Group photo and collection of contact number and email is also necessary for sharing information in future.

Reading reference materials

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- Slusser, M. S. (1982). *Nepal Mandala, Vol. I*, New Jersey, Princeton University Press.

मूल्याङ्कनका औजारहरु



स्थानीय विकास प्रशिक्षण प्रतिष्ठान

(स्थानीय विकास प्रशिक्षण प्रतिष्ठान रेस. २०८४ बाटा स्थापित)
Local Development Training Academy
(Established by Local Development Training Academy Act, 2049)

"An Autonomous, Professional, Client Centered, Gender Responsive National Institute of Excellence in the area of Local-Self Governance."

LDTA >>>



नेपाल सरकार

सड़कीय मामिला तथा सामान्य प्रशासन मन्त्रालय

Training on Urban Design

प्रशिक्षण पुर्व / पश्चात जानकारी

सहभागी विवरण

नाम :

संस्था :

पद :

जिल्ला :

अन्य विवरण

क. लिङ्ग :

ख. उमेर:

ग. जाती(Ethnicity) :

घ. शिक्षा:

Put the (X) mark for appropriate answer.

1. How do you understand the term ‘Urban design’?

- [a] Urban design bridges architecture and planning
- [b] Urban design is designing cities without designing buildings
- [c] Urban design gives priority to people
- [d] All of them

2. refers to number of people in an urban area per sq. km.

- [a] Citification
- [b] Urban population
- [c] Urban density
- [d] Urbanism

3. A scientific distinction between rural and urban community can be made on the basis of

- [a] Population density
- [b] Area covered
- [c] Citizens' occupation
- [d] None of the above

4. Why residential buildings are being converted into schools, training centre, nursing homes and so on?

- [a] Functional use
- [b] High profit
- [c] Poor enforcement of building byelaws
- [d] None of them

5. Which development can be considered as successful urban design example in Nepal?

- [a] Land pooled area
- [b] Haphazardly growth city peripheral area
- [c] Historic core area developed during Malla period
- [d] None of them

6. Which activities are responsible for increasing disaster risk in municipalities?"

- [a] Haphazard digging off road
- [b] Construction of buildings near river edges
- [c] Haphazard extension of floors on the existing buildings
- [d] All of them

7. What makes huge destruction of houses in the rural region of Nepal in 2015 Gorkha earthquake?

- [a] Rural climate
- [b] Poor building material and construction
- [c] Joint family
- [d] Agriculture and livestock

8. Why newly built houses do not respect the traditional architectural characters?

- [a] Poor awareness
- [b] Lack of incentives
- [c] Unavailability of traditional materials and workmanship
- [d] All of them

9. Which statement is correct for squatter settlements?

- [a] Poor living condition
- [b] Illegal occupation without land ownership
- [c] Single family
- [d] Poor working labors

10. What is the implication of developing local road network haphazard using bull dozer without any scientific study?

- [a] Risk of land slide
- [b] Risk of vehicular accident
- [c] High cost of construction
- [d] All of them

11. What are the salient features of livable and smart city?

- [a] Pedestrian friendly neighborhood
- [b] Safer and secure living
- [c] Affordable and accessible facilities
- [d] All of above

12. What is the biggest weakness of building byelaws in managing urban growth?

- [a] It regulates only individual building
- [b] It controls building height and set back
- [c] It controls ground coverage
- [d] None of above

13. Why majority of general people tend to ignore the prevailing building byelaws in Kathmandu valley?

- [a] Lack of education
- [b] Impractical clauses
- [c] Negative control
- [d] All of them

14. Why MM21 in Yokohama and Batter Park City in New York are considered as successful?

- [a] Planned by Urban Designer
- [b] Priority on public spaces and pedestrianization
- [c] Allocation of adequate public parks, open spaces and facilities
- [d] All of them

15. How land pooling project in Nepal can be improved for better outcome?

- [a] Improving master layout plan
- [b] Consultation with experts
- [c] Engaging public utility providing agencies
- [d] All of them

16. What is lacking in the present practice of Land pooling process in Nepal?
[a] Participation of land owners [b] Survey of the land [c] Re-plotting of the area [d] Sharing of development gain among participating agencies
17. How communities can be made safe and resilience?
[a] Raising awareness [b] Following National Building Code in building construction [c] Improving livelihoods and income generation [d] All of them
18. What was the biggest weakness in post-earthquake housing reconstruction in rural part of Nepal?
[a] Failure to acknowledge housing typology, socialization space and vernacular architecture of pre-earthquake period [b] Self-help support during construction time [c] Grant money [d] Masons' training work
19. How safer land development, new building construction and retrofitting of the existing building stocks can be achieved at municipal level?
[a] Stockpiling of rescue and relief materials [b] Rapid urbanization [c] Haphazard digging of roads [d] Provision of incentive mechanism
20. Public infrastructure design such as pond revitalization and public rest house design has multiple options prepared by different architects and engineers. In such a situation, how to achieve the best design?
[a] Engaging urban designer [b] Carrying out contextual study [c] Identifying planning and design goals [d] All of them
21. How development of viable municipal infrastructure can be financed from alternate source?
[a] Taking loan from commercial banks [b] Transferring budget from municipal other sources [c] Taking support (loan and grants) from Town development fund (debt financing) [d] None of above
22. This training is most useful for carrying out:
[a] Cost estimate of road pavement [b] Supervision of private house construction [c] Preparation of ward level projects [d] None of above

अर्वन डिजाइन (Urban Design) प्रशिक्षण

दैनिक पृष्ठपोषण फाराम (.....दिन)

नाम:

मिति:

१. आजका प्रशिक्षण सत्रहरुबाट के के सिकाईहरु भयो ?

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२. तपाईंती सिकाईहरुलाई कसरी प्रयोग गर्नु हुन्छ ?

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३. प्रशिक्षणलाई अङ्ग प्रभावकारी बनाउन के गर्नु पर्ला ?

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अर्वन डिजाइन (Urban Design) प्रशिक्षण

प्रशिक्षण अन्तिम मूल्यांकन फाराम

प्रशिक्षणको नाम:

प्रशिक्षण मिति:

कृपया तलका प्रश्नहरुमा आफुलाई उपयुक्त लागेको विकल्पमा चिन्ह लगाउनु होस्।

१. यस प्रशिक्षणलाई तपाईं कसरी मूल्यांकन गर्नुहुन्छ ?

- (क) उत्कृष्ट (ख) ज्यादै राम्रो (ग) राम्रो (घ) ठिकै (ङ) सुधार गर्नुपर्ने

टिप्पणी/सुझाव
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२. सहजकर्ताहरुलाई तपाईं कसरी मूल्यांकन गर्नुहुन्छ ? (विषयवस्तुको ज्ञान, संचार क्षमता, प्रस्तुतीकरण शैली आदि)

- (क) उत्कृष्ट (ख) ज्यादै राम्रो (ग) राम्रो (घ) ठिकै (ङ) सुधार गर्नुपर्ने

टिप्पणी/सुझाव
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३. प्रशिक्षणका विषयवस्तु तपाईंलाई कस्तो लाग्यो ? (कामसँग सम्बन्धी र उपयोगी, ज्ञानमा वृद्धि, सीप र दक्षताको विकासमा सहयोगी आदि)

- (क) उत्कृष्ट (ख) ज्यादै राम्रो (ग) राम्रो (घ) ठिकै (ङ) सुधार गर्नुपर्ने

टिप्पणी/सुझाव
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४. प्रशिक्षणमा प्रयोग भएका प्रशिक्षण विधि तपाईंलाई कस्तो लाग्यो ? (विषयवस्तु बुझनका लागि सहयोगी आदि)

- (क) उत्कृष्ट (ख) ज्यादै राम्रो (ग) राम्रो (घ) ठिकै (ङ) सुधार गर्नुपर्ने

टिप्पणी/सुझाव
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५. प्रशिक्षणमा उपलब्ध गराइएका पाठ्य सामाग्री / सन्दर्भ सामाग्री तपाईंलाई कस्तो लाग्यो ? (विषयवस्तु बुझनका लागि सहयोगी, भावी प्रयोजनका लागि उपयुक्त आदि)

- (क) उत्कृष्ट (ख) ज्यादै राम्रो (ग) राम्रो (घ) ठिकै (ङ) सुधार गर्नुपर्ने

टिप्पणी/सुझाव
.....
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स्थानीय तहको क्षमता अभिवृद्धिका लागि तयार पारिएका प्रशिक्षण सामग्री

मोड्युल ११	भवन निर्माण मापदण्ड तथा भवन संहिता
मोड्युल १२	आगलागी र अग्नी नियन्त्रण उपकरण सञ्चालन
मोड्युल १३	फोहोरमैला व्यवस्थापन तथा वातावरण व्यवस्थापन
मोड्युल १४	जग्गा नापजाँच
मोड्युल १५	हरित आवास
मोड्युल १६	सडक ठेगाना र भौगोलिक सूचना प्रणाली
मोड्युल १७	एकीकृत स्थानीय विकास योजना प्रणाली
मोड्युल १८	Urban Design (अर्वन डिजाइन)
मोड्युल १९	सूचना र संचार प्रविधि
मोड्युल २०	पूर्वाधार निर्माण
मोड्युल २१	चट्ट्याङ्ग र विद्युतीय निरीक्षण



नेपाल सरकार

सङघीय मामिला तथा सामान्य प्रशासन मन्त्रालय



स्थानीय विकास प्रशिक्षण प्रतिष्ठान
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National Centre
of Excellence in
the area of Local-
Self Governance."
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